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Evaluating the effect of earthquake components on the space roofs

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Abstract: Space structures are widely used in covering the large spans. Similar space structures are largely used in the lattice space structures. Space roof is one of the most common types of space structures. Moreover, evaluating the effect of earthquake on the behavior of space structures has always been a significant and notable issue for the researchers. In this paper, the effect of horizontal, vertical and both horizontal and vertical components of three famous earthquakes, TABAS, KOBE and DUZCE, on a space roof is studied and the rates of buckling and vertical and horizontal displacement are investigated in four areas. The results of research have indicated that the displacement of the whole structure and the number of buckling items are higher in 62 percent of models, undergoing both horizontal and vertical earthquakes, than the models, undergoing just the horizontal earthquake, and these values have been reduced in 21 percent of models and 17% of models have had no buckling.

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Keywords: Space structures, roof structures, horizontal earthquake, vertical earthquake

1) Introduction

Space structure means the structure which has the three-dimensional behavior so that its general behavior cannot be estimated by one or more two-dimensional independent sets (Ishikawa, 1993). Nowadays, new needs and demands in the field of structural engineering have been occurred by the advancement of science and technology. Time factor in building the structures has been so important, thus the tendency towards the prefabricated structures has been increased. Moreover, the tendency to large areas with no intermediate columns has been enhanced due to the increased population of societies. In this regard, since the early current century a number of experts have been fascinated by the unique capabilities of space structures and have sought the response of many new requirements in these structures, thus they have achieved very positive results. There are several examples of space structures, which have been built in the world and Iran including: the sport stadiums, cultural centers, community halls, shopping malls, train stations, hangars, recreational centers, radio towers, and… (Chiwiacowsky, 2008) Space structures are classified into three major groups as follows.

A - Flat networks

It is the combination of tetrahedral or polyhedral system with the layers of network unit. Flat network is composed of a dual-layer system which is connected to the unit beams. Flat networks can have one, two, three or even multiple layers, but are widely used as a dual-layer unit (Saka, 1997). Dual-layer networks are composed of two parallel networks plates which are connected to each other by several elements. When the items in a two-layer network are elongated, the three-layer networks are used in order to prevent the risk of buckling, and since a half of space structures costs belongs to the jointers (Chen, 2005), this type of structures is often non-economic. Another point, which should be considered in designing the two-layer networks and most of the space structures, is to provide a better distribution of force and making it tensile by building the columns within the network and connecting the column to multiple nodes, and it is better to build it around the console for creating a regular force distribution (Sokol, 2002).

B: Barrel Vault

Barrel Vault is a network which has the curvature in one direction. These structures have been used for

covering the rectangular corridor surfaces and are sometimes without the columns and are placed on the edges attached to the support. Barrel Vaults have the axis (Saka, 1997). If the Barrel Vault has just a layer, the connections are rigid. Barrel Vaults are often connected to each other and the horizontal beam has a role to attach the Barrel Vaults to each other. The point, which should be considered in designing this type of structure, is that the end of Barrel Vault should be reinforced and this reinforcement can be achieved by the beam, beam and column, and the sun-shaped form.

C: Domes

If a network has the curvature in two directions, it is called the Dome (Specifications for the Design and Construction of Space Trusses, 2001). Probably, the covering of a dome is a part of a sphere or a cone or the connection of several coverings. Domes are structures with high rigidity and are used for very large spans until approximately 250 meters. Dome height should be higher than 15% of dome base diameter.

Appropriate design of each structure requires the accurate prediction of forces which will be imposed the structure (Sadeghi, 2003). The force of earthquake is among these forces. Numerous regulations have provided several approximate correlations which estimate the equivalent earthquake force for building structures (Shear Frames). Using these correlations are based on simplifying assumptions, which according to the geometric structure and structural behavior of space structures are not useful for these structures. Given the widespread application of space structures it seems that the prediction of dynamic behavior of structure is so important due to the high volume of data needed for structure analysis, wide volume of calculations in the structure analysis, evaluating the behavior of structure before building it, making the physical models for investigating the structures behavior, and creating the appropriate view for the designers (Khabbazan, 1989, Anekwe, 1984).

Several researchers have proposed the scientific contents in the field of evaluating the effect of earthquake components. For example

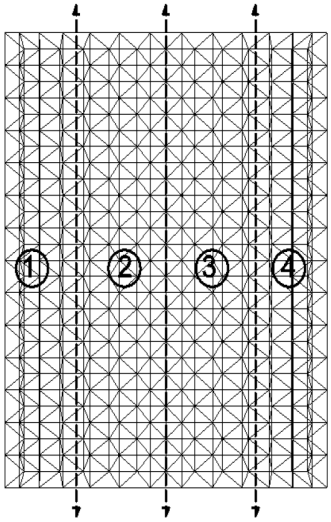
Shin,et.al (2012) studied on seismic behavior of double-layer barrel vault systems with different open angles and the models had maximum values at the 1/4 and 3/4 nodes, while having relatively smaller responses at the center node from horizontal earthquakes. It is believed that the barrel vault model with an open angle of 90 degrees has the most advantageous shape for model.

Khabbazan (1989) used Renecture Method for Analysis of Space Frame. This method usefuland simple to calculate space frame strength. Anekwe (1984) Reducation Method of Analysis for Dense Space Structure in his study.

Accordingly, the main objective of this paper is to evaluate the effects of horizontal and vertical earthquakes on the space roof. In this regard, three earthquakes of TABAS, KOBE and DUZCE are studied and the impact of these earthquakes on a space roof was investigated.

2) Research Methodology

In this study, the space roof was studied as shown in Figure (1). In this regard, as it is shown in Figure 1, the target barrel vaults were classified into four equal parts and each part was numbered and the impact of each studied earthquake on it was presented in order to determine the location of buckling items in the barrel vault.



Form 1: Schematic design of studied space structure

In this research, the following accelerographs have been used and selected from the available databases about the earthquake due to the high PGA. Table (1) represents the information about the selected earthquakes which have been used in the seismic analysis.

Table 1: Horizontal and vertical components of three studied earthquakes

Earthquake	Parameter	(H)	(V)
KOBE,Japan,1995	HP (Hz)	0.05	0.05
	LP (Hz)	Null	null
	PGA (g)	0.821	0.343
	PGV (cm/s)	81.3	38.3
	PGD (cm)	17.68	10.29
TABAS,Iran,1987	HP (Hz)	0.05	0.05
	LP (Hz)	null	null
	PGA (g)	0.852	0.688
	PGV (cm/s)	121.4	98.03
	PGD (cm)	94.58	76.37
DUZCE,Turkey,1999	HP (Hz)	0.15	0.06
	LP (Hz)	50	50
	PGA (g)	0.97	0.193
	PGV (cm/s)	36.5	9.5
	PGD (cm)	5.48	6.2

3) Research Results

The elements of COMBIN39 and MASS21 have been used in order to define the nonlinear geometric and material abilities for dynamic analysis in ANSYS. The items of target space structure models were investigated with the thinness coefficients 100 and then the post-buckling for desired thinness was calculated according to the formula (1) which was introduced by Mr. Kato and Ishikawa.

$$\left(\frac{\sigma}{\sigma y}\right)^2 + 3.476\left(\frac{\sigma}{\sigma y}\right) - 11.62\left(\frac{\varepsilon}{\varepsilon y}\right)\left(\frac{\sigma}{\sigma y}\right) + 2.10\left(\frac{\varepsilon}{\varepsilon y}\right) - .09241\left(\frac{\varepsilon}{\varepsilon y}\right)^2 + 1.189 = 0 \quad (1)$$

Because the structure enters the nonlinear field (item) at the time of earthquake, the geometric nonlinear and materials behavior have been applied for the structure. After defining the post- buckling diagrams with thinness 100 for the mentioned models, these models were faced with the earthquake TABAS (Iran) for 19.5 seconds, earthquake KOBE (Japan) for 18 seconds and earthquake Duzce (Turkey) for 18.5 seconds in horizontal, vertical and both directions and the seismic behavior of target barrel vaults was studied. The results can be observed in Tables (2) to (4).

Table (2): Information of models after dynamic analysis under the earthquake TABAS

TABAS Earthquake					
Name of Model	Dx (m)	Dy (m)	t_0	x_0	N
BA15-H	0.02299	0.10088	4.23	2-3	25
BA15-V	0.00102	0.00102	---	---	---
BA15-HV	0.02183	0.18818	4.23	2-3	25
BA30-H	0.05859	0.04530	4.07	4	38
BA30-V	0.00039	0.01649	---	---	---

Table (3): Information of models after dynamic analysis under the earthquake KOBE

KOBE Earthquake					
Name of Model	Dx (m)	Dy (m)	t_0	x_0	N
BA15-H	0.00414	0.00762	---	---	---
BA15-V	0.00663	0.00798	---	---	---
BA15-HV	0.00465	0.00877	---	---	---
BA30-H	0.14841	0.12028	2.11	1	191
BA30-V	0.00000	0.00873	-		
BA30-HV	0.17654	0.14162	2.10	1	151
BA45-H	0.95642	0.49664	2.19	3	89
BA45-V	0.01106	0.01892	-		
BA45-HV	1.07670	0.57036	2.23	3	109
BB15-H	0.00456	0.00857	---	---	---
BB15-V	0.00093	0.00090	---	---	---
BB15-HV	0.00456	0.00456	---	---	---
BB30-H	0.06218	0.05093	2.95	1	62
BB30-V	0.00000	0.00960	---	---	---
BB30-HV	0.06392	0.05209	2.93	1	56
BB45-H	0.01765	0.04326	5.10	2-3	52
BB45-V	0.01310	0.02221	---	---	---
BB45-HV	0.01930	0.04753	5.08		66

Table (4): Information of models after dynamic analysis under the earthquake DUZCE

DUZCE Earthquake					
Name of Model	Dx (m)	Dy (m)	t_0	x_0	N
BA15-H	0.01135	0.02018	---	---	---
BA15-V	0.00081	0.00825	---	---	---
BA15-HV	0.01145	0.02018	---	---	---
BA30-H	0.35793	0.30264	2.0564	1	186
BA30-V	0.00000	0.00883	---	---	---
BA30-HV	2.74510	0.23183	2.0564	1	215
BA45-H	0.51701	0.01853	---	---	---
BA45-V	0.01077	0.01833	---	---	---
BA45-HV	0.05199	0.01727	---	---	---
BB15-H	0.00679	0.01232	---	---	---
BB15-V	0.00096	0.00094	---	---	---
BB15-HV	0.00673	0.01193	---	---	---
BB30-H	0.06916	0.05519	1.5132	4	106
BB30-V	0.00000	0.00977	---	---	---
BB30-HV	0.06829	0.05704	1.5132	4	97
BB45-H	0.03783	0.12222	1.6296	2-3	125
BB45-V	0.02609	0.02153	---	---	---
BB45-HV	0.01154	0.12222	1.6296	3	117

4) Conclusion and Discussion

In this paper, the horizontal, vertical components of three earthquakes, TABAS, KOBE and DUZCE, on a space roof are studied. The results of research have indicated that the displacement of the whole structure and the number of buckling items are higher in 62 percent of models, undergoing both horizontal and vertical earthquakes, than the models, undergoing just the horizontal earthquake, and these values have been reduced in 21 percent of models and 17% of models have had no buckling. The outbreak time of the first buckling is not different in the models with horizontal and both horizontal and vertical earthquakes. The mutation of barrel vaults node displacement has been intensified in the earthquakes which enter the structure both horizontally and vertically. By increasing the height of span, the outbreak time of the first buckling has been reduced according to the studied earthquakes and the number of buckling items has been severely reduced and no buckling have been occurred in most of the cases for the barrel vaults with height of span 0.15.

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Critical thinking dispositions among junior, senior and graduate nursing students in Iran

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Abstract: The purpose of this study was to comparison the critical thinking skills in junior , senior and graduate nursing students of Zahedan University of Medical Sciences . In this study the clinical skill level of 120 junior and senior nursing students and clinical nurses in 2010 was determined using the random sampling method. Data was collected by Watson questionnaire(WGCTA) and analyzed using t-test, and analysis of variance with Scheffe's test. Result showed significant difference between mean scores of all critical thinking skills in the three groups ($p = 0.006$), so that critical thinking ability of senior students was more than junior students and the ability of critical thinking in clinical nursing students had been lower than the seniors. According to the findings of the study, it can be stated that although critical thinking is important in clinical judgments and decisions but during the training period, have had no significant development therefore the traditional education system needs evolution and revision in order to realize training purposes in line with fostering creative and efficient students.

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Key words: Critical Thinking, Nursing Students, Graduate Nursing Students, Iran

Introduction:

Concern for patient safety has grown worldwide as high rates of error and injury continue to be reported. A recent Commonwealth Fund international survey of six nations showed that between one-quarter and one-third of patients with health problems experienced medical, medication, or testing errors. A number of countries, including the United States of America, Australia, Canada, Germany, New Zealand and the United Kingdom, have identified a need for improvement in the coordination and delivery of care [1] and a reduction in preventable medical errors [2]. Patient safety can be directly affected by the critical thinking ability of a nurse. Nurses must have the ability to recognize changes in patient condition, perform independent nursing interventions, anticipate orders and prioritize [3]. These actions require critical thinking ability, advanced problem-solving skills and the ability to communicate clearly [4]. Using root cause analysis, the Joint Commission on the Accreditation of Healthcare Organizational Standards (JCAHO) identified orientation, training, and competence assessment as top factors contributing to patient safety errors over the past 10 years It is expected from nursing graduates to have critical thinking skills, so that, on the basis of which they can make appropriate decision in clinical settings [5]. Therefore, since the researcher have had the inference, during few years of experience and working with nursing students and internship in this field, that higher semester students have failed to reach the basic level of critical thinking in nursing that is a certain learning and giving correct answers in any form and having a reason for every action; therefore, this study was conducted to evaluate this skill so that the results of the study be considered by training managers to address educational deficiencies and to reinforce the strength points.

Material and Methods:

Study design

This descriptive cross-sectional study was undertaken to assess the level of critical thinking skills of junior and senior nursing students and clinical nurses of Zahedan University of Medical Sciences in 2010.The survey was conducted from October 25 to December 3,2010.

Participants and settings

In this study, 120 participants, Including all junior and senior nursing students (90) and clinical nurses that graduate from Nursing and Midwifery Faculty of Zahedan University of Medical Sciences. (30), which were selected using random stratified approach, were studied.

The criteria for exclusion of subjects in this study in the group of students was determined to be occupation of student with nursing, being transferred or guest for students or guests, and having another university degree and in nurses' group was enjoyment of nurse of nursing experience, the history of nurses participation in the workshop of critical thinking a the working history of less than two years.

Measurements and variables

To assess the students' and clinical nurses' critical thinking ability, Watson-Glaser Critical Thinking Appraisal (WGCTA) Form A was used. The first part of the questionnaire is about the demographic characteristics(age, sex, Materials status)and the second part contains 80 questions in five sections including inference, recognition of assumption, deduction, interpretation, and Evaluation of argument. In the inference section, the data is obtained through identifying the correctness or incorrectness of expressions, in the recognition of assumption section, by diagnosis of presence or absence of assumptions in the mentioned expressions, in the deduction section by specifying of extracted or non-extracted results from situations, in the section for ability to interpret and clarify by specifying the extracted or non-extracted interpretations of biographies and finally, in Evaluation of argument' section by detection of strong and weak evidences. WGCTA is scored for only correct answer .Each correct answer receives 1 point, resulting in a total subscale score of 16.The total critical thinking score is a summation of the 5 subscale scores to give a maximum of 80. Duration of responding to the questionnaire was 60 minutes that the samples completed the questionnaire in the presence of the researcher.

Validity and reliability of the tools, conducted inside and outside the country, have been confirmed (Cronbach' s α coefficient of 0.82 in this study).

Statistical analysis

Statistical Package for the Social Sciences (SPSS) 19.0 for windows was used for statistical analysis. Frequencies and percentage were used for the analysis of general characteristics, and the mean score and standard deviation (SDs) were calculated for the analysis of the students' critical thinking skills. The scores of critical thinking skills among 3 group were compared using Analysis of Variance (ANOVA) techniques, Scheffe' s multiple comparison for continuous variables. The level of significance was set at p< .o5.

Ethical consideration

Approval for the research was obtained from Zahedan University of Medical Science Ethical Committee . All participants were briefed on the purpose of the study and were given a complete guarantee of confidentiality and the option of voluntary withdrawal from the study any time. The privacy of the participants was protected by keeping the questionnaires in confidence and in the possession of the investigator only.

Results:

Sample Characteristics

Table 1 shows the demographic characteristics of participants. The mean age was 26.7 years and range of participants was between 18-36 years. 75% of the participants of the study were female and 25 percent were male. 71.6 percent of participants were single and 28.4 percent were married. The respondents were classified by age in to 3 group:≤ 23 years,24-29, and ≥ 30.Those aged 24-29 constituted the largest portion (47.50%).

Comparison of Critical Thinking Skill among Nursing student and graduate nurses

The overall critical thinking skill scores and all subscale scores for 3 group are presented in Table 2.

Regarding the overall goal of studying the critical thinking ability in three groups, the results showed that fourth-year students had the highest average (M= 42. 80) and first- year students had the lowest average (M= 39) that showed a significant difference in the score of the three groups in this section (p= 0. 006) so that the average score for first-year students to think critically had been so lower compared with the fourth-year students (p= 0.004).

The mean score of points of the ability to Inference in first-year nursing students was 4. 79 and clinical nurses was 4.16, that were respectively the highest and lowest scores in this section. For comparing the groups' mean in this section, ANOVA test was used that did not reveal any significant difference in this regard.

The average score of the last-year students in part of recognition of assumption had been higher than the two other groups (9. 73). Results showed that between the mean of the three groups there is a statistically significant difference does and Scheffe' s test , as well, detected the difference between the average of points of the ability to detect Recognition of assumption in the group of clinical nurses and last-year students, so that

the mean and point of nurses ability in the field of detecting the Recognition of assumption had been significantly lower compared with the last-year students (p=0.02). regarding the ability to deductive of the studied groups the average score of clinical nurses in this section had been more than the other two groups. However, the results of ANOVA showed no significant differences compared with the other two groups (p=0.1). fourth-year and first-year students had respectively allocated the highest (11.4) and the lowest (9.65) average score in section of interpretation and Scheffe' s test results showed the difference between fourth-year and first-year students so that the average score of the first year nursing students' ability to interpret had been significantly less compared with the fourth-year students (p= 0.006). Another finding of this study was the weakness of first-year students in the evaluation of argument ability compared with the other two groups. Moreover, clinical nurses also gained the highest score in the group (9. 10). According to ANOVA test results between the three groups, in terms of evaluation of argument ability, there was a statistically significant difference and the difference had been between the group of clinical nurses and last-year nursing students, in a way that the mean score of evaluation of argument ability for first-year students had been significantly lower compared with the other groups (p= 0.008). Moreover, Average of scores' difference in this section in these two groups, i.e., in the first and fourth year students was also significant (p= 0. 009).

Discussion:

In this study, the first and fourth year students' and clinical nurses' critical thinking ability was studied. Findings indicated that the critical thinking skill of nursing students and clinical nurses in Zahedan have had a mean scores ranging from 39 to 42 and students obtained nearly 50 percent of the total test score (80 points). Shin, in his study, which had been conducted using Watson - Glaser tool, reported the average score of critical thinking for students studying in nursing associate degree courses to be 41.98 and bachelor students to be 47.22 [6]. Other studies indicate that no difference was observed in critical thinking skills [7] and critical thinking skill of nursing students in different countries had been different [8,9]. Islami et al in their study reported the nursing students' critical thinking scores assessed with these tools to be 45.6± 5.3 for the first year and 46.5 ± 5.6 for the last year. Clinical nurses mean scores in this study have been estimated to be 40.8 ± 7.8 [10]. It seems that the scores obtained from this study are lower than those of foreign students and students of Tehran nursing faculties. In a study which was conducted on the bachelor's students using the California B tool, the mean score obtained from the total 34 points of the questionnaire was lower than 14 scores, indeed, students obtained 32.40% of the scores [11]. To the researchers, learning in the educational system of the country, at the primary and higher education levels, takes place at the initial cognitive levels and higher levels such as analysis or synthesis, and evaluation are less addressed. In fact, less attention is paid to the growth of the critical thinking power. Sullivan et al state that only 20 percent of the bachelor's degree nursing programs meet the needs of critical thinking [12], other studies also indicate that general skills of critical thinking are taught to nursing students, but they do not use the skills to solve problems and nursing faculties had not been successful in terms of the training of problem solving and decision-making process [13]. Lwitze's results also showed that the one third of students is lacking the critical thinking skills [14). However, in the present study, fourth-year students revealed higher rate of utilization of critical thinking compared with the first year students and clinical nurses and their mean score had been significantly higher than the other two groups, which is consistent with the results obtained by Baba Mohammadi in Semnan, and Hosseini in Isfahan that conducted their study on the first and last year nursing students [15, 16]The results of similar conducted studies show the lack of difference and changing of the bachelor-degree nursing students' critical thinking despite passing the training units [11, 14 – 17]. Considering that the test of critical thinking is based on the problem-solving process and the nursing process in the defined problem solving stages the use of which is emphasized in nursing education programs. So, it is expected that the scores of students' critical thinking test to be different in the beginning of their arrival to the learning environment up to the end of it that the results of the study are in line with the above reasoning, although this change is not acceptable in comparison with other students inside and outside the country. Experts proposes main and serious obstacle in the development of critical thinking, one of which is the predominant use of traditional teaching methods in the current education system which is preventing from the development of decision making and troubleshooting (or problem solving) skills in the learners and as a result limits the opportunities for students' critical thinking [2]. by an optimistic view of the results of the research regarding the differences seen in the first and fourth year students, one can attribute it to the positive effects of professional training of bachelor-courses in fostering the critical thinking as well as implicit training and records and troubleshooting (or problem solving) skills and decision making of students. It must be acknowledged that the transfer of knowledge and skills of mental – motor skills from the environment of the classroom to the clinical environment and its application need critical thinking skill and clinical judgment. But,

how can the nursing faculties design the nursing education programs to promote critical thinking, needs further research. In this study, the ability of critical thinking in clinical nursing who were enjoying the professional experience was significantly less than the fourth-year students. Skills of nursing students in Japan have been reported to be higher than the graduates [18]. In Islami' s study, as well, the ability of critical thinking in clinical nurses reported to be significantly less than students [11]. Likewise, the results of Sullivan studies revealed the lack of sufficient competency in critical thinking, judgment and decision making of nurses [12], but the other studies' results show that the critical thinking and decision making of nurses increases with clinical expertise and clinical skill [19, 20 and 21].

among the possible causes which are worth mentioning regarding the weakness in the ability of critical thinking in nurses, one can points out such factors as the lack of professional autonomy of nurses, the lack of explicitness of professional position of the class in the health care system, taking course of actions based on the superiors' decision, and the lack of use of the nursing process in taking care of the patient. Experts believe that the ability to foster the critical thinking ability and its application by nurses requires professional autonomy so that the nurses would be able to independently make decisions and solve problems and thus find the opportunity to improve their intellectual ability and cognitive skills [11] .The results of the present study can be a reflection of the current situation of the ability of critical thinking of students and clinical nurses. it seems that employing the active and creative teaching methods of designing the questions that evaluate students' high levels of cognitive domain, using the nursing process in clinical environment and creating an educational setting that provide the psychological security and intellectual freedom of students is one of the issues that should be considered by educational planners.

Conclusion:

The results of this study showed that fourth-year nursing students' critical thinking ability had been significantly higher than first- year nursing students, but the level of this skill had been lower in comparison with other studies inside and outside the country and has had no considerable growth. It seems that the effective strategies to improve critical thinking skills, as expected, are not used in training programs and traditional system of education needs evolution and revision for realizing the educational purposes in order to foster students efficient students.

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Table 1: General Characteristic (n=120)

Characteristics	Junior(n=30) n(%)	Senior(n=60) n(%)	graduate(n=30) n(%)	Total (N=120) n(%)
Age (yr)				
18-23	90.0	3.30	3.30	25.0
24-29	6.70	88.40	6.70	47.50
30-36	3.30	8.30	90.0	27.50
Gender				
Female	62.1	78.7	80.0	75.0
Male	37.9	21.3	20.0	25.0
Materials status				
Single	100.0	86.9	10	71.6
Married	0	13.1	90	28.4

Table2: Critical Thinking Ability Among the Junior , senior Nursing student and graduated nurses (N=120)

Subscales	Junior (n=30) Mean (SD)	Senior (n=30) Mean (SD)	Graduated (n=30) Mean (SD)	p
Inference	4.79(1.31)	4.40(1.94)	4.16(1.94)	**0.4**
Recognition of assumption	8.68(2.97)	9.73(2.27)	8.46(1.69)	**0.02**
Deduction	8.13(1.40)	8.50(2.56)	9.23(1.50)	**0.1**
Interpretation	9.65(1.87)	11.04(2.04)	10.33(1.72)	**0.006**
Evaluation of argument	7.72(2.06)	9.09(2.11)	9.10(2.12)	**0.008**
Total	39(5.54)	42.80(5.37)	41.30(4.21)	**0.006**

Significant at the < 0.05 level

Association of secondary hyperparathyroidism with malnutrition and inflammation in maintenance hemodialysis patients

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ABSTRACT: This study conducted to found out the association of high PTH levels with various indices of malnutrition and inflammation in hemodialysis (HD) patients. Intact serurm PTH (iPTH) and serum C-reactive protein (CRP), serum calcium (Ca), phosphorus (P), Alkaline Phosphatase (ALP), serum cholesterol (chol) and serum triglyceride (TG) were measured. Total patients were 36 (f=15 m=21). The mean patient's age was 44(±17) years. The value of serum iPTH of all HD patients was 434+455 pg/mL, the value of serum iPTH of diabetic and non-diabctic dialysis patients were 201±277 and 537±483 pg/mL, respectively. In this study we found a significant positive correlation of serum iPTH with serum CRP, a significant inverse correlation of serum iPTH with BMI and a significant positive correlation of serum ALP with Logarithm of CRP. Also a significant positive correlation of serum phosphorus with serum CRP and a significant inverse correlation of serum phosphorus with BMI were found. When patients with iPTH below than 200 pg/mL were deleted, the correlation of iPTH with CRP became positive (r=0.42, p =0.085) and when patients with iPTH more than 500pg/mL were deleted, this correlation was found to be negative (r=-0.42, p:0.047), which means that a low iPTH value is an index of malnutrition while higher value is associated with inflammation. Further attention needs to better control of hyperphosphatemia and maintaining the iPTH levels l.5 times of normal to avoid the sides effects of secondary hyperparathyroidism.

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Keywords: secondary hyperparathyrcdisim, End stage, renal failure, nutritional status

Introduction

Among potential candidates for the high rate of hospitalization and mortality in maintenance hemodialysis (HD) patients, both protein-energy malnutrition (PEM) and inflammation continue to be at the top of the list (1-7). Epidemiological studies repeatedly and consistently have shown a strong association between clinical outcome and measures of both malnutrition (4-14), and inflammation in dialysis patients (9-17). Moreover, many investigators have observed that these two conditions tend to occur concurrently and coexist in individuals with end-stage renal disease (ESRD), and many factors that engender one of these conditions also lead to the other (18-22). Therefore, the terms malnutrition-inflammation complex syndrome (MICS), or malnutrition, inflammation, and atherosclerosis syndrome have been proposed to indicate the combination of these two conditions in these patients (23-27). The MICS increasingly has become the main focus of attention of outcome research concerning maintenance dialysis patients (25-34). Indeed malnutrition is present to some extent in approximately 40% of chronic renal failure (CRF) patients on maintenance HD (28-38). Several markers of malnutrition such as low body mass index and low serum albumin have been associated with high morbidity and mortality rates in this group of patients (38-42). Malnutrition in these patients is considered to be due to anorexia with low food intake (30-34), to the loss of nutrients and catabolism during the dialysis procedure, intercurrent illnesses (30-43), metabolic acidosis (40-44), glucose intolerance, increased cytokine levels, and other hormonal derangements (40-47). Among these last disturbances, high parathyroid hormone (PTH) level, frequently observed in CRF patients may be implicated in the nutritional abnormalities found in these patients (48-56). In fact, it has been observed

that patients with primary hyperparathyroidism may show evidence of weight loss, weakness and muscle atrophy and negative nitrogen balance (57-63). In this regard few studies have analyzed the association of high PTH levels with body mass index as a marker of nutritional status and serum C reactive protein as a marker of inflammation to better found the association of high PTH levels with malnutrition-inflammation complex syndrome (MICS) (58-66). We therefore sought to study this adverse effect of secondary hyperparathyroidism (sHPTH) in a group of maintenance hemodialysis patients (MHPs) consisting of non-diabetic and diabetic patients.

Patients and methods

Patients

This cross-sectional study was conducted on patients with end-stage renal disease (ESRD), who were undergoing maintenance HD treatment. The etiologies of renal failure were different, containing mainly diabetic nephropathy, hypertension, various glomerular diseases, autosomal dominant poly cystic kidney disease (ADPKD) and also urinary tract infections (64-70). According to the severity of hyperparathyroidism, each patient being treated for sHPTH was given oral active vitamin D3 (Rocaltrol), calcium carbonate, and Rena-Gel capsules at various doses. According to the severity of anemia, patients were under IV iron therapy with Iron sucrose (venofer) at various doses after each dialysis session, all patients were under treatments of 6mg folic acid daily, 500mg L-Carnit hyperparathyroidism in daily, oral Vitamin B complex tablet daily and also 2000U W Eprex (recombinant human erythropoietin (rHuEPO) unique for each patient after each dialysis session routinely (71-73). Exclusion criteria were active or chronic infection. The study was done in the hemodialysis section of Shahrekord University of Medical Sciences in Shahrekord of Iran.

Laboratory methods

After an overnight fast, blood samples were obtained. Intact serum PTH (iPTH) was measured by the radioimmunoassay (RIA) method using DSL-8000 of USA (normal range of values is 10-65 pg/mL). Also peripheral venous blood samples were collected for biochemical analysis including serum predialysis creatinine (Creat), post and predialysis blood urea nitrogen (BUN), albumin (Alb) as well as serum C-reactive protein (CRP), serum calcium (Ca), phosphorus (P), Alkaline Phosphatase (ALP), serum cholesterol (Chol) and serum triglyceride (TG) were measured using standard kits. Body mass index (BMI) calculated using the standard formula (post dialyzed weight in kilograms/height in square meters ; kg/m^2). For the efficacy of hemodialysis the urea reduction rate (URR) was calculated from pre- and post-blood urea nitrogen (BUN) data (74). Duration and the amount of sessions of HD were calculated from the patients' records, The duration of each hemodialysis session was 4 hours. Statistical analysis: Results are expressed as the mean±SD and median values. Comparison between the groups was done using Student's t-test. Statistical correlations were assessed using partial correlation test. Statistical analysis was performed on total hemodialysis, females, males, diabetics and non diabetic populations separately. For some correlations the logarithm of some data were used too. All statistical analyses were performed rising SPSS (version 1 1.5.00). Statistical significance was determined at a $p<0.05$.

Results

Total patients were 36 (F: 15, M: 21), consisting of 25 (F: 1l , M:14) non-diabetic HD patients and 11 (F:4, M:7) diabetic HD patients. Table 1, 2 and 3 show the Mean ±SD, minimum and maximum and median of age, duration and sessions of HD and also laboratory results of all patients. The value of serum iPTH of total HD patients was 4J4±455 (median: 309) pg/mL, the value of serum iPTH of diabetic and non-diabetic HD patients were 201+277 (median:41) and 537+483(median:340)pg/mL respectively. In total HD patients a near significant positive correlation of serum iPTH with serum CRP (r=0.33, p=0.081) (adjusted for Ca, P, URR, DM, age, duration and sessions of dialysis) was seen, a significant inverse correlation of serum iPTH with BMI (r=-0.46, p=0.038) (adjusted for dialysis sessions) were seen. In total patients a near significant positive correlation of serum ALP with Logarithm of CRP (r=0.32, p=0.069) (adjusted for age, duration and sessions of dialysis) was found. In this group also a significant positive correlation of serum phosphorus with serum CRP (r=0.31, p=0.065) (adjusted for age duration & sessions of dialysis) and a significant inverse correlation of serum phosphorus with BMI (r=-0.31, p=0.042) (adjusted for dialysis sessions) were found too. Moreover in all patients a significant positive correlation of serum TG with BMI (r=0.43 p=0.012) (adjusted for age, duration and sessions of dialysis for correlations) was existed too. In all patients a significant inverse correlation of serum albumin with logarithm of CRP (r=-0.33, p=0.038) (adjusted for age, dialysis sessions and duration, serum Ca and P) was seen. In male HD patients there was a near significant positive correlation of serum albumin with BMI (r=0.99, p=0.063).

Table 1: Data of all HD patients

N=36	Minimum	Maximum	Mean±SD	Median
Age in years	16	80	44±16.5	43
DH+ months	2	156	30±36	17.5
Dialysis dose (cessions)	18	1584	285±396	144
URR%	39	75	53.5±9.8	57.5
Ca (mg/dL)	5	10	6.4±1.9	7.9
P (mg/dL)	3	10	6.4±1.9	6.2
ALP (IU/L)	175	5487	628±891	433
Alb g/dL	2.4	4.8	3.8±0.5	3.96
CRP (mg/dL)	3	40	8.7±6.7	8
iPHT pg/mL	16	1980	434±455	309
Chol (mg/dL)	59	211	117±38	115
TG (mg/dL)	29	461	130±96	95
BMI kg/m^2	16	34	22±4.4	21.5

Table 2: Data of non diabetic patients.

n=25	Minimum	Maximum	Mean±SD	Median
Age (years)	16	80	44±16.5	43
DH* (months)	2	156	40±40.8	22
Dialysis dose cessions	36	1584	370±452	156
URR%	60	76	61±7.5	60
Ca (mg/dL)	6	15	7.8±0.75	8
P (mg/dL)	4	10	606±1.8	6.5
ALP (IU/L)	190	5478	760±1044	478
Alb (g/dL)	2.4	4.7	3.8±0.5	4
CRP (mg/dL)	2	20	7.4±3.8	6
iPHT pg/ml	22	1980	537±483	340
Chol (mg/dL)	59	171	110±33	120
TG (mg/dL)	61	461	129±85	99
BMI(kg/m^2)	16	33	21±4.6	19

* Duration of hemodialysis

Table 3: Data of diabetic HD patients.

n=11	Minimum	Maximum	Mean±SD	Median
Age (years)	27	75	53±15.8	55
DH (months)	6	24	14.5±6	12
Dialysis (dose cessions)	54	216	123±54	108
URR%	39	75	53.5±9.85	54
Ca (mg/dL)	5	10	7.4±1.3	7.5
P (mg/dL)	3	10	5.9±2	6
ALP (IU/L)	175	584	327±148	295
Alb (g/dL)	3	4.8	3.8±0.5	3.9
CRP (mg/L)	4	40	12±10	10
iPHT (pg/mL)	16	840	201±277	41
Chol (mg/dL)	60	211	133±49	111
TG (mg/dL)	29	456	130±120	88
BMI (kg/m^2)	20	34	23.3±4	23

Discussion

In this study we found a near significant positive correlation of serum iPTH with serum CRP, a significant inverse correlation of serum iPTH with BMI and a near significant positive correlation of serum ALP with Logarithm of CRP. Also a significant positive correlation of serum phosphorus with serum CRP and also a significant inverse correlation of serum phosphorus with BMI were found. A significant inverse correlation of serum cholesterol with serum

phosphorus was seen. We also found a significant inverse correlation of serum albumin with logarithm of CRP. Moreover a significant positive correlation of serum albumin with BMI was observed, too. Serum albumin, cholesterol and also BMI are indexes of nutritional status in HD patients while serum CRP could show the inflammation status (5,9, 18-24). PTH has long been considered a uremic toxin, with many deleterious cellular and metabolic effects (52-58). It increases bone turn over and induces neuropathy, myopathy, cardiac hypertrophy, hyperlipidemia, carbohydrate intolerance, and immune dysfunction (52-63). Although specific studies are lacking, such conditions could influence the nutritional status of uremic patients with sHPTH (75-81). Garber demonstrated in vitro that high PTH levels enhanced muscle proteolysis and increased the release of alanine and glutamine. This effect, however, was observed only in normal rats (82). In a study conducted by Yasunaga et al. on Thirty-four patients under dialysis therapy received a parathyroidectomy (PTx) for secondary hyperparathyroidism found that PTx had beneficial effects on hurmoral immunological markers (83). They concluded that this effect is probably due to the remarkable PTH reduction and partly improver nutritional state after PTx (83). The nutritional and biochemical parameters of 15 chronic HD patients with severe sHPTH who had undergone total PTX with a forearm implant, were retrospectively studied by Khajehdehi et al. at 1, 3, 6, and 12 months pre- and post-PTx. They found that in 53% of the patients, the weight gain was more than 5% above the baseline (84). Avram et al. studied prospectively the relationship between the enrollment serum iPTH and all cause mortality in 345 HD and 277 peritoneal dialysis patients for 14 years and found that lower than expected levels of PTH in uremic patients are associated with increased mortality (85). Moreover, Guh et a136 recently reported similar findings that low levels of serum PTH at entry and lower time-dependent PTH levels predict mortality in HD patients(85). Avram et a1., hypothesized that inadequate protein intake, phosphorus intake or both result in impaired development of the expected sHPTH and in the excess mortality risk inherent with malnutrition(85), however, to date epidemiologic studies have shown a positive association between a high serum phosphorus and poor outcome among ESRD patients (49). In MHD patients, associations between demographic, clinical and laboratory values and mortality, including cardiovascular death, are significantly different and, in some cases, in the opposite direction of those derived from the general population, a phenomenon, termed reverse epidemiology (12, 42, 45, 47). Hence, the association between serum PTH and nutritional status may be bidirectional. Similar reverse epidemiologic observations have been made for serum creatinine and cholesterol in our previous study too (86). These studies show that, in MHD patients, the relation between the measure and outcome is counterintuitive. The cause of the unanticipated relation between lower serum PTH and increased mortality might be explained by the malnutrition-inflammation syndrome. Low intakes of calcium phosphorus, protein and 1ow serum phosphorus (which may all be associated with malnutrition or an inflammatory state or both), may account for this relation. Reduced intakes of these substances might lead to lower serum PTH concentrations and, directly or as a result of associated diseases, might induce higher mortality. While a 1.5 time of PTH level is necessary for bone activity in dialysis patients, the values more than this amount have deleterious effects as mentioned. While serum CRP is a marker of inflammation (14,42), we showed its positive correlations with serum iPTH as well as its negative correlation with BMI. Whilest the BMI is a marker of nutritional status(86,87). More over positive associations of high serum phosphorus and ALP as the markers of uncontrolled secondary hyperparathyroidism in MHPs with CRP and also negative correlation of high serum phosphorus with BMI further support the association of poorly controlled SHPTH with MCS in dialysis patients. In this regard when we deleted patients with iPTH below than 200 pg/mL, we found that the correlation of iPTH with CRP was positive (r=0.42, p=0.085) and when we deleted patients with iPTH mare than 500pg/mL, we found that this correlation was negative (r=-0.42, p=0.04), means that a low iPTH is an index of malnutrition while higher values is associated with inflammation. Thus further attention needs to control of hyperphosphatemia and maintaining the iPTH levels 1.5 times of normal to avoid the sides effects of secondary hyperparathyroidism.

Conflict of interest

The author declared no competing interests.

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Utilizing Mixed Use Theory in Order to Obtain a Sustainable Urban Development

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Abstract: One of the most important challenges for urban designers and planners about the conditions of cities is changing cities main structure and initial form of some areas because of mismanagement, kinds of different pollutions and converting land uses or discharging them due to inhabitants' migration. In duration of time, they transform to problemable areas and free of residents. Unfortunately many residential areas are developed without any particular regard to their surroundings. This causes because of increasing reliability on cars (Biddulph, 2007, 131). On the other hand builders typically only build houses, while other developers specialize in commercial schemes, and investors like the security of investing their money in single uses–rather than in mixed developments–thus maximizing their profits and planners often like to zone and therefore separate, different types of uses so that conflicts of amenity do not occur (the same) and a city doesn't have seen as an active and energetic open system that reforms itself in order to responding the surroundings condition. So for achieving a mixed use balance between different needs of users and beneficiaries we require to present the alternative that can satisfy all beneficiates and users also create desirable urban spaces. As a main problem of current cities and metropolises, is land leakage and its difficulties, one of the suitable options is a kind of using the space that encourages the commercial benefits and can be efficient in longer period of time. This spatial design pattern attains by mixed use theory

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1. Introduction:

1.1. Recent History of Mixed-Use Development

Prior to World War II, much of town planning and development, including housing construction, incorporated a mix of uses in relatively close proximity to one another. Examples include the "apartment above the store" still found in older inner cities, and the "streetcar suburb", where single family and multi-family housing was typically located within walking distance to retail, services and public transportation. Due to the much lower rate of automobile ownership at this time, it was necessary to build housing accessible to alternative forms of transportation.

After World War II, automobile ownership increased dramatically and a mass exodus from central cities began. Land use planning and zoning regulations followed suit by requiring greater and greater distances between housing and non-residential uses, and even between differing types of residential units, thus increasing dependency on the automobile. This pattern of development has created various challenges, however, and current trends are revisiting how to mix or better integrate these uses to meet these challenges (A. Tombari, 2005).

By the end of the 1980s, two movements seemed to offer strategies: both saw mixed use as part of the solution to urban problems. The healthy cities movement proved quite influential in Europe and in Canada. Its proponents suggested that cities should promote health, not detract from it. Clean environments, good employment and education, resource conservation, healthy living, and livable cities are essential to human and environmental health. Compact cities with good public transportation and walk able neighborhoods would contribute to community health. An international movement for sustainable development gained steam with the publication of the Brundtland Report. Sustainable development offered strategies for economic improvement without damaging environments or robbing future generations of their opportunities. The initial push of sustainable development theory involved a message of restraint: for instance, minimizing use of non-renewable materials, reducing waste outputs, and finding strategies that protected the environment (Jill Grant, 2004, 5).

Both these movements supported mixed use as a strategy. Mixed use could contribute to community health by reducing the need for car transportation and enhancing local self sufficiency Strategies that might reduce energy consumption could also be defined as sustainable. Sustainable development implies limited growth in that seeks to minimize resource consumption and waste generation. Both theories looked for bottom- up solutions, often providing support for local initiatives such as running recycling drives, planning open space systems, and revitalizing neighborhoods. Today, much commercial development is environmentally benign, and there are often advantages to locating different uses in close proximity (the same: 6).

Mixed use concentrated development, preferably near transit, is seen as a key "smart growth" tool to reduce auto dependence and preserve green space and natural resources. Thus many communities are turning to "mixed use," which generally refers to a deliberate mix of housing, civic uses, and commercial uses, including retail, restaurants, and offices (Metropolitan Area Planning Council, 2009, 1).

Mixing uses, however, works best when it grows out of a thoughtful plan that emphasizes the connectivity and links among the uses. Results may be haphazard when communities simply enable multiple uses without providing guidance about the mix of uses and how they are spatially related.

Mixed land use enables a range of land uses including residential, commercial, and industrial to be co-located in an integrated way that supports sustainable forms of transport such as public transport, walking and cycling, and increases neighborhood amenity (the same).

A mixed-use development is not a standardized product form. It can differ in location because it can be built in an urban setting or a suburban setting. The density levels are generally higher in an urban setting but not necessarily. It can differ in relation to its surroundings. It can be a higher density infill project in an established urban setting or it can be a development in the growth corridor in a suburban setting. It can also differ in configuration (Joseph S. Rabianski & J. Sherwood Clements, 2007, 4).

Two differentiating terms about the uses in a mixed-use development are "cornerstone use" and "dominant use." The *cornerstone use* is the most viable and profitable use in the project. It drives the development concept as well as the decisions about the suitability and compatibility of the other uses in the project. The *dominant use* is the use that takes up the most space in the project. The dominant use might not be the cornerstone use but it needs to be financially strong (the same).

2. Benefits of Mixed-Use Development

Mixed-use development is not a new concept, but it has gained popularity as a development and revitalization strategy in recent years. The mixed-use development projects can benefit a community by:

- creating a "sense of place";
- increasing economic vitality and expanding economic market opportunities;
- supporting long-term economic stability by providing tax base and jobs for communities, building and maintaining markets for businesses, and enhancing investment potential for lending institutions and investors;
- increasing transportation options such as walking, biking or busing, subsequently reducing auto-dependent travel;
- maximizing use of public investment and infrastructure, i.e., roads, sewer, water;
- maximizing use of land and supporting sustainable development;
- providing affordable and market-rate housing options; and
- encouraging historic preservation, reuse or redevelopment of existing buildings.

These benefits often provide an added incentive for developers, neighborhood and local government representatives, and lenders to pursue mixed-use projects despite the added complexity of this kind of development (www.minneapolisfed.org).

3. Challenges, Obstacles or Barriers to Mixed-Use Development

- Extraordinary planning, management, political patience, capital resources and risk
- Assembling land parcels
- Inadequate capital planning
- Lacking knowledge of available public/private benefits
- Maneuvering through zoning regulations
- Addressing environmental issues
- Working with planning agencies
- Working with the community
- Working with multiple development teams
- Working with multiple owners
- Securing project finance/capital
- Addressing transportation issues
- Designing parking
- Designing a pedestrian-friendly environment
- Managing the financial challenges of a sequenced roll-out of project parts
- External trip generation to all uses but mostly to retail and office
- Street capacity
- Water usage
- Air emissions
- Sewer capacity
- Endangered habitat limitations
- Economic and market cycles
- Congestion and traffic issues
- Location
- Management Healthy balance of uses (Jill Grant, 2004, 16).

4. How Is Synergy Achieved in a Mixed-Use Development?

- Each use is able to generate revenue from the other uses on the site. Occupants of the residential and office uses shop at the on-site retail facilities. Office and retail space users live in the residential units.
- Each use is an amenity for the other uses. Office users need restaurants and hotels in close proximity to

attract tenants. Hotels benefit from visitors to the office space.

The combination of uses provides a place for supply to meet existing, unfulfilled demand in the geographic market area. Moreover, it could be a catalyst to redevelop a blighted area which increases the future level of demand. It could be a "town center" for a suburban community which will attract consumers from further distances. It could be a starting point for additional development projects (Joseph S. Rabianski & J. Sherwood Clements, 2007, 8).

5. Mixed Housing Types

A diversity of housing types should be offered to meet the diverse needs of the community. Housing types could include accessory units, multifamily units including duplexes and quadraplexes, small lots, condos, townhouses, and manufactured pre-fab homes.

- In order to prevent homelessness, a variety of housing types are needed including single room occupancy dwelling units and housing with appropriate supportive services.
- In addition to diverse housing types, changes to current zoning may be needed to allow for greater occupancy levels.
- Alternatives to single family detached homes will bring prices down and create more green space.
- Residents in the planning district have diverse needs and require a mix of affordable rental units as well as opportunities for home ownership. In order to meet the needs of low income people, it is necessary to increase the rental stock in the area and develop ordinances to ensure affordable units in any new developments (www.tjpdc.org).

6. Building Types

In a mixed use development, a variety of building types are permitted. Each building within a mixed use development shall be classified as a building type and shall adhere to all standards applicable to that building type.

I. Mixed-Use Building is a structure with a vertical mixture of uses. The upper floors may be used for office, residential, lodging, storage, or parking; the ground floor (lot frontage at the street level) may be used for retail or office

II. Live/Work Building is a dwelling unit that contains, to a limited extent, a retail or office component. A live/work building is a fee-simple unit on its own lot with the commercial component limited to the ground level.

III. Civic Building is a structure specifically designed for a civic function. Buildings and structures for public or private assembly, including places of worship and schools, shall be considered civic buildings.

IV. Commercial Building is a single-use, one story structure with either office or retail use.

VI. Townhouse is a dwelling unit attached by a common wall to at least one other dwelling unit. A townhouse is generally a fee-simple unit, from ground to roof, with no units above or below. Structures containing townhouses must contain at least three townhouses.

VII. Flat-over-Flat (Duplex) is a structure with two dwelling units placed one above the other.

VIII. Paired House (Duplex) is a structure with two dwelling units placed one beside the other sharing a common wall.

IX. Single Family Detached House is one dwelling unit on its own lot, detached from structures on adjoining lots. An accessory unit may be located on the same lot as a single family detached house; the accessory unit may be attached or detached to the single family detached house.

X. Accessory Unit is a dwelling unit that is located over a garage on the same lot as the main structure.

An accessory unit may also be a single story dwelling unit, not associated with a garage, located on the same lot as the main structure. An accessory unit may be attached or detached from the main structure and is located to the rear of the lot

(Urban Design+ Architecture, 2009, 21).

7. Non-Residential Uses and Risk in a Mixed Use Development

- The least risky non-residential use to develop is community program space, which even though do not produces rent or revitalize commercial corridors, they can provide tremendous benefits to a supportive or affordable housing project.
- Developing space for a childcare center or as office space for the sponsoring agency or another non-profit group can be a reliable way to generate income from the commercial space, without taking on too much financial risk.
- Developing space for a for-profit office tenant in an affordable or supportive housing development can be difficult to market, depending on the nearby availability of comparable spaces for rent.
- The highest level of risk comes with trying to develop retail or restaurant space since location is a major determining factor in the success of a retail or food service establishment (www.nlihc.org/oor2004).

8. Where Are Mixed-Use Opportunities?

- Downtown

Regardless of the size of the downtown, it can be a good place for mixed use but must be designed to scale.

- Commercial Centers

Commercial centers, when developed or redeveloped, are good locations for mixing commercial, retail services, and employment.

- Employment Centers

When located outside of the core, employment centers are like office campuses. In suburban settings, they are often set off in an island of green surrounded by parking; the only mixing of use might be a drycleaner or concierge service. In more urban areas, an employment center could be a concentration of office buildings near a major intersection or off ramp. Most employment centers are housed in two story buildings. Because people will be at work and will travel to and from the site each day, the potential is there for expanding the activities that can be accomplished on site. Adding dining for lunch or dinner, or facilities for evening entertainment can expand the hours that the parking lot is used. Dense enough employment centers can be served by transit (bus or rail) which increases the opportunity for pedestrian-oriented amenities.

- Main Streets

Every community, even if it is without a historic downtown, has major streets that carry most of the traffic. Often these are older commercial corridors with underdeveloped properties. A focus on mixed use offers opportunities for making these areas more than just the place you drive past on the way to somewhere else.

- Corridors or Nodes in Neighborhoods

When neighborhoods are built, or when underused land can be found at major intersections, it is possible to carefully fit limited commercial or service uses into the neighborhood which can meet the everyday shopping needs of the residents without requiring additional car trips. The work must be done in a way that respects the existing character and does not create excessive traffic trolling through residential neighborhoods looking for parking.

- Transportation-Efficient Development

Transportation efficient development occurs at a density great enough to support transit which can be buses or even carpools (Community Design Committee, 2008, 4).

9. Successful Mixed Use Areas Can Be Achieved Through

- locating development within easy walking distance (400 metres) of high quality public transport corridors or other public transport operating at a frequency of four or more services per hour in the off-peak
- providing a range of development types that allow for a mix of day and night time activities supported by dense residential activity that aids with natural surveillance and provides a 'base load' of activity
- ensuring that surrounding transport networks and adjoining development is integrated with the new development
- providing high amenity open space and recreation areas especially for children, and
- ensuring that lighting, street furniture, signage, footpath treatment and safe road crossings provide a safe and convivial urban realm for all users.

(Australian Government Department of Health and Ageing, 2009).

10. The Examples of Mixed Use Developments

The Marquette Block on East Hennepin Avenue in Minneapolis, Edinburgh and Centennial Lakes in Edina, the Phalen Corridor Initiative in St. Paul, and River City Centre in Shakopee. These projects illustrate vast differences in location, design, scale, ownership structure, and mixed-use orientation, yet they are all examples of mixed-use development.

10.1. Mission Bay

San Francisco, California

Mission bay is one of the most significant urban development projects in the United States. It sets new standards for innovative urban planning. It is a water-oriented community created by the leading minds in architecture, design and urban planning and encompasses more than 30 acres on San Francesco's historic waterfront.

Fig (1): Mission Bay site

a. The Entitlement Includes

- 6,000 residential units (28% of which are affordable)
- 5 million square feet of commercial space
- 100,000 square feet of retail space
- 500-room hotel
- Public school
- Police and fire station
- 50 acres of parks and open space
- Bio-tech campus for the University of California at San Francisco
- 1,000 linear feet of new roads
- 350,000 square feet of new parks
- Additional 400.000 square feet of new parks featuring recreational sports and boating facilities.

Infrastructure that included the deployment of a fiber optic, open-architecture network of broad band communications for high speed voice, data and video communications to residents and businesses.

b.Building Development Projects Include

- Residential
- Office
- Bio-Science

- Telecommunications facilities (www.catellus.com).

Fig (2): Mission Bay mixed land uses


10.2. Mueller
Astin, Texas
a. Project Overview

The 711-acre Mueller site vacated when Austin's municipal airport relocated in 1999, is well on its way to becoming home to approximately 10,000 people , 10,000 permanent employees, 10,000 construction jobs, 4,600 homes (more than 1,100 affordable) and approximately 140 acres of public open space.

Fig (3): Mueller site

b. Project Summary

- One of the nation's most notable new urbanist communities
- 650,000 square feet of retail space
- 4 million square feet of commercial space, including Class A office space
- Broad variety of new home opportunities, both for-sale and for-rent
- Connections to public transportation
- 140 acres of parks and greenways
- A Town Center with lakes, shops, plazas and live/work space
- 5 miles of hike and bike paths

Fig (3): residential and commercial units

c. Mixed Use

- A town center planned to include at least 30 percent locally-owned businesses

Up to 4.4 million square feet of commercial and institutional space including office, retail, medical and film production (the same).

Fig (4): Mueller's town center

11. Characteristics of Successful Mixed-Use Projects

1. Specific goals for both the housing and commercial components of the project, informed by careful market analysis that verifies the needs and assumptions underlying those goals.
2. Development teams with solid experience in mixed-use design, commercial leasing, housing & commercial financing, and property management.
3. Sites located within existing commercial districts with good visibility and access to transit and roads.
4. Architectural designs that accommodate specific needs for commercial uses into the project on the front end, while incorporating unique elements that attractively integrate the projects into their communities.
5. Careful selection of a strong and unique mix of commercial tenants.
6. Sufficient parking that will adequately serve the needs of commercial and housing tenants.
7. Partnerships with municipalities on site assembly and the financing of infrastructure improvements.
8. The use of phasing for large, multi-block projects when resources are not sufficient to undertake all activities at one time.
9. Creative financing opportunities for short, medium and long term investors that allow the commercial portion of the project to establish its customer base.
10. Realistic pro form as that include funds for tenant improvements, rents that are in line with the market, a healthy vacancy rate for the commercial, and tested assumptions for operating expenses.
11. Legal structures that separate the different uses when necessary to obtain financing.
12. Incorporation of civic uses, public or green spaces such as libraries, banks, community centers, urban parks, and creative landscaping (Joseph S. Rabianski & J. Sherwood Clements, November 2007).

12. Lessons Learned from Mixed-Use Projects

First, government support and involvement through public/private/nonprofit partnerships is critical to project success.

local government plays an important role in providing ongoing support, zoning flexibility, and/or creative financing for mixed-use projects.

Second, financing mixed-use projects can be complicated and requires a working knowledge and understanding of all the project components (www.minneapolisfed.org).

13. Types of Condominium in Mixed Use Development

Mixed-use developments create many interesting and vexing challenges for real estate lawyers. Traditional property boundaries do not exist in projects where multiple owners are stacked vertically above each other and share common facilities. Real estate lawyers must exercise particular care and creativity in structuring these compact and dense communities to ensure that residential, office, and commercial uses co-exist and thrive as vibrant communities. Lawyers can structure mixed-use developments in several different manners. Some possibilities include the following:

(a) Single condominium;

(b) Master condominium with master units that can each be a separate sub condominium structure;

(c) Master property owners association with separately individually owned parcels; and

(d) Multiple air rights condominium parcels subject to a reciprocal easement agreement.

Each of the foregoing legal structures has its own advantages and disadvantages.

Although not appropriate in every situation, developers are increasingly utilizing master condominiums to structure mixed-use communities, particularly communities with dense vertical structures.

a.Single Condominium Regime

- Works well when the nonresidential uses are minimal
- Structure is simple relative to other approaches
- No subdivision of the property into multiple uses
- Master insurance policy on overall project
- The easements inherent in a condominium reduce the need for separate complex easement agreements

Disadvantage:

- Non-residential owners will be minority owners in an association dominated by residential owners
- Less flexibility to provide for future changes in use or ownership structure

b. Master Condominium with Sub-Residential Condominium

- Avoids division of property into separate parcels/lots
- Maximize density or yield on property
- Residential owners participate through one elected representative to the master condominium
- Unit boundaries can be described in reference to recorded floor plans
- Master insurance policy on project as whole obtained by master condominium association
- The easements inherent in a condominium reduce the need for separate complex easement agreements

Disadvantage:

- Declarant cannot maintain long term control over the project
- Non-residential owners will be minority owners in an association dominated by residential owners
- More complex legal structure
- Not specifically contemplated in most condominium statutes

c. Master Property Owners Association with Sub-Residential Condominium

- Residential owners participate through an elected representative to the master association
- Gives developer ability to exercise long term control over the development
- Master structure to statutory limitations in condominium statute

Disadvantage:

- May be treated as subdivision of property
- Requires surveying of air rights parcels
- Typically requires more complex cross-easement agreement
- Potential complications for property casualty policies
- Need to draft numerous specific easements
- Make all outreach activities accessible to people with special needs (B. Curry, 2008, 3).

14. Education and Awareness

Participants agreed that educating the development, investment, real estate, government and resident communities on the benefits of mixed use development was a top priority.

- Increase awareness among developers and real estate agents of affordable housing needs in mixed use development.
- Create and publicize model projects.
- Increase public awareness about the need for affordable housing.
- De-stigmatize affordable housing and break down myths about low income housing.
- Help homebuyers learn about creative financing options and develop reasonable expectations.
- Coordinate education and advocacy for underrepresented groups with particular housing needs.
- Provide financial skills, budgeting, savings, and homeownership education to adults and youth.
- Create a central information clearinghouse to provide information about financing, availability of housing, and services available (www.tjpdc.org).

15. Incentives

- Offer tax incentives including enterprise zone tax credits, real estate tax credits for affordable accessory units, and other tax incentives.
- Create incentives for developers to increase density by encouraging affordable dwelling units.

- Encourage public investments in infrastructure that supports affordable mixed use development (www.ci.livermore.ca.us).
- Local municipalities can support affordable mixed use development by donating land.
- Provide developers with density bonuses.
- Streamline the permit processes for plans to develop affordable mixed use development.
- Encourage employer assisted financing such as setting up individual development accounts and promoting fund matching by the city, counties, or university to match their employees' funds.
- Use housing authorities to access or underwrite financing (i.e. bonds).
- Promote flexibility in development (i.e. planned unit developments, single room occupancy).
- Local governments should be able to require impact fees from developers for the cost of public infrastructure and facilities (www.tjpdc.org).

16. Conclusions

Although residential mixed use development has increased dramatically in the last 10 years, it still makes up a fraction of the total amount of new residential development constructed each year. There is no reason to believe that single use residential markets will not dominate the development sector for many years to come as well. However, home builders and land developers should not underestimate the growing opportunities within the mixed use sector, not just in large metropolitan areas, but also in smaller communities as well. Many of these communities have no mixed use development whatsoever, so lack of competing projects may prove to be financially lucrative.

As stated in this paper, residential components of mixed use development, as part of a larger, diverse housing stock, can help achieve many of the goals espoused by the smart growth philosophy and whatever that is considerable in sustainable developments. If communities speak of smart growth as something they strive for, than they must take the actions necessary to allow it to happen.

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Assessment of Memory Performance and Memory Biases in Iranian and Indian Opium Dependents: A Cross Cultural Study

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Abstract: ***Background:*** According to cognitive models, biases in information processing play a vital role in the etiology and maintenance of psychological disorders. Several researches have been done on cognitive biases in drug dependence disorders, which suggested that drug related stimuli are able to influence most of cognitive processes such as attention, perception, learning and memory. ***Aim:*** The main aim of the present study was to investigate memory performance and implicit and explicit memory biases toward opiate related stimuli, in Indian and Iranian opiate dependent individuals. ***Method:*** As this study was cross-cultural in nature, so 100 opiate dependent and 100 non-drug dependent individuals were selected from India and Iran using cluster and simple random sampling, respectively. The primary data collection was conducted using memory recognition task and "word-stem completion" test. ***Results:*** The results reflected that explicit and implicit memory bias scores were different between opiate dependents and non-drug dependent individuals significantly, as opiate dependents had greater explicit and implicit memory bias than non-drug dependent individuals. In contrast, non-significant main effect for nationality showed that explicit and implicit memory bias scores were not different between Iranian and Indian subjects regardless of opiate dependence variable. In addition, the results showed that explicit memory impairments in opiate dependent individuals were greater than non-dependent subjects. In contrast implicit memory performance in opiate dependent individuals was better than non-dependent subjects.
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Introduction:

In cognitive psychology, memory bias is a cognitive bias that results in memory's enhancement or impairment for remembering special subjects or events. Indeed, when information is encoded or retrieved selectively, memory bias would be happened. The main focus of most researches related to memory bias has been on two memory bias i.e. explicit memory bias and implicit memory bias (Williams, Watts, MacLeod, & Mathews, 1997). Explicit memory bias refers to the process in which emotionally related information is retrieved better than neutral information on conscious recollection test (Graft & Schachter, 1985). Implicit memory bias occurs when emotionally related information is retrieved better than neutral information on an unconscious recollection test (Graft & Schachter, 1985).In the recent years, several studies have examined the possibility of memory biases in various mental disorders such as depression (Barry, Naus & Rehm, 2004; Ruiz-Caballero & Gonzalez, 1997; Beeney & Arnett, 2008; Watkins, Martin & Stern, 2008) anxiety (Scott, Mogg & Bradley, 2001; Dowens & Calvo, 2003; Dewhurst & Marlborough, 2003; Russo, Whittuck, Roberson, Dutton, Georgiou & Fox, 2006), obsessive compulsive disorder (Radomsky & Rachman, 1999; Radomsky, Rachman & Hammond, 2001), posttraumatic stress disorder (Brewin, Kleiner, Vasterling & Field, 2007), general anxiety disorder (Coles & Heimberg, 2002; Russo, Fox, Bellinger & Nguyen-Van-Tam, 2001; Friedman, Thayer & Borkovec, 2000) and eating disorders (Hermans, Pieters & Eelen, 1998; Sebastian, Williamson, & Blouin, 2005).

Furthermore, a number of studies have used different techniques to evaluate memory impairments in substance abuser/dependent individuals. For example, Krank and Kreklewetz (2003) assessed the effects of alcohol advertising on implicit and explicit memory in young adolescents. They found that exposure to five alcohol commercials, which mixed with other commercials, increased alcohol-related responses on implicit but not on explicit memory tests in drinkers, immediately after exposure. The authors suggested that personal experience may be a critical factor in the development of implicit alcohol related cognitions. In another study, Seifert and colleagues (Seifert, Seeland, Borsutzky et al., 2003) investigated memory functions of alcohol dependent patients during the early days of acute alcohol

withdrawal. Their results suggested that acute alcohol withdrawal impairs memory functions, especially free recall. Seifert and colleagues (Seifert, Peters, Jahn et al., 2004), in another study, showed a higher verbal memory performance state could be favorable for a psychotherapeutic approach.In addition, some of scientific studies have investigated the effects of Ecstasy on memory performance and all of them showed the memory deficits in Ecstasy users (e.g. Parrott & Lasky, 1998; Morgan, 1999; Wareing, Fisk & Murphy, 2000; Verkes, Gijsman, Pieters et al., 2001; Rodgers, 2000). Some studies investigated prospective memory in the substance dependence disorder. For example, Heffernan and colleagues (Heffernan, Ling, Parrott, Buchanan, Scholey & Rodgers, 2004) assessed impairments in prospective memory performance and everyday memory performance in nonsmokers, light smokers (1-4 cigarettes/day), moderate smokers (5-14 cigarettes/day) and heavy smokers (15 or more cigarettes/day). The results showed that heavy smokers reported significantly greater impairment in long-term prospective memory performance than either nonsmokers or light smokers. In another study Heffernan, Moss and Ling (2002) examined the influence of heavy alcohol use on impairments in prospective memory performance. The results showed that heavy drinkers reported significantly greater levels of impairment in prospective memory compared to a light drinking and non-drinking control groups.

Another approach that researchers are interested to evaluate in drug dependent individuals is memory bias toward drug related information. Associative learning mechanisms, such as the encoding and retrieval of memory, may play an important role in the maintenance of addictive behaviors (White, 1996). Some theorists and researchers discussed that a conditioned stimulus related to drugs can activate a specific neural network and manipulate the original memory (Grant, London, Newlin, et al., 1996; Robbins & Everitt, 1999). For example, Goldman and his colleagues (Goldman, Brown, Christiansen & Smith, 1991) proposed a model related to memory bias in alcoholic individuals. According to them, alcohol expectancies are representative of individuals' experiences about alcohol, both direct and alcohol consequences based on individual's biological characteristics and environmental exposure. This model proposed that "unique expectancy concepts (images, memories of sensory-motor and affective experiences) are nodded in an information network. Activation of particular nodes occurs in a predictable fashion once the individual encounters stimuli that match previously encoded material relevant to drinking". Goldman (1999) believed that information processing memory system acts as a repository of the potential to consume alcohol and other drugs, and this potential is then manifested in certain stimulus circumstances.

According to the knowledge of researcher, there are a rare number of researches related to memory bias in substance dependence and the results of these researches are varied among different kind of dependency. For example, Litz, Payne and Colletti (1987) found that the smokers showed memory bias for positive information about smoking and it was more consistent with their actual smoking behavior than what they said they believed. In another study, Leung and McCusker (1999) used a free association task with smoker and non-smoker samples. The results showed that both groups generated more negative than positive associations to a smoking cue. However, while the ratio of positive/negative associations was constant across free association time intervals in non-smokers, smokers generated proportionately more of their positive associations in the early time interval and proportionately more of their negative associations in the later time period. The authors suggested that associations generated in the early time period maybe have an automatic nature, whereas those generated later reflected more effortful and unconscious processes, and they interpreted these findings as evidence for an accessibility bias for positive smoking associations in smokers.Furthermore, Franken, Rosso and van Honk (2003) assessed explicit memory bias for alcohol-related pictures in alcoholics compared to nonalcoholic (light) drinkers and in this study the cognitive processing of alcohol cues was compared to general incentive cues (food) and neutral cues. The results indicated that alcoholics showed enhanced memory for alcohol cues compared to neutral or general incentive cues.

Some researchers have focused on implicit memory for addiction related information. Implicit memory bias toward drug related words and also toward positive vs. negative outcomes related to the addiction, have been observed in gamblers, heavy drinkers and smokers (Armstrong, 1997; McCusker & Gettings, 1997). Stacy (1995; Stacy, Leigh & Weingardt, 1994) has suggested that memory activation (an implicit memory component) represents the effects of associative memory that is activated by motivational and situational factors, automatically. Stacy, Arnes and Dent (1996) showed that implicit positive memory associations for alcohol or marijuana predict the amount of alcohol or marijuana use in at risk adolescents for substance abuse. In another study that conducted by Stacy (1997), the effect of drug related memory associations on drug taking behavior was examined.

They used a semantic priming measure of implicit cognition in which participants were ask to create activities associated with positive/negative outcomes or states. They revealed that positive outcomes not linked explicitly in the task to alcohol, nevertheless automatically primed representations of alcohol as a function of drinking history and behavior and also showed that the memory association measures significantly predicted subsequent drug use.

In addition, Jarvik and colleagues (Jarvik, Gross, Rosenblatt & Stein, 1995), using a perceptual identification task, showed that nicotine deprived smokers identified more smoking related words than food related or neutral words. They also used a categorization task, in which smoking or food related words were rapidly presented and participants were required to categorize the word as being either food or smoking related. The results showed that abstinent smokers more quickly categorized the smoking related words than food related words. A same pattern of nicotine deprivation's effect has been reported by Zeitlan, Potts and Hodder (1994). Using a word stem completion task, they showed that abstinent smokers recalled more smoking related words than non-abstinent smokers or nonsmokers.

In another study Zwaan and Truitt (1998) showed that smokers' sentence comprehension was reduced during recall of a smoking script compared to a neutral script, whereas non-smokers' sentence comprehension was equivalent during recall of the two scripts. Based on Hogarth and colleagues (Hogarth, Mogg, Bradley, Duka & Dickinson, 2003) one explanation for these results could be that the smoking cues elicited an attentional bias, which interrupted processing of the information, which are necessary for the performance of the other tasks. However, they suggested that it could be explained based on MacLeod (1991) that "the smoking cues elicited a motor response, which interfered with the production of responses necessary for the performance of the ongoing tasks" (Hogarth et al., 2003). In a different study Fehr, Wiedenmann and Herrmann (2006) assessed memory function in smokers and non-smoking controls by obtained EEG data during a modified Stroop task and a color matching task (nicotine Stroop). The behavioral data from nicotine Stroop didn't show a comparable interference effect related to the use of drug-related words in both groups. However, in smokers the smoking-related words elicited ERP activation patterns comparable to those evoked by the Stroop interference task. According to the authors, the results showed interference effect of smoking-related words in smokers that may be associated with memory bias and enhanced sensitivity for drug-cues.

Taking together,a lot of studies have evaluated implicit and explicit memory biases in different disorders, but based on researcher's knowledge study on memory in substance dependence disorder is very scarce. As above review has revealed, the most of previous studies in this field have demonstrated that drug taking behaviors result in various memory impairments and memory biases toward addiction related stimuli in drug dependent population. Furthermore, any research hasn't considered that which type of memory biases for drug related information is associated with opiate dependence disorder and as yet it doesn't determine whether opiate dependent individuals show implicit and explicit memory biases or not. According to these limitations, the main aim of present study was to investigate memory impairments and explicit and implicit memory biases toward opiate related stimuli, in Indian and Iranian opiate dependent individuals.

Hypotheses

We attempted to examine the following hypotheses in this paper:

- Opiate dependent individuals show significantly greater impairment in explicit memory performance than non-dependent group.
- Opiate dependent individuals show significantly greater impairment in implicit memory performance than non-dependent group.
- Opiate dependent individuals demonstrate greater explicit memory bias toward drug related stimuli compared to non-dependent individuals.
- Opiate dependent individuals demonstrate greater implicit memory bias toward drug related stimuli compared to non-dependent individuals.

Method:

Present study's research method was an Ex-post facto or Causal-comparative research. As this study was cross-cultural in nature, so it was included two groups from each country, i.e. experimental group (opiate dependent subjects) and control group (non-dependent subjects). As the opiate dependent sample were selected from male inpatient and outpatient opiate dependent individuals, who had DSM-IV-TR (APA, 2000) criteria for opiate dependence, in Delhi, India and Tehran, Iran, it was easier to access them through de-addiction centers (as clusters), so in the present study the cluster random sampling was used. Participants in the control group were recruited among Indian and Iranian male students and staff of universities that located in Delhi, India and Tehran, Iran, without any current or previous substance dependence of any kind using simple random sampling. This group was matched as closely as possible with the experimental group for

demographic characteristic, such as age, education, marital status and monthly income. Descriptive analyses showed that Iranian opiate dependent subjects had a mean age of 33.58 years and a mean education of 12.50 years. They have used drugs for an average of 11.86 years. Mean amount of drug that they used was 236.20 mg per day and their mean onset age of drug taking was 21.7. The Indian opiate dependents consisted of50 men with a mean age of 33.64 years and a mean education of 12.66 years. Dependent participants have used drugs for an average of 10.62 years. Mean amount of drug that they used was 236.60 mg per day and their mean onset age of drug taking was 22.90. The analyses also showed that the Iranian control group consisted of 50 non dependents with a mean age of 31.54 years, a mean education of 13.32 years. In addition, Indian control group had a mean age of 31.70 years and a mean education of 13.40 years. In present study, to assess explicit memory bias, recognition memory task and to measure implicit memory bias, word-stem completion test was conducted.

Recognition memory task: To measure explicit memory bias, a computerized recognition task has been used that was designed by researcher. In this test subjects is presented with previously seen words (old), and with length matched distractor words (new), and instructed to determine those words that they recognize as having been exposed previously. Indeed, this task asks subjects to consciously recognize previously presented stimuli items. Explicit memory is revealed by increased accuracy with which previously seen words, relative to previously unseen words.

Materials and stimulus: The materials for the task were 60 words consisting of 20 opiate related words, 20 neutral words and 20 fruit related words. The fruit words used in this memory task as general intensive cues, for comparison between effects of opiate related words as stimulus intensive cues and fruit words as general intensive cues on memory process. The pilot study was conducted to select the appropriate words for recognition memory task. To eliminate an effect for word length on encoding and recognition, the stimuli in the fruit related and the neutral categories were matched as closely as possible for the mean number of letters in each word and syllables with opiate related words. These total words were divided in to two presentation sets, each consisting of 10 opiate related words, 10 neutral words and 10 fruit related words. Only one of these sets was presented in the first stage of the task (encoding) for any subject, while another set provided the distractor items in the second phase of the task given to that subject.

Apparatus: The present explicit memory task was designed and presented by Authorware Runtime Macromedia (version 6.0). This experimental task starts with the appearance of a set of words on the screen one by one and each word is presented for 500 milliseconds and participates are asked to look at the words carefully. In this phase, 10 words from each category (total 30 words) are presented twice. The appearance of the words is random; the only restriction is that the same words could not appear subsequently. After first presentation, second phase would be started wherein the previous words (old) are combined by thirty new words that were not presented previously and act as distractor and all sixty words appear in center of screen one by one. In this stage, the subjects are asked to distinguish whether they have been exposed to the word during the first stage or not as quickly as possible. A button box with two keys labeled “Yes” or “No” allowed them to response to each word. The word stayed on the screen until a response is made or after 1000 milliseconds. After completion the task, the report sheet records which is including of the number of correct and out time responses for each words’ category separately.

Word-Stem Completion Test: In the present study for measuring implicit memory bias, “word-stem completion” test was used which is an indirect measure of memory. In this test, the participants were given a list of incomplete words (word stems) and asked to complete each stem with the first word that comes to their mind. Implicit memory was assessed by counting the number of stems that were completed to make stimulus words and comparison with the number of stems that were completed to make neutral words.In this study, if the number of completing stems with opiate related words was more than neutral words, the probability of implicit memory bias to drug related stimuli has being increased. In the other word, opiate dependent individuals may be unintentionally offered drug related words as first word triggered, rather than the many other possible alternatives. In this task, 24 words consisting of 12 opiate related words and 12 neutral words were applied.

Results:

Explicit Memory Performance:

In order to evaluate performance on the explicit memory task, the number of opiate related words, neutral words and fruit related words (as general intensive cues) that each subject recognized

from both presentation statuses were calculated. As were explained earlier, in this task two sets of words were presented in two stage, the presented words in encoding stage as main words (i.e. Old words) and the word set that had not been presented in encoding stage but presented in the recognition stage as distractor words (i.e. New words). To compare means number of recognized words based on their type and presentation status among Indian and Iranian opiate dependent and non-dependent groups, mean number of recognized words were entered into a 2 × 2 × 2 × 3 mixed design analysis of variance (ANOVA) with group (opiate dependents and non-dependents) and nationality (Indian and Iranian) as the between subjects variables and presentation status (old and new words) and word type (opiate related, neutral and fruit related words) as within-subjects variables. The results of ANOVA have been shown in Table 1.

Several significant effects came out from this analysis. First there was a high significant main effect of presentation status $F(1,196) = 3884.67$, $p<0.001$, which was expected and reflected that all participants, regardless of nationality and dependence status, recognized more old words (6.49) than new words (1.28), irrespective of word type.

Table 1. ANOVA outcomes on means number of recognized words among groups

Source of variations	F	Sig.
F (Present status)	3884.66	.000
F (Word type)	136.08	.000
F (Group)	124.60	.000
F (Nationality)	17.70	.000
F (Present status × Word type)	2.80	.062
F (Present status × Group)	202.48	.000
F (Present status × Nationality)	.004	.952
F (Word type × Group)	183.13	.000
F (Word type × Nationality)	.951	.387
F (Nationality × Group)	2.29	.132
F (Present status × Word type × Group)	.426	.654
F (Present status × Word type × Nationality)	.240	.787
F (Present status × Word type × Group × Nationality)	6.49	.002

The results also showed that there were significant main effects for word type, $F(2,196) = 136.83$, $p<0.001$, group $F(1,196) = 124.60$, $p<0.001$ and nationality $F(1,196) = 17.70$, $p<0.001$. Significant main effect for group reflected that irrespective of nationality, non-dependent group (26.30) recognized more number of words in average (regardless of presentation status and kind of the word) than opiate dependent group (20.33). Also, significant main effect for nationality reflected that irrespective of dependence status, there was significant difference between Iranian and Indian participants on mean number of recognized words, regardless of presentation status and kind of the word, as Iranian subjects (24.44) recognized more number of words than Indian subjects (22.19).

This analysis also demonstrated a significant group × word type interaction $F(2,196) = 183.13$, $p<0.001$, which displayed that there were significant differences between opiate dependent and non-drug dependent groups, irrespective of nationality, on the numbers of recognized words based on their type. In order to clarify differences between opiate dependent and non-drug dependent participants, three independent samples t-test were used for each kind of recognized words regardless of their presentation status, separately. The results showed that opiate dependent individuals recognized more number of opiate related words in compare with non-drug dependent subjects (10.17 vs. 8.52) and this difference between two groups was significant [$t(198) = 6.65$, $p<0.001$] (Figure 1).In addition, as have been shown in Figure 1, the differences between two groups on the numbers of recognized neutral words [$t(198) = -13.10$, $p<0.001$] and fruit related words [$t(198) = -14.80$, $p<0.001$] were found to be significant; as non-drug dependent subjects recognized more number of neutral (8.87 vs. 5.10) and fruit related words (8.91 vs. 5.06) in compare with opiate dependent participants.

These results reflected that drug dependent participants recognized more number of opiate related words than neutral words and this is representative of greater explicit memory bias in this group.

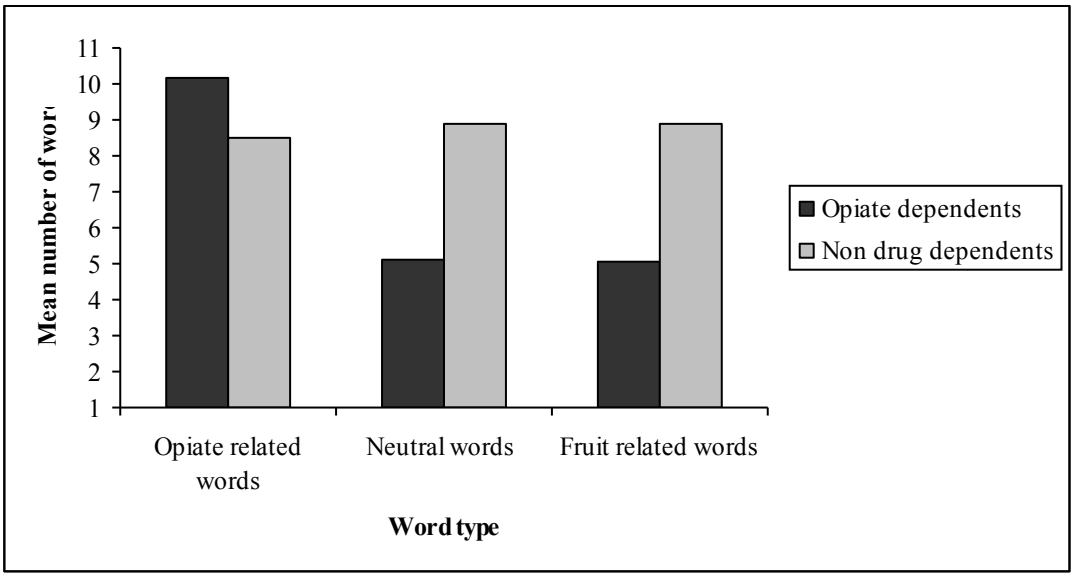

Figure 1. Comparisons between means number of words based on their type between groups

Significant interaction effect for group × presentation status F(1,196) = 202.48, p<0.001 displayed that there were significant differences between opiate dependent and non-drug dependent groups, irrespective of nationality, on the mean number of recognized words based on their presentation status and regardless of word type. In order to compare explicit memory performance between groups, independent samples t-test was used and the mean number of total words (without considering type of words) that recognized by participants correctly (old words) was entered into independent sample t-test. Also, the mean number of total words (without considering type of words) that recognized by participants incorrectly (new words) were calculated in order to compare amount of error on recognition of words between two groups. The results showed that non drug dependent individuals recognized more number of correct words (old words) in compare with opiate dependent subjects (22.74 vs. 16.19) and difference between two groups was significant [t(198) = -14.11, p<0.001]. In addition, the difference between two groups on the numbers of incorrect (new) words [t(198) = 2.27, p<0.05] was found to be significant; as opiate dependents recognized more incorrect (new) words (4.14) in compare with nondependent group (3.56). The explicit memory performance of opiate dependent and non-dependent groups has been shown in Figure 2.

Based on above Figure non-opiate dependents recognized more numbers of correct (old) words in compare to opiate dependents, so their explicit memory performance was better than opiate dependent individuals. In contrast amount of error was greater in opiate dependents than non-dependent individuals.

In addition, the presentation status × word type interaction F(2,196) = 2.80, NS was not significant, which revealed that participants had ability to discriminate old words from new words in all type of words (opiate related, neutral and fruit related words), but as a four way interaction for presentation status × word type × group × nationality F(2,196) = 6.49, p<0.01 was significant, so this discrimination was different across four groups.In order to clarify these differences in details, two 2 × 2 × 3 mixed design analysis of variance (ANOVA) with group (opiate dependents and non-dependents) and nationality (Indian and Iranian) as the between subjects variables and word type (opiate related, neutral and fruit related words) as within subjects variables were used for each presentation status (old and new), separately.

First analysis for old (correct) words showed significant main effect of word type F (1,196) = 74.27, p<0.001 and interaction effect of group × word type F (2,196) = 86.42, p<0.001. Significant effect for group × word type interaction displayed that there were significant differences between opiate dependent and non-drug dependent groups, irrespective of nationality, on the mean numbers of correct (old words) recognized words based on their type. In order to clarify differences between opiate dependent and non-drug dependent participants, three independent samples t-test were used for each kind of correct recognized words, separately. The results showed that the differences between opiate dependent individuals (7.22) and nondependent group (7.51) on the mean number of correct recognized opiate related

words were found to be non-significant [t(198) = -1.70, NS]. In contrast, the differences between two groups on the mean number of correct recognized neutral words [t(198) = -13.63, p<0.001] and fruit related words [t(198) = -13.67, p<0.001] were significant; as non-drug dependent subjects recognized more number of correct neutral (7.65 vs. 4.52) and fruit related words (7.58 vs. 4.45) in compare with opiate dependent participants. Totally, non-dependent group recognized all type of words more than opiate dependent individuals, correctly, but only differences between two groups were significant only in case of neutral and fruit related words. In the other word, non-dependents' explicit memory was better than opiate dependents subjects.

Second analysis for new (incorrect) words showed significant main effect of word type F(1,196) = 86.69, p<0.001 and interaction effect of group × word type F(1,196) = 135.86, p<0.001. Significant effect for group × word type interaction displayed that there were significant differences between opiate dependent and non-drug dependent groups, irrespective of nationality, on the mean number of incorrect (new words) recognized words based on their type. In order to clarify differences between opiate dependent and non-drug dependent participants, three independent samples t-test were used for each kind of incorrect recognized words, separately. The results showed that opiate dependents had greater error on recognition of opiate related words than non-dependent groups [t(198) = 11.34, p<0.001]; as opiate dependent individuals (2.95) recognized more numbers of incorrect opiate related words in compare to non-dependent group (1.01).

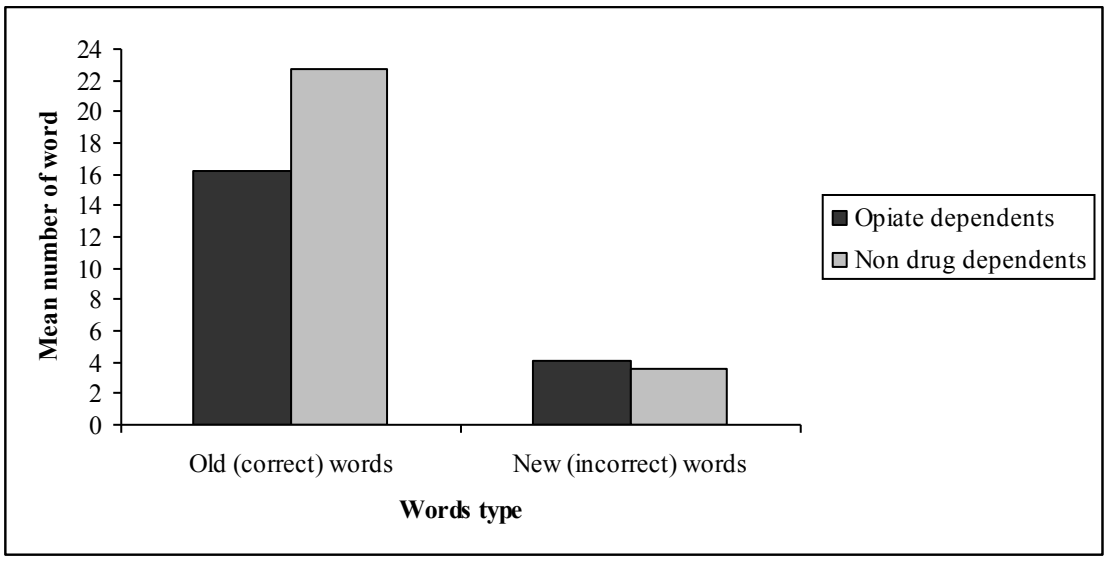

Figure 2. Comparisons between means number of words based on their presentation status (old (correct) and new words (incorrect)) between groups

Implicit Memory Performance:

In order to evaluate implicit memory performance, the number of stem that had been completed to make a stimulus (opiate related) words and the number of stem that had been completed as a neutral words on word-stem completion task were calculated. The meaningless, incorrect and incomplete words were not entered into calculations. The means and SD number of the stems, which were completed as stimulus (opiate related) and neutral words, stratified by group and nationality have been presented in Table 2.

To evaluate implicit memory task performance among Indian and Iranian opiate dependent and non-dependent groups, a 2 × 2 × 2 mixed design analysis of variance (ANOVA) with group (opiate dependents and non-dependents) and nationality (Indian and Iranian) as the between subjects variables and completed stem type (opiate related (stimulus) and neutral words) as the within subjects variable was used. The results showed that there were significant main effects for completed stem type, F (1,196) = 545.68, p<0.001 and group F (3,196) = 38.90, p<0.001. Also, interactions for completed stem type × group F (1,196) = 378.94, p<0.001, and nationality × group F (1,196) = 7.34, p<0.01, were found to be significant.

Table 2. Means (and SD) number of completed stems as stimulus and neutral words by four groups in word-stem completion task and the results of ANOVA

		completed stems as stimulus words		completed stems as neutralwords	
Nationality	**Groups**	Mean	SD	Mean	SD
Indian	Dependents	9.12	1.21	9.82	2.08
	Non dependents	5.30	1.47	12.52	1.50
	Total	7.21	2.34	11.17	2.26
Iranian	Dependents	9.74	1.27	10.32	2.15
	Non dependents	5.18	1.17	12.04	1.75
	Total	7.46	2.60	11.18	2.13
Total	Dependents	9.43	1.27	10.07	2.12
	Non dependents	5.24	1.33	12.28	1.64
	Total	7.33	2.47	11.18	2.19
F (Stem type)		F(1,196) = 545.68**			
F (Group)	F(1,196) = 38.90**				
F (Nationality)	F(1,196) = .67, NS				
F (Stem type×Group)		F(1,196) = 378.94**			
F (Stem type×Nationality)	F(1,196) = .533, NS				
F (Nationality×Group)	F(1,196) = 7.34*				
F (Stem type× Nationality × Group)	F(1,196) = .13, NS				

Note: * p< .01, ** p< .001

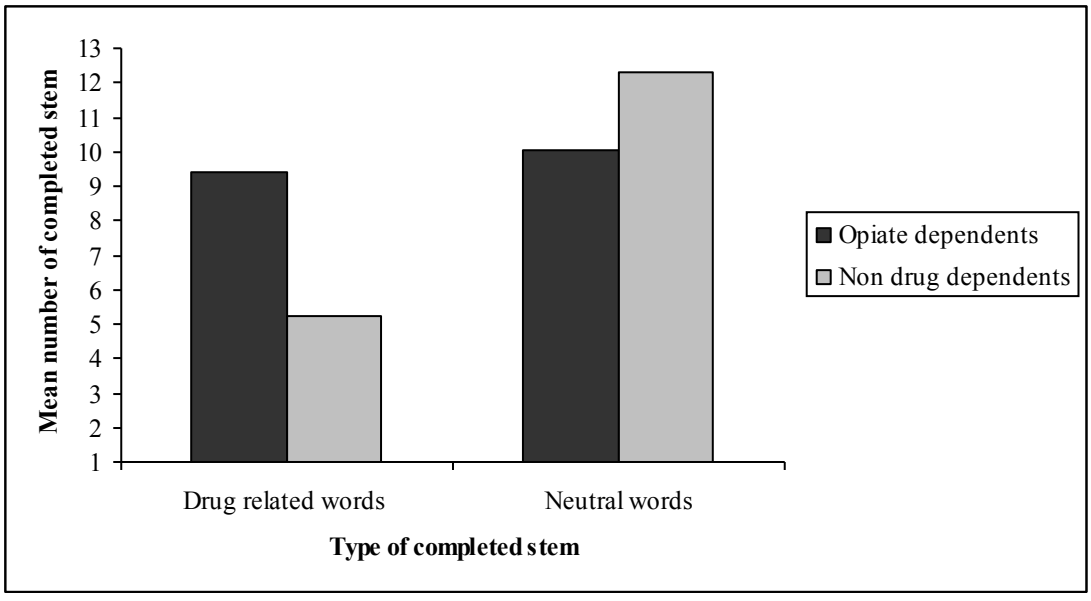

Figure 3. Comparisons between groups mean number of completed stems as drug related and neutral words

Significant main effect for group reflected that irrespective of nationality, there was difference between opiate dependent (19.50) and non-drug dependent (17.52) individuals on mean number of completed stems regardless of their kind (opiate related or neutral); as generally opiate dependent individuals completed more number of stems than non-drug dependent subjects. Significant interaction for completed stem type × group showed that differences between groups on mean number of completed stems were different based on kind of completed stems. In order to clarify differences between opiate dependent and non-drug dependent participants, two independent samples t-test were used for each kind of completed stem, separately. The results showed that opiate dependent individuals completed more number of stems as drug related words in compare with non-drug dependent subjects

(9.43 vs. 5.24) and this difference between two groups was significant [$t(198) = 22.79$, $p<0.001$] (Figure 3).

In addition, the difference between two groups on the mean number of completed stems as neutral words was found to be significant [$t(198) = -8.25$, $p<0.001$]; as non-drug dependent subjects completed more number of stems as neutral words in compare with opiate dependent participants (12.28 vs. 10.07). These results reflected greater implicit memory bias in opiate dependent individuals compare to non-drug dependent subjects. In the other hand, non-significant main effect for nationality and stem type × nationality interaction revealed that regardless of opiate dependence variable, generally there was not difference between Indian and Iranian subjects on mean number of completed stems as drug related words (7.21 vs. 7.46) and as neutral words (11.17 vs. 11.18).

Conclusion and Discussion:

The main aim of the present study was to compare explicit and implicit memory performance between opiate dependent and non-dependent individuals and also assess explicit and implicit memory biases in opiate dependent individuals. In order to evaluate effect of opiate dependence disorder on explicit memory performance, first hypothesis was introduced: Opiate dependent individuals show significantly greater impairment in explicit memory performance than non-dependent group. The results showed that there were significant differences between opiate dependent and non-drug dependent groups on the mean numbers of correct (old words) recognized words on explicit memory task; as non-opiate dependents recognized more number of words (all type of words) than opiate dependents, correctly, in contrast amount of error in opiate dependents was greater than non-dependent individuals. These results reflect that explicit memory performance in non-dependent group is better than opiate dependent individuals. In the other word there is greater impairment in explicit memory performance in opiate dependent individuals compare to non-dependents and opiate dependence disorder impairs explicit memory function, especially recognition. These findings support the results of previous researches that all have reported memory deficits in drug dependent individuals (e.g. Rodgers, 2000; Seifert et al., 2003; Seifert et al., 2004; Heffernan et al., 2004). Memory impairments in opiate dependent individuals could be explained in this way that performance on explicit memory task needs to attention and concentration in order to store the information in encoding phase and subsequently, retrieve them in recognition phase. But as the opiate dependents' concentration and attention has been impaired by consuming the drug, so this attention deficit could effect on explicit memory and disrupt its performance.

In order to evaluate implicit memory impairments in opiate dependent individuals, the second hypothesis was introduced as follow: Opiate dependent individuals show significantly greater impairment in implicit memory performance than non-dependent group. The results showed that there was difference between opiate dependent and non-drug dependent individuals on mean number of completed stems regardless of their kind (opiate related or neutral); as generally opiate dependent individuals completed more number of stems than non-drug dependent subjects. These results reflect that not only opiate dependents don't have impairment in implicit memory performance, but also implicit memory performance in this group is better than non-dependent individuals. This result could be explained in this way that enhanced attention and memory bias to drug related cues and personal experience in the field of drug can increase implicit drug related cognitions in opiate dependent individuals, therefore these people have more ability to complete stems that adjusted for drug related words in word-stem completion task than non-dependent subjects and this ability may be an important factor that cause to increase the total numbers of completed stems by opiate dependent subjects and subsequently their better performance on implicit memory task.

The third hypothesis, i.e. opiate dependent individuals demonstrate greater explicit memory bias toward drug related stimuli compared to non-dependent individuals, was introduced to find out whether opiate dependence disorder effects on explicit memory in opiate dependent individuals or not. The results showed that there were significant differences between opiate dependent individuals and non-drug dependent group on the numbers of recognized words based on their type, as opiate dependent individuals recognized more number of opiate related words in comparison with non-drug dependent subjects in both status of word presentation old (correct) and new (incorrect) words. Also, the differences between two groups on the numbers of recognized neutral words and fruit related words were found to be significant; as non-drug dependent subjects recognized more number of neutral and fruit related words in comparison with opiate dependent participants. In addition, within group comparisons were made by taking responses of opiate dependent group and that of non-dependent group pertaining to (a) drug related words (stimulus words), (b) neutral words and (c) fruit related words

(general stimulus words). It revealed that opiate dependent group recognized more stimulus (drug-related) words than neutral and fruit related words, in contrast non-dependent group, who recognized all type of words almost with similar rate. The overall result reflected greater explicit memory bias toward drug related cues than general incentive cues (fruit) and neutral cues in opiate dependent individuals. A small number of researchers have investigated explicit memory bias for drug related information in substance dependent individuals. These researches have shown mixed results among different dependency, but most of them have supported the presence of explicit memory bias in drug dependent individuals (e.g. Zeitlan et al., 1994; White, 1996; Franken et al., 2003), so findings of present study are consistent with previous studies. There are several possible explanations for explicit memory bias in opiate dependent individuals. According to the cognitive theories information related to the disorder will be more readily encoded in memory and more easily accessed in recall (Williamson, Muller, Reas & Thaw, 1999), therefore one possibility is that as opiate dependent individuals are more familiar with drug related cues than non-dependent individuals, so when opiate dependents exposure to drug related cues, these information would be encoded easier than neutral cues in their memory and then simply would be recognized by them. In addition, explicit memory bias could be explained in this way that, opiate related cues have positive effect on opiate dependent individuals' mind and as usually people are able to encode and recall positive information better than neutral data, therefore, memory bias for drug related cues (as positive information) could appear in these individuals. Another possibility could be explained by using Robbins and Everitt's (1999) theory. According to them, a conditioned stimulus can activate a specific neural network that consolidate the original memory, therefore, it is possible that drug related cues as conditioned stimuli could trigger a specific neural network that leads to change the normal process of memory and subsequently facilitates the encoding and recognition of drug related information.

The last hypothesis was mentioned as follow: Opiate dependent individuals demonstrate greater implicit memory bias toward drug related stimuli compared to non-dependent individuals. The results showed that opiate dependent individuals completed more number of stems as drug related words on word-stem completion task in compare with non-drug dependent subjects, significantly. In contrast, non-drug dependent subjects completed more number of stems as neutral words in compare with opiate dependent participants. Totally, opiate dependents showed greater implicit memory bias than non-drug dependent individuals. Biases in implicit memory for drug related words have been observed in some previous researches (e.g. Stacy, 1995; Stacy et al., 1996; Stacy, 1997; Jarvik et al., 1995; Zeitlan et al., 1994), which are consistent with results of present study and this study support their results. There are several probabilities to explain implicit memory bias in opiate dependent individuals. One possibility could be explained in this way, as activation of implicit memory is unconscious, it may be influenced by attention that has been activated automatically by motivational factors such as drug related cues. Therefore, as opiate dependent individuals have attentional bias to drug related cues, so this bias automatically effect on implicit memory and increase implicit memory bias in these people. In addition, another possibility could be explained by Goldman's model (1999). According to Goldman (1999), memory system of drug dependent individuals acts as a repository of the drug related information and these potential concepts are manifested in certain stimulus circumstances, automatically. Based on this model, as opiate dependent individuals encode drug related stimuli better than neutral stimuli, amount of these kind of concepts become very huge in their information network; so when they want to match some new information with previously encoded material, those which were relevant to addiction would be activated very fast and that is why they complete more stems as drug related words in stem completion task than non-drug dependent individuals. Another explanation of these results is that attentional bias to opiate related cues interrupt processing of the information and enhance sensitivity for drug cues, so it maybe influence on implicit memory performance and automatically lead to increase bias toward drug related words in implicit memory task. Also, based on MacLeod (1991) it is possible that attentional bias to opiate related cues may elicit a specific motor response, which interfere with the production of responses for the performance of the memory tasks.

Overall, the results of present study indicated that opiate dependent individuals were able to process information related to drugs faster and better than neutral data that reflected the presence of great explicit and implicit memory biases in these individuals. In addition the results showed that explicit memory impairments in opiate dependent individuals were greater than non-dependent subjects; as in performance on explicit memory task amount of error in opiate dependents was greater than non-dependent individuals. But implicit memory performance in opiate dependent individuals was better than non-dependent subjects. Regarding to the

growing evidence related to this fact that implicit and explicit cognitions are influenced by substance abuse/dependence disorders, it could be considerable that understanding cognitive processes in drug dependence and cognitive interventions may be very effective in treatment of these disorders and also it could have some implications for the prevention of substance abuse/dependence disorders. For example, evaluation of implicit processes may help therapist to determine why addicted individuals continue drug taking behaviors despite knowing the disadvantages of drug using. Also, increasing awareness of drug dependent individuals about their cognitive processes could lead to successful treatment outcomes.To strengthen and support the current results, further studies are required that identify the effect of other psychoactive substances (e.g. cannabis, ecstasy, cocaine and etc.) on cognitive processing. In addition, to evaluate whether the current results could be extended to other cultures, duplicated studies are required to assess the present research design among other countries.

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Evaluation and Grading the Financial Performance of Financial Investment Firm Accepted in Tehran Exchange: Applying AHP, Shanon and Topsis

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Abstract: Evaluating financial performance of the companies and reporting the data and information will provide a chance for the investors to invest accurately and will provide this will result in increasing the competitions in market and consequently society will be develop. This article which will be implemented and done in Tehran attempts to grade the financial investment companies regarding the financial criteria. Nine financial investment companies regarding the financial criteria, Nine financial investment companies has been evaluated and graded for a period from 2008-2009 at this article. The criteria of financial performance of investment companies at exchange have been determine and identified after review of literature, regarding the nature of financial investment companies, studying the article at this area, paying attention to views of financial experts. To increase the authenticity of the research, the weight of financial proportion has been measured both with AHP method, expert's view and with Anthropy Shanoon and its reason is under the data transmittal of each criterion and then these weight have been blended together with average weights. Finally, algorithm TOPSIS has been implemented for grading investment companies regarding final weight. The companies have been graded and ranked under the preference and priority of the financial evaluated proportions after employing the above methods and the companies with better performance were graded and ranked higher according to preference of these proportions.
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Key words: evaluating the performance, the financial investment companies, Anthropy Shanon, AHP, TOPSIS

1. Introduction

One of the main elements of stable economic growth and development in countries is investment issue. Also, in capital market and Stock Exchange Market, the role of investment companies as financial intermediaries has major importance. The efficiency of these companies has been one of the influencing phenomena on capital markets in the economy sector. Since by increasing their efficiency, it can be efficiently contributed to the country's economic performance improvement, there is a need to evaluate their activities and performances based on an appropriate mechanism (Qayi, Alirezaei, Nikoomaram, 2006).

Assessment of companies listed in Stock Exchange requires identifying several factors so that the decision-making process is accompanied by complexity and difficulties. The decision-making has been always a difficult process, and in current situations that rapid and increasingly changes occur, the decision-making trend has undoubtedly accelerated. Ranking the listed Companies in Tehran Stock Exchange according to the financial criteria is among the important topics that unfortunately, little research has been done in relation so far.

Investment companies are a form of financial intermediaries that integrate the participants' funds in the market and use these funds to purchase a portfolio of securities such as stocks and bonds (Abdo Tabrizi, 1998).

Considering that the experts in financial management area know the investment companies as one of the enabling tools of market and the capital, we decided to review the performance of the financial investment companies, hoping that addressing this issue will make it easier for further research in different dimensions and with the aim of creating a boom in the capital market. We wish that the present study will be associated with useful results for the investors and economic planners of our beloved homeland.

2. Defining of the basic concepts

Performance Evaluation

Evaluation shows that which tasks do not proceed in accordance with scheduling and goals. The evaluation also shows in which items it is going well. Thus, based on them, the next successes can be achieved. This reveals the necessity of considering the performance evaluation category. The performance evaluation is a process by which the employee performance is measured, and when it is

done properly, all the employees, supervisors, managers and ultimately the organizations will benefit from it (Madani Mohammadi, 2007).

Table 1: Summary of researches

Row	Research Topic	Researcher	Year	Results
1	Designing a decision-making model to formulate the priority strategy of companies' assignment covered by the Oppressed and Disabled Veterans Foundation using decision-making techniques	Fazaeli	1999	The obtained results suggest that the Department of Mines and Petroleum products has been the best industrial group of the Industries and Mines Organization and Textile groups are the weakest industrial groups of this organization
2	Evaluation of parent investment companies based on hierarchical analysis process	Heibati	1999	Rating of parent investment companies
3	Financial assessment of companies listed in Tehran Stock Exchange based on hierarchical analysis process	Abbasnejad	2002	Rating of companies listed in Tehran Stock Exchange
4	Assessing the economic performance of companies listed on Tehran Stock Exchange; the 9-item indices for about 170 companies in 13 industries	Moemeni	2005	Rating of companies listed in Tehran Stock Exchange
5	Evaluate the performance of airline companies	Fang & Wong	2000	Rating of airline companies
6	Assessment article of financial performance of agriculture - business companies with multi-indicators decision making system approach	Calpgrass et al.	2004	Assessment of financial performance and rating of agriculture - business companies
7	Applying fuzzy multi-criteria assessment to evaluate the financial capabilities of Taiwan airlines	Wong	2008	Evaluate and rating the financial capabilities of 3 airline companies in Taiwan
8	A classification method for determining fiscal representing rates	Wong	2008	
9	Evaluation of the Turkey's banking sectors using fuzzy AHP and fuzzy TOPSIS	Sim et al.	2009	Evaluation of 5 Bank of Turkey using 27 financial criteria And 5 non-financial criteria

Decisions-making

Decision-making can be defined as how to act and/or moving in a given direction, which has been chosen among different ways and methods by realization and consciously to achieve a desired goal (Massi, 1987, 42). In an age characterized by rapid and increasing changes and developments, the decision-making rate has also accelerated, and the need for rapid decision making to deal with rapid interactions in environment has created such conditions that the time of reflection, thinking and decision-making for the manager has been reduced significantly. In fact, today's managers find themselves forced to make more decisions regarding more, more widespread and more various issues in shorter time (Toffler, 1980).

Rating

Rating the companies is considered as one of the most important tools to identify the strengths, weaknesses, opportunities and external threats to the companies. The companies' rating follows several internal and external goals. Among the most applied companies' rating purposes, some can be mentioned as follows:

- Ability to compare the company with the competitors, to determine the internal strengths and weaknesses and environmental opportunities and threats in order to help developing appropriate strategies consistent with environment and the firm's capabilities.
- Improvement of guiding and direction of the performance of the company's senior managers and its various units based on the assessments.
- Re-considering of the past investments and decision- making on new investments according to the performed rankings based on performances evaluation.

- Assisting to the creditors in selecting top companies in the future credit granting.
- Revision in decision-making on purchase and making the customers loyal to the superior companies.
- Helping the government and governmental agencies revision and decision-making on support, intervention, punishment or rewarding and directing the companies (Qodratian Kashan & Anvari Rostami, 2005).

Capital

The capital means investable and savings resulting funds that are applied as machinery, buildings, tools, skills or cash. In economics, any wealth used to produce more wealth is called the capital (Momeni and Najafi Moghaddam, 2005).

Investment companies

The investment companies are the tools that investment the money in a number of securities to benefit their shareholders from diversified advantages of portfolio and performance management (Admister, 1988). The services provided by the investment companies to their customers, include risk reduction, financial intermediation among individuals and financial markets as well as ease of communication (Rose and Fraser, 1988). These institutions have also developed a structure in which the active person in the securities market will encounter lower operational and transitional costs, and ultimately will get more profits (Dietrich, 1996).

Summarized in the following formats, the main reasons for the importance of these companies can be outlined as:

- Capital resources mobilization and participation of people in capital formation through gathering the wandering capitals, which exist as scattered and sometimes in small amounts in the community, and concentration of the collected funds to conduct them toward the priorities with economic advantage.
- Providing liquidity to investee companies and sharing in production issue, especially in secondary markets that give the opportunity to the production units to attract new capital through new equity publishing or debt securities issuance.
- Reducing the investment risk (Shahdaii, 2009).

3. The Problem definition

The existence of an organized and efficient capital market is inevitable for achieving economic growth and development. Indeed, economic growth and savings resources are interdependent and need each other, and with no doubt, the lack of financial resources is the major barrier to economic growth. Creation and development of capital markets requires directing the people's savings and excess liquidity toward economic productive and useful activities. Such a capital market not only prevents the over-increase of consumption and use of public savings in non-productive sectors, but also causes increased production and decreased inflation. Meanwhile, the owners of the savings will benefit good bonuses and profits, which will increase the motivation of the general public for more savings.

Establishment of such a capital market requires a variety of measures and policies of which one of the most important is providing the investment companies. Since the creation of investment companies and starting their activities in the world, their role in the world's capital market has been considered as one of the major players, so that they still play an effective and undeniable role in today's markets. Obviously, whenever these companies have been active and efficient, the financial markets in the concerned countries have become more prosperous (Raee, 1997).

Rating companies in different industries can explicitly mirror the situations of different companies than to their competitors and identify the internal strengths and weaknesses and external opportunities and threats of the companies; but the more important is the ranking model, appropriate criteria and mathematical technique for such ranking. What will be studied in this study includes financial performance evaluation and ranking financial investment companies listed in Tehran Stock Exchange. Given the above points, the following questions will be answered in this study:

- What are the most important components and effective indices for financial performance evaluation in ranking the companies?
- How are the priorities and coefficient importance of each of the effective components in evaluating the financial performance of companies and their rankings?
- What is the rating order of financial investment companies listed in Tehran Stock Exchange?

4. The proposed solutions

The proposed solutions include scientific research, problem-solving methods and following a step by step, logical, systematic and accurate method to identify the problems, collecting data, data analysis and valid conclusions from them (Sekaran, 2007). Without measurement, there will be no basis for evaluating, and what cannot be evaluated, would not be also possible to be properly being managed. Therefore, it is necessary to use a scientific model for performance evaluation of the investment companies

for applying proper and effective management in order to be able to make continuously measurement of their efforts level and their work results (Qayi, Alirezaei and Nikoomaram, 2006).

The multi-criteria models are used for selecting the best option and several criteria (not the ideals) are considered simultaneously in decision makings. The decision matrices in these methods are two-dimensional matrices, in which the rows are the options and columns form the criteria. The quantitative values of each column are normalized by hourly method, which is the same option weight in proportion with the criterion. The set of techniques in MADM can be classified into two categories, including compensatory techniques and non-compensatory techniques (Asgharpoor, 2009).

In this study, after a comprehensive review of the discussion literature and considering the nature of the investment companies, the measures (ratios) of financial evaluation of investing companies listed in the stock market have been identified. After extracting the data on financial ratios using the Rahavard Novin software, a program was prepared in EXCEL to make the necessary calculations in it. First, the inconsistency rate of the paired comparisons tables were calculated, and the tables with the rate of inconsistency over 0.1 were excluded from the calculations. Among the fourteen completed comparisons tables, two tables had inconsistency rates more than 0.1, which have been excluded from the calculations, since it was not possible to review them. Then, using the geometric mean, the paired comparison tables (completed by the experts) were combined, and using the AHP method – based on the experts' opinions – the financial evaluation criteria weights were calculated. In order to increase the research accuracy, these weights have been combined with the weights calculated using the Shannon entropy method, which logic is based on data distribution of each of the criteria. After determining the final weights of the criteria, the evaluation of the investment companies and their prioritization were performed using the TOPSIS method. The financial investment companies listed in Tehran Stock Exchange studied in this research included 9 companies, as the following: Atieh Damavand, Bu Ali, Bimeh, Toseae Melli, Sepah, Sanat o Maadan, Behshahr Group, Mellat and Melli.

5. The financial evaluation process of investment companies

5.1. Developing the evaluation criteria

Very valuable efforts have been carried out during the past years to develop appropriate and efficient criteria for financial assessment evaluation of companies. However, these criteria have not been often studied themselves in comparative ratios by each other, and a similar significance weight has been considered for them.

In the present study, according to the performed studies, the nature of studied companies and considering the experts' opinions, fifteen criteria were adopted for financial evaluation of the companies. As mentioned above, the major problem of these criteria lies in the absence of their relative priority determination. This major weakness has been addressed in the current study. These criteria include:

A. Fixed assets to total shareholders' equities ratio
B. Fixed assets to long-term debts ratio
C. Total debts to total assets ratio
D. Total shareholders' equities to total debts ratio
E. Working capital to total assets ratio
F. Current assets to current liabilities ratio
G. Immediate assets to current liabilities ratio
H. Working capital to current assets ratio
I. Operating income to fixed assets ratio
J. Operating income to total assets ratio
K. Profit to operating income ratio
L. Income before taxing to operating income ratio
M. Profit to operating income ratio
N. Net income to total assets ratio
O. Net income to shareholders' special equities ratio

To make the paired comparisons possible, the criteria have been grouped in four main categories of financial structure, debt capacity, return on investment and profitability.

5.2. Determination of criteria weights

In this step, using the questionnaires distributed among the experts, the final weights of AHP were obtained for each of the options (criteria). Then, using the Shannon entropy, the weight for each of the options was obtained.

5.3. Combining the AHP and SHANON weights and determining the final weights of the measures

To increase the accuracy of the present study, these two types of weights obtained from AHP and Shannon Entropy methods were combined together. So, the adjusted weight $\left(w'_j\right)$ is calculated as follows (Momeni, 2009):

$$\forall\ j \quad ; \quad \frac{\lambda_j . w_j}{\sum_{j=1}^{n} \lambda_i . w_j} = \text{the adjusted weight} = w'_j$$

5.4. Ranking of investment companies using TOPSIS method

In this step, 9 investment companies were evaluated considering 15 criteria (financial ratios), and the selected option should be at the least distance from the positive ideal solution and at the farthest distance from the negative ideal solution. In this method, the best value that an indicator can have is the positive ideal, and the worst value is considered as the negative ideal indicator.

6. Final prioritization of financial investment

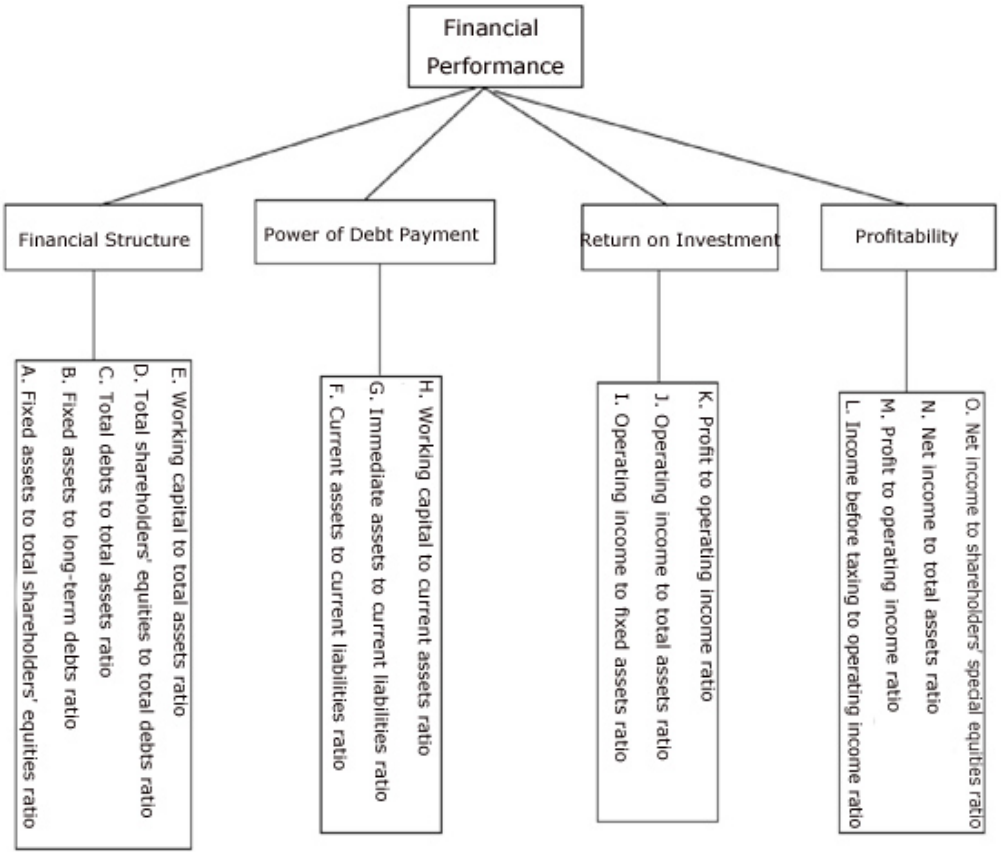

Figure 1: Overview of the studied financial criteria groups and subgroups

Table 2: Final prioritization of financial investment companies

Prioritization order of financial performance	Option	Financial investment company name
1	A5	Sepah
2	A4	Toseae Melli
3	A2	Bu Ali
4	A1	Atieh Damavand
5	A3	Bimeh
5	A8	Mellat
7	A9	Melli
8	A6	Behshahr Group
9	A7	Sanat va Maadan

7. Conclusion

Through evaluating the financial performance of companies and provide information, an appropriate opportunity will be provided for investors in order to perform correct investments, which causes the increased competition in the market and ultimately leads to the community development. Combining two perspectives of the experts' opinions and use of data in weights calculation has been as the strengths of this study. Also, detailed evaluation of financial performance of the companies from the four dimensions, including financial structure, debt capacity, return on investment and profitability is the other unique feature of the present research.

7.1. Applications

It can be suggested based on the results of the study that for investment in the shares of investment companies, the best way is to study and evaluate the past years performance of these companies at first; then, predict their future performance and based on that, select the companies those can better meet the investor's expectations. Also, using the survey results, the competitive strength and the weakness of these companies can be identified. In studied ratios, except for C ratio that is the total debts to total assets ratio, the other ratios with more values would be better. Certainly, the companies with better financial performance - except for the C ratio, other ratios with high value - are placed in the higher ranks based on the priority of these ratios. Accordingly, it is recommended to the investors to take their steps toward appropriate investment by detailed identifying these companies through financial performance evaluation, which would increase the competition in market, and ultimately will lead to the community development.

7.2. Suggestions for future research

- It is possible the results obtained from the different performance evaluation indicators are not identical; hence, it is suggested that the performance evaluation will be performed based on non-financial (qualitative) criteria and the results will be compared with this study results.
- Conducting the research in the future and comparing its results with this research results and impact analysis of each of the ratios on success or failure of the investment companies.
- In the case of access to the appropriate and adequate information, the research will be done in longer periods.
- The investment companies will be evaluated with combined methods and the results will be compared with this study results.

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Design of an optimized Reversible Ternary and Binary Bidirectional and Normalization Barrel Shifters for Floating Point Arithmetic

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Abstract: One of the most challenging issues in circuit design is power consumption. Designing circuit using reversible logic is one of the solutions to decrease power loss. Theoretically, a reversible circuit has zero internal power dissipation because it does not lose information. Thus reversibility will be necessary for future circuit designs. Multiple-valued reversible logic which decreases the width of quantum circuits is an emerging area of reversible/quantum logic. The simplest type of multiple-valued logic is ternary quantum logic. On the other hand, Data shifting has been widely used in many key computer processes such as high-speed/low-power error-control application, address decoding, bit indexing and many arithmetic operations specially floating point arithmetic units. Barrel shifters are combinatorial shifters which are used in high speed and high performance applications. Reversible binary and ternary bidirectional barrel shifter and binary normalization barrel shifters for floating point arithmetic are presented in this paper for the first time. Proposed barrel shifters are evaluated and formulated in terms of number of reversible gates, number of garbage outputs, number of constant inputs, quantum cost and hardware complexity. All the scales are in nanometric area.
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Key words: nanotechnology based systems; quantum computing; reversible logic; reversible multiple-valued logic; ternary quantum logic; reversible ternary barrel shifters.

1. Introduction

Although traditional computers with the advent of VLSI and ULSI technologies are constructed in smaller dimensions and high processing speed, but always there is a question that up to where they can continue in such a direction. Due to the fact that there is a constraint for traditional computers' dimensions and processing speed, it cannot be continued any more. Thus in such a case novel technologies based on nanotechnology such as Quantum Computing will be replaced with the traditional ones. Quantum computers are based on Quantum physics' laws and have been constructed on reversible gates design and using hardware concludes Quantum tools, are suitable substitute for classic computers in the near future. In other words, nowadays, quantum computing and reversible circuits, in order to power minimization designs, have received significant attention. Bit loss from information relates to heat generation whereas in reversible circuits due to this fact that there is no any information loss, no heat will be generated. From one point of view Circuit design using reversible gates relates to no energy consumption in circuits. Landaulet[1] proved that generated heat for erasure of a single bit is KTln2 joules of energy Where K= $1.3806505*10^{-23} m^2\ kg^{-2}\ K^{-1}$ (joule/Kelvin) is Boltzmann constant and T is the absolute temperature of the environment. In 1973 Bennett [2] pointed out that reversible computing is computing without any information loss. Reversible logic is one of the interested subjects in systems based on nanotechnology, Quantum computing, low power CMOS design, DNA computing, bioinformatics and optical information processing. Multiple-valued quantum circuits are important options for future quantum computing and they have several advantages more than the corresponding binary quantum system. Muthukrishnan and Stroud showed realization of multiple-valued quantum gates using liquid ion-traps and proposed a family of 2-qudit multiple-valued gates called M-S gate[3]. The implementation of Ternary logic gate is realized by M-S gate. Moreover, ternary quantum gates have been realized using traps ions by Klimov et al [4], Hugh and Twamley [5]. Ternary reversible/quantum logic synthesis is a neoteric and growing area. There is a good number of works that have been presented on ternary quantum logic synthesis [6-18]. The quantum gates act on quantum bits (qubit). A qubit is a unit of quantum information. In ternary logic the possible states for a qubit are $|0\rangle, |1\rangle \& |2\rangle$. On the other hand, circuit design for shifting data is possible as combinatorial and sequential circuits. Shift registers are sequential circuits which require clock pulse for shifting data while barrel shifters are combinatorial circuits without any requirement clock pulse.

As we know, the most popular numerical system that is commonly used in computer systems and has peculiar importance in its widespread use in various areas is "floating point" numbers. In floating point operations such as addition/subtraction, multiplication and division, shifters are key components and crucial in computing speed. The speed of shifters has an extreme impact on overall performance of the floating-point addition/subtraction unit. Consequently, shifters are usually implemented as combinatorial shifters rather than shift registers, which would require a large and variable number of clock cycles to complete the shift. Barrel shifters are a common design choice due to fulfilling multi-bit shifts in a single cycle. Barrel shifters are normally utilized in many applications as: word pack/unpack, encryption and decryption Algorithms, test generation for DSP [19], variable length encoding, floating-point normalization, quantum-dot cellular automata [20], high-speed/low-power error-control application [21] and many other applications. To design a reversible ternary and binary floating point adder/subtractor is required to have crucial ternary/binary barrel shifters, so in this paper, optimized reversible binary and ternary bidirectional barrel shifters and also normalization barrel shifters for floating point arithmetic are presented for the first time. The proposed work is the first endeavor for designing reversible binary and ternary non-rotating barrel shifters.

The structure of the paper is organized as follows: section 2 discusses the common definitions of reversible and ternary logic and some utilized ternary gates. Section 3 presents a summary of the works that have been performed on reversible binary and ternary barrel shifters. Introductory structure on barrel shifters as well as Reversible binary and ternary bidirectional logarithmic logical shifter is described in section 4. Required reversible barrel shifters for floating point arithmetic are proposed in section 4 too. The simulation results with VHDL language and Quartus simulator are shown in section 5 and section 6 draws conclusions.

2. Reversible Binary and Ternary Gates

A reversible circuit is composed of reversible gates in which there is a one-to-one relationship between its inputs and outputs [22]. Designing reversible circuits using reversible gates have two limitations: one of the constraints is that the fan-out is not allowed; therefore FG is often used as a copying gate. The other limitation is that the feed-back is forbidden. In this section the definitions of garbage outputs, constant inputs/ancilla bits, quantum cost and necessary ternary gates are described. For information on other utilized reversible gates such as NOT, FG, FRG, PG you can refer to [23, 24] references.

Garbage outputs: Garbage outputs are used to preserve reversibility and they are defined as some outputs that are not used for further computations in the circuit [25, 26].

Constant inputs/Ancilla bits: The inputs that are added to an n×k function to make it reversible, are called constant inputs [25, 26], in other words an auxiliary input that has a constant value is called an ancilla bit.

Quantum cost: The quantum cost of a reversible gate is realized by using 1×1 and 2×2 reversible gates. The quantum cost of 1×1 and 2×2 reversible gates are zero and one respectively[25, 26]. The quantum cost of a ternary gate is the number of 1-qudit gates (shift gates) and 2-qudit gates (M-S gates) that are used in its implementation.

Ternary Modified Fredkin Gate

Modified Fredkin gate is a reversible ternary 4*4 gate. It has been proposed in [27] by A. I. Khan et al. MFG can be represented as:

$$I_V = (A, B, C, D)$$

$$O_V = (P = A, Q = B, R = CifA < BelseR = D, S = DifA < BelseS = C)$$

Where I_V and O_V are the input and output vectors. The symbolic representation of a 4-qutrit MFG is depicted in figure 1. If A was larger than or equal to B (A≥B) then input lines(C, D) are displaced otherwise outputs(R, S) are the same repetitive inputs. According to MFG realization by M-S gates in figure 2, the QC of MFG is 41. It consists of 21 shift gates and 20 M-S gates. The proposed circuits exert this gate as a 2*1 multiplexer.

Ternary Feynman Gate

A ternary Feynman gate can be described by the equations: P=A, Q=A+B where P is the pass through output and Q is the controlled output. A "+" sign is used to indicate GF (3) addition. This gate is used by designer for fan-out purpose. If the controlled input (B) is set to zero the Q and P output are A. The logic diagram of ternary Feynman gate is demonstrated in figure 3. Ternary Feynman gate can be realized using two M–S gates and two shift gates with QC=4. In Figure 3, P = (A + 1) + 2= A. If A = 0, then $a_1 = 0$ and $a_2 = 1$ none of the transformations will be applied on B and the output will be Q = B = B

+ 0 = A + B. If A = 1, then a_1 = 1 and a_2 = 2 only the right transformation (+1) will be applied on B and the output will be Q = B + 1 = A + B. If A = 2, then a_1 = 2 and a_2 =0 the left transformation (+2) will be applied on B and the output will be Q = B + 2 = A + B [27].

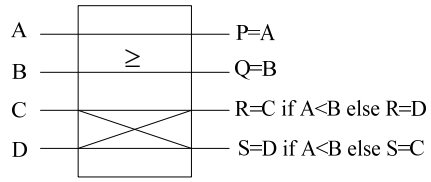


Figure 1. Symbol of Ternary MFG

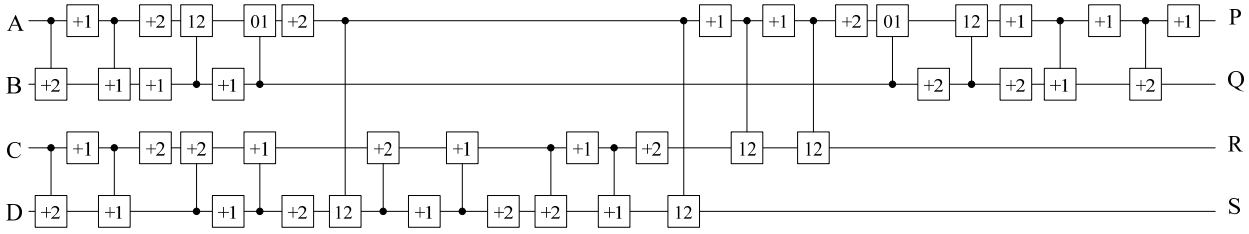


Figure 2. Modified Fredkin Gate Realization Using M-S gate

Figure 3. Ternary Feynman gate, (a): Symbol of Ternary FG, (b): Realization of ternary FG using M-S gate

Ternary Toffoli Gate

Three-qutrit Ternary Toffoli gate has three inputs. A and B are the controlling input and C is the controlled one. TTG can be represented as:

$$I_V = (A, B, C)$$

$$O_V = (P = A, Q = B, R = AB + C)$$

Where I_V and O_V are the input and output vectors. The symbolic representation of a 3-qutrit TTG and quantum realization of this gate by M-S gates are depicted in figure 4. As can be observed the realization of TTG required two ternary Feynman gates and four 1*1 shift gates and four 2*2 M-S gates. So it will have a total of eight 1*1 shift gates and eight 2*2 M-S gates, thus the quantum cost of TTG equals 16 with no ancillary bit [27].

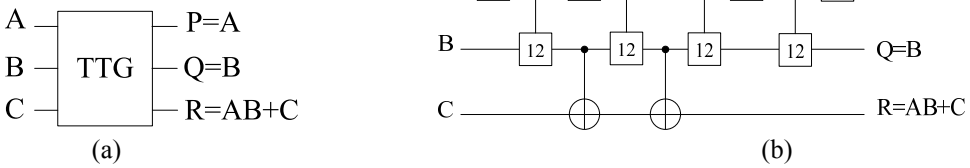


Figure 4: Ternary Toffoli gate, (a): Symbol of Ternary TG, (b): Realization of ternary TG using M-S gate

3. Literature Survey

Barrel shifters are useful in embedded processors. Multiple shifts are needed to do computations in digital signal processors. Paul Gigliotti [28] proposed the design of irreversible barrel shifters using multipliers. Several other complex irreversible barrel shifters such as Mask-based data-reversal barrel shifter, Mask-based two's complement barrel shifter and Mask-based one's complement barrel shifter with overflow and zero flag have also been presented by Pillmeier and et al. [29]. Saeid Gorgin and Amir Kaivani[30] published the first paper on reversible barrel shifters. They proposed a unidirectional logarithmic shifter with large number of gates. Irina Hashmi and Hafiz Hasan Babu [31] showed the optimization of the Gorgin's paper. They proposed an efficient unidirectional barrel shifter with less QC, garbage outputs and number of gates. Saurabh Kotiyal and et al. [32] described design of a ternary unidirectional barrel

shifter using multiple-valued reversible logic. There are several types of shift operations depending on their applications including logic shift, arithmetic shift and rotate. The proposed barrel shifters in [30-32] are capable of only rotating to the left. Thus, Ravish Aradhya H.V and et al [33] proposed bidirectional logarithmic shifter using RLM gate. The proposed barrel shifter in [33] can be rotate input data in both directions (left and right). Design of a reversible bidirectional barrel shifter is explained by Saurbh Kotiya, Himanshu Thapliyal and Nagarajan Ranganathan[34]. This barrel shifter is a non-rotating barrel shifter that is capable of bidirectional logic and arithmetic shift.

4. Barrel Shifter

Intel was the first company that utilized barrel shifters in its numerical data processors. A combinatorial shifter generates all possible shifted patterns but only one is provided at the output according to some control bits. Since, in general, such combinatorial shifters are capable of performing circular shifts (rotates) as well, they are commonly known as barrel shifters [35]. In [30-33] left rotating and bidirectional rotating barrel shifters has been proposed, but non-rotating barrel shifters are required for floating point operations and many other applications. On the other hand, A barrel shifter can be implemented as a single level array where each input bit is directly connected to m (and even more) output lines. For example a single level array right shift barrel shifter with four bits input data and two select lines for controlling bit shift operation is depicted in figure 5.

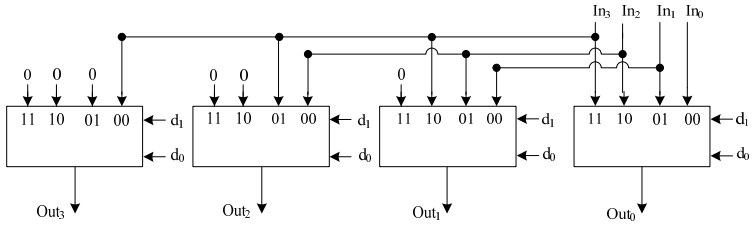


Figure 5. Irreversible single level array four bit right barrel shifter

For floating point calculation, which deals with large numbers, single level array barrel shifter design is not appropriate, because the large number of connections and resulting large electrical load make an undesirable solution [36]. One alternative is a logarithmic barrel shifter as demonstrated in figure 6. A logarithmic (m, K) barrel shifter is composed of m-bit input data and K select lines that control bit shift operations. The logarithmic barrel shifter has $K = \log_2 n$ stages so that i=0, 1, …, (K–1). In every stage if d_i control signal equals one then 2^i times shift will occur in input data, otherwise the input data will not change. The irreversible logarithmic shifter implemented with 2×1 multiplexers. The proposed reversible barrel shifters will be explained and evaluated in the next section.

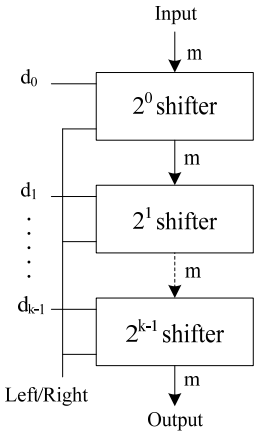


Figure 6. (m, k) logarithmic barrel shifter

4.1 Proposed optimized Reversible bidirectional logarithmic logical shifter

A bidirectional logarithmic logical shifter is a non-rotating barrel shifter which can shift input data to left or right. It has a control signal (D) for determining the direction of the shift. If D signal is set to zero then the logical shifter will work as a logical right shifter otherwise it will work as a logical left shifter. For instance a 4-bit bidirectional logarithmic logical shifter which is shown in figure 7a has two stages(d_i, i=0,1) and it is constructed by 12 Fredkin gates, and every one of them is as a 2×1 multiplexer and 5 Feynman gates as a copying gate. The 2 Fredkin gates before and after the logical right shifter is required to reverse input data and logical right shifter's output data respectively. The (4, 2) bidirectional logical barrel shifter which is depicted in figure 7 takes m_3,m_2,m_1,m_0 as data inputs and d_1,d_0 as select inputs. The circuit function is according to table 1. In D,d_1,d_0=000 & D,d_1,d_0=100 states the input data does not change, in other states the value in d_1,d_0 determines shift amount and depend on D the input data is shifted to the right or left.

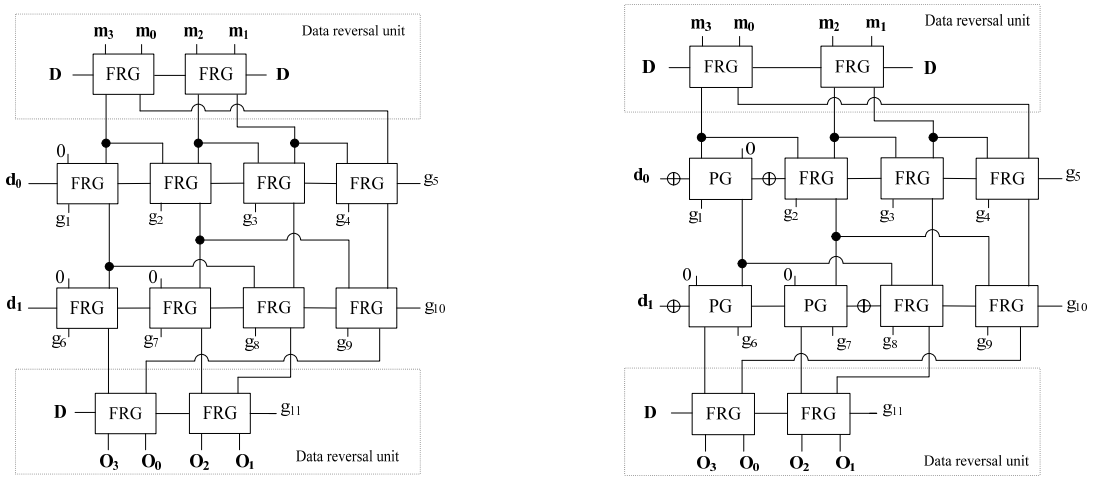
Table 1. Function table of the (4, 2) bidirectional logical barrel shifter

D	d_1	d_0	output
0	0	0	$m_3m_2m_1m_0$
0	0	1	$0m_3m_2m_1$
0	1	0	$00m_3m_2$
0	1	1	$000m_3$
1	0	0	$m_3m_2m_1m_0$
1	0	1	$m_2m_1m_00$
1	1	0	m_1m_000
1	1	1	m_0000

This article proposes an optimized bidirectional logarithmic logical shifter. We can replace the FRG gates which have a zero input (figure 7a) with PG gates that are put as AND gates with two inputs consisting of data bit and $\overline{d}_i$. So the proposed circuit has a less QC and hardware complexity than common bidirectional logical barrel shifter. Table 2 shows the compressive between the proposed design and common design.

Table 2. Comparison between common and optimized barrel shifter

	NO. of gates	NO. of Constant inputs	NO. of Garbage outputs	Quantum Cost	Total Logical Calculation
Optimized Design Figure 7b	17	8	11	62	$29\alpha + 39\beta + 18\gamma$
Common Design Figure 7a	17	8	11	65	$29\alpha + 48\beta + 24\gamma$



(a) (b)

Figure 7. Bidirectional logarithmic logical shifter (a): Common design, (b): proposed optimized design

Optimized (4, 2) bidirectional logarithmic logical shifter has four main outputs and 11 garbage outputs with QC=62. Optimized (4, 2) bidirectional logical barrel shifter can be generalized for (m, k) reversible barrel shifter.

Theorem 1: The proposed optimized (m, k) reversible bidirectional logical shifter has an m-bit input and output data and K stages for logical right shifter. Let N_{PG}, N_{FRG} and N_{FG} be the total number of Peres, Fredkin and Feynman gates respectively then

$$N_{PG} = 2^K - 1$$

$$N_{FRG} = (K+1)m - (2^K - 1)$$

$$N_{FG} = \sum_{i=0}^{K-1}(m - 2^i)$$

Proof: PG is utilized as a AND gate in proposed circuit. Every stage in logical right shifter is denoted by i, so the number required PG gates in each stage equals $2^i, i = 0,1,...,k-1$ thus K stages will have a total of $\sum_{i=0}^{k-1}2^i$ Peres gates. Every reversal data unit needs $\frac{n}{2}$ Fredkin gates and the logical right shifter requires ($m-2^i$) Fredkin gates for each stage. Thus an m-bit bidirectional barrel shifter with K stages will have a total of $(K+1)m - \sum_{i=0}^{k-1}2^i$ Fredkin gates. Fan-out gates must be used for copying signal in reversible circuit. One of the fan-out gates is FG. The number of FG gates in each stage is $m-2^i$ hence the circuit can be realized with $\sum_{i=0}^{k-1}(m-2^i)$ Feynman gates.

Theorem 2: Let GO, CON be the total number of DC outputs and inputs respectively, then

$$GO = K(m+1)+1$$

$$CON = 2^K - 1 + \sum_{i=0}^{k-1}(m - 2^i) = Km$$

Proof: Every PG and Fredkin gate produces one garbage output except the last Fredkin gate that generates two DC outputs. In other words in each row the logical right shifter produces m+1 DC outputs so K stages will have a total of K(m+1) garbage outputs. Further, the last data reversal unit consists of the chain of $\frac{n}{2}$ Fredkin gates with only one garbage output. Thus, the proposed shifter produces K (m+1) +1 number of garbage outputs. The number of constant input is commensurate to the number of Peres gates and Feynman gates so it equals $2^K - 1 + \sum_{i=0}^{K-1}(m-2^i) = Km$.

Theorem 3: Let QC and T be the total number of quantum cost and hardware complexity of proposed design respectively, then

$$QC = N_{FG} + 5N_{FRG} + 4N_{PG}$$

$$T = N_{FG}(\alpha) + N_{FRG}(2\alpha + 4\beta + 2\gamma) + N_{PG}(2\alpha + \beta)$$

Proof: The quantum cost is the most common comparison criterion of quantum circuits. This yardstick is also used in reversible circuits. The quantum cost (QC) of a reversible or quantum circuit is calculated by required number of primitive reversible logic gates (1*1 or 2*2) which is used in the circuit design. So each Reversible gate has a certain cost. The proposed circuit is realized by PG, FG and FRG gates with quantum costs 4, 1 and 5 respectively. Thus the total cost of proposed design is $QC=N_{FG}+5N_{FRG}+4N_{PG}$. Another significant factor for evaluation of reversible circuits is hardware complexity. It refers to the number of NOT, AND and EXOR gates required to realize the output phrase of desired gate. Hardware complexity has four main factors consisting α, β, γ and T which are defined as: α is the number of two-input EX-OR gate, β is the number of two-input AND gate, γ is the number of NOT gate, and T is Total logical calculation. So the total logical calculation of this circuit is

$$T = N_{FG}\alpha + N_{FRG}(2\alpha + 4\beta + 2\gamma) + N_{PG}(2\alpha + \beta).$$

4.2 Proposed optimized ternary bidirectional logarithmic logical shifter

Ternary Feynman gates, ternary Modified Fredkin gates (MFG) and ternary Toffoli gates are used for implementation of ternary bidirectional logarithmic logical shifter. The ternary Feynman gate is utilized to avoid the fan-out. The ternary MFG and TFG are applied as mux 2*1 and AND gates respectively. The design of optimized (4, 2) ternary bidirectional logical shifter has been demonstrated in figure 8 and the symbol «o» is used to indicate ternary Feynman gate for better diagnosis. The circuit function is like the optimized binary barrel shifter function in the previous section, therefore avoided repetitive explanations. The (4, 2) ternary bidirectional logical shifter is constructed by five ternary FG, nine MFG and three TTG and it produces four main outputs and twelve garbage outputs with QC=437. The (4, 2) ternary bidirectional logical barrel shifter can be generalized for reversible (m, k) ternary bidirectional logical barrel shifter. The number of ternary gates required to produce the ternary logical barrel shifter equals the number of gates in binary logical shifter, while the number of ancilla bits and garbage outputs are different. The proposed ternary right barrel shifter requires m+1 garbage outputs for each stage. Furthermore the last reversal data unit needs two garbage outputs. Thus if the total number of stages is K, then the circuit can be realized with at least K (m+1) +2 number of DC outputs. The number of ancilla inputs is proportional

to the number of TTG and TFG in addition, the first reversal unit needs one ancilla bit so it equals Km+1. Hence the ternary bidirectional logarithmic logical shifter for transferring m-bit data will require the following parameters:

- Number of ternary Feynman gates: $N_{TFG} = \sum_{i=0}^{k-1}(m-2^i)$
- Number of ternary modified Fredkin gates: $N_{TMFG} = (K+1)m-(2^k-1)$
- Number of ternary Toffoli gates: $N_{TTG} = \sum_{i=0}^{k-1}(2^i) = (2^k-1)$
- Number of ancilla inputs: $CON = 2^k + \sum_{i=0}^{k-1}(m-2^i) = Km+1$
- Number of garbage outputs: $GO = K(m+1)+2$
- Quantum cost: $QC = 4N_{TFG} + 41N_{TMFG} + 16N_{TTG}$

With these formulas, it is needless to draw complicated and time-consuming figures for ternary (m, K) bidirectional logical shifter.

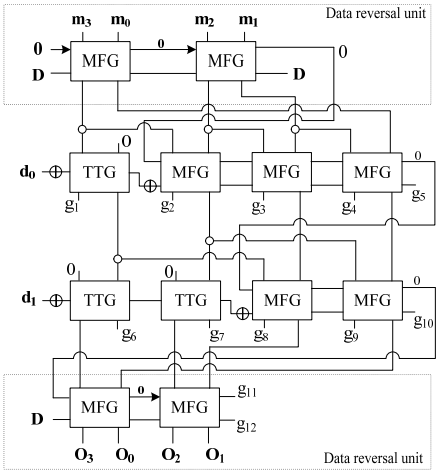


Figure 8. Optimized (4, 2) ternary bidirectional logical shifter

4.3 The proposed optimized reversible binary logarithmic right shift barrel shifter & GRS-bit Generation Component for floating point operation

The method of floating-point operations' execution depends on the particular format applied to display the operands. In the standard form it is assumed that the significants are normalized fractions in signed-magnitude display and the exponents are biased. For example in addition/subtraction operations the exponents of both operands must be equal before adding or subtracting the significant. To achieve this, the significant are aligned by shifting the significant of the smaller operand to the right, incrementing its exponent at the same time, until it equals the other exponent. So If an alignment preshift is fulfilled, the bits that are shifted out should not all be thrown away, since they can possibly affect the rounding of the result. Keeping all the bits that are shifted out doubles the width of the significant adder/subtractor. A general solution is to use three bits, namely, G (guard), R (round) and S(sticky). When the significant of the number with the smaller exponent is shifted to the right through a number of bit positions that equals the exponent difference, two of the shifted out bits of the aligned significant will be retained as guard (G) and Round (R) bits. So for m-bit significant, the effective width of aligned significant must be m + 2 bits. A third bit, namely the sticky bit (S), is appended at the right end of the aligned significant. The sticky bit is the logical OR of all shifted out bits. Therefore in this section a reversible logarithmic right barrel shifter & GRS-bit Generation Component is proposed for the first time. The display of floating-point numbers comprises two parts the significant (or mantissa) M and the exponent E. In order to illustrate the modeling strategy, the design of reversible (8, 3) right barrel shifter & GRS-bit Generation is explained, so if M=8 and E=5 then d_4, d_3,d_2,d_1,d_0 lines will equal to exponent difference of the two mantissa which d_2,d_1,d_0 determine the shift amount and d_4,d_3 lines are utilized as two inputs of PG(as a NOR gate) to create final result and required GRS-bits. As can be observed in figure 9, the proposed shifter is composed of FRG (as a multiplexer), FG(as fan-out gates) and PG(as AND/OR/NOR gates). For most readability, the Feynman gates are shown with symbol of «●». The proposed design consists of 21 Fredkin gates, 28 Feynman gates for producing the fan-out and 29 PG as a AND gate as well as 4 PG as an OR gate and 1 PG as a NOR gate so the total number of PG equals 34 gates. This circuit produces 64 garbage outputs with 62 constant inputs. The quantum cost of the (8, 3) reversible right barrel shifter & GRS-bit Generation equals 269. Next section summarizes the important characteristics of the proposed optimized (m, k) reversible right barrel shifter & GRS-bit Generation in terms of number of gates, garbage outputs, ancilla bits, quantum cost and hardware complexity.

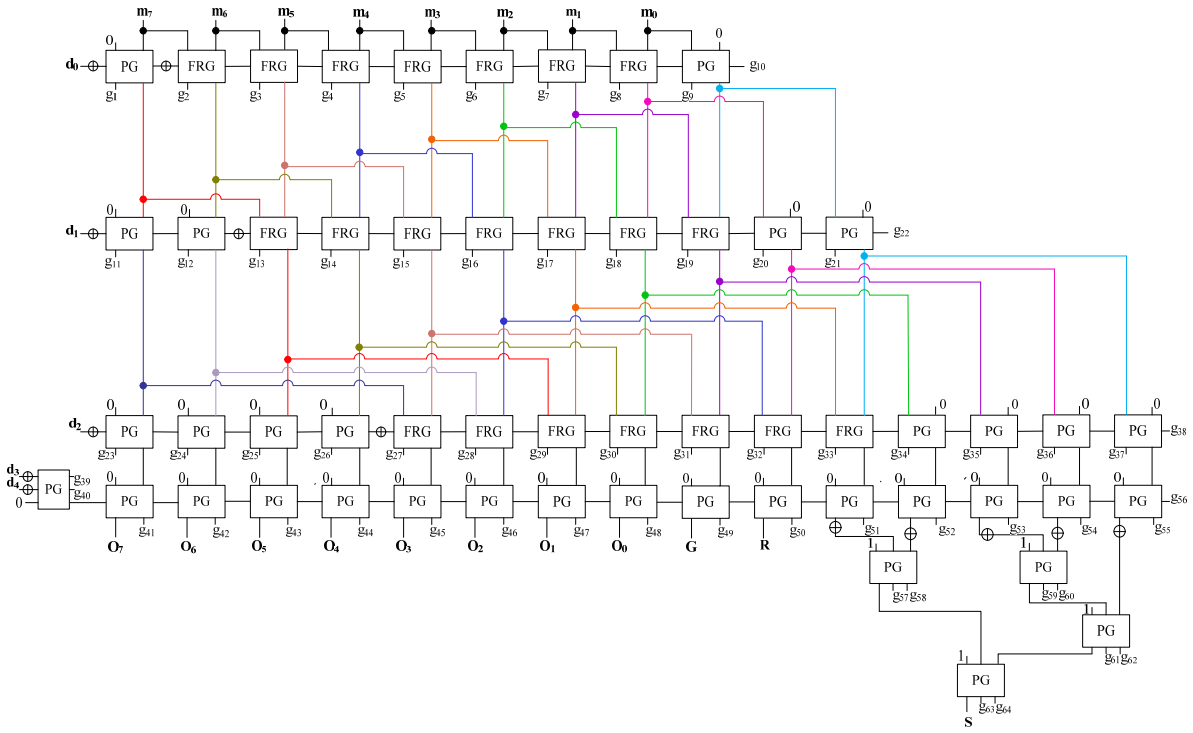


Figure 9. The proposed optimized (8, 3) reversible right barrel shifter & GRS-bit Generation component

4.3.1 The Performance Evaluation

In the (m, k) reversible optimized right barrel shifter & GRS-bit Generation, if m is total number of mantissa bits, k is the shift value and E is the number of exponent bits then this circuit will have K+1 rows which the number of required PG gates in each stage equals 2×2^i, $i=0,1,...,k-1$ thus K stages will have a total of $2\times\sum_{i=0}^{k-1}2^i$ Peres gates. As well as the last row((K+1)th row) is constructed by $\sum_{i=0}^{k}2^i$ number of Peres gates as AND gates, m–4 PGs is required to make OR gate for producing sticky bit and E–K–1 PGs is also needed to implement NOR gate. Thus K+1 stages will have $2\times\sum_{i=0}^{k-1}2^i+\sum_{i=0}^{k}2^i+(m-4)+(E-K-1)$ which is $N_{PG}=2^{k+2}+m+E-K-8$ number of Peres gates. The proposed barrel shifter requires m–1 Fredkin gates for each stage. So the circuit can be realized with at least $N_{FRG}=K(m-1)$ number of Fredkin gates. Every stage in proposed shifter is denoted by i, so the number required FG gates in $i=0,1,...,k-1$ equals $m-1+2^0, m-1+2^1, m-1+2^2,..., m-1+2^i$ respectively. It means that the total number of Feynman gates equals $K(m-1)+\sum_{i=0}^{k-1}2^i$ which is $N_{FG}=K(m-1)+2^k-1$.

- **DC inputs and outputs**

DC inputs and outputs are an important figure of merit to evaluate a design. In this section, the required formula for calculation of constant inputs and garbage outputs is presented. The number of constant inputs is commensurate to the number of Peres gates and Feynman gates so it equals $N_{FG}+N_{PG}=m(k+1)+5\times 2^k+E-2k-9$. In each row, every PG as an AND gate and Fredkin gate produce one garbage output except the last Peres gate that generates two DC outputs which is $(2^{k+2}-3)+N_{FRG}+K+1$. As well as every PG produces two garbage outputs for implementing NOR and OR gates which are $2(E-K-1)$ and $2(m-4)$. Thus, the (m, k) reversible optimized right barrel shifter & GRS-bit Generation produces $m(K+2)-2K+2E+2^{K+2}-12$ garbage outputs.

- **Quantum cost and hardware complexity**

Two most significant criterions for evaluation of reversible circuits are QC and Total logical calculation. So these factors can be calculated by the functions bellow:

$$QC=N_{FG}+5N_{FRG}+4N_{PG} \quad (1)$$

$$T=N_{FG}(\alpha)+N_{FRG}(2\alpha+4\beta+2\gamma)+N_{PG}(2\alpha+\beta) \quad (2)$$

4.4 The Proposed optimized reversible binary normalization barrel shifter for floating point arithmetic

A floating-point number is normalized if the most significant digit of the mantissa is nonzero. In this way the mantissa contains the maximum possible number of significant digits. When two numbers are subtracted, the result may contain most significant zeros as shown in the following example:

0.11100101×2^5

$-\ 0.11011110 \times 2^5$

0.00000111×2^5

In the above example, the result number is necessary to shift left five times to obtain 0.11100000×2^0. In other words, the mantissa has an underflow if the most significant bit in position m_7 is zero. In this case, the mantissa is shifted left and the exponent decremented. The bit in m_7 is checked again and the process is repeated until it equals 1. When $m_7 = 1$, the mantissa is normalized and the operation is completed, but loop is not possible in reversible logic. In this reason, the proposed normalization shifter must be able to shift mantissa necessary number with receiving the position of the first bit one from left. In order to illustrate the modeling strategy, we follow an example. If Proposed (8, 3) reversible normalization barrel shifter which is depicted in figure 10 takes $m_7m_6m_5m_4m_3m_2m_1m_0 = 00000101$ as data inputs then data will be shifted to the left through 5-bits for normalization. M2 is the position of the first bit one from left. It means that the position of first one bit is "010" thus the select lines of barrel shifter must be one's complement of $010 \rightarrow d_2'd_1'd_0' = 101$. In other words the selecting lines in normalization left barrel shifter equal one's complement of position of the first one bit in result mantissa. The proposed normalization barrel shifter for floating point arithmetic has been implemented using NOT, FRG and FG. This circuit is optimized due to the standing Peres gates instead of FRG gates which have zero inputs in common left barrel shifter. The Proposed optimized (m, K) reversible binary normalization left barrel shifter requires $2^i, i = 0,1,...,k-1$ Peres gates for each stage so it will have a total $\sum_{i=0}^{k-1} 2^i$ PGs. The number requirement Fredkin gates in each stage equals $(m - 2^i)$ thus K stages will have a total of $km - \sum_{i=0}^{k-1} 2^i$ FRGs. The number of FG gates in each stage is $(m - 2^i)$ hence the circuit can be realized with $\sum_{i=0}^{k-1}(m - 2^i) = Km - (2^k - 1)$ Feynman gates. The required parameters for evaluation of this circuit are calculated as bellow:

- Number of ancilla inputs:

$$CON = N_{PG} + N_{FG} = \sum_{i=0}^{k-1} 2^i + \sum_{i=0}^{k-1}(m - 2^i) = Km$$

- Number of garbage outputs: $GO = K(m+1)$
- Quantum cost: $QC = N_{FG} + 5N_{FRG} + 4N_{PG}$
- Hardware complexity:

$$T = N_{FG}(\alpha) + N_{FRG}(2\alpha + 4\beta + 2\gamma) + N_{PG}(2\alpha + \beta)$$

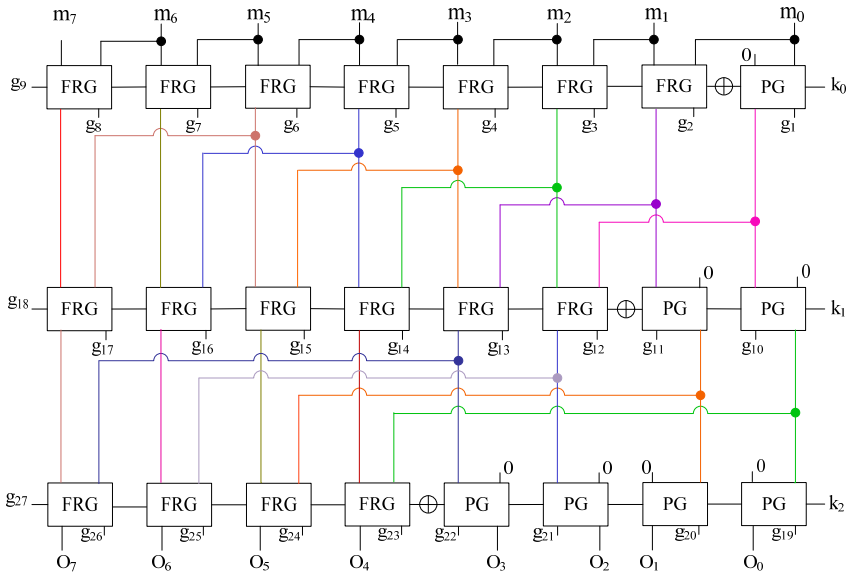


Figure 10. The proposed optimized (8, 3) reversible Normalization left barrel shifter

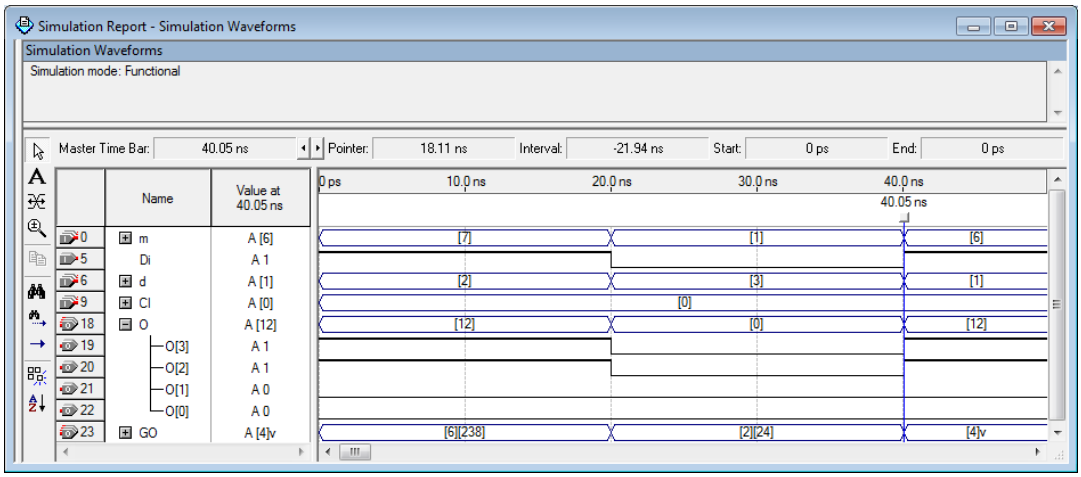


Figure 11. Simulation result of the proposed optimized (4, 2) Reversible bidirectional logical barrel shifter

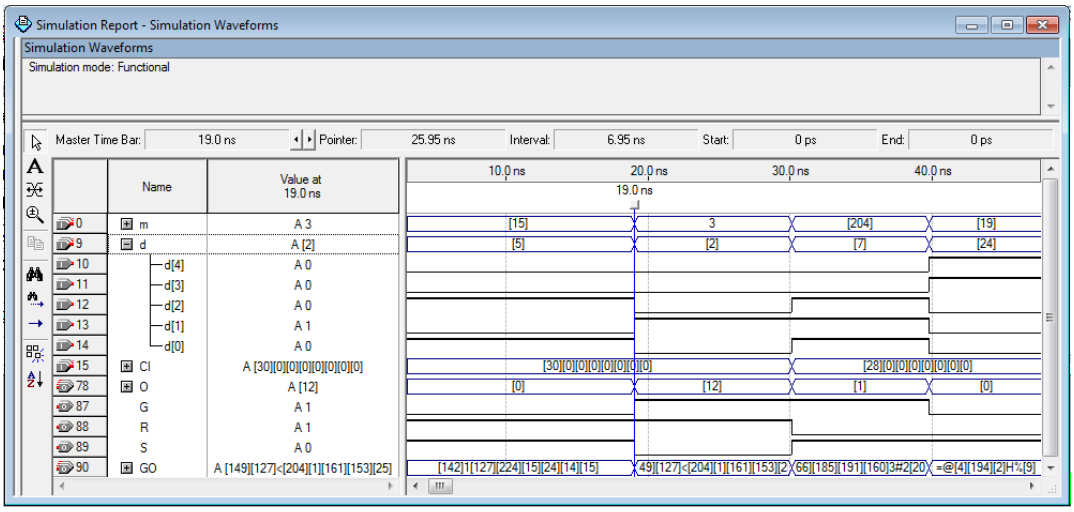


Figure 12. Simulation result of the optimized (8, 3) reversible right barrel shifter & GRS-bit

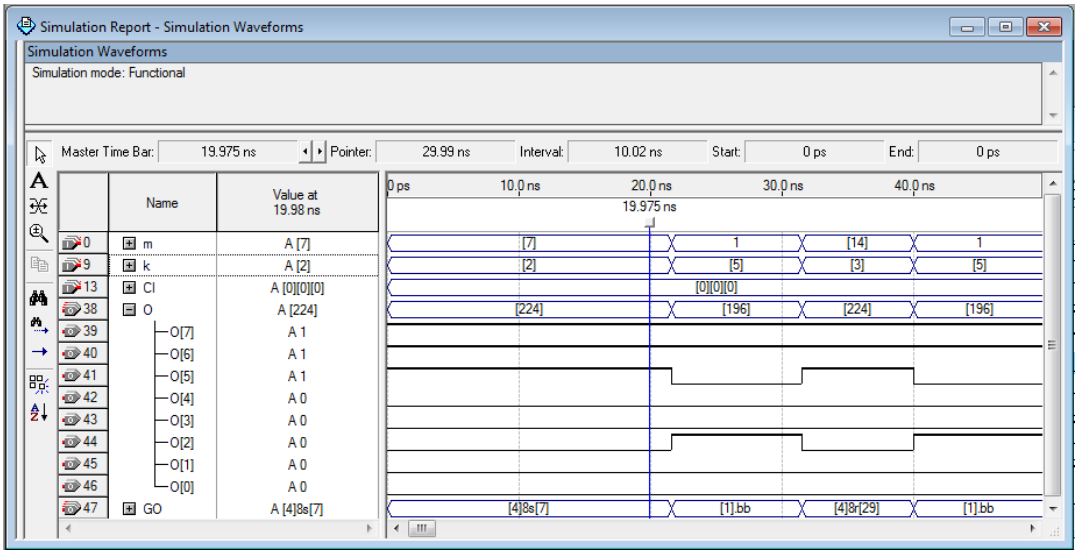


Figure 13. Simulation result of the proposed optimized (8, 3) reversible Normalization left barrel shifter

5. Simulation Results

VHDL stands for VHSIC (Very High Speed Integrated Circuits) Hardware Description Language. VHDL is commonly used to write text models that describe a logic circuit. It is a powerful language that allows you to describe and simulate complex digital systems. VHDL simulation environments provide ways of applying test vectors to the inputs of the circuit. The Quartus software supports Verilog HDL and VHDL languages. The proposed optimized (4, 2) Reversible bidirectional logical barrel shifter, optimized (8, 3) Reversible right barrel shifter & GRS-bit generation and optimized (8, 3) Reversible normalization logical left barrel shifter are implemented using VHDL code and simulated using Quartus Simulator. The Figures 11, 12 and 13 show an output waveform of proposed designs for several data test sets.

6. Conclusions and Future Work

Many of papers have worked on reversible binary/ternary rotating barrel shifters, but very little has been focused on non-rotating barrel shifter. So this article proposed an optimized reversible binary/ternary non-rotating barrel shifter. On the other hand, a few of researchers have concentrated on designing the required circuits for reversible floating-point units, thus this research proposed optimized reversible binary logarithmic right shift barrel shifter & GRS-bit Generation Component and binary normalization barrel shifter for floating point arithmetic for the first time. The proposed optimized binary shifters are designed using Feynman gates, Fredkin gates and Peres Gates. Some parameters such as the amount of garbage outputs, the number of constant inputs, size of the circuit and quantum cost, are very important criteria in reversible logic design. So, all of the proposed designs have been evaluated in terms of aforementioned parameters. Two reversible four-bit bidirectional logical barrel shifters have been compared in terms of necessary factors and according to the obtained results from table 2, the proposed optimized barrel shifter is better than common barrel shifter in terms of QC and hardware complexity. In this research, the reversible optimized ternary bidirectional logical barrel shifter is also presented for the first time. The proposed optimized circuits are also generalized for m-bit operands and necessary formulas for computing the number of required gates, number of DC outputs/inputs, quantum cost and hardware complexity are suggested. With these formulas, it is needless to draw complicated and time-consuming figures for computing the parameters of the reversible binary and ternary proposed barrel shifters. Future related work could design the combinational of rotating and non-rotating barrel shifters as well as optimize one or more of evaluations metrics in proposed circuits.

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Relationship between Mental Health and Interest in Field of Study in Nursing and Midwifery Students

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Abstract: Nursing and midwifery students face high level of stress in their educational experiences which could influence on their mental health status. Furthermore, motivation and interest in field of study are important factors for students' academic achievement and lack of them conducive to their failure. This study aimed to identifying relationship between mental health and interest in field of study in nursing and midwifery students. In this corrolational- cross sectional study, 209 nursing and midwifery students in Mashhad University of medical sciences were selected by stratified-cluster random sampling. Data were collected by demographic data form, General Health Questionnaire (GHQ-28), and questionnaire for interest in field of study. Data was analyzed by using SPSS software. Results showed according to GHQ score 32.1 % of students had poor mental health. There was a negative significant relation between interest in field of study and mental health status (r= - 0.22 P=0.001), the lower interest in field of study brought the higher score of GHQ-28 representing worse mental health status or greater problems. In conclusion; lack of interest in field of study had a negative effect on students' mental health. So it is recommended to considering students' interest and providing educational and psychiatric consultation in order to improve educational condition and mental health promotion.
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Keywords: Mental health, interest, field of study, nursing, midwifery, students

1. Introduction

Mental health is one of the important aspects of health and related to the mental well-being component include in WHO's definition of health "a state of physical, mental and social well-being and not merely absence of disease" (Ganji, 2000).

Nursing and midwifery students are the future professional staff in health care system who play an important role in providing care, treatment and support patients physically and psychologically (Parsa 2000, Carveth et al. 1998). Nursing is an important career which requires very good mental health (Ni et al. 2010). Nursing and midwifery students face stress factors in their educational experiences (Carveth et al. 1998) including hospital atmosphere, working with dying patients, special clinical skills, interpersonal relationship with nurses, other stuff and patients, examinations and academic workload and lack of free time (Gibson et al. 2009, Pryjmachuk and Richards 2008, Beck 1991). High level of stress can cause physical and mental health problems and my affect students' academic performance (Sreeramareddy et al. 2007).

Some epidemiologic studies provide a lot of evidences that 7.7-28.6 % of Chinese nursing students have mental health problems. Mental disorders have become a leading cause of absenteeism, suspension and suicide (Ni et al. 2010). Stress level among British nursing students seem to be high, with studies reporting harmful stress levels in between 20-55% of students, determined by GHQ (Pryjmachuk and Richards 2008). Hong and Chongde (2003) in their study conducted on 788 Chinese nursing students concluded that college stress consisted of academic hassle, personal hassle and negative life event exert negative impacts on psychological well-being. Also Lotfi et al. (2010) assessed mental health of 689 medical sciences students in Iran using GHQ-28 and concluded 35.7% of students experience mental health problems of which nursing and midwifery students showed the highest percentage of mental health problems. Papazisis et al. (2008) in Greece used GHQ-30 in 170 nursing students and reported 35.2% of students had psychiatric morbidity and also 52.4% of them experienced depression symptoms. In Pryjmachuk et al. (2008) cross sectional study in UK; prevalence of stress among 120 midwifery students using GHQ-12 was reported 43.1%.

Psychologists believed personal characteristics, psychological and environmental stress, socioeconomic and familial status, lack of achieving goal in life and lack of motivation affect on individuals mental health (Ganji 2000, Shamlou 2001). Motivation is considered as an important factor for learning, skill acquirement and finally students' academic achievement (Dalir et al. 2011). Interest is a type of actual motivation and interest in field of study is under influence of personal, social, economic factors and consistency between content

with individual capabilities and talent (Arfaei et al. 2008). Parsa (2000) in her study on 114 nursing and midwifery students in Iran concluded 50.9% of students suffered from problems such as lack of motivation and self concept as well as dissatisfaction of their field of study. Pourrahimi et al. (2000) and Arfaei et al. (2008) studies showed low interest in field of study in nursing and midwifery students.

Lack of motivation, dissatisfaction of field of study and studying in undesired faculty inhibit progress and positive activity and could lead to tension, physical illness, psychological stress, social maladjustment, unsuccessfulness and failure (Pourrahimi et al. 2000, Uner et al. 2008). In Rafati and Ahmadi (2004) study in Iran, 60% of nursing students had mild to moderate depression and students with strong interest in field of study had significantly lower depression. Dadkhah et al. (2006) reported in 426 students studying in medical sciences field, more mental health was related to students with higher interest in their field of study.

According to studies and as motivation and interest in education are necessary for educational success and lack of them lead to frustration and educational failure, so student's interest in their field of study is so important. In addition as nursing and midwifery students will be responsible for community health maintenance and health promotion, their mental health should be paid especial attention, so this study aimed to detect relationship between mental health and interest in field of study in nursing and midwifery students.

2. Materials and Methods

This corrolational - cross sectional study was conducted on 209 nursing and midwifery students who studying at school of nursing and midwifery, Mashhad University of medical sciences. They were selected by stratified-cluster random sampling. At first two class of nursing and midwifery was detected, then they were divided in to clusters based on educational term and some of them were selected at random. Data collection instruments were demographic data form, General Health Questionnaire (GHQ-28) and questionnaire for testing interest in field of study. Demographic data included age, gender, marital status, job and educational level of parents, economic status, educational term, failing courses, residency place, psychiatric disease and drug history, and stressful event in recent 3 months. Psychological assessment was conducted by means of the General Health Questionnaire (Goldberg and Hiller, 1972), the short version of GHQ-28 has been widely used for the screening of psychiatric problems in the general population , it contain 28 items divided into four sub-scales evaluating physical symptoms, anxiety, social dysfunction and depression. All the items have a 4 point scoring system, with descriptors of (better/healthier than normal, same as usual, worse/more than usual, and much worse/more than usual). The Likert scoring method was used in the current study (scoring as: 0, 1,2,3), and score range was "0-84". The cutoff point for GHQ-28 was 23. The students who acquired a score of less than 23 had good mental health status and the scores ≥ 23 indicate poor mental health (mental problems). Reliability and validity of the questionnaire have been reported before (Dadkhah et al. 2006, Rezaei et al. 2007).

The other questionnaire was interest in field of study questionnaire including 11 questions and tested a spectrum of interest elements of nursing and midwifery, each question tested quality of intrinsic and extrinsic motivations. Scoring was based on 3 points Likert scale (yes, in some extent, no) and scoring as 1-3. The scores range was "11-33". For classification the level of interest, the lower 25% of score (≤17) was considered low interest, the score between "18-22" was moderate, and the higher 25% (≥23) considered high interest. Reliability and validity of the questionnaire have been reported before in Pourrahimi et al. (2000) study, content validity and Cronbakh's alpha reliability (α= 0.72). In present study alpha was calculated α=0.76.

Data collection has done in the middle of educational semester, researcher explained necessary information for students in selected classes at random, and concentrated on confidentiality of data by anonymous complement of questionnaires. Students who would not like to participate were excluded. Data were analyzed using SPSS 11.5 software by descriptive (frequency, mean, standard deviation) and analytic (t-test, ANOVA, Pearson correlation coefficient, multiple regression) statistic. Confidence interval was considered 95%.

3. Results:

Students aged 18-27 years old (20.79±1.74) and 74.2% (155) were female and 25.8% (54) were male. 75.1% (157) were single and 24.9% (52) were married. 66% (138) were studying in nursing and 34% (71) in midwifery. 87.1% of students had average economic status. 19.1 % (40) of students experienced a stressful event in recent 3 months.

Results showed according to GHQ, 32.1 % (71) of the students were found to have scores above cut-off point GHQ (scores ≥23), indicating poor mental health and probable psychiatric problems. The mean GHQ scores were 19.21±12.75.In terms of interest in field of study 37.8% of students had low interest, 52.2% moderate interest and 10% had high interest. Their mean interest scores were 20.47±4.6.

By Pearson correlation test, significant negative relation was found between GHQ scores and interest in field of study (r= -0.22 P=0.001), indicating the lower interest in field of study brought the higher score of GHQ, representing poor mental health or greater mental problem. This negative relation was found for each subscales of GHQ-28 including physical symptoms, anxiety, social dysfunction and depression with level of interest in field of study. The lower score for interest in field of study was accompanying with higher score in each subscale, indicating more problems in each subscale (Table 1).

There was significant difference between students' mental health status with gender and having stressful event in recent 3 months by t-test. Prevalence of mental problems was more among female (p=0.004) as well as students who experienced stressful event in recent 3 months (p=0.036) (Table 2). No significant difference was found between mental health status and other variables such as age, marital status, economic status, educational term, failing courses, parents' job and educational levels, disease and psychiatric drugs history.

Table 1: **Correlation between Mental health score (GHQ-28), GHQ subscales scores and Interest in field of study**

	GHQ-28	GHQ subscales			
	Mental health	Physical symptoms	anxiety	Social dysfunction	Depression
Interest in field of study	-0.22**	-0.17*	-0.11*	-0.23**	-0.22**

**P value <0.01, *P value <0.05

Table 2: Comparison Mean scores of the mental health (GHQ) for gender and stressful events

Variable	GHQ Mean±SD	Statistical test
Gender		
female	20.57±12.83	t=2.91
male	15.3±10.97	P=0.004
Stressful events		
yes	22.95±1077	t=2.11
no	18.33±12.83	P=0.036

P value is considered significant if <0.05

There was significant difference between level of interest in field of study and failing course by t-test (P=0.04), i.e. Students who experienced failing their courses had lower interest (Table 3). No significant difference was found between interest in field of study and other variables.

Table 3: Comparison Mean scores of the Interest in field of study for failing course

Failing course	Interest in field of study Mean±SD	Statistical test
yes	18.91±4.72	t= -2.916
no	21±4.44	P=0.004

P value is considered significant if <0.05

At the present study, independent variables such as interest in field of study, gender and stressful event in recent 3 months had significant effect on mental health status (GHQ), so these variables were entered in a stepwise multiple regression model. As Table 4 shows, in the stepwise multiple regression model, the final model contained significant variables interest in field of study (P<0.001) and gender (P= 0.013). Stressful event was dropped from the final model (Table 4).

Table 4: Multiple regression analysis with Mental health status (GHQ)

Independent variables	B	S.E	Standardized Beta	t	sig
(Constant)	27.993	3.994		7.009	0.000
Interest in field of study	-0.642	0.181	-0.235	-3.540	0.000
Gender	4.862	1.939	0.170	2.508	0.013

R=0.318, R Square=0.101

4. Discussion

As to the result, of 209 nursing and midwifery students 32.1% had poor mental health. In other studies, prevalence of mental problems in nursing and midwifery students using GHQ in Papazisis et al. (2008) study 35.2% and Rezaei et al. (2007) study 30.6% has been reported which are very close to present study. In Lotfi et al. (2010) study the prevalence was reported 40.8% in nursing and midwifery students; and in Pryjmachuk and Richards (2008) study reported 43.1% for midwifery students by using GHQ, which were higher than present study. The cause of these differences may be related to different educational, social and cultural conditions of the students.

The level of interest in field of study was in average level (20.47±4.6) which similar to Pourrahimi et al. (2000) study that reported 20.17 in nursing students. In present study 90% of students showed low-average level of interest. In Parsa (2000) study 50.9% of nursing and midwifery students showed lack of motivation and dissatisfaction of their field of study, and in Dadkhah et al. (2006) study 72.8% of nursing students had no interest to their field of study, also in Arfaei et al. (2008) study 80.8% of midwifery students showed low-average level of interest. At the present study, the probable reason for low interest may be due to negative cultural and social attitude toward nursing and its effect on individual attitudes about social position of this career.

In Law and Arthur (2003) study, negative attitude of more than 50% of students was related to low social position of nursing, also Pearcy and Elliott (2004) concluded that the students' interest in nursing as a career was directly affected by their observations of trained nurses and their attitudes, and the cause of leaving nursing course was students' negative experiences in clinical setting due to negative attitudes of personnel toward nursing and nursing students. Deary et al. (2003) reported one of the nursing personnel's reason for leaving nursing is that nursing programmes have not lived up to their expectations. Some students believed there is no respect and enough recognition of nursing (Buerhaus et al. 2005). Also the stereotypical image of nursing and negative societal perception of nursing status is effective on decreasing entrance to this field of study (Miers et al. 2007, Brodie et al. 2004). Arfaei et al. (2008) mentioned some reasons for low interest in field of study in midwifery students are lack of social position, lack of employment possibility and lack of free time for midwifery students.

As to present study, there was a negative significant relation between mental health status (GHQ score) and interest in field of study. The lower interest brought the worse mental health status, which in agreement with Dadkhah et al. (2006) study. According to table 4 interest in field of study is inversely related to GHQ scores, so decrease of interest leading to a increased score of GHQ by the value B (indicating worse mental health status).

In Rafati and Ahmadi (2004) and Bayati et al. (2009) studies in nursing and medical students, lack of interest in field of study was the most important risk factor for depression. Depression in students is primarily caused by adaptive difficulties and stresses and disorientation regarding the university environment and lack of interest in field of study may all lead to psychiatric problems and failure in academic achievement. Uner et al. (2008) reported studying in desired faculty and academic achievement affected on mental health of students and students with lower academic achievement were 3.07 times more risk for mental problems. If students had to studying in undesired department/faculty, they would go toward unsuccessfulness and educational failure. Also Faragher et al. (2005) in Meta analysis study reported job dissatisfaction can be hazardous to individuals' mental health and wellbeing. In Kaewboonchoo et al. (2009) study nurses who intent to leave the profession had poor mental health. Tendency to success and meeting this need is necessary for mental health and one of the main reasons for feeling of inferiority is failure to achieve predetermined goals (Shamlou 2001).

In this study, prevalence of mental problem in female was more than males' students which is similar to Uner et al. (2008), Papazisis et al. (2008) and Lotfi et al. (2010). According to Table 4 gender was a strong predictor for mental health status and female student experienced more mental problems. The probable reason may be related to physiologic characteristics of females as well as their social performance in interpersonal relationship and their fragility against stress. Also prevalence of mental problems was higher in students who experienced stressful events in recent 3 months, which is similar to Hong and Chongde (2003) and Uner et al. (2008) studies; they reported presence of a negative events affect negatively on mental health of university students. In Beck (1991) study, students experienced high stress levels and that they were at risk of having physical and psychiatric illness. Although at the present study having stressful event was dropped from the final regression model.

No significant relation was found between age and marital status with students' mental health status, which was consistent with Lo (2002), Banks et al. (2012) and Esfandiari (2001) studies. However Shariati et al. (2007) study showed lower prevalence of mental problems among married and higher level

of depression among single students. Simon (2002) reported married persons had better mental health status and single persons had more depressive symptoms.

No significant relation was found between economic status and mental health status which similar to Lo (2002) study. But it is different with Uner et al. (2008), Dadkhah et al. (2006) and Shariati et al. (2007) studies; in these studies mental problems in students with low economic status was higher. According to studies financial problem is one of the important stressors during academic course (Pryjmachuk and Richards 2008, Beck 1991, Rafati and Ahmadi 2004). Nonsignificant relation in present study may be due to the economic status of students was nearly similar, so that 87.1% of them had middle economic status. No significant difference was found between mental health status of nursing and midwifery students, which in agreement with Esfandiari (2001) study. It seems nursing and midwifery courses are similar and have similar effect on mental health.

As to the results, students who had failed their courses, showed significantly lower interest in field of study. It is in agreement with Najafpour and Yektatalab (2008) study which 53.6% of failed students lacked interest in their field of study. Interest and motivation link highly to academic achievement and interest is considered as a predictor for academic achievement (Najafpour and Yektatalab 2008, Tanaka and Yamauchi 2001). Motivation, capability and quality of education are the most important factors for success. Highly motivated students are more active and experience more academic achievement; in many situations presence or absence of motivation lead to success and failure obviously (Dalir et al. 2011).

Limitations of the present study include personal difference, personal interpretation of students of questions and psychological state at answering questionnaire. As this study has been done in one school in cross sectional design, the results could not be generalized, so it is necessary to conduct it in larger scale for providing external validity.

5. Conclusion

The study showed around one-third of nursing and midwifery students had poor mental health and there was a relationship between interest in field of study and students mental health status .i.e. lack of interest in field of study had a negative effect on students' mental health. According to findings and regarding prevalence of mental problems among nursing and midwifery students and as they face several stressors during their academic course, it is necessary to intervene for decreasing stress level and preventing mental problems. Also according to the results, as nursing and midwifery students lacked enough interest in field of study and regarding the importance of interest and its effect on students' mental health, it is necessary to give consultation by special organization for presenting information about academic disciplines before entering university and provide opportunity for students to choose their field of study by interest. It would be effective giving specific information about curriculum, rules and regulations, the attitudes and behaviors expected of students for examples of some stressful situation, they may encounter as students and they could be advised to visit clinics and hospitals for better knowing of their professional setting. By awareness of problems which conductive to lack of interest, could be provide strategies for improving education as well as their interest.

Nursing professors could be helpful for early diagnosis of students' stress and mental problems. They could give consult to students and help them to cope with their discipline. There is need to revising nursing curriculum and students' educational program for evaluating what impacts on students stress levels. It is recommended to introduce strategies for stress management for reducing the stress level as well as providing proper educational condition, psychiatric and educational counseling sessions and effective strategies for confronting stressful situations in order to maintain and promote students mental health.

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Examination of Chlorophyllic Pigments Contents in Iranian Extra Virgin Olive Oil using High Performance Liquid Chromatography

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Abstract: In this study, extra virgin olive oils from provinces Gilan, Zanjan, Qazvin, Golestan , Fars, and Kermanshah were sampled and then chlorophyllic pigments and their derivatives contents in 7 oil samples were determined using high performance liquid chromatography with inverse phase. The results showed that olive oils from Zanjan and Gilan1 had the highest content of chlorophyll a, at 22.6 ppm, 26.5 ppm respectively, and the sample from Fars had the lowest amount at 12.4 ppm. Qazvin and Zanjan samples showed the highest amount of chlorophyll b at 15.8 and 11.3 respectively and Fars sample showed the lowest one at 5.5 ppm. Fars (64.79 ppm) and Gilan2 (61.3 ppm) samples showed the highest content of pheophytin a at 64.79ppm and 61.3ppm, respectively and Zanjan sample had the lowest amount at 49.18 ppm. The results also revealed that pheophytin a is the most abundant chlorophyllic pigment in Iranian extra virgin olive oil as it represents 58.02% of total chlorophyllic pigments and pyropheophytin a show the lowest contents (0.28% of total chlorophyllic pigments).
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Keywords: Chlorophyllic pigments, Extra virgin olive oil, High performance liquid chromatography

1. Introduction

Natural olive oil predominantly is the only vegetable oil that is consumed as crude directly without any purification (Viola and Viola., 2009) and contains nutritional elements including silica, phosphorous, potassium, sulphur, copper, manganese, vitamins and antioxidants (Roca & Minguez-Mosquera., 2002).

Natural extra virgin olive oil, among different olive oil categories, has significant olive oil categories, has significant nutritional, therapeutic, and economic benefits. This type of olive oil has desirable taste and aroma with maximum free fatty acid at 1% on the basis of oleic acid and maximum peroxide value at 20 m Eq/Kg (IOC, 2008).

Iranian per capita consumption of olive oil is 150g annually representing one percent of European per capita consumption and three percents of global olive oil consumption. At the present, olive cultivation covers approximately 100,000 ha in Iran (Keshavarzi Jihad, 2010). Carotenoids and chlorophylls give the color of natural olive oil (Atenaa Poiana et al., 2009). Pigments contents in olive oil depend on the variety, olive ripeness, climatic conditions the kind of extraction process, and storage conditions (Oconnella et al., 2007). Green color of natural olive oil consists of chlorophyll a and b as well as the products of chlorophyll decomposition, i.e. pheophytin a, and b (Glorine and Fabietti, 2005).

The chlorophyllic pigments contents depend on olive variety, olive ripeness, and the kind of extraction, climatic conditions and oil storage conditions (Tsimidou and Psomiadou., 2001). Chlorophyll molecule consists of four pyrrole rings connected by methyl bridges with a magnesium ion in the center (Glorine and Fabietti., 2005). Chlorophyll content in natural olive oil ranges from 1.7 ppm to 27 ppm. Pheophytin content in natural olive oil ranges from 0.3 ppm to 21.7 ppm. Pheophytin a, is predominate ranging from 70 to 80 percent of total pheophytin (Giuffrida et al., 2007).

Chlorophyll and pheophytin serve as catalysts in the presence of light for production of single oxygen in the process of photo oxidation. (Cichelli and Pertesana., 2004, Cinquanta et al., 2001). Chlorophylls, thus, act as proxidant depending on their concentrations resulting in reduced oil stability (Fakourelis et al., 1987). The research on chlorophyll pigments and their derivatives in vegetables showed that pheophytin b and pheophorbide b had the most significant antioxidant activity against fat oxidation that was comparable with BHT (Lanfer et al., 2005). Chlorophyll pigment has an important role in removing harmful compounds from the body by liver. It also improves circulation, immune system function and may reduce cramps and infection. (Mario et al, 2007).

The level of chlorophyll is considered as one of the most important factors in olive oil. Chlorophyll plays a vital role in determining the olive oil color,

and the color plays a key role in acceptability among consumers. in fact ,many consumers preferred a deep green color in olive oil, as in virgin oils (Del Giovine and Fabietti, 2005). Color is an important attribute to consumers, who associate the green hues from the chlorophyll in the oil with freshness of product (Ryan et al., 1998). Climate also has an important role in the chlorophyll concentration in olive oil, as does the ripeness of the fruit. Pervious researchers have found that the concentration of chlorophyll is high, up to 80 mg/kg of oil at early stage of ripening period, and at very low (about 2 mg/kg oil) when fruit is very ripe (Salvador et al., 2001).

Mataeos and Garcia (2006) quantified chlorophyllic pigments and carotenoid content in olive oil by using three different methods of extraction, solid phase extraction by DLI cartridge, and high performance liquid chromatography with inverse phase and UV bipolar arrangement detector, liquid-liquid extraction with N, N'-dimethyl formamide, and solid phase extraction with C18 column (C18 SPE). The results showed higher percentage of pigments recovery by diol-SPE method (98.4%) as compared with LLE method (96.4%) and C18 SPE method (51.3%)

Tsimidio and Psomiadou examined pigments in olive oils from different parts of Greece, they showed that pheophytin a (>10 mgkg-1) was the main pigment. Lutein and beta-carotene were the main pigments of carotenoid (Tsimidio and Psomiadou, 2001).

Giuffrida et al, (2007) examined the pigments of 24 samples of natural olive oil from three Italian main varieties. The study showed that pheophytin a (25.04-36.19) was the main pigment in olive oil. Other pigments included beta carotene (27.16-8.06), pheophytin b (17.6-2.92), lutein (49.4-28.2), and neosantin (11.2 – 1.54). Beta-carotene and neosantin contents were higher than the other varieties likely because of different genetic factors (olive variety) or climatic conditions (Giuffrida et al., 2007)

Criado et al., (2005) examined the effect of temperature behavior of olive fruit on olive color by measuring main pigments of virgin olive oil. The results showed that lutein and beta-carotene contents increase as compared with control samples. Chlorophyllic compounds such as chlorophyll a and b as well as pheophytin a, and b also showed significant increase. High temperature resulted from the processes of oil extraction and cutting was the reason of high temperature behavior (Criado et.al., 2005).

Hashem pour and Fotouhi, (2010) were measured the quality indicators including pigments of olive oil from yellow, oily, and Mary varieties in Kazeroon district using spectrophotometer. The obtained results revealed that yellow and oily varieties had the highest amount of chlorophyll and carotenoid. In the present study, contents of chlorophyllic pigments and their derivatives in Iranian olive oils from different parts of Iran were examined (Hashem pour and Fotouhi, 2010).

2. Materials and Methods

2.1. Materials

Seven samples of extra virgin olive oil were collected from provinces Gilan, Qazvin, Zanjan, Golestan, Kermanshah, and Fars.

2.2. Physicochemical analysis

The amounts of chlorophyllic pigments and their derivatives in extra virgin olive oil samples were determined according to Mataeos and Garcia (2006) method and using high performance liquid chromatography with reverse phase as well as solid phase extraction by DL cartridge. The pigments were separated from olive oil samples (1g) by solid phase extraction using banded DL cartridge and then injected to high performance chromatography with reverse phase equipped with UV detector and then analyzed.

In order to confirm olive oil samples being extra virgin, in this study, acidity value test according to AOAC standard No. 940.28 was conducted in triplicates. Also, peroxide index of the samples was determined using iodometery method according to AOAC standard No. cd -8b- 90.

2.3. Solid phase extraction of pigments using DL cartridge

Banded DL cartridge is connected to vacuum washing system in order to prevent the column from drying and to facilitate solvent movement and then is conditioned by successive movements of 6ml of methanol and 6 ml of hexane. Olive oil sample (1.0±0.001) weighed and then dissolved in 4ml of hexane. The oil solution, then, transferred to the column and the solvent is collected in a volume flask. Then, 5 ml of hexane is added to the column and integrated with the previous hexane. Finally, the column is washed with 3 ml of acetone and the solvent is dried in a vacuum rotating evaporator at room temperature. The leftover is dissolved in 0.3 ml of acetone and then 20 µl of the final solution injected to high performance liquid gas -chromatography (Mataeos and Garcia, 2006).

High performance liquid gas-chromatography was characterized by Youglin model with UV detector, wavelength 660 nm for chlorophylls identification particle size 5µm with a column of ODS2 type, with

250 mm long, 4.2 mm internal diameter, and mobile phase speed at 1 mm/ min.

2.4 Experimental design and statistical analysis

One-way analysis of variance (ANOVA) and Tukey's test ($p \leq 0.05$) were used to analyze the results obtained from all the tests. The statistical analysis was performed using the Minitab version 14 (Minitab Inc., State College, PA, United States).

3. Results and discussion

3.1 Acidity means values of olive oil samples

In order to confirm being extra virgin, the acidity of the samples was measured. The results from Table 1 revealed that the acidity values of the experimental samples meet IOC standard being below 1 percent for extra virgin olive oil (IOC, 2008).

Table 1. Acidity value of extra virgin olive oil

Treatment	Acidity
Gilan2	0.72 ± 0.02^{b}
Qazvin	0.92 ± 0.01^{cd}
Fars	0.98 ± 0.01^{d}
Zanjan	0.84 ± 0.03^{c}
Gilan1	0.95 ± 0.02^{d}
Golestan	0.60 ± 0.01^{a}
Kermanshah	0.62 ± 0.01^{a}

3.2 Peroxide index mean values of olive oil samples

As shown in Table 2, peroxide index mean values of all extra virgin olive oils at 1st week of storage meet IOC standard for extra virgin olive oil, ≤20.

Table 2. Peroxide index (mEq/kg) of extra virgin olive oil

Treatment	Peroxide value
Gilan2	6.51 ± 0.25^{a}
Qazvin	11.43 ± 0.15^{c}
Fars	11.24 ± 0.12^{c}
Zanjan	11.07 ± 0.15^{c}
Gilan1	9.86 ± 0.06^{b}
Golestan	9.75 ± 0.12^{b}
Kermanshah	10.05 ± 0.10^{b}

3.3 chlorophyllic pigments contents and their derivatives in olive oil

Table 3, shows chlorophyllic pigments contents in olive oil from different parts of the country. As shown in Table 3, pheophytin a, is the most abundant chlorophyllic pigment in Iranian extra virgin olive oil, representing 58.02% of total chlorophyllic pigments.

Pyropheophytin shows the lowest amount of chlorophyllic pigments in Iranian extra virgin olive oil. As the results indicated that, pheophytin a shows the highest content, followed by chlorophyll a, and pyropheophytin and pheophytin a show the lowest contents.

As shown in Table 3, pheophytin a is the most abundant chlorophyllic pigment in Iranian extra virgin olive oil, representing 58.02% of total chlorophyllic pigments. Pyropheophytin shows the lowest amount of chlorophyllic pigments in Iranian extra virgin olive oil. As the results indicate, pheophytin a shows the highest content, followed by chlorophyll a, and pyropheophytin a and pheophytin a show the lowest contents.

As demonstrated in Table 4, variation coefficient (VC%) of different chlorophyllic pigments in extra virgin olive oil from different districts of Iran reveals that the pigments vary among different oil samples because of different factors including the climatic condition, variety, oil extraction method, stage of ripening, and irrigation management.

As show in Table 4, pheophytin a, and pheophytin b have the lowest VC% (10.3) and the highest VC% (45.5), respectively. The lower VC% of pheophytin a, implies that its content fluctuation is insignificant in the district of interest.

Pheophytin b is one of the chlorophyllic pigments in natural olive oil resulting from chlorophyll b decomposition. Its high CV% reveals its significant variation and content fluctuation. As indicated in Table 4, pheophytin a and pyropheophytin a show the highest (57.42 ppm) and the lowest (0.285) contents, respectively.

The obtained result corresponds with the findings of Tsimido, (2001), Giuffrida, (2007) and Criado, (2007) who suggested that pheophytin a among chlorophyllic pigments in olive oil showed the highest contents.

Table 3. Chlorophyllic pigments contents (ppm) of extra virgin olive oil from different parts of Iran.

Treatment	pheophytin a`	pheophytin b	pheophytin a	Pyropheophytin a	Chlorophyll b	Chlorophyll a
Kermanshah	3.46±0.04^{ab}	11.05±0.10^{b}	57.64±0.51^{b}	0.39±0.05^{a}	10.46±0.03^{b}	16.20±0.20^{cd}
Golestan	6.06±0.05^{cd}	12.63±1.89^{b}	59.70±0.25^{c}	0.00±0.00^{a}	6.70±0.07^{a}	15.05±0.25^{a}
Gilan1	8.39±0.8^{d}	0.00±0^{a}	49.46±0.26^{a}	0.00±0.00^{a}	6.81±0.53^{a}	22.60±0.23^{e}
Zanjan	3.18±0.68^{a}	9.72±0.5^{b}	49.18±0.23^{a}	0.00±0.00^{a}	11.30±0.30^{b}	26.50±0.18^{f}
Fars	2.90±0.27^{a}	13.00±0.32^{b}	64.17±0.12^{e}	0.78±0.27^{a}	5.50±0.53^{a}	12.40±0.11^{a}
Qazvin	4.70±0.5^{abc}	10.75±0.30^{b}	60.01±0.25^{cd}	0.83±0.32^{a}	15.80±0.30^{c}	15.11±0.20^{bc}
Gilan2	5.40±0.20^{bc}	11.19±0.30^{b}	61.30±0.12^{d}	0.00±0.00^{a}	5.72±0.28^{a}	16.28±0.23^{d}

Table 4. Mean, maximum and minimum values of chlorophyllic pigments of extra virgin olive oil from the districts of interest.

Index	pheophytin a`	pheophytin b	pheophytin a	Pyropheophytin a	Chlorophyll b	Chlorophyll a
Coefficient of variation (%)	40.00	45.50	10.30	13.40	42.70	27.90
Mean (ppm)	4.87	9.76	57.42	0.28	8.89	17.73
Maximum (ppm)	8.39	13.00	64.70	0.83	15.80	26.50
Minimum (ppm)	2.90	0.00	49.18	0.00	5.50	12.40

3.4 Examination of chlorophyllic pigments contents mean values in Iranian extra virgin olive oil

Diagram 1, shows chlorophyllic pigments contents mean values (ppm) of Iranian extra virgin olive oil obtained from different parts of Iran. As shown in Figure 1, pheophytin a, and pyropheophytin a were shown the highest and lowest content of mean value Iranian extra virgin olive oil respectively.

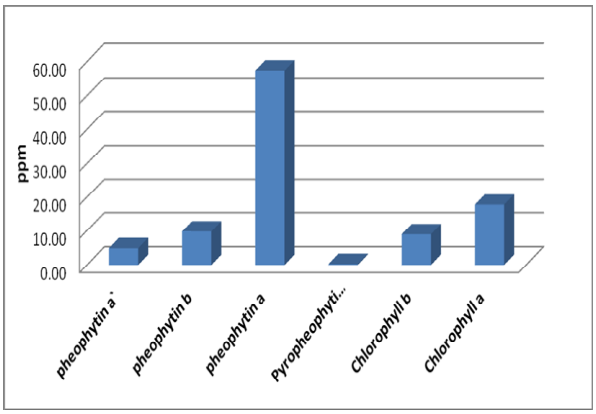

Figure 1. Mean values (ppm) of Iranian extra virgin olive oil obtained from different parts of Iran.

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Role of Strategic Entrepreneurship and Strategic Management of Human Resources in Fledging Companies

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Abstract: Small and risk able companies are remarkably skilled at identifying entrepreneurship opportunities. Upon arrival, these new companies encounter high environmental uncertainty. This turbulence can quickly lead to disintegration of these companies because of being barely effective in development and maintenance of competitive advantages needed for benefiting from these opportunities by the course of time. Besides establishment of company, the entrepreneurs can be hopeful to their long-term survival only if their resources are strategically utilized. Objective of strategic entrepreneurship attitude is to organize the resources so as to help identification and utilization of entrepreneurial opportunities contributing to development of competitive advantage. Among others, human resource is highly significant due to its scarcity, non-substitutability and non- limitability .In the current paper, significance of strategic entrepreneurship as an opportunity and strategic human resources management as the most important competitive advantage was comprehensively studied in wealth production for fledging companies.
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Keywords: Strategic Entrepreneurship, Strategic Management, Human Resources, Fledging (Emergent) Companies

1- Introduction

Wealth is created only in combination and effective behavior of opportunity-searching, and through behavior of advantage prospect. Entrepreneurship is comprehension of an opportunity and identification of opportunity is entrepreneurship [1]. WRIGHT et al. through a resource-based attitude stated that maintenance of competitive advantage can be more achieved via unification of human capital in certain circumstances than by groups such as top managers and other elites under the title of organizational success or failure variables.

Strategic entrepreneurship refers to agency's insistence on superior performance via simultaneous implementation of opportunity-seeking and benefit-oriented activities. Strategic management of human resources pertains to uniformity and coherency issues. Strategic uniformity or unification is essential for establishing alignment between strategy of human resources and strategy of company. The researchers and scientists hold the opinion that the personnel are the most important competitive advantage of organizations. They believe that human capital of company meets all strategic requirements. This capital is highly significant due to scarcity, non-substitutability and non-imitability.

Literature review is presented in the first section of the present paper, and then, strategic entrepreneurship and strategic management of human resources are generally discussed. The current study intends to propose a model to analyze the relationship between these two important concepts since they have been widely taken into account by many researchers in connection with fledging companies.

2- Strategic Entrepreneurship

Exploration, evaluation, and extraction of opportunities are defined as features of entrepreneurship [2]. Small firms are more skilled at finding opportunity while their limited knowledge and small market share impair their capability of exploiting the prospective opportunities.

Success of entrepreneurial companies can be assessed in terms of strategic opportunities they identify, evaluate, and ratify. Therefore, opportunity recognition significantly suggests how companies are created through transforming entrepreneurship attitudes into strategic advantage.

SHIN & NEKATARMAN (2000) stated that discovery, evaluation and extraction of opportunities are the defined features in entrepreneurship scope. Opportunity recognition signifies converting information into knowledge. Ideas are generated and evaluated for their quality and consistency so that the information will be analyzed and combined for knowledge generation (NONAKA, 1994).

Three key concepts of strategy

1) **Competitive advantage**: is achieved for the companies which appreciate value of its customers
2) **Distinctive capabilities:** treatment opportunities of company are determined taking the approach of maintaining

competitive advantage by means of its potentials

3) **Strategic coordination**: means maximizing coordination of competitive advantage of a company and its capabilities. It also means maximization of resources using the available opportunities in the external environment [3].

Based on the formerly conducted researches, concept of strategic entrepreneurship can be expressed in the following figure:

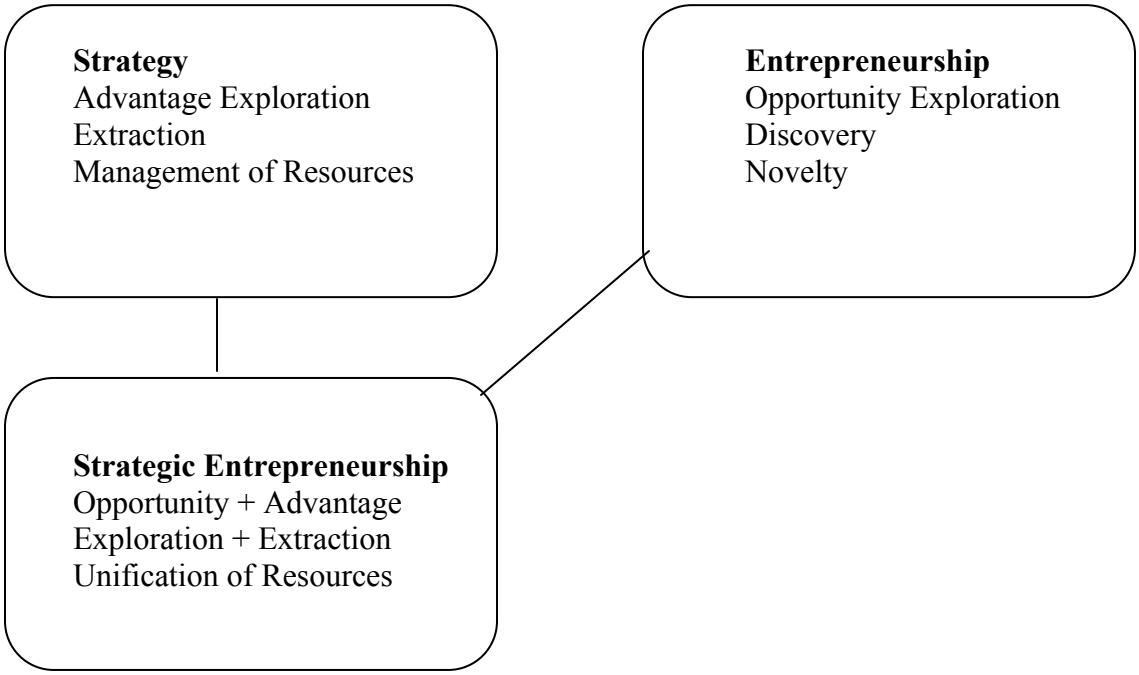

Figure 1: Concept of strategic entrepreneurship

Strategic entrepreneurship is formed by combination of entrepreneurial activities and processes of opportunity discovery and also strategic activities related to acquisition of competitive advantage. It ultimately contributes to value creation and mitigation of competitive threats. GREEN states: the small businesses seeking for strategic entrepreneurship must provide themselves with a rich collection of resources and capabilities from either insides or outsides of the organization. Strategic entrepreneurship enables the companies to react appropriately against the environmental changes [7].

Knowledge is a key tool for success in competition among companies and even nations. Knowledge needs to be effectively managed in individuals and organizations in order to guarantee value creation. Meanwhile, mechanism of achieving and maintaining competitive advantage is among the forthcoming challenges of most companies regardless of size, age or industry. Neglecting the economical conditions and competitive viabilities of the current technology status, the companies are likely to confront this challenge in management of their knowledge system. According to ZUCK [9], knowledge creation capability and maintenance of the learning process through this feature is a competitive advantage because today's developed innovative knowledge will be the principal knowledge of tomorrow. Knowledge does not merely consist of intangible resources and assets linked to organizations but there is also intellectual capital which comprises those intangible assets that are not registered in financial statements but might account for 80% of market value of an organization [10]. According to BONTIS, human capital is structural capital and relational capital but intellectual capital does not suffice for wealth creation by itself. Some activities are required for strategic management of intangible assets. This indicates that resources are not by themselves capable of determining performance difference of companies. In fact, company's specific resources may generate consistently competitive advantage only when they are managed strategically [11]. Most important items of these resources include:

Financial Capital

Financial capital includes all different monetary resources of companies for development and execution of strategies. For risking companies, financial resources are mainly provided by riskable investors or even family members [12]. New risking investors, especially those from independent growing organizations, encounter adverse situations i.e. they must be able to appropriately surpass those companies which possess financial resources. The reason is the fact that they enjoy the needed skills for pursuing opportunities and development of competitive advantages for wealth creation [3].

Human Capital

Having a resource-based attitude, WRIGHT et al. stated that in certain circumstances maintenance of competitive advantage can be more effectively achieved through unification of human capitals rather than fulfillment by groups such as top managers or other elites under the title of organizational failure or success variables. This competitive advantage could be attained through augmentation of value and significance of independent human capital, or at least, semi-private and non-renewable human capital.

Social Capital

Social capital is a set of interpersonal relationships (internal social capital) and also relationships among individuals and organizations (external social capital). Companies rely on internal social capital for knowledge transfer aimed at utilizing entrepreneurial opportunities which support production and successful usage of competitive advantage. Accordingly, internal social capital is associated with the acquired attraction capacity. External social capital consists of relationships among heads of companies and other notable persons in the organizations [8].

3- Strategic Resources Management

Strategic management of the resources portfolio includes elimination of resources when they are potentially unable to create wealth and unification of those resources for establishing wealth-generating capabilities in the company. Strategic management of human resources include: relating human resources management to long-term and short-term strategic objectives of organization for improvement of its performance and creation of an organizational culture intended to strengthen flexibility and creativity (Truss et al, 1994). Objective of strategic human resources management is to create strategic capability through guaranteeing and assuring that the organization possesses skilled, committed and motivated staffs for attempting to attain competitive advantage.

Purchase, unification and elimination of resources would maintain company's capability with regard to appreciation and utilization of opportunities and development of competitive advantages, which include the following stages [7].

3-1- Organizing Resources Portfolio

Resource portfolio is the sum of all tangible and intangible resources which a company owns or controls. The important process of organizing resources portfolio incorporates perpetual identification, unification and elimination of resources (DIERICKX & Cool, 1989). This process states that resource portfolio changes consistently and leads to ownership or control of a dynamic collection of tangible and intangible assets. All organizations require resource. Therefore, identification of resources is vitally significant for new riskable companies as well as current organizations.

3-2 Unification of resources

Strategic entrepreneurship attitude suggests that the objective of tangible and intangible resources is to organize themselves aimed to help identification and utilization of entrepreneurial opportunities leading to development of competitive advantages. Resources are unified to create abilities such as research and development, marketing and uniform production. These capabilities are usually needed for selection and implementation of company's strategies. The uniquely created capabilities cause the companies to unify resources in some cases aimed at maintaining their current competitive advantages. Unification of resources in this manner can be effective when companies are competing in relatively stabilized markets or when their commodities are somewhat distinctive from their rivals. Gradual progresses in the current capabilities are suitable when these capabilities have the minimal value or are rare or might be non-substitutable and partially imitated. The most effective set of unified capabilities contributes to application of this set in an appropriate way for benefiting from opportunities and development of competitive advantages [7].

3-3- To use capabilities as leverage

After organizing and unification, the decision must be made with the intention of creating capability using unification of intra-unit or extra-unit resources of business. For different companies, the decisions are made independently in company level and also in business units [8]. In independent commercial companies, unification of resources intended to maximize appreciation and utilization of opportunities requires coordinated usage of unified resources among organizational duties [12]. Resource

managers effectively learn how to create considerable value through unification of capabilities. Effective unification of resources is more largely dependent on the outcome of managerial decisions rather than superior competitive potentials of companies. Additionally, majority of effective decisions with respect to unification of resources are made for identification of opportunities and money allocation for those creative and entrepreneurial opportunities [14]. Creativity and innovation are achieved if strategic management is deployed. Innovation is crucially important in taking use of entrepreneurial opportunities, and consequently, in strategic entrepreneurship.

Strategy coherency of human resource activities for management and flourishing of manpower is mentioned as an instance to have a glance at human resources management from strategic standpoint and in the frame of definition proposed by NEOBEN & BRIANT (2004). From viewpoint of this definition, personnel can be regarded as center and pivot of human resources management.

These activities shall emphasize on the following essential needs [3]:

- Supporting organizational strategies and objectives
- To guarantee that activities of human resources will create added value
- Supporting cultural changes plans
- Discovery and development of personnel's latent talents
- Designing a process which leads to maximization of personnel's participation level
- Providing job promotion opportunities for talented personnel
- Perpetual emphasis on training and development of all individuals who work in the organization
- Design, execution and management of systems for guaranteeing access to related experiences
- Presenting special vocational instructions

How personnel can improve the competitive advantage:

Team work: Let appropriate people work together

Training (instruction): Train the personnel progressively for success of team work

Empowerment: Enable the individuals to generate a competition

Notes: Grant payments and incentive rewards on the condition of performance results

Coherent Strategy of Human Resources

Some sort of human resources management needs to be present in alignment with organizational culture so that coherent performance and personnel can be accompanied with organizational effectiveness [4].

Motivation strategy: This attitude deals with effective individual performance via motivating by reward payment.

Participation strategy: independence and accountability are major slogans of organizations which apply this strategy. In this strategy, personnel are expected to be flexible and to adapt themselves to new changes

Investment strategy: organizations deploy this strategy in order to improve the personnel who are expected to be creative and innovative in fulfilling their duties.

4- Model Presentation

The abovementioned discussions about definitions and significance of strategic entrepreneurship and strategic management of human resources can be illustrated using the model below. For establishing relationship between strategic entrepreneurship and strategic management, the most vital resource for riskable companies i.e. human resource was used.

4-1- Model Analysis

Small businesses have features such as simple organizational structures with high flexibility and low formality, direct involvement of management in the processes, acceleration of decision-making process and also existence of limited organizational boundaries which provide more opportunities to gain resources for the company. These businesses also benefit from advantage of large companies with less external risks, and hence, can establish relationship with their beneficiaries including customers, providers and rivals. The studies conducted on viability of human resources management in small entrepreneurial institutions are scattered.

By the course of time, personnel further exhibit themselves as major origin of competitive advantage. The ability to share attempts and perform independent activities, innovation exposure, and adoption of creative approaches for economical growth and thrives are considered as vital factors. Significant and substantial skills in working environment signify a need to promoting one's perception toward the role of human resources management for founding successful entrepreneurial institutions.

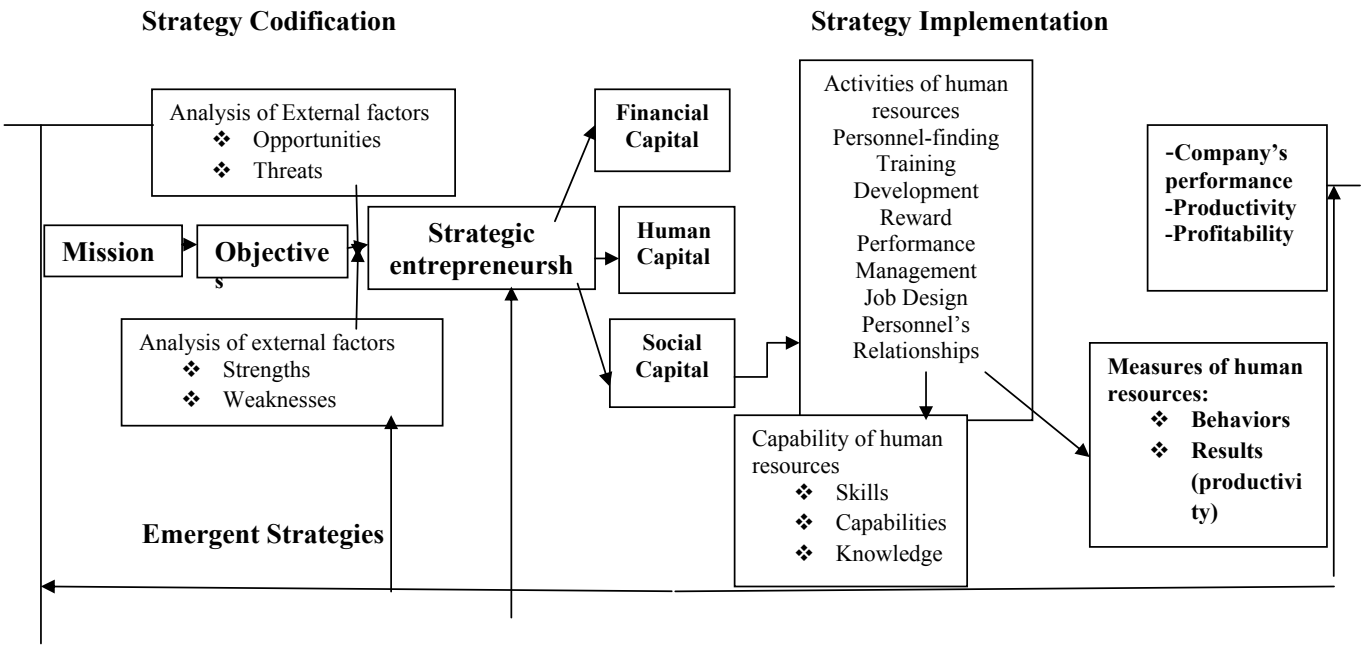

Figure 2: Proposed model for establishing relationship between strategic entrepreneurship and strategic management of human resources

Some management scientists hold the notion that concentration on human resources can lead to an essential success in achieving superiority to the rival companies. Appropriate use of superior resources as an efficient means can contribute to improvement of organizational productivity [4].

Strategic resources in system of human resources management shall be imposed with the intention of enhancing interface of systematic, circumstantial and strategic aspects of benefits. Elements or principal components of human resources management system and strategic attitude can be summarized as below [5]:

- Objectives or output of strategic human resources management
- Processes of human resources management
- Input of human resources management
- Extra-organizational environment
- Intra-organizational environment

Strategic human resources management pursues the following items as part of their variable functions: productivity of work force (manpower), promotion of more suitable services based on customers' perspective and enhancement of manpower's role in codification and implementation of organizational strategies.

Special position of strategic human resources management is highly significant as the agent which realizes functions of entrepreneurship and unification inside the subsystems through interaction among the subsystems and with the surroundings (intra and extra-organizational). These subsystems will be investigated in subsequent parts. It is attempted to analyze these components from standpoint of companies since this model is proposed for riskable firms.

4-1-1- Personnel-searching

Recruit key persons with positive records to fulfill the new requirements in business with desirable value. Prediction of variation trend, market conditions and obligations, and planning for its commensurate manpower shall be taken into account. In emergent (fledging) companies, use of Internet to search for personnel can be a proper choice for saving the expenses.

4-1-2- Training (Instruction)

In small entrepreneurial organizations, high dissipation rate and fluctuation levels besides intense instability of staff all corroborate the significance of training and instructing personnel and management in order to improve the performance, consistence, adaptation, and survival maintenance [6].

4-1-3- Rewarding the Personnel

Following the growth, entrepreneurial companies are obligated to recruit good staff and allocate suitable rewards for competing with large companies. Reward strategy shall be determined in company prior to making decision about any career.

Many of entrepreneurial companies are not able to pay in cash to their staff and take other

options. For example, flexible working times in which two people share the same work. This is commonplace for persons who do not have full-time work and wish to control their schedule. Nonetheless, the individual is authorized to even do the job at home. This is greatly important for entrepreneurial companies with limited resources and the company is supposed to determine a specific and precise policy for its domain of activities and responsibilities.

4-1-4- Personnel's Relationships

A) Industrial relationships: management and maintenance of official and unofficial relationships with unions and their members

B) Personnel's participation: giving the personnel the right to comment and express their opinions; information shall be shared with them; they must be consulted concerning the issues related to mutual interests and benefits

C) Establishing relationships and transferring useful information to the personnel [3].

This strategy deals with issues like establishment of a viable and dynamic organization and provision of learning and training opportunities for personnel in order to improve their performance.

4-1-6- Performance Management

A) **Individual and organizational learning**: systematic and disciplined design and codification as an organization that seeks for learning; provision of instructional opportunities for personnel to develop their potentials and capabilities and to prepare them for job promotion.

B) **Management development:** provision of development and instructional opportunities for managers aimed at enhancing their capability and strength in favorable participation with organization for attaining its objectives and ideals

C) **Management of occupational succession**: planning and development of occupational routes for talented personnel.

4-1-7- Job-designing

Job-designing is intended to make decisions about content of jobs, their duties and responsibilities and the relationships holding among career-holders and other staffs of organization.

5- Conclusions

In current paper, strategic entrepreneurship attitude was introduced as a factor that plays the role of organizing tangible and intangible resources in a manner that helps detection and utilization of entrepreneurial opportunities and leads to expansion of competitive advantage. A model was proposed to relate strategic entrepreneurship and strategic management of human resources whose goal is to create strategic capability through guaranteeing and assuring that the organization benefits from skilled, committed, and motivated personnel for attempting to reach competitive advantage. This model uses the most important intellectual capital and most vital advantageous resource i.e. human resource as the interconnecting bridge between these two essential concepts.

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Resources

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Development of agricultural sector through an increase in investment and relying on Credit & Finance Firms from the viewpoint of credit &finance experts and farmers of Kohgiluye & BoyerAhmad Province

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Abstract: The issue of the effects of finance markets on investment and development of agriculture is one of the significant economic subjects which demands perfect care and subtle attention in its implementation, distribution as well as application in order to be most effective in blooming of the economy, increasing investments, and development of efficient agriculture; thus, the fundamental objective of the present research is development of agricultural sector through an increase in investment and relying on credit & finance firms from the viewpoint of credit &finance experts and farmers of this province. Required information includes collection of data from the finance and agricultural markets, investment and development of agriculture sector, which were realized through some questionnaires and collection of data from the relevant organizations (during 2005-2010) and the data was processed and analyzed using SPSS software. It turned out that development and variation in financial markets of the country, in a general, and privatization of finance markets in agricultural sector, in particular, can lead to a rise in investment, growth and development as well as higher VAT in this sector. This research has shown that the government has to devise ways to remove barriers of financial intermediaries, reinforcement of financial structures, development and diversification of financial tools, cash injection into financial market of the country, supporting the private sector, implementing modern technology in this sector, and support in export. Based on the views of experts and farmers of the province, highest investment has been made in sectors like fishery, beekeeping, and cattle raising, and the least investment was in horticulture, farming as well as agricultural industries; production volume in the above mentioned sectors, and during the mentioned period, had a rising trend. Finally some recommendations have been offered to organize financial markets in agriculture and its effect on increase of investment and development of this sector.

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1. Introduction

The effects of financial markets on investment and development of agriculture sector is a significant economic issue that needs particular attention with regard to application, distribution and use so that it contributes effectively to economic boom, increase of investment, development of agriculture, and enhancing the farmers' level of income and thus enhancement of quality of life, the agriculture sector in Iran is among the fundamental economic sectors and it constitutes a major part of GDP. Therefore, investigation of the effects of different economic variables on the growth and development of agriculture sector could be of great importance. Based on the positive effects of financial markets on the growth of added value in agriculture sector, the development and variability of financial markets of the country in general, and the privatization of financial markets in the agriculture sector in particular could lead to more growth in added value of the agriculture sector. The capital market that is manifested in the stock market is one of the main ingredients of any country's financial market. Therefore, the development of stock markets could play a vital role in empowering the financial markets of the country and consequently its economic development. It is clear that fast and easy access to financial resources is one of the obligations and pre-requirements of investment and development of agriculture sector. However, due to the unique features of this sector, lack of development of financial markets of agriculture, obstacles for supplying the necessary finances, and high risks have imposed severe limitations on investments in this sector. This study indicates that in order to see the effects of financial markets on investment and development of agriculture sector in this province, the government needs to apply certain policies,

eliminate its inefficient interventions in this sector, and embark on clearing the obstacles of financial intermediary, strengthening financial structures, development and variability of financial instruments, injection of liquidity to agriculture's financial market, strengthening and supporting the private sector, using modern technologies, and supporting exports as well as providing sustainable financial services for new investments and having economic agents in this sector. In spite of the many advantages in the agriculture sector, it encounters such significant challenges as shortage of assets, lack of proper investment in comparison to other sectors, low financial and economic ability of producers, reliance on the banking system, incomplete insurance coverage, and destruction of the infrastructures, high risk, and the issues related to the market. Therefore, one of the main reasons behind lack of investment in agriculture sector in Iran is probably the fact that lack of investment security in the agriculture sector reduces the motivations of capital holders for entering this sector and thus the influx of capital to other sectors. The financial markets in the developed countries have a binary structure, through the changes occurring in the financial markets they reveal some responds. The financial market of Iran isn't perfect, the existence of non-formal structures with high rating of profit is one of the main problems of the Iranian financial market , which not only hinders the formation of the formal market, but also the positive activity of the latter. Bad organization and management, in transparency as well as lack of compatible conditions are at present the characteristic features of the Iranian financial market. All these factors have a negative impact on the development of agricultural market. Subsidation with alternative prices, precautions on behalf of the government at charging the prices from profit and giving any kind of loans or aid from the banking system are other restrictions of the financial market in Iran. Simple view on these phenomena causes some people consider this as a result of gaining and losing. The influence of the financial structure on the economic structure is of crucial importance nowadays and the lack of proper financial structure is the principle obstacle for the economic development. On this matter some great economists such as Shumpeter, emphasizing the development of financial structure, call it «the engine of economic development. Economic development should be achieved very quickly as the capital is an important factor both for the increase of productivity and for other fields. Capital is very essential in agricultural sector as well, the lack of capital in any country results in overall recession. Small income leads to the reduction of capital investment. Agriculture in the developing countries because of the scarcity of the necessary financial markets faces great difficulties. These markets have no capacity for capital investments thus are not able to develop agriculture. Some other factors are also involved here e.g. low efficiency of the banking system in the development of agriculture., lack of information and some other limitations also have negative impact on agricultural sector, as well as on the economy as a whole (Levin, 1997) One of the main factors of the economic development is considered the financial development of the national market. A lot of research has been carried out on this issue; we pay attention that research in this field.

Ansari et al. (2011) said in their article, In order to achieve the economic growth and development, some specific plans and mechanisms in social, cultural and economic fields are required. Strong financial markets are among such specific mechanisms in the economic area which in turn requires powerful financial institutions. In this research, abilities and restrictions of financial system of Kohgiluye & Boyer-Ahmad province of Iran have been reviewed and discussed that the substantial proportion of required agricultural credits of province farmers is provided by the formal sector of financial market, especially Agricultural Bank of Iran. The interest rate of formal sector credits is much less than the rates of interest applied in the informal sector even by enumerating administrative costs.

Soltani et al. (2007) quote in their article: "Investment is one of the most effective ways in improving any country's economy. Among all kind of investment in different economic sectors, investing in agricultural sector is of significant value and status since such investment, due to consistent demand for food and produce, can lead to growth in production and employment in this sector; however, with regard to studies conducted, this sector doesn't have the required attractions for investment, considering physical resources, human resource and chances of development. Among the reasons to avoid investing heavily in this sector are high risk of producing agro products, high expenses of conservation, lack of local and foreign, lack of expansion in transformational industries, absence of an encouraging system, and focusing on other more prolific sectors such as services sector.

Shakeri (2004) said in them article: agriculture has allocated a small portion of national investments to itself. One of the structural problems of agriculture in Iran's economy is the flow of capitals from this sector to other economic activities and the government's support policies to reduce this flow have not yet been so effective. And the results of the research implies the fact that the added value

of the agriculture sector has no effect on private investment in agriculture sector in the long run.

Haji Rahimi and Torkamani (2003) mentioned in their research : The added value in service sector , the investment of private sector in agriculture , the state investment in agriculture , the added value of oil and development of technology has a positive effect on the relation between trade and proportion of price index for agro-products compared with total price index , and has a negative impact on the added value in economic sector , Also , the added value in agriculture has had the most positive impact on the total added value.

Torkamani and Bagheri (2002) have said in their article: variable of the public and private investment proportion to added value and economic growth in agriculture had a positive effect on the growth of this sector and the variables of growth and agriculture organization as well as growth in employment had a negative impact on agriculture the growth of this sector , and the variables of growth and agriculture. The variable of growth in added value in agriculture has a two – way relation only with public& private investment , and a one – way relation with other variables.

Fetros (1997) studied the effect of monetary and financial policies of government on the variables of agriculture sector using ILS method. According to this research, financial policies have a positive increasing effect on agriculture, and financial policies with a decreasing rate have a positive effect on productions of this section.

Shirinbakhsh and Namravaei (2007) have mentioned in their paper : investment is so important that the UNCTAD has introduced and selected it as an indicator for evaluating the ability and performance of the world countries. In this regard ,having analyzed the data collected during1974-2004 it has been concluded that , roughly, the effect of bank loans on investment In agriculture is by far greater than the effect of added value (GDP) in this sectors in other words ,the role of banks in increasing the volume of investment had been more than the predicted gains in producing units therefore ,it is expected that organizing the banking system of the country could help increase the volume of investment inside Iran and consequently , lead to an increase in added value.

Loonyr (1999) has studied the affecting factors on private investment in agriculture using a regression model . the results gained from estimating the equilibriums in his study showed that private investment gross domestic products and agricultural credits are all with a one year interval, and infrastructural investment will have a positive impact , and non-infrastructural investment will have a negative effect on private investment .

Parivash et al. (2004) pointed to positive effects of financial markets on agricultural sector growth. They also assumed that development of the financial structure of the country has played a significant role in growing the value added of the agricultural sector. Therefore, this study is aimed at analyzing Development of agriculture through increased investment regarding on financial institutions, credit Province Agriculture.

2. Material and Methods

This research is a descriptive and analytical study carrying out as longitudinal. All data related to the financial market activities and also average and huge investments (5000$) and development rate in the agricultural sector of Kohgiloyeh & Boyerahmad state during the last five years will be collected and analyzed. Based on such data, the process of the activity changes of the financial markets, the investment rate and the agricultural section development of the state go under analyzed. According to the research objectives and to consider the sampling Lapse of 7% and Maximum Lapse of 1% and the conservative P = 5% and, Also consider the selection of a cluster and a selected level of statistical units the sample size is estimated at 100. Considering the small number of experts in credit, finance, Agriculture and selected a Number all of them. Expert،s credit, financing and Agriculture that they were 50 person willing to participate in the plan, the gathered data are used after performing necessary monitoring and analysis processes. Likewise, SPSS software is applied to analyze the gathered data. Frequency distribution tables, central and dispersion indices as well as diagrams are used to describe data and they are analyzed using simple and partial correlations and multivariate regression analysis.

2.1. Types of the financial markets.

According to the requirements such markets are divided into two groups.

2.1.1. The Capital Market

Long-term trade can be involved in this group. This group is subdivided into the initial and secondary bonds.

a) The initial market is a place where capital is created.

In such a market the bonds are issued for the first time.

b) Secondary market.

In this type of a market most of the issued bonds are subject to buying and selling in the market.

The existence of such kind of market guarantees the stability in the financial market.

2.1.2. Money Market

This market is in charge for the the private and state sector for the short-term period.

Those, which participate in such a market, have surplus savings. They make either direct or indirect deposits into banks; otherwise they buy short-term securities and submit them wherever it's necessary. In most cases these are production companies or the government.

The distinctive characteristics of such markets are the following:

1-on such markets the bargains are made very quickly.

2-the money market has no permanent location.

3-on such markets the prices of objects are very high.

2.2. The role of financial markets

Taking into account the role of the financial market in economy and having researched the factors affecting the economic growth, more profoundly studied the financial markets and their activities one may call the financial markets the lever of growth of the economy as a whole. Such markets can also provide factors of production (capital). Through the existence of financial market he country may reach the profit sources, diminish expenditures on commercial and information needs, decrease the rate of risk, hold the companies and financial organizations under control and simplify the forms of savings, as well as the exchange of goods and services, the influence of innovations and prices and through all these measures to achieve the economic development and growth. The study of financial markets and their effect on capital investments and development of agriculture are the main purposes of the given research. The idea that through these means capital can be increased. Actions involving big sums increase the interest towards the capital investment and give a positive result. Some economists keep to the opinion that the difference between the countries with developed economy and developing economy lies not in the existence of the sophisticated technologies, but in existence of active financial market.

The studies reveal that the level of the financial market development especially its effect on the economic provision of the company and choice of their provision method holds an important part in the economy of the country.

2.3. Globalization and its effect on the financial markets

The developed financial markets, which are connected with the financial organizations on the international level increase the compatibility and strengthen the economy of that country. The main factors of the country's compatibility are the existence of the financial markets, developed banking system and utilization of superior financial services. During the recent years the effect of the financial markets on economic growth has been forgotten. Goldsmith for the first time in 1969 started to speak on this matter from the viewpoint of comparison methods and comparative patterns (models) of economy. For the evaluation of the financial power of one country the measure corresponds to the company prices at the stock exchange for every initial (raw material) production of the given country.

This property illustrates the power of the country. In such countries exists the system of buying and selling. The financial system can be divided into two big groups:

The system, based on the bonds, the system, based on the banks, but financial market in Iran is based on the banks. Taking into account the role of the financial market in economy and having researched the factors affecting the economic growth, more profoundly studied the financial markets and their activities one may call the financial markets the lever of growth of the economy as a whole. Such markets can also provide factors of production (capital). Through the existence of financial market he country may reach the profit sources, diminish expenditures on commercial and information needs, decrease the rate of risk, hold the companies and financial organizations under control and simplify the forms of savings, as well as the exchange of goods and services, the influence of innovations and prices and through all these measures to achieve the economic development and growth. The study of financial markets and their effect on capital investments and development of agriculture are the main purposes of the given research. The idea that through these means capital can be increased. Actions involving big sums increase the interest towards the capital investment and give a positive result. Some economists keep to the opinion that the difference between the countries with developed economy and developing economy lies not in the existence of the sophisticated technologies, but in existence of active financial market. The studies reveal that the level of the financial market development especially its effect on the economic provision of the company and choice of their provision method holds an important part in the economy of the country.

3. Results and discussions

1-Linear regression model related to factors affecting Investment Development regarding the farmers' opinion in Kohgyloye and Boyerahmad province. Investment Development= 0.204 (Considering the private sector) + 0.193(Variation in financial institutions - credit) + 0.185(Inject liquidity to financial market and agriculture) + 0.298 (updating Financial institutions with new technologies) +0.131(Establishment of the financial counseling centers)+ 0.250

R = 0.972 R2=0.944 Adjusted R2= .940

2-Linear regression model related to the affecting factors with regard to the opinion of the Agricultural Section Development from the farmers' viewpoint in Kohgyloye and Boyerahmad province

Agricultural Section Development= 0.240* (Export supports) 0.169(Collaboration and gatherings) + 0.293 (Exhibitions and Conferences) + 0.279(Spread and Distinctive financial services) + 0.110(The use of modern technology) + 1.78

R = 0.976 R2 = 0.953 Adjusted R2 = 0.950

3- Linear regression model related to affecting factors on Investment Development regarding opinion of financial Experts in Kohgyloye and Boyerahmad province.

Investment Development = 0.257 (Considering the private sector) + 0.201(Variation in financial institutions - credit) + 0.189(Inject liquidity to financial market and agriculture) + 0.327(updating Financial institutions with new technologies) +0.120(Create financial counseling centers) + 1.056

R= 0.982 R2= 0.964 Adjusted R2 = 0.960

4- Linear correlation model related to the affecting factor on Agricultural Section Development, regarding to the opinion of financial Experts in Kohgyloye and Boyerahmad province

Agricultural Section Development = 0.214 (Export supports) + 0.101(Collaboration and gatherings) + 0.291 (Exhibitions and Conferences) + 0.314(Spread and Distinctive financial services) + 0.120(The use of modern technology) + 1.218

R= 0.989 R2= 0.979 Adjusted R2 = 0.976

As it was indicated, based on the common view between experts and farmers in this study, the highest investment was in fishing, beekeeping, and husbandry and lowest investment was in gardening, farming, and agriculture industry sector. A look at the trend of payment of credits in the formal financial markets of the province (Agriculture Bank) indicates that in the period under study (2004-2009) the payment of credits was higher in a way that the paid credits in fishing, beekeeping, and husbandry was greater than that of other sectors (with regard to their scope and volume). As it was demonstrated, the trend for the amount of produces in the agriculture sector of the province in the abovementioned period was upward in a way that the volume of production was 33% in beekeeping, 27% in fishing, 20% in husbandry, 13% in gardening, and 7% in farming. These statistics confirm the claims made by farmers and experts in this study and demonstrates that liquidity injection to the financial and agricultural market and variety of financial and credit monetary institutions have positive effects on increasing the investors and developing agricultural sector in this province. See Table 1 and Figure 1.

The results demonstrate that during the past three decades, the share of agriculture sector of formation of total gross capital was 4.2% on average and the scope of changes was between 3.8 and 4.6. In this period, the average of value added of the agriculture sector in the whole economy was 12.9% and the value added of the province's agriculture sector was 18.9%.On one hand, this shows the high potential of this sector and on the other hand it is indicative of the decrease of tendency in investment in this sector, pointing to an obvious contradiction in the country's economy. As it was shown, about 75.9% of the offering of the cash of financial markets in the province was through the banking system (Agriculture Bank and formal financial market) and 24.1% was through informal financial markets. Due to the low interest rate of credits in the formal financial market, there is extra demand in this market; while due to the high rate of interest rate in the informal financial market (i.e. between 21% and 61%), there is no extra demand. In addition, the balanced inflation rate is much higher than the balanced rate of facilities and deposits; thus it could be said that the actual interest rate of the facilities has been negative, Average value of agricultural land used by farmers in various parts were as follows: agriculture, horticulture, animal husbandry, fishing: 68000, 32697, 6500, 4800(M2), Average amount of investment in the above description were: 328, 268, 620, 4800, (Million Rials)، The results indicated that the following items, in order of priority, had the highest effect on the objective of the study in this province: updating financial and credit institutes with modern technology, attention to the private sector, variety in the financial and credit institutes of the province, liquidity injection to the financial market of agriculture, establishment of financial consultancy centers, holding exhibitions and conferences, development and distinguishing services of financial and credit markets, supporting exportation, cooperation and meetings, use of modern technology. In addition, the results demonstrated that higher education of experts has not had great effect on the objective. See Tables 2 to 6.

Table 1: Facility payment to agricultural sub sectors during the years: 2001-2009 agricultural province by Banks (formal financial market) (Million Rials)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
farming	39280	51932	39901	58612	58390	167103	55303	162873	135975
horticulture	18256	24618	25552	29829	57605	65424	43015	6850	68973
Ranch	56780	86012	95528	91329	81960	95065	96967	46534	133800
Fisheries	3136	7345	6419	6860	12086	18369	10629	8950	2519
Bee	1469	4717	4098	1204	1311	4472	4328	…….	……
Machinery	12558	18784	21439	13150	35670	29105	25568	2952	10025
Water wells	2044	2990	2324	3486	5729	2766	3838	3449	7232
Irrigation pressure	3217	4709	4572	4676	32595	6719	18522	32908	141645
Sum	136740	201107	199833	209146	285346	389023	258170	264516	500169

Source: Agricultural Bank of Kohgilouyeh and Boyer Ahmad Province

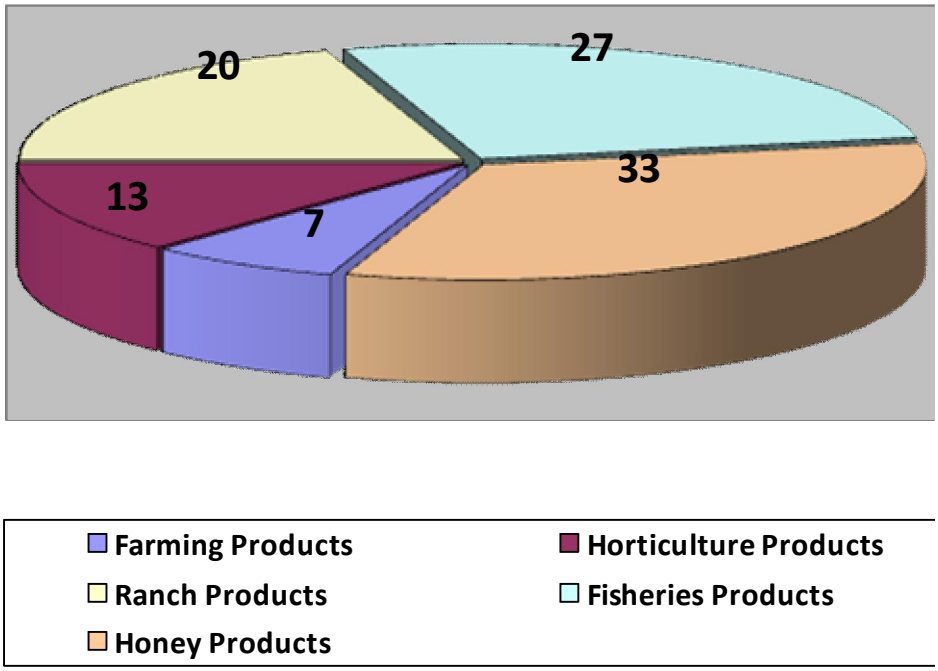

Figure 1: Agricultural sub sectors Products during the years: 2001-2009.

Table 2: Distribution of the farmers, according to their investment amount & the using Land Area in their activity field, I.R.IRAN, Kohgyloye & Boyerahmad, September 2010.

Description	Number	Land Area (Meter ^{2})	Investment (10^6 Rials)
Vegetable cultivation	14	18215±19212*	110± 65.3**
Farming	43	68000±47618	328± 259.5
Gardening	32	32696.9± 18562	268.4± 222.1
Husbandry	16	6500± 7581.3	620± 365.3
Fishery	6	4317±2893	4800± 65.3
Total	111	----------	6016.4± 977.5

Mean ± SD, *

Table 3: The main sectors of economic value added contribution (without oil) in the province and the country's gross domestic product in 2008

row	Activity	Total Country	Province
1	Agriculture & Fishing	10.9	18.9
2	Mine industry	17.1	5.4
3	Buildings, water, electricity and gas	9.9	15
4	Services	61.4	60
5	Sum	99.3	99.2
6	Net taxes on imports	0.7	0.8
7	Gross domestic product at market prices	100	100

Source: Kohgilouyeh and Boyer Ahmad Province Agricultural Jihad Offic.

Table 4: Main resources of facilities payment in agricultural-rural financial Market

Types Resources	**Resources**	**Share of suppliers (%)**	**Excess demand (%)**
Formal resources	Agricultural Bank Commercial banks	50.4 25.5	26.5 22.9
Informal resources	Funds Tradespeople Forward purchasers Relatives, etc.	2 1.7 2 18.4	46.6
	Grand total	100	

Source: Arab Mazar, Khodarahmi

Table 5: balanced average of real interest rates of facilities and deposits during (1979-2009) (percentage)

Inflation weighted rate	Facilities weighted rate	Deposits weighted rate	Period
18.9	9.8	7.5	1979-1988
19.0	13.4	9.0	1989-1994
25.6	17.2	12.6	1995-1999
13.9	17.1	12.2	2000-2004
16.7	12.63	13.05	2005- 2009
36.8	26.03	22.75	Total

Source: CBI, Statistics and Economic Analyses Bureau

Table 6: Status of value added and investment in agricultural sector during various periods (percentage)

period	Before Islamic Revolutions (1974-1978	First period of Revolution (1979-1987)	First development plan (1987-1993)	Second development plan (1994-1999)	Third development plan (2000-2004)	Total (1974-2004)
Share of agricultural value added in GDP	7.7	12.6	15.1	15.2	13.9	12.9
Share of agricultural gross capital formation in gross capital formation	3.8	3.8	4.6	4.4	4.6	4.2
Gross capital formation to agricultural value added ratio	21.5	10.6	9	7.8	11	11.6
Gross capital formation to total GDP ratio	44.9	34.7	29.4	26.7	33	33.7

Source: CBI, economic report and.

4. Summary and Concluding Remarks

It is evident that cash and resource control in Iran is under the authority of the government, in the financial market, the government provides facilities with low interest rates. Along with this formal or governmental market, there are some informal markets that provide the financial and credit resources required by the agriculture sector with higher interest rates. The existence of these informal markets with high interest rates is one of the most

significant setbacks in the Iranian financial market as it not only prevents the formation of formal markets, but also hurdles the positive effects of these markets on the agriculture economy. This is indicative of lack of development of financial markets in Iran. The existence of insufficient organizational structures, lack of : variety in financial instruments, competitive conditions, attention to the private sector, liquidity in the agricultural financial markets, support for exportation, and not updating the technology used in agriculture sector, lack of investment in agriculture, high risk of producing agricultural products, high costs of maintenance and packaging of agricultural products, shortage of domestic and foreign currency credits in this sector, and economic insecurity including the current limitations in financial and agricultural markets in the province and country that result in capital flights from this sector and their attraction in other economic sectors. Based on the point of view of farmers and financial and credit experts studies in this province, in the model provided for development or capital increase, the effective factors, in order of significance, were as follows: updating financial and credit institutes with modern technology, attention to the private sector, variety in the financial and credit institutes of the province, liquidity injection to the financial market of agriculture, establishment of financial consultancy centers. As it can be seen, there are similar attitudes among farmers and experts with regard to these items and the only difference is that experts consider these factors more significant. Based on these common views, it could be said that these items could leave fundamental and sufficient effects on this issue as well as on the objective. In order to increase investment in this sector, the government must pay more attention to these factors and embark on improvement and application of these factors in the private sector. Based on the perspectives provided by farmers and experts in this study, the effective factors in order of priority include: holding exhibitions and conferences, developing and distinguishing services of financial and credit markets, supporting exportation, cooperation and meetings, and use of modern technologies. It can be seen that there is difference of opinion with regard to order of priority between farmers and experts; however, these items have left significant effects, though with different degrees, on the development of agriculture sector. It could be said that the highest amount of investment has been in fishing and the lowest amount has been in gardening and The highest amount of the lands used were in farming and gardening and the lowest amount has been in fishing and husbandry. Based on the viewpoints of the experts, and farmers the trend of investment in all agricultural subcategories in the last five years has been as follows: rising trend in husbandry, fishing and beekeeping and falling trend in agriculture, gardening, and agriculture industry, This is indeed due to the cold climate of the province and high density of tribal population who work in fishing and husbandry as well as the consecutive droughts and the geographical location.

Based on the findings of this study, it is recommended that in order to see Development of agriculture through increased investment Regarding on financial institutions, credit Province Agriculture, the fundamental and effective factors in the shared viewpoint of farmers and financial and credit experts of the study be considered in the model for development or increase of investment. These factors, in order of priority, are: updating financial and credit institutes with modern technology, attention to the private sector, variety in the financial and credit institutes of the province, liquidity injection to the financial market of agriculture, and establishment of financial consultancy centers. According to the farmers and financial and credit experts in this study, the main factors contributing to the model for development of agriculture sector, in order of priority, are: development and distinguishing services of financial and credit markets, holding exhibitions and conferences, supporting exportation, use of modern technology, cooperation and meetings. Moreover, there is need to develop different methods, resources and instruments for financing agriculture sector, including: development of export of agricultural products, establishment and development of statistical data bases as well as the necessary infrastructure for giving information to the farmers, government's maximum use of the potentials of the private sector with regard to agriculture, issuance of bonds, securities and other innovative papers with different interest rates. Thus, structural reform of Agriculture Bank, as the most important formal institute that supports the financial needs of this sector, is of great significance. Encouragement and support of financial and investment organizations to invest in the agriculture sector of the province in order to boost and provide the required liquidity, produce and enhance profit-making programs that create job opportunities in rural areas, We recommend that based on the conditions and agricultural status of the province and the results gained from this study, more attention should be paid to husbandry, Beekeeping, and fishing as they have more earnings in comparison to other agricultural sectors. This in fact depends on the geographical location of the province.

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Effect of reduced rate herbicides and citowett mixtures on weed control, oil composition and seed viability in canola

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ABSTRACT: Farm experiments were conducted to determine the effect of reduced rates of Butisan Star and Clopyralid with a given amount of Citowett on rapeseed associated weeds, oil composition, and seed viability in 2009. The trial was laid out in randomized complete block design (RCBD) with 11 treatments and four replications. The effects of treatments were assessed at the 2 leaf stage development of canola. Average grain yield in plots treated with mixture of 2/3 full rate Clopyralid and Citowett were similar to those plots which were treated with full rate of standard treatments. Addition of Citowett in a tank mix with Clopyralid substantially improved control of weeds which resulted in more grain yield. Canola oil quality was, generally, unaffected by production practices investigated. The contents of saturated fatty acids in the oil was ≈ 8.0% indicating that the quality of oil from canola produced in Urmia is comparable to that from other locations. Application of Clopyralid at 2 kg a.i. /ha and Citowett at 400 ml /ha effectively controlled weeds in canola, and significantly increased seed yields similar to those of standards; the herbicides mixture with Citowett had little, if any, effect on seed-oil content or oil quality. Canola oil quality was, generally unaffected by production practices investigated. The combination of two herbicides at reduced rate had no phytotoxic effect on the crop. Canola germination rate was not diminished by toxic impact of herbicides mixture with Citowett. The plumule length was not reduced following exposure to Clopyralid and Citowett mixture in comparison to untreated check.
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KEY WORDS: Reduced rate, herbicide, weed control, germination, fatty acid.

Introduction

Canola (*Brassica napus* L.) is a specific edible type of rapeseed, developed in the 1970s (Kandel & Knodel, 2011), which contains about 40 percent oil. Canola varieties must have an erucic acid content of less than 2 percent and less than 30 micromoles of glucosinolates per gram of seed. This makes it acceptable as an edible oil and animal protein feed. Canola oil is considered one of the highest quality edible oils available. Canola oil has achieved worldwide commodity status and is extensively used in Japan, Canada and Europe. Canola seeds contain 38-44% (w/w) oil (based on 8% moisture) with very low levels of saturated fatty acids (~ 6%), high levels of oleic acid (~ 60%) and intermediate levels of linoleic and linolenic acids (~20 and 10%, respectively) (Alternative Crop Overview, 2002).

There is general agreement that in the last two decades consumers have demanded healthier edible oils, naturally low in saturated fat such as olive and canola oils. The quality of oils is associated with their fatty acids (FA) composition, particularly with respect to the percentages of oleic (omega-9), linoleic (omega-6) and linolenic (omega-3) acids (Jalilian et al., 2012).

Heavy weed infestations left uncontrolled can reduce canola yields by 50% or more and can reduce seed quality leading to dockage (Gunsolus and Porter, 2004). Judicious weed management in canola should involve assessing weed species and weed densities present in each field and designing an integrated control program. Application of appropriate herbicide in weed control could be the most powerful tool to secure a high yielding, high quality crop of canola. Weed control strategies in canola, whether mechanical, chemical or a combination of both control methods should primarily be directed toward reducing weed competition during the first four to eight weeks after seeding. Otherwise, canola seedlings, which tend to grow slowly, can be overcome by certain weed species. Control of key broadleaf weeds was the most important constraint to production of canola throughout Iran.

Herbicide mixtures are considered powerful tools for cost effective control in intensive agriculture. A number of factors, however, may significantly modify the expected behavior of herbicide mixtures in practice. The selection of the most appropriate combinations should be made taking into account the properties of the

herbicides to be combined and the species to be controlled.

Applying two or more herbicides simultaneously, either using prepackages mixtures or by mixing different herbicide products before the application, is a very common approach in intensive agriculture (Zhang et al., 1995). This is because the application of a single herbicide, even though may provide good control of certain weeds, is often inadequate for satisfactory and cost effective weed control. Furthermore, many herbicides have a narrow spectrum of weed control; whereas, other herbicides do not show the same efficacy against all weeds of their spectrum of control when applied at the recommended rates. Given that weed flora normally consists of many species with varying levels of herbicide sensitivity, more herbicide applications should be often performed or additional measures for weed control should be additionally adopted. This, however, increases the cost of weed control and consequently the cost of crop production. Good weed control is necessary for a good canola stand. Sod fields or fields with significant weed pressure should have weeds controlled in the fall prior to canola planting.

O'Donovan et al. (2004) stated that herbicide rate is an influential and crucial factor in weed control systems. This view is seconded by Shimi et al. (2007) who evaluated new herbicides in canola and reported that Butisan Top at 2-3 L/ha and Teridox at 2-3 L/ha are appropriate herbicides for weed control in canola fields. Despite what appears to be the sound basis for the use of mixtures as herbicide resistance prevention strategies, they have seldom been advocated or implemented. This is in great part due to the belief that in order to be effective, components of the mixtures must be used at the normal label rate (Diggle et al. 2003). A mixture tailored to prevent resistance would therefore, not only address the compatibility environmental requirement, but ensure that target weed species are adequately controlled.

To date, there are 313 resistant biotypes of weeds in over 270 000 fields worldwide (Heap, 2007). There are many tactics that are recommended to prevent or delay the evolution of herbicide resistance and diminish the threat of multiple-resistance in weeds. Among these tactics, the application of herbicide mixtures poses the outmost importance. Using mixtures does not necessarily mean that the overall chemical load is increased. It is conceivable that, because of additive or synergistic action among different molecules, the amount of each component could be reduced compared to when they are used alone at the full rate.

Ijaz et al. (2008) using several pre and post emergence herbicides in canola stated that none of the herbicides had a phytotoxic effect on the crop; the consequence of application of all herbicide is increased of canola yield. However, the post emergence herbicide is more effective when there is a preponderance of grassy weeds in infestation the crop. This view is seconded by Marwat et al. (2005) who reported that Treflan 4EC 1-2 liters ha^{-1} in rapeseed was the best treatment, reducing significantly the weed density and dry weight.

Considerable research has examined the potential use of lower-than-labeled herbicide doses. Kirkland et al. (2000) reported that good crop yields and the highest net returns could be attained up to a 50% herbicide dose in the crops with high competitive ability. Increasing the crop seed rate can be a dependable means of improving the efficacy of herbicides applied at reduced doses. In this line, the weed control was markedly improved with increased crop seed rates in a canola when a reduced rate of herbicides was utilized (O'Donovan et al., 2004).

Mixtures of herbicides with surfactants have been recommended for weed control enhancement and prevention of resistance phenomenon. Progress continues to be made on maintaining high efficacy levels at lower herbicide rates through the use of improved adjuvant that increase solubility in the spray tank and aid in herbicide uptake and translocation (Green and Cahill, 2003; Ramsey et al., 2005). Citowett as a non-ionic surfactant could be able to increase foliar uptake of active ingredients for example, by enhancing retention of spray droplets on cuticles and penetration and absorption into leaf tissue. An appropriate adjuvant assures maximum performance and crop safety. Curran et al. (1999) stated that the type of adjuvant added to the spray tank can enhance or reduce the performance of the pesticide. Progress continues to be made on maintaining high efficacy levels at lower herbicide doses through the use of improved adjuvant that increase solubility in the spray tank and aid in herbicide uptake and translocation (Green and Cahill 2003; Ramsey et al. 2005).

Seed germination tests provides the maximum germination potential of a seed lot and this can be used to compare the quality of different seed lots and also estimate the field planting value. For preservation of oil seeds quality, it is essential that the seed is tolerant to the herbicide spray solution. Seed viability could be a good indicator of oilseed quality after exposure to weed control agent. Therefore, in this study three measurements related to seed quality were investigated (ISTA, 1976).

The effects of reduced - rate of herbicides in combination with surfactants on crop has been reported previously. However, little information is

available on the effects of reduced rate herbicides alone or in combination with Citowett on weed control, oil composition and canola seed viability. With retrospect, to fill this void and to have insight in this arena, the current research was undertaken.

Materials and Methods

Study Site

The field experiments were conducted at the research fields of Urmia University, Urmia (37.34° N 44.58° E and altitude 1365 m) a town in Iran in 2009. Soil of experimental site was sandy loam with pH of 7.1 and 1.5% organic matter. The trials were laid out in using randomized complete blocks design (RCBD) with 11 treatments including an untreated check and four replications with a plot size of 4 m × 3 m separated from adjacent plots by a 1 meter wide buffer. In order to have a uniform weed stand in each plot, a mixture of 100 g of *Xanthium pensylvanicum* Wall. and 50 g from each the rest common broadleaf rapeseed weed species and 7.2 g of canola seeds were sown by hand evenly as much as possible. Post emergence herbicides -Butisan Star, and Clopyralid- alone or in combination with Citowett were used. Addition of Citowett in a tank mix with herbicides was at a concentration of 0.1 % (v/v). Herbicides treatments were applied by Xinfeng Bao, 45 psi and 3 bar personnel, back pack sprayers and hand held booms equipped with fan nozzles. The treatments were sprayed at 400 L/ha of spray mixture. All trials were replicated four times.

In all plots of canola each experimental unit was harvested by hand. All canola samples collected in each bag were cleaned, weighed and tested for percent moisture content. Yields were calculated allowing for seed moisture content of 9%. Weed biomass from all experimental units was taken at harvesting time using a total quadrant area of 1 m^2 . For all experimental units, weeds were clipped at the ground level, identified, counted and placed in paper bags. Weeds were then dried for 2 weeks under ambient conditions and dry weights were measured. The combination mixture was compared to four standard herbicide treatments each composed of 2 herbicides at the full label rate to determine efficacy of the combination treatment. These treatments were applied in post-emergence of canola when the crop was at the two -leaf stage.

Oil Extraction and Composition

After the canola plant reached physiological maturity status, seed yield was secured by harvesting of one m^2 in the center of each plot. A sample of 20 g of clean seeds from each treatment was isolated to measure the oil concentrations. Soxhlet extraction technique was employed to determine the total oil concentration of the canola seed and the oil concentration was expressed as mg g^{-1} (Movahhedy-Dehnavy et al., 2009). The oil concentrations were reported as percent of the seed weight standardized to 9% moisture. Lipid was extracted from 20 g of ground seed three times at room temperature by homogenization with hexane/isopropanol (3:2, v/v) (St. John and Bell, 1989).

The formation of FAME was carried out according to the procedure described by Desvilettes et al. (1994**).** The sample was saponified with methanolic sodium hydroxide and the fatty acids were esterified with methanolic sulfuric acid. FAME were analyzed with a 6890 N GC–FID (Agilent Technologies, Wilmington, DE, USA) fitted with a J&W DB-Wax capillary column (30m, 0.25 mm i.d., 0.25 mm film thickness), a split–splitless injector with Agilent tapered liner (4 mm id) and flame ionization detector. The initial column temperature was maintained at 100°C for 1 min and then raised at 25°C/min to 190°C and held for 10 min. Nitrogen was used as carrier and make up gas, at flow rates of 1.0 and 45 mL/min, respectively. The injector and detector temperature were held at 250 and 260°C, respectively. ChemStation software was used for online data collection and processing. Individual FAME was identified by comparison with known standards (Sigma, Chemical Co. St. Louis).

Germination Tests

Germination tests were conducted according to the principles stated in International Seed Testing Association (ISTA, 1976) methods with minor modification. Seeds of oilseed were exposed to herbicide for 24 h in 1150 mL glass jar. Fifty herbicide treated seeds were soaked with 50 mL of distilled water for 24 h. Pre- treated seeds were spaced uniformly on sheet paper and placed in a germination cabinet for 8 d at 20°C. Non-herbicide exposed seeds treated identically and served as control standards for comparison. Each experiment was replicated four times on four different days. The number of germinated seeds was counted after four and eight days and the mean plumule length of fifty seedlings was determined at eight days.

Data Analysis

An arcsine square root transformation of the original data was performed to satisfy the assumptions that the error was random and normally distributed, and that all components were additive. Weed control and germination tests data were analyzed by analysis of variance (ANOVA) with SPSS software (SPSS Inc. 1993) followed by Tukey's Honestly Significant Difference (HSD) test to determine statistical differences between means at test ($P \leq 0.05$). For comparison to independent groups' means, T-test was used.

Results:

Treatments

Citowett as a surfactant was used in combination with treatments displayed in Table 1. Therefore, it was doted in a concentration of 250 ppm in tank mix spray solutions. Preliminary experiments revealed undetectable phytotoxic effects of Citowett on crop stands at recommended rate. As reference, herbicides solutions were applied alone and in combination with Citowett (Table 1).

Seed and Weed Weight

Statistical analysis of the data revealed that herbicides had significant effect on seed yield and weed weight (Table 2). The highest seed weight was obtained from standard treatments and mixture of Clopyralid and Citowett ranging 28.5 – 21.5 g. It was further observed that the lowest seed weight (3.5 g) was obtained from untreated check plots.

There was no significant effect of the treatments on crop injury or crop yields; while significant differences were observed among treatment seed yields and weed weights (Table 2). Together, crop yield was highly influenced by competition from weeds. In this context, an inverse relationship between seed yield and weed weight was detected. Therefore, in analysis of variance for the regression of seed yield on weed weight, mean seed yield was modeled as a function of weed's weight with linear equation: Seed yield = 31.28 – 0.087 weed weight. The equation has potential to be useful in prediction of the seed yield with $R^2 = 0.77$.
In the majority of cases, the mixture of 2/3 full rate of Clopyralid and Citowett at recommended rate (treatment 3) provided high level of seed yield and broadleaf weed control similar to the standard herbicides –recommended rate of Butisan Star and Clopyralid- (Table 3). A pronounced and significant difference was detected between resultant seed yield and weed control level of these treatments with the other treatments group. Addition of Citowett in a tank mix with both herbicides and associated reduced rate mixtures substantially improved of canola seed yield in comparison to treatment with lack of due Citowett addition (Table 3).

Dominant Weeds

The results indicated that among the weeds population, the *Echinchola crusgalli* L. and *Setaria faberil* Hernm. are significantly more tolerant to herbicides compared to the other weeds. These weed species; therefore, have paramount importance in competition with canola. For comparison the two means, 95% mean confidence intervals was implemented and criterion for non significant difference between tow treatments was overlapping of the confidence intervals (Table 4).

Oil Fatty Acid Profile

In 9 out of 10 cases, the effects of reduced rate of Clopyralid and Citowett mixture on canola oil composition were similar to those of control treatment. While, in comparison to control, this treatment was significantly affected the C18:1n content. Since, this unsaturated fatty acid constitute ≈ 2/3 of the oil fatty acid composition, it could be an important topic for further research and elucidation (Table 5).

Seed Viability

The germination seed rate and plumule length of canola after exposure to Clopyralid and Citowett mixture are shown in Table 6. The standard error from four replicates of 50 seeds each was less than 1% of the mean value in all cases. Results from vigor test at four-day count were unchanged at eight-days (total germination test). The standard error in plumule length was less than 3% of the mean value. Clopyralid and Citowett mixture did not significantly reduced plumule length in comparison with unexposed seed (Table 6).

Discussion:

To increase production in canola, effective weed control measures must be taken. Canola usually develops a full canopy cover at 8 weeks after emergence and can then compete well with weeds up to maturity. Little or no reduction in yield occurs if canola are kept weed free for the first 4 weeks this is the critical period of time for weed competition in canola (Gunsolus and Porter, 2004).

Canola oil comes from select rapeseed cultivars that produce low erucic acid rapeseed oil and low glucosinolate meal. Starner et al. (1999) stated that Rapeseed (*Brassica napus* and *B. rapae*) is the third most important source of vegetable oil in the world. Canola oil is considered healthy for human nutrition due to its lowest content of saturated fatty acids among vegetable oils and moderate content of poly-unsaturated fatty acids. In the present study canola oil quality was, generally unaffected by production practices investigated. The mean content of saturated fatty acids was ≈ 8.0% and was similar to those content of 7% reported in the United States (USDA, 1998) indicating that the quality of oil is comparable to that from other locations. Although fatty acid profiles vary somewhat from sample to sample, they are generally used to characterize vegetable oils from particular species or varieties of plants (Ehrensing, 2008).

Tank mixing two or more herbicides is a useful practice in intensive agriculture aiming to improve

efficacy of the combined herbicides, or reduce herbicide rates and consequently to reduce the cost of weed control. In this line, Doyle and Stypa (2004) point out that much research is conducted with a new herbicide to identify doses that will maximize product value and minimize the required use rate. This view is seconded in current study in which the mixture of 2/3 Clopyralid with Citowett provided seed weight similar to those of standard treatments. Blackshaw et al. (2005) stated the benefit of integrated weed control program becomes much greater when several integration components are utilized in companion. Once an integrated weed control program has been implemented, farmers can consider choice of companion herbicides reduced rates. However, reduced rates nullify the manufacturer's guarantee of herbicide efficacy (Duchesne et al., 2004), entail concerns, and thus, should be used with great caution.

Miri and Rahimi (2009) using mixtures of herbicides stated that in Rapeseed application of post emergence herbicides mixture full rate from each − Galant Super + Lontrel − and Butisan Star at full recommended rate are good weed management treatments. In this context, the results of the present study reveled that the mixture of 2/3 full rate of Lontrel with recommended rate of Citowett is good enough for weed control similar to those of either Lontrel or Butisan Star at full recommended rate.

It could be postulated that addition of Clopyralid in a tank mix with Citowett reduced herbicide required rate substantially and improved canola weed control level. There is general agreement; herbicide application minimizing weed competition during crop development can have a significant impact on crop yields. In this line, Amin et al. (2003) stated that seed weight increases with application of some herbicide. This view is in conformity with the current research results and seconded in the average yield results taken from the trials (Table3). The average canola yield was similar to those of standard herbicides in plots treated with the tank mix combination of Clopyralid (0.7 Kg a.i. / ha) and Citowett (100 mL/ha), due to improved weed control level.

Despite what appears to be the sound basis for the use of mixtures as herbicide resistance prevention strategies, they have seldom been advocated or implemented. This is in great part due to the belief that in order to be effective, components of the mixtures must be used at the normal label rate (Diggle et al., 2003). This research, however, refuted such assumption and demonstrated that the reduced rate herbicides mixture approach is highly effective and should be researched more thoroughly in the development of any novel herbicide.

Farmers are becoming increasingly interested in more judicious weed control measures such as use of reduced rates herbicide that lower their production costs and undue environment contamination problems. The current research indicates that there is good potential to utilize reduced herbicide rates in combination with citowett. Therefore, it could be recommend this mixture as an alternative to Butisan Star and Clopyralid at recommended rates. An advantage of this mixture over the standard herbicides treatments is that it is cost effective and entails avoiding undue environmental contamination which is criterion for superiority to the treatments in question.

The distinction between live seeds and germinated seeds is important since herbicides may cause injury by retarding germination as well as destruction of germinative capacity (ISTA, 1976). Therefore, decrease in germination rate or plumule length after exposure was adequate to prove a deleterious effect of herbicide on canola's seed viability.

Together, the current study demonstrates the potential of a reduced-rate herbicides tank mixture with Citowett in canola weed management operation under field conditions. Hence, with sound recommendations for herbicides mixtures, herbicides application rates and costs could be reduced. By speculation these outcomes also may occur in other regions with similar weed population and agro-climate conditions.

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Table 1: Herbicides treatment, rate applied, and application time.

No	Herbicide treatment	Rate (Kg a.i. ha-1) or ppm in spray solution	Timing
1	Clopyralid (full rate)	0.7	Post-eme.
2	Clopyralid (2/3 of full rate)	0.47	Post-eme
3	Clopyralid + Citowett	0.47+250 ppm in spray solution	Post-eme
4	Butisan Star	3.0(full rate)	Post-eme
5	Butisan Star	2.0(2/3 of full rate)	Post-eme
6	Butisan Star+ Citowett	2.0+250 ppm in spray solution	Post-eme
7	Clopyralid + Butisan Star	0.47 + 1.0	Post-eme.
8	Clopyralid+ Butisan Star+ Citowett	0.47+1+250 ppm in spray solution	Post-eme.
9	Butisan Star + Clopyralid	2.0 + 0.23	Post-eme.
10	Butisan Star+ Clopyralid + Citowett	2.0+0.23+250 ppm in spray solution	Post-eme.
11	Weedy check		

The order of experimental treatments will be the same in table 3.

Table 2: Analysis of variance of seed yield and weeds weight of canola treated with different treatments at harvesting time.

		Mean square	
Source of variation	df	Seed yield (g)	Weed weight (g)
Block	3	53.21^{ns}	2487.47^{ns}
Treatment	10	262.60^{**}	26580.2^{**}
Error	30		
Total	43		

ns, and ** are non and significant at $p \leq 0.01$, respectively.

Table 3: Mean comparisons of seed yield and weeds weight in plots treated with different herbicides and associated combinations.

	Traits	
Treatment	Seed yield	Weed weight
1	28.5[a]	67.5[d]
2	10.5[cd]	114.8[bcd]
3	21.5[ab]	99.8[cd]
4	26[a]	136.8[bcd]
5	9.5[d]	147.3[bcd]
6	11.0[cd]	145.8[bcd]
7	10.75[cd]	156.3[bcd]
8	24.5[a]	254.0[ab]
9	14.75[bc]	248.5[abc]
10	12.0[cd]	273.5[a]
11	3.5[d]	309.8[a]

Numbers within a column followed by the same letters are not significantly different ($p > 0.05$).

Table 4: Average weight (g) comparisons and associated descriptive statistics of dominant weeds at harvesting time.

Treatment	Weed						
	Setaria faberil	Convolvulus arvensis	Xanthium pensylvanicum	Brassica alba	Raphnus raphanistrum	Echinchola crusgalli	Chenopodium album
Minimum	27.00	14.00	11.00	17.00	19.00	12.00	10.00
Maximum	246.00	203.00	150.00	64.00	103.00	345.00	100.00
Mean (g/m2)	69.39a	44.43b	39.46b	31.91b	40.85b	100.68a	34.52b
Std.Deviation	7.49	5.02	5.84	2.54	3.06	15.82	4.18
95% confidence limits	54.7-84.0	34.6-54.2	28.0-50.9	26.9-36-9	34.8-46.8	69.68-131.68	26.3-42.7

Means followed by the same letter in a row do not differ significantly at 5% level with Tukey's test.

Table 5: Mean comparisons of oil compositions of canola treated with a mixture of Clopyralid and Citowett at 2-leaf developmental stage with control.

Traits	Fatty acid profile (Mol %)									
	Saturated				Unsaturated					
	C16	C18	C20	C22	C16:ln7	C18:1n	C18:2n	C18:3n	C18:3n6	C18:4n3
L + C	4.12[a]	2.68[a]	1.21[a]	0.65[a]	0.18[a]	64.34[a]	18.44[a]	7.67[a]	2.03[a]	0.11[a]
Control	4.14[a]	2.72[a]	0.77[a]	0.25[a]	0.17[a]	62.38[b]	18.47[a]	5.99[a]	1.34[a]	0.08[a]
T value	-1.20	-0.33	0.15	1.54	0.03	-2.92	0.66	-0.75	-0.63	-1.26
P	0.28	0.75	0.88	0.19	0.98	0.03	0.54	0.49	0.56	0.26

L + C = treatment No. 3 (Clopyralid + Citowett).
Means followed by the same letter within columns are not significantly different (P > 0.05; Tukey's test).Fatty acid profile shows the percentage of each fatty acid component in canola. The first number in the notation at the top of each column in the profile (e.g., 18:3) indicates the number of carbon atoms in the fatty acid.

Table 6. Mean comparisons of seed germinability and plumule length of canola treated with a mixture of Clopyralid and Citowett at 2-leaf developmental stage with control.

Treatment	Viability	
	Germination rate (%) Mean ± SEM	Plumule length (mm) Mean ± SEM
Check	96.33 ± 2.20[a]	93.4 ± 0.41[a]
Clopyralid+ Citowett[•]	89.00 ± 2.64[a]	85.9 ± 2.77[a]

Means within columns with similar letters are not significantly different ($P \geq 0.05$) according to T- test. [•]Clopyralid + Citowett = Treatment No. 3.

Identifying and evaluating effective factors on lean-agile supply chain

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Abstract: Today's competitive environments make lots of changes in organizations and manufacturing systems and in order to increase productivity, tools and techniques are developed. Lean thinking or production that is one of the most important of them has pointed such organization that accomplished the processes without wasting resources and with less resource assigning. In this research we study lean-agile supply chain and effective factors on it, in order to improve and promote supply chain management, identify models and lean-agile supply chain indicator and how the situation of soft drink industry in associate with being lean and agile is?, and what weakness and strangeness points this lean-agile supply chain has? The results show that customer-oriented 0.16 importance degree is the first priority for company in order to increase supply chain leanness and introducing new product with 0.13 importance degree is the first priority for company in order to increase supply chain agility.

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Key word: supply chain management, lean, agile, lean-agile supply chain

1. Introduction

Today's competitive environments make lots of changes in organizations and manufacturing systems and in order to increase productivity, tools and techniques are developed. Lean thinking or production that is one of the most important of them has pointed such organization that accomplished the processes without wasting resources and with less resource assigning. But in many of today unstable markets, with the aim of surviving and successfulness, it is not enough just to be lean and eliminate waste.

Today, deliver the right product in right price and right time to market is not the necessary and sufficient condition for victory in the field of competition. But it's just the condition for survival in competitive environments. In markets where price is the value of customer's view, the smooth time scheduling and eliminate waste might be the cause of successfulness, but essential factor in many today's markets is availability and the service level that are the causes of emergence of new patterns such as agility and quick responsibility. In other word, business environments' changes that are caused by customer's needs changes, is leaded to uncertainty in decision parameters and it is necessary that supply chain be flexible to deal with these uncertainties. The successful organization is the organization that has competitive advantages in new environments and ability to adapt itself with customer's needs and market's changes.

In today's business world, supply chain management is considered as a tool for achieving short term economic revenue and long term competitive advantages. Supply chain management is considered as a set of approaches and efforts that supports manufacturers, suppliers and distributors and coordinates the value chain in such a way that the products are delivered in right volume, right time and right place in order to achieve customer satisfaction.

Agile supply chain approach is associated with interaction between company and market and external outside perspective to flexibility. The successful implementation of this approach needs quick and continuous respond to market's changes, organization's dynamic, consideration of growth and flexibility and customer's expectations. This approach focuses on unexpected market demand changes and attempts to resolve unpredictable problems by quick transportation, making lead times flexible and handling new technologies.

In this approach, systems and information technologies are used extensively and also by using EDI, information is quickly transferred to all of the chain.

In this research we study lean-agile supply chain and effective factors on it, in order to improve and promote supply chain management, identify models and lean-agile supply chain indicator and how the situation of soft drink industry in associate with being lean and agile is?, and what weakness and strangeness points this lean-agile supply chain has?

The organization of this paper is as follows. Section 2 discusses the literature review. In Section 3, we explain the process of the research. Section 4 is data analysis and the paper ends with concluding remarks in section 5.

2. Literature review

2.1. Supply chain management

Supply chain management means strategic coordination of traditional business tasks in one special organization and in its existing businesses, with the aim of long term performance improvement in one hand and whole of chain in another hand (Fine, 2000).

Supply chain management is the clear and obvious organizing, strategic coordination along trading partners and twofold goals development (i.e. improving organization performance and whole supply chain performance), (Jafarnezhad, 2005, p 538).

The major aim of supply chain management is to optimize the performance of supply chain in order to add possible value on product with minimum cost. In other word this aim is consisting of associating and linking all agencies of supply chain in order to join to cooperate with company, as a one way to optimize productivity in supply chain and provide the most revenue to all relevance parts (Christopher, 2000).

2.2. The concept of agile supply chain

Parallel promotion in agile scope and supply chain management has led to introduce agile supply chain (Christopher, 2000). Where, agility has been accepted as a win strategy in widespread form, even has seen as a basic for surviving in some special business environments and the thought of creating agile supply chain had designed as a rational step for organizations (Ismail & Sharifi, 2005).

Agility is total ability of supply chain and its partners for quick coordination with networks and operations to match with dynamic and unruly requirements of organization. Agility is the ability of supply chain to rapid respond to market changes and customer's needs (Toloee ashlaghi, 2008).

According to Van Hook (2005), there are three specifications for association of supply chain and agility: skill in using and utilizing of undulations, quick respondent and particular respondent or respond even in small volumes. Agile supply chain is a set of specifications that make chain able to react quickly to arising changes in environment. There are some researches that had done according to Christopher and Van Hook model in 2000. They measured the agility of supply chain according to following model (Van Hook et. al, 2000).

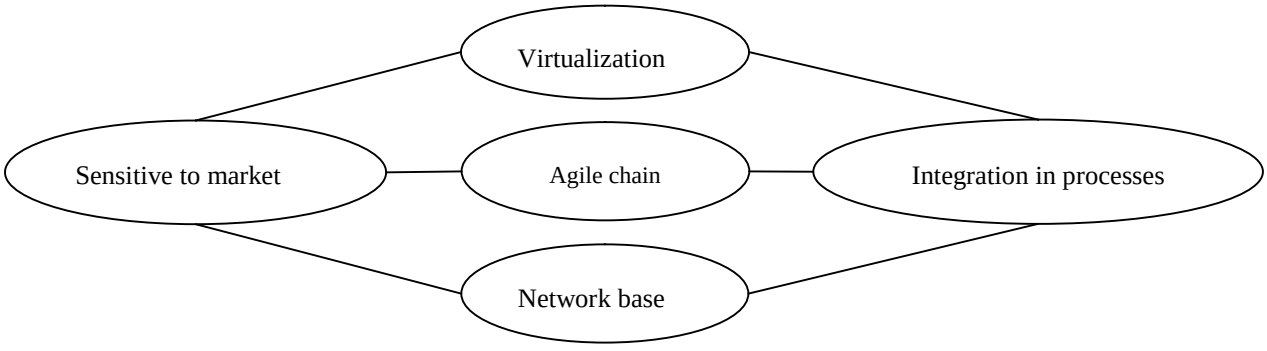

Fig 1, Agility model of supply chain

In fact, in this model there is a point that these mention's factors that are intended to measure the agility, are themselves effect of other factors and are not the major cause for agility in supply chain. For example one chain is agile when it is sensitive to market. This sensitivity itself is the effect of power of supply chain responsibility, or an agile supply chain for quick respondent to demands must be in a network form, in such a way that all chain's partners connect to each other. These connections are used with the aim of

increasing speed of responsibility to changes. So in this research flexibility, responsibility, quickness and qualification are used as major indicators to measure agility according to proposed esmaeili and sharifi's indicators.

2.3. Agility capabilities

Agility capabilities include the abilities that should be created in organization; in order to have enough power of responsibility to changes. Power of responsibility that is the ability of changes' distinguishes and quick responds to them. The followings are: Strategic planning (Gunasekaran et. al, 2008), virtual firm, (Gunasekaran et. al, 2008; Faisal et. al, 2007) and, sensitive to market (Gunasekaran et. al, 2008; Ismail & Sharifi, 2005).

Competence: competence is a vast set of abilities that supply the tasks productivity in line with organization's goals. This factor is included connection, trust and commitment, culture and group decision making and integration mechanism. The sub-indicators are extracted from spekman et. al (2002). The following indicators have been extracted from (spekman et. al, 2002).

Flexibility: flexibility is the ability to produce and provide various products and achieve organization goals with similar resources and equipment. The flexibility is considered in four scopes; resource flexibility, market flexibility, system flexibility and logistic flexibility. According to Duclos et. al (2003), the types of flexibility are as follow:

Operation system: the ability of matching properties and operation in order to react to change in customer's needs in each loop of supply chain.

Market: the ability to customized produce in high level and create close relationship with customers including design and changing new or existing products.

Resource: changing supply chain in order to match supply goods with customer needs.

Logistic: the ability of receiving and sending products from supply resources to customers with effectiveness of cost.

Speed: speed is the ability of implementing the operation in shortest possible time that is included: distribution speed of new products to markets, quick and on time product delivery and speediness in operation time (Christopher, 2000; sharp et. al, 1999; Giachetti et. al, 2003; lin et. al, 2006).

2.4. The concept of lean supply chain

Lean production theory was introduced by womak and jones in 1990 and then developed to its deaper lean thinking concept in 1996 by them. In fact lean thinking concentrates on reduction and elimination of wastes and it is also called moda (Christopher and Towill, 2001). The original approach of lean system is TOYOTA that its focus is on efficiency handling of resources with stage planning (Ohno, 1988).

Lean thinking as the point of supply chain is value flow that eliminates all wastes and makes possible a stage planning (Naylor et. al, 1999). This strategy can include; inventories reduction, production's volume reduction, suppliers' delivery base volume reduction, supplier evaluation according to quality and delivery performance, long term relationship with suppliers, and eliminating bureaucracy (Treville et.al, 2004).

Lean principles can be used in markets where demand is high and consequently predictable and also diversity is low (Christopher, 2000).

Lean management system is founded on three main bases: strategic planning, organic structure, and human resource capabilities. A lean organization in order to grow must have obvious sight of its strategy, structure and capabilities (Motaghi and ayoogh, 2007).

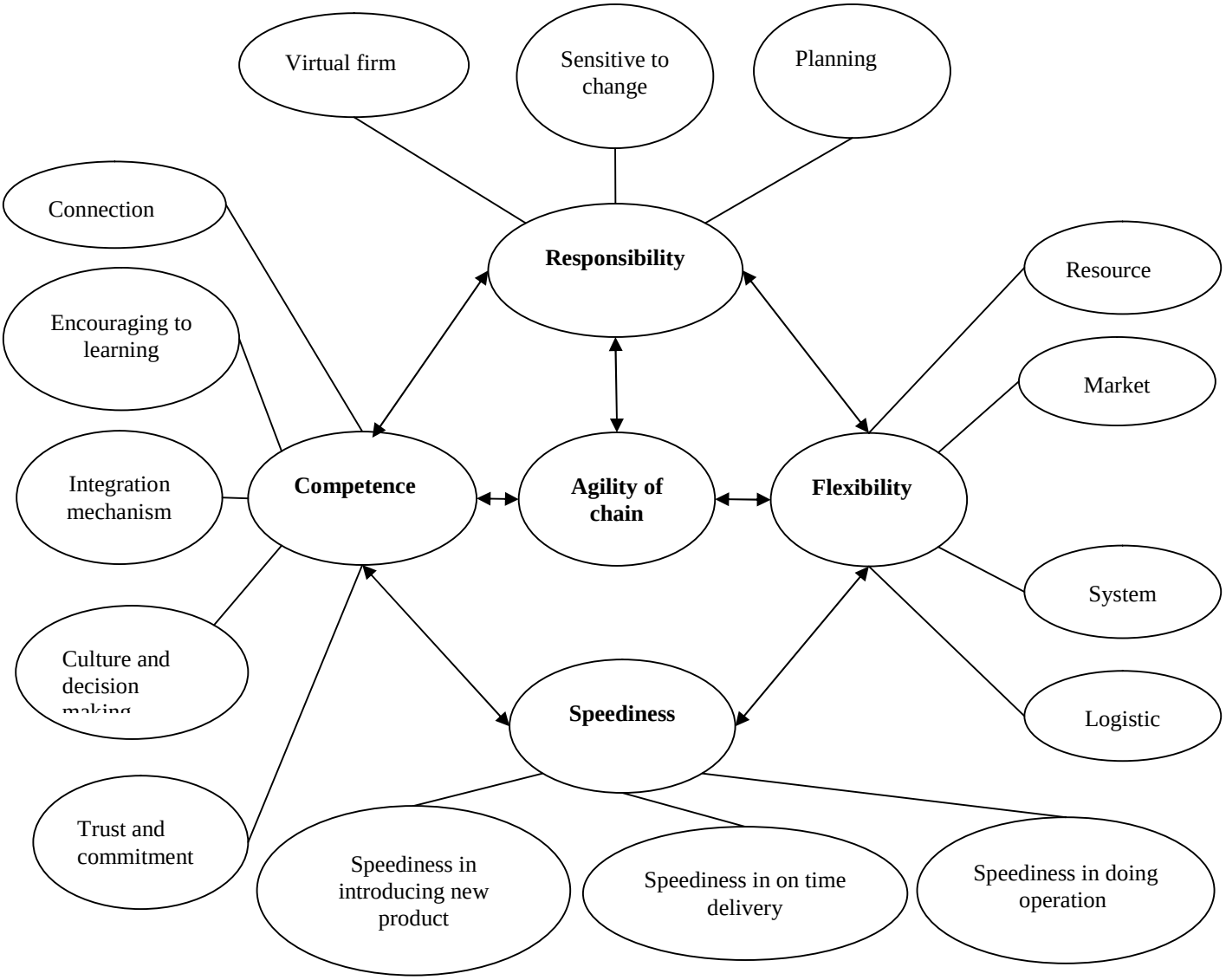

Fig 2, Agility evaluation model

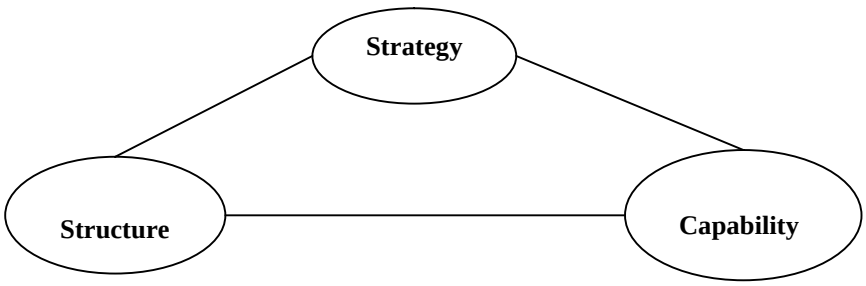

Fig 3, three main bases for growth

2.4.1. Nine keys for developing

Strategy management, structure and capabilities are easy to talk before implementing, actually in dynamic environment. In mass production organizations these specifications of developing processes of product were traditional and are constructed based on primary pioneers thinking of organization about future. Without having clear picture of future, the changings cause to disconnect between strategies, structure and capabilities of organization and make organization confused. Often business leaders with traditional system focus on financial strategy and don't consider capabilities and structure. The result that is obtained in most cases is old structure and lake of operational capabilities with discontinuous strategies.

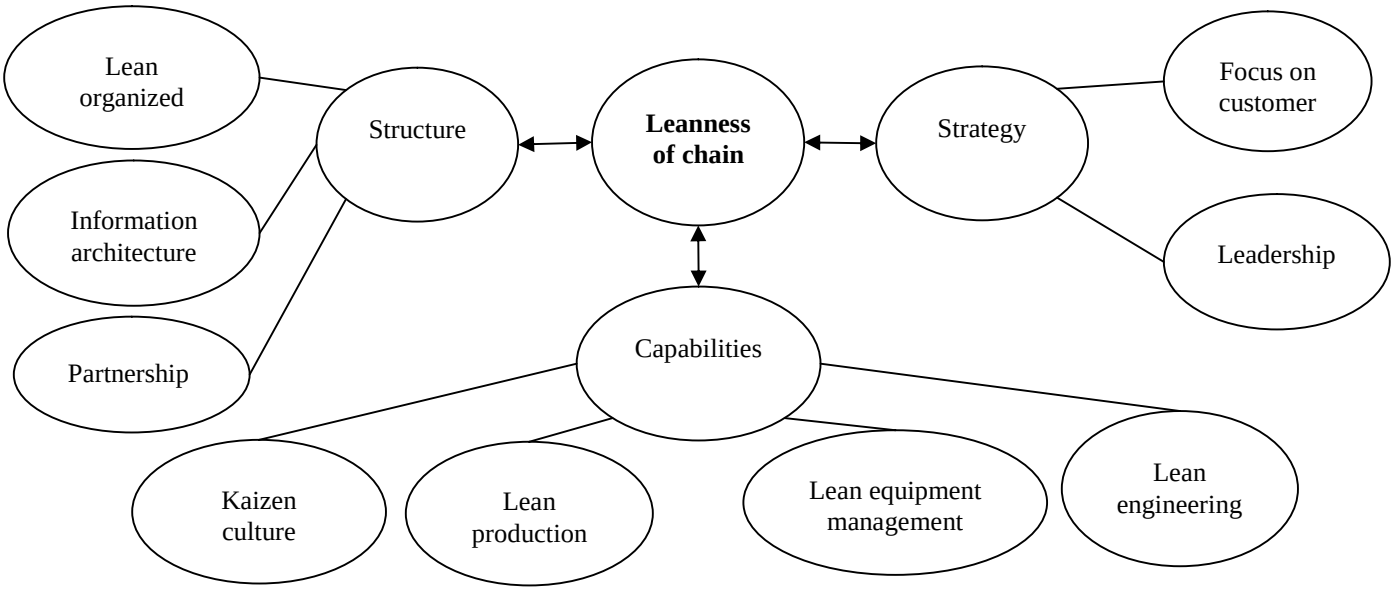

Fig 4, leanness evaluation model

2.5. Lean- Agile supply chains

The purpose of two lean and agile approaches is to respond to customers with low cost, but they are basically different in method (Goldsby, 2006). Most of researches show that there are a lot of ways to create lean- agile strategy integration (Childerhouse, 2000). Rational choice and integration of appropriate aspects of these patterns offers specific strategy that called lean-agile supply chain strategy.

3. Methodology

3.1. Lean and agility degree evaluation

For evaluating the leanness we use linguistic scales (five point likert scale). Fuzzy data are aggregated by fuzzy relations and then fuzzy aggregated data will be crisped. In final stage normalization of fuzzy weights will be done. For evaluating agility we use the same way as mentioned above.

The statistic population of this study is the experts in DAINAMIN sport's soft drinking producing that are ten people. In this study likert scale is used for designing questionnaire that is the most common. The scales are from one that shows very low to five that shows very high. In this study we use cronbach's alpha to compute reliability of questionnaires. The formula for computing cronbach's alpha is $r_a = \left(\frac{j}{j-1}\right) \times \left(1 - \left(\frac{\sum s_j^2}{s^2}\right)\right)$. Where j is the numbers sub- questions of questionnaire, s_j^2 is variance of jth sub-exams and s^2 is the total variance (Sarmad et al, 2006).

Table 1, Reliability of agility questionnaire

Row	The cronbach's alpha importance	The current situation of cronbach's alpha	Dimension
1	0.91	0.828	Responsibility
2	0.938	0.884	Competence
3	0.89	0.869	Flexibility
4	0.923	0.892	Speediness

Table 2, Reliability of lean questionnaire

Row	The cronbach's alpha importance	The current situation of cronbach's alpha	Dimension
1	0.908	0.819	Strategy
2	0.892	0.83	Structure
3	0.921	0.853	Capabilities

Also, according to concept of reliability (Khaki, 2008), these study's questionnaires have been confirmed by experts and academic professors.

4. Data analysis

After fuzzy computing and crisping fuzzy numbers, the arithmetic mean was calculated for each criterion (see table 3). Also in order to evaluate the importance of each criterion the normalization had done.

Table 3, leanness degree of supply chain in current and ideal situation

	indicator	Current situation	Ideal situation
strategy	Customer oriented	2.800	4.700
	Leader ship	2.890	3.890
structure	Lean organized	3.170	4.400
	partnership	3.110	4.400
	Information architecture	3.170	4.250
capability	Kaizen culture	2.900	4.350
	Lean production	2.690	4.500
	Equipment management	3.170	4.330
	Lean engineering	3.000	4.450

According to table 3 we can consider the importance of customer oriented sub-indicator in supply chain leanness. Also we can consider lean production sub-indicator that is far from ideal situation. These two sub-indicators can be put in our first priority in order to improve.

4.1. Leanness improved priority

Table 4 shows the gaps between current ideal situations of leanness indicators that are obtained by difference between ideal and current situation. According to table 5 the total gaps is 12.37 and finally the weight of each indicator is obtained by dividing the gap of each indicator on total gaps.

Table 4, gaps between current and ideal situation of lean indicator weights

	Leanness indicator	Gap	Gap weight
Strategy	Customer oriented	1.9	0.16
	Leader ship	1	0.08
Structure	Lean organized	1.23	0.10
	partnership	1.29	0.10
	Information architecture	1.08	0.09
capability	Kaizen culture	1.45	0.11
	Lean production	1.81	0.15
	Equipment management	1.16	0.09
	Lean engineering	1.45	0.12
		12.37	

With comparing current and ideal situation our important priority is improving the gap between these two situations. Accordingly the absolute values of differences between two tables show us the priorities. So the customer-oriented and lean production indicators are our first priority to improve.

The total weights of current and ideal leanness indicators are 26.9 and 39.27 respectively. With dividing each indicator on its total weight, the weight of each indicator will be obtained.

Table 5, leanness indicator weights in current and ideal situation

	Leanness indicator	Current situation	Ideal situation
Strategy	Customer oriented	0.104	0.120
	Leader ship	0.107	0.099
Structure	Lean organized	0.118	0.112
	partnership	0.116	0.112
	Information architecture	0.118	0.108
capability	Kaizen culture	0.108	0.111
	Lean production	0.1	0.115
	Equipment management	0.118	0.110
	Lean engineering	0.112	0.113

As mentioned above in conceptual model of research, the nine indicators are able to categorize in three main criteria (strategy, structure and capability). So we need to compare the importance of these three criteria. According to table 6, that shows the weights of each criterion in current and ideal situations, we can conclude that structure is in better situation than other criteria.

Table 6, current and ideal main lean indicator situations

Criterion	Current	Ideal
Strategy	0.212	0.219
Structure	351	0.332
Capability	0.437	0.449

4.2. Agility supply chain evaluation

With the same leanness evaluation's procedure, agility had evaluated. After fuzzy computing and crisping fuzzy numbers, the arithmetic mean was calculated for each criterion (see table 7). Also in order to evaluate the importance of each criterion the normalization had done.

Table 7, agility degree of supply chain

	Indicator	Current	Ideal
Responsibility	Strategic plan	2.450	4.500
	Sensitive to change	2.460	4.700
	Virtual firm	3.000	3.800
Competence	Encouraging to learning	2.330	3.330
	Integration mechanism	1.330	4.000
	Common culture	3.130	4.600
	commitment	2.000	3.750
	trust	2.330	4.330
	connection	3.000	4.500
	Common decision making	2.000	3.330
Flexibility	Flexibility of operation	2.750	4.200
	Market	2.660	4.500
	Logistic	2.600	4.000
	Resource	2.270	3.900
Speediness	Introducing new product	1.330	5.000
	Delivery	2.670	3.750
	Doing operation	2.875	4.280

Table 7 shows the distance of sub-indicators from their ideal situations. In table 7 we can consider two introducing new product and integration mechanism's sub-indicator that have significant distance from their ideal situations and after that commitment and common decision making that are in low levels.

Table 8 shows the gaps between current and ideal situation agility indicators that are obtained by differences between current and ideal situations. As it's seen in table 8 total gap is 29.285 and finally the weight of each indicator will be obtained by dividing each indicators gap on total gap. Accordingly introducing new product is our first priority to improve.

Table 8, gaps between current and ideal situation of lean indicator weights

	Agility indicator	Gap	Gap weight
Responsibility	Strategic plan	2.05	0.07
	Sensitive to change	2.24	0.08
	Virtual firm	0.8	0.03
Competence	Encouraging to learning	1	0.03
	Integration mechanism	2.67	0.09
	Common culture	1.47	0.05
	commitment	1.75	0.06
	trust	2	0.07
	connection	1.5	0.05
	Common decision making	1.33	0.05
Flexibility	Flexibility of operation	1.45	0.05
	Market	1.84	0.06
	Logistic	1.4	0.05
	Resource	1.63	0.06
Speediness	Introducing new product	3.67	0.13
	Delivery	1.08	0.04
	Doing operation	1.405	0.05
		29.285	

As it's considered in table X, total current and ideal agility indicators are 41.185 and 70.47 respectively. The weight of each indicator will be obtained by dividing each agility indicator on total agility.

Table 9, Table 5, lean indicator weights in current and ideal situation

With considering table Y it's obvious that all indicators except introducing new product and integration mechanism are close to each other and these two indicators had the most effect on agility distance to ideal situation. It could be said that the most important reason can be the weakness of R & D in finding out new opportunity in new markets and also the low speed in research and development that are the main causes for having low speed to introduce new product to market. On the other hand one of the most important reasons for having distance with ideal situation is integration mechanism that is the process of exchange information in supply chain.

As mentioned above in conceptual model of research, the seventeen indicators are able to categorize in four main criteria (responsibility, competence, flexibility and speediness). So we need to compare the importance of these four criteria. According to table 10, that shows the weights of each main criteria in current and ideal situations, we can concluded that speediness has significant gap in its current and ideal situation the main effect of this gap is introducing new product sub-indicator. So this criterion is our first priority in order to improve.

Table 9, Table 5, lean indicator weights in current and ideal situation

	Agility indicator	Current	Ideal
Responsibility	Strategic plan	0.059	0.064
	Sensitive to change	0.060	0.067
	Virtual firm	0.073	0.054
Competence	Encouraging to learning	0.057	0.047
	Integration mechanism	0.032	0.057
	Common culture	0.076	0.065
	commitment	0.049	0.053
	trust	0.057	0.061
	connection	0.073	0.064
	Common decision making	0.049	0.047
Flexibility	Flexibility of operation	0.067	0.060
	Market	0.065	0.064
	Logistic	0.063	0.057
	Resource	0.055	0.055
Speediness	Introducing new product	0.032	0.071
	Delivery	0.065	0.053
	Doing operation	0.070	0.061

Table 10, current and ideal main agility indicator situations

Criteria	current	Ideal
Responsibility	0.192	0.184
Competence	0.391	0.395
Flexibility	0.25	0.236
Speediness	0.167	0.185

5. Conclusion

With considering the result of previous section we can conclude that the customer-oriented factor has the most important effect in leanness of PADIDEH DINAVAND Company. This indicator with 0.16 importance degree is the first priority for company in order to increase supply chain leanness. Lean production and lean engineering are the next priorities. So the company must consider these factors in order to achieve leanness.

The priorities of company in order to improve leanness in its supply chain are as following:

1-customer-oriented, 2- Lean production, 3- Lean engineering, 4- Kaizen culture, 5- Lean organized, 6- Cooperation, 7- Information architecture, 8- Equipment management, 9- Leadership.

As it is considered, the leadership indicator has the best situation through other effective indicator on leanness in company.

With analyzing the results, it's considered that introducing new product factor has the most important effect in agility of PADIDEH DINAVAND Company.

This indicator with 0.13 importance degree is the first priority for company in order to increase supply chain agility. Integration mechanism and sensitive to market are the next priorities. So the company must consider these factors in order to achieve agility.

The priorities of company in order to improve leanness in its supply chain are as following:

1-Introducing new product, 2- Integration mechanism, 3- Sensitive to market, 4- Strategic plan, 5- Trust, 6- Market flexibility, 7- Resource flexibility, 8- Commitment, 9- Common culture, 10- Connections, 11- Common decision making, 12- Operation flexibility, 13- Logistic flexibility, 14- Speediness of doing operation, 15- Speediness of delivery, 16- Virtual firm, 17- Encouraging to learning.

So, as it is considered the encouraging to learning indicator has the best situation trough other effective indicators on supply chain agility.

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Study on Meteorological Drought Phenomenon by using Normal Percent Index in Sistan& Balouchestan Province in Geographical Information System

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Abstract: Drought is an ecological phenomenon that found in a wide area of Iran in different forms. Because of special condition and out of Mediterranean Rainfall System Way and locating in the main high pressure topic situation, Sistan& Balouchestan Province has been considered changeability and it has been subjected on drought climate more than other provinces. In this study, Place and Time Patterns, Meteorological Drought in method of Interpolation of Normal Z, Rainfall in Geographical Information System (GIS) are determined and categorized. Climatology of Meteorological Organization and Ministry of Energy will be also determined by using dimensionless criterion method and variable average of dry and wet years during statistical period. On the basis of results from categorizing drought, it decreases from north to south and rainfall has been changed each year. Chabahar Station doesn't follow on the given theory and it's humid is provided by the sea and doesn't need to ascending factor in the rainfall mechanism. But in other stations, it follows on Convectional Factor that experienced the most frequency and also high level disturbances that are the most plenty of ascending mechanism.

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INTRODUCTION

Arid and semiarid climates have covered wide area of internal lands, southern and eastern boundaries of Iran. These deserts and arid areas have involved about 1/4 of Iran. All of areas may be affected by Drought Phenomenon but this case is found in the areas where affected on different climate systems accidentally and irregularly, more than other areas (Raziati et al, 2003). The main appearance of emerging Meteorological Drought is to decrease rainfall to the lowest normal limit (long term average). Decreasing soil moisture and surface water and groundwater are the next results from decreasing rainfall. Kerman Province is located on the drought climate successively. On one side, time of drought period is longer than wet period, on the other side, intensity of we years is more than dry year. This case influences on decreaseing agricultural products and water and increasing deserts and drying pastures and natural herbal covers. Limitation of water resources of the considered province, increasing demand of water, on one hand, occurring drought in more frequency and in the longer period, on the other hand, have been caused that low water problem threatens this province seriously. It is necessary for environmental and economical planning to determine dry and wet year features in an area. It is necessary to draw a perspective of future rainfall condition and dry and wet years in many long-term plans. Because of that, it is important to predict drought and its features especially to manage water resources.

This Drought Phenomenon will cause many problems in the above-mentioned area. Climate fluctuation, alternative dry and wet years are the impotent subjects to study natural phenomena and it is one of the subjects of climatology and other environmental science that are considered by the specialists. Although, climate applies for general and approximately stable condition of weather in an area but this stability is relative and it may be changed during different years (Alijani, 1996)

Drought Condition is one of the environmental risks that cannot be predicted easily because 1) it is extended slowly 2) it isn't defined exactly and it isn't generalized (because there are different varieties that interfere in Drought Phenomenon directly and indirectly, it isn't provided any general and reasonable definition for the researchers and researchers in different fields believe that the given definitions have specialty aspect) 3) its effects are nonstructural and it is often extended in a wide area. (Hisdal & Tallaksen, 2000)

Drought Phenomenon is inevitable in both arid and humid areas but it is possible to be drought more than other conditions because Iran is suffered by arid and semiarid climate. Drought Phenomenon is one of natural phenomena that related to meteorology and

hydrology. It affects on environmental parameters and activities that related to agriculture, herbal cover, and human's life, and wild life, local and national economy and it can be aggravated by agriculture and animal husbandry. On the basis of it and an extensive study on drought by World Meteorology Organization, the drought conditions are categorized on the basis as follow: 1) Rainfall 2) combination of rainfall and temperature, humidity and evaporation 3) soil moisture and parameter of product 4) climate indexes and evaluations of evaporation and transpiration 5) definitions and general branches (Jiasilan, 2005)

In the recent decades, Iran has been affected by drought conditions alternatively. Drought Phenomenon influences on environmental condition, human communities and generally environmental ecology seriously. It is necessary to know this natural phenomenon to overcome, and then specialists have considered it in different views and methods. The aim of these researches is to obtain easy, cheap and precise solution in different phases of notice, preparation and prevention against any losses from drought condition and also to find the reasons of available disorders in the climate systems. Therefore, it has been studied in various methods such as statistic, synoptic, artificial neural network and remote sensing, etc. (Azizi & Shamsipour, 2006)

In the recent years, multivariable statistic methods (Zehtabian et al, 1999, Moussa et al, 1999, Vafakhah and Mahdavi, 1999, Alijani and Ramezani, 2002, Azizi & Shamsipour, 2006), synoptic method (Khoshakhlagh, 1997, Azizi 1999, Nazem Alsadat, 1999), Geographical Information System (Farajzadeh, 1996, Mohammadi and Shamsipour 2003 and 2005) have used to study on drought condition. Also, Arbabi and Bayat (2001-02) have studied on drought effect of Ghazvin and Damavand plains on the groundwater.

In this research, multivariable statistic methods and Geographical Information System have been used and Normal Z Index that is to set time and pace patterns is defined and drought periods of Kerman province are specified.

MATERIALS AND METHODS

Drought is studied on the basis of statistics and data from measurement of synoptic stations. Meteorological Data has been recorded in number, and then it can be used in statistical and mathematical models easily. Also, Meteorological parameters have been considered in the physical models because they have dynamic features. Rainfall is the most important variable that studied in the climate and drought subjects. Average annual and seasonal rainfalls of the controlled stations (1986-2007) have been used to analyze the drought by Normal Z Index. Normal Z Index is selected to calculate Intensity of climate drought, then, rainfall has been calculated in annual and seasonal scales.

Where, z is normalized drought index, $\underline{x}$ is variable of measured year or season, $\underline{x}$ is the average of long term climate variant and standard deviation. Standard Z Index is one of Statistical coefficients and one of the important normal indexes that considers possibility of occurring drought and nonoccurrence of drought. In Z index, the coefficients are determined in table 1.

Table (1): Normalized Rainfall Index to calculate Rainfall of Zahedan Station (Iran Meteorology Organization)

Year	January	February	March	January z	February z	March z
1986	3.6	33.5	24	-0.8	1.3	0.7
1987	0	4	16.9	-1.0	-0.6	0.2
1988	9.8	14.7	7.4	-0.3	0.1	-0.3
1989	0.4	27	4.8	-1.0	0.9	-0.5
1990	16.4	15.3	0.9	0.1	0.1	-0.7
1991	49.7	35.2	71.8	2.3	1.4	3.6
1992	6.8	0.5	9.3	-0.5	-0.9	-0.2
1993	25.3	2	0.6	0.7	-0.8	-0.8
1994	31.4	1.3	15	1.1	-0.8	0.1
1995	2.9	4.5	12.5	-0.8	-0.6	0.0
1996	51.1	8.2	27.3	2.4	-0.4	0.9
1997	16.1	7	3.4	0.1	-0.4	-0.6
1998	16.8	17.2	6.9	0.1	0.2	-0.4
1999	14.4	26.7	5.2	0.0	0.9	-0.5
2000	24.9	0.1	13.3	0.7	-0.9	0.0
2001	2	3	6	-0.9	-0.7	-0.4
2002	0.6	3.5	1.2	-1.0	-0.7	-0.7
2003	7.4	14.8	6	-0.5	0.1	-0.4
2004	17	0	0	0.1	-0.9	-0.8
2005	4.5	55	25.6	-0.7	2.8	0.8

Also, standard dimensionless method has been used to specify the drought condition in the selected stations. Wet year and dry year are divided on the basis of this index as negative numbers indicates drought or dry year and positive numbers indicates wet year. The ratios are stated on the basis of percent.

Extent of limit	Meaning
Lower than -100	High Arid
-100 to -50	Arid
-50 to 50	Normal
50 to 100	Moist
More than 100	High Moist

Index is obtained as follow:
Where, is amount of rainfall annually (in mm)
p is annual rainfall averagely (in mm)
SD is standard deviation of annual rainfall in Zahedan Station
That, its results is as the same as results from rainfall method of Normal Z.

DEFINITION OF STUDIED LIMIT

Sistan & Balouchestan Province, 187500km^2, where is equal to 11/4% of total area of Iran. It is one of the largest provinces in Iran. This province is located on 25º 3´ in latitude to 31º 27´ of northern latitude from the equator and 58º 50´ in longitude to 63º 21´ of eastern longitude from line of longitude. This province is limited to southern Khorassan province and Afghanistan from the north, to Afghanistan and Pakistan (1107km soil border), to Oman Sea (300km) from the south, Kerman and Hormozgan Provinces from the west (see from Hamoon to Oman 16: 2001,and Sistan & Balouchestan Planning and Budget Organization 1997:4). Generally, this province has been divided in two geographical areas, Sistan in the north and Balouchestan in the south.

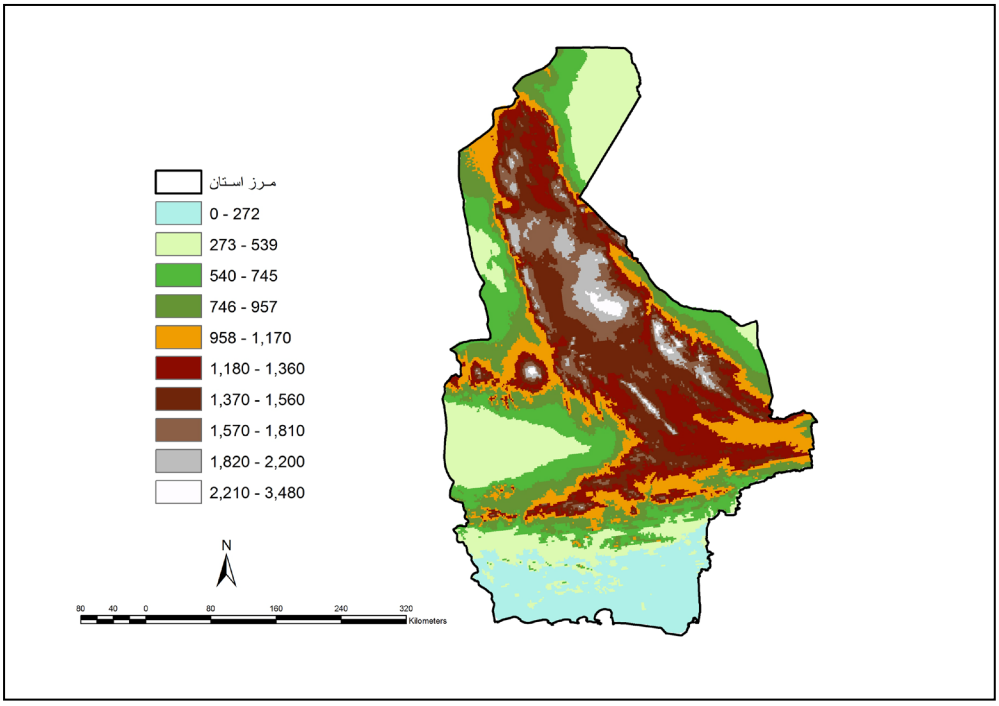


Fig.1: Topography of studied limit (Arbabi, Bayat 2012)

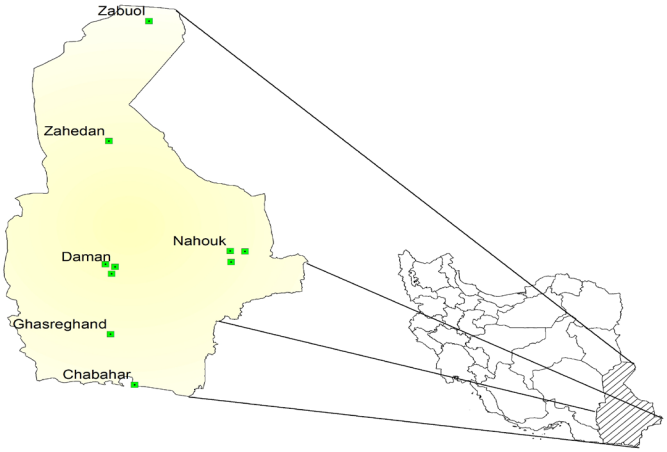
DATA OF METEOROLOGY STATIONS

Data of Meteorology Stations that belonged to Meteorology Organization and Ministry of Energy includes Zahedan, Khash, Saravan, Chabahar, Zabol, Iranshahr, Jalogh, Nahouk, Ghasr ghand, Daman, Bampour Dam (table 2). Long term data of the stations has been used to study general condition and to determine the main patterns of climate elements. Then, data of rainfall, temperature, relative humidity in annual and seasonal scales are used to calculate wet and dry years and climate categorizations. Also, there are other climate variables such as direction and speed of wind, cloudy and sunny hours, atmospheric pressure, number of rainfall evaporation and transpiration days.

Then, drought is measured by categorizing climate drought with rainfall normal Z. Map 2 shows situation of selected stations.

Table 2: Specifications of selected stations

Raw	Name of Station	Name of Organization	Height (m)	Longitude	Latitude
1	Zahedan	Meteorology Organization	**1370**	**60/53**	**29/28**
2	Khash	Meteorology Organization	**1394**	**61/12**	**28/13**
3	Saravan	Meteorology Organization	**1195**	**62/20**	**27/20**
4	Chabahar	Meteorology Organization	**8**	**60/37**	**25/17**
5	Zabol	Meteorology Organization	**489/2**	**61/29**	**31/2**
6	Iranshahr	Meteorology Organization	**591/1**	**60/42**	**27/12**
7	Jalogh	Ministry of Energy	**944**	**62/42**	**27/36**
8	Nahouk	Ministry of Energy	**1377**	**62/.20**	**27/38**
9	Ghasr ghand	Ministry of Energy	**382**	**60/34**	**25/45**
10	Daman	Ministry of Energy	**800**	**60/48**	**27/23**
11	Bampour Dam	Ministry of Energy	**668**	**60/34**	**27/28**



DISCUSSION AND CONCLUSION

Environmental threats are one of the important limiting factors to develop. These threats are influnced differently on the basis of intensity, frequency and range of affecting. For example, flood and earthquake have low frequency and high intensity and wide depth in the center of event. According to the diffusion theory, if they are nearer to the center of event; their effect will be more intense and obvious. But, drought as a climate phenomenon has wide geographical range, more frequency and effective. Because of fast effective on water resource, herbal cover, providing drinking water, agriculture, food products and industries, natural threats are influenced more than other threats.

As environmental researches in natural categorization has been considered carefully and the better results have been presented. Because of rainfall changes of Sistan & Balouchestan Province where is one of the biggest and driest province, and its various topography, the considerable stations are selected on the basis of geographical condition from the most northern stations to the southern stations. This researches suggest that the extent of this province, various topography and adjacent to Lout Desert, on one hand, and adjacent to boundaries of Oman Sea and affected by seasonal rainfall system, on the other hand, its rainfall has internal homogeneity and it can't be managed uniformly. Regarding, difference of climate area and calculated intensities, it is useful to select the methods of management to determine the same areas in drought,

Low rainfall, herbal cover and animal life depend on the small and big available water resources, spite of the considerable herbal cover resist the long dry

conditions severely. Because drought is result from climate fluctuations and it makes a disorder in natural condition of area then, the drought can be influenced on herbal life and ecology of this area destructively.

On the basis of spreading rising factor, Iran is divided in six areas where southeastern area, Sistan & Balouchestan Province, is one of them. In this area, convectional factor is the most frequency and high level disorders are the most rising mechanism.

All over Iran, The rising mechanism is high level disorders in the cold seasons that it is decreased from the south to the north and it is only allocated to the southeast of Iran.

In summer, the disorders have decreased in all over the country. In autumn and spring, high level disorders are the most raising factor in all over the country. In the hot season, the seasonal winds spread tropic hot and humid airs that entered to the south by two methods. Also, Bashagerd Mountains play important role to provide humidity of Oman Sea and amount of rainfall.

Rainfall Coefficient of Variation shows that Chabahar Station has the highest Rainfall Coefficient of Variation (99.47) and the most rainfall is in the summer that it uses rainfall system of sea and Zabol Station (on the north of the province) has the lowest Rainfall Coefficient of Variation (48.56) and the most rainfall is in December that it receives west wind rainfall system in autumn. More percent (40%) of this index in rainfall shows high abnormality of rainfall and arid condition in the considered stations.

Table 3: Annual Statistical Rainfall Index in the considered stations (1986- 2005)

Station	Average **Xi/n=∑μ**	Standard Deviation **X1-X)¯2/n-1=√∑(σ**	Cœfficient of Variation **CV=σ/X*100**
Zahedan	75/1	44/1	58/7
Khash	150/5	101/9	59/4
Saravan	106/8	52/5	49/1
Chabahar	113/3	112/6	99/5
Zabol	61/2	29/7	48/5
Iranshahr	104/9	57/7	55
Jalogh	56/5	33	58/4
Nahook	107/5	64/5	60

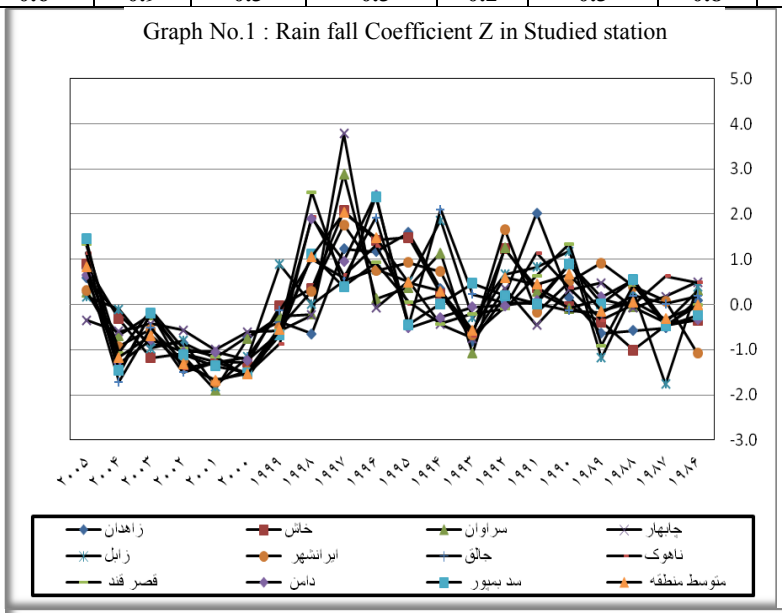
According to table3, rainfall is abnormal and in high variability that shows arid conditions and drought. Analyze of alternative drought by using unstable average, standard distribution and dimensionless criterion suggests that drought is decreasing from north to the south of the province. These rainfalls are different from year to year and its coefficient of variation is increased.

Table 4 and graph 1 show coefficients of index Z in the considered stations and graph 2 shows coefficient of index Z in Zahedan stations. Map 3 shows categorization of drought in the considered area.

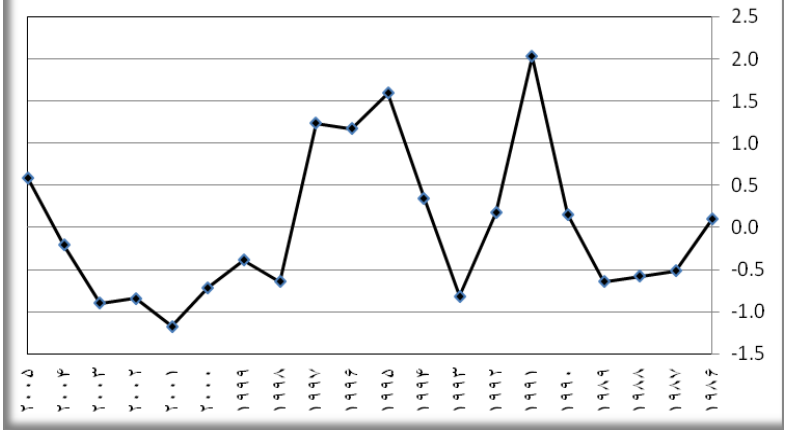
Table 4: Rainfall Coefficient in the considered stations

Year	Zahedan	Khash	Saravan	Chabahar	Zabol	Iranshahr	Jalogh	Nahook	Ghasr ghand	Daman	Bampour Dam
1986	**0.1**	**-0.3**	**0.3**	**0.5**	**0.4**	**-1.1**	**0.2**	**0.5**	**0.0**	**-0.3**	**-0.2**
1987	**-0.5**	**-0.5**	**-0.4**	**0.2**	**-1.8**	**0.1**	**0.0**	**0.6**	**-0.5**	**-0.4**	**-0.5**
1988	**-0.6**	**-1.0**	**-0.1**	**-0.1**	**0.3**	**0.4**	**0.2**	**0.0**	**0.4**	**0.5**	**0.5**
1989	**-0.6**	**-0.4**	**0.1**	**0.5**	**-1.2**	**0.9**	**-0.2**	**-0.4**	**-0.9**	**0.2**	**0.0**
1990	**0.2**	**0.0**	**-0.1**	**0.3**	**1.2**	**0.5**	**-0.1**	**0.4**	**1.3**	**0.9**	**0.9**
1991	**2.0**	**0.4**	**0.3**	**-0.5**	**0.8**	**-0.2**	**0.0**	**1.1**	**0.6**	**0.1**	**0.0**
1992	**0.2**	**1.2**	**1.2**	**0.4**	**0.7**	**1.7**	**0.0**	**-0.1**	**-0.1**	**0.0**	**0.2**
1993	**-0.8**	**-0.6**	**-1.1**	**-0.7**	**-0.3**	**-0.7**	**0.2**	**-0.7**	**-0.2**	**-0.1**	**0.5**
1994	**0.3**	**0.2**	**1.1**	**-0.4**	**1.9**	**0.7**	**2.1**	**0.2**	**-0.4**	**-0.3**	**0.0**
1995	**1.6**	**1.5**	**0.4**	**0.5**	**0.5**	**0.9**	**-0.5**	**0.0**	**0.1**	**-0.5**	**-0.4**
1996	**1.2**	**1.4**	**0.1**	**-0.1**	**0.8**	**0.7**	**1.9**	**1.3**	**0.9**	**2.4**	**2.4**
1997	**1.2**	**2.1**	**2.9**	**3.8**	**0.5**	**1.8**	**0.6**	**0.6**	**0.4**	**1.0**	**0.4**
1998	**-0.6**	**0.4**	**-0.2**	**-0.2**	**0.0**	**0.3**	**1.0**	**1.9**	**2.5**	**1.9**	**1.1**
1999	**-0.4**	**0.0**	**-0.3**	**-0.6**	**0.9**	**-0.5**	**-0.1**	**-0.9**	**-0.6**	**-0.6**	**-0.7**
2000	**-0.7**	**-1.3**	**-0.8**	**-0.6**	**-1.2**	**-1.5**	**-1.2**	**-1.5**	**-1.6**	**-1.2**	**-1.5**
2001	**-1.2**	**-1.3**	**-1.9**	**-1.0**	**-1.8**	**-1.7**	**-1.3**	**-1.3**	**-1.2**	**-1.0**	**-1.4**
2002	**-0.8**	**-1.1**	**-1.1**	**-0.6**	**-0.8**	**-1.2**	**-1.5**	**-1.4**	**-1.0**	**-1.0**	**-1.1**
2003	**-0.9**	**-1.2**	**-0.2**	**-0.4**	**-1.0**	**-0.5**	**-0.5**	**-0.2**	**-0.1**	**-0.8**	**-0.2**
2004	**-0.2**	**-0.3**	**-0.7**	**-0.6**	**-0.1**	**-0.9**	**-1.7**	**-1.5**	**-1.1**	**-1.3**	**-1.5**
2005	**0.6**	**0.9**	**0.3**	**-0.3**	**0.2**	**0.3**	**0.8**	**1.1**	**1.3**	**0.6**	**1.5**

Graph No.1 : Rain fall Coefficient Z in Studied station



Graph No.2 : Rain fall Coefficient Z in Zahedan station



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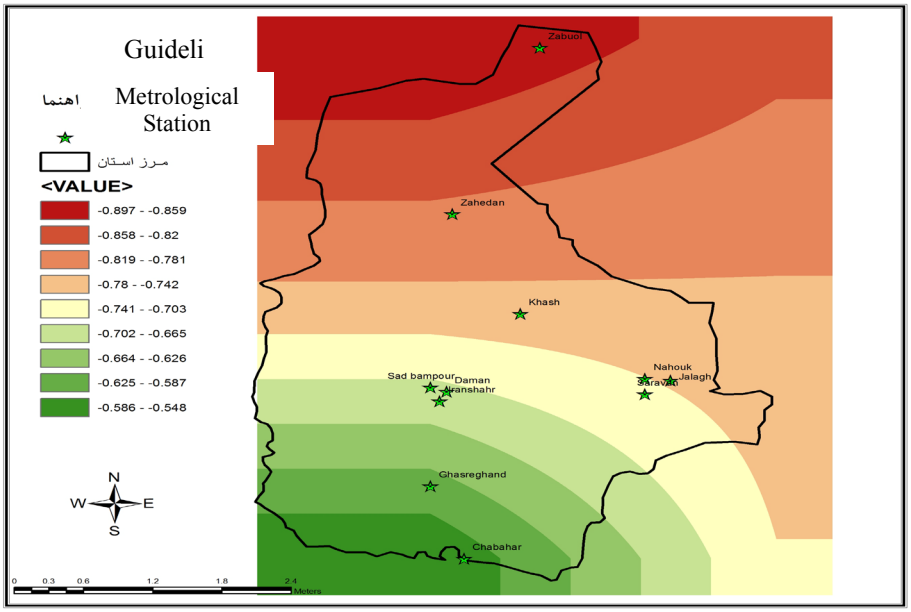


Map 3: Drought Categorization in the considered area (Arbabi, Bayat 2012)

Study on Drought Condition in the considered stations by using method of Normal Z

Zabol is the most north station of province that has arid condition. During statistical period (1987, 1989, 2000, 2001, 2003), it is high drought, in 1993, 1998, 2002, 2004, it was low and middle drought and it was moist in the rest years.

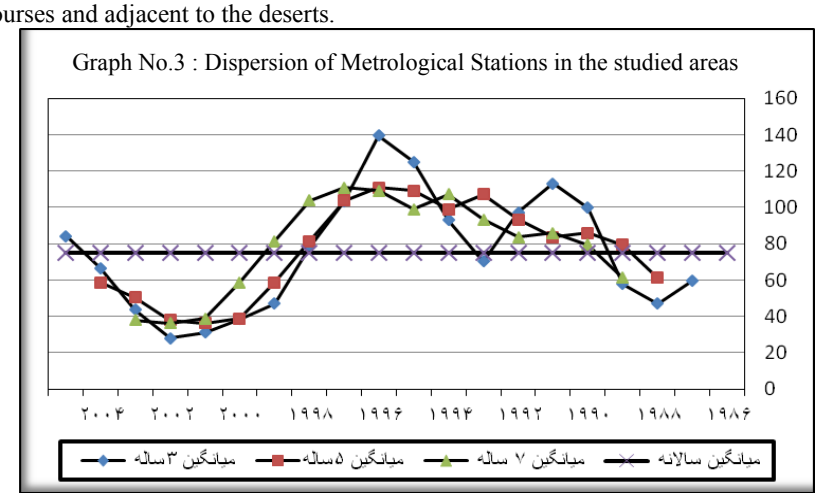
Zahedan Station is one of the north stations and its altitude from the sea is 1370m and its latitude is 29/28. On the basis of Normal Z method, Zahedan has had high arid in 2001 and 2003, middle arid in 1989, 1993, 1998,2000, 2002, low arid in 1987, 1988,1999, normal condition in 2004 and humid condition in the rest years.

Totally, the northern stations show arid conditions and droughts because it is far from humidity recourses and adjacent to the deserts.

Saravan Station where selected as a representative of central region in 2001 has very highly drought, highly drought in 2002, lowly drought in 2003, 2003, 2005 and normal condition in the rest years.

Chabahar Station is an only station where has very highly drought in 2001 and normal condition in the rest years. Chabahar Station is located on 8m altitude from the sea and 25/7 in latitude. This station is located almost on sea level and affected by humidity of Oman Sea. It isn't founded any highly drought in this station except in 2001.

After calculating Rainfall Normal Percent Index of Stations, unstable average index of 3, 5 and 7 years in graph 3 and standard distribution of table 5 are used to draw drought process.



Graph 3: Unstable Average of Zahedan Station

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Table 5: Method of dimensionless index in Zahedan Station

Year	Zahedan	Percent	Quality
1986	**81.7**	**14.97**	Normal
1987	**50.2**	**-176.65**	High Arid
1988	**47**	**-183.26**	High Arid
1989	**44.1**	**-189.26**	High Arid
1990	**82.5**	**-109.92**	High Arid
1991	**173.1**	**77.27**	Arid
1992	**83.6**	**-107.64**	High Arid
1993	**35.6**	**-206.82**	High Arid
1994	**91.8**	**-90.70**	Arid
1995	**152**	**33.68**	Normal
1996	**131.7**	**-8.26**	Normal
1997	**134.8**	**-1.86**	Normal
1998	**44**	**-189.46**	High Arid
1999	**56.3**	**-164.05**	High Arid
2000	**40.7**	**-196.28**	High Arid
2001	**18.3**	**-242.56**	High Arid
2002	**34.3**	**-209.50**	High Arid
2003	**31.6**	**-215.08**	High Arid
2004	**64.9**	**-146.28**	High Arid
2005	**103.6**	**-66.32**	Arid

Table 6 shows average of dry and wet years and current process of the considered stations, except Chabahar Station that its current process is dry year, the rest stations are passed through wet year process.

Table 6. Average of dry and wet years and current process of the stations

Current Process	Number of Wet years	Number of Wet years	Stations
Wet year	9	11	Zahedan
Wet year	10	10	Khash
Wet year	9	11	Saravan
Dry year	7	13	Chabahar
Wet year	12	8	Zabol
Wet year	11	9	Iranshahr
Wet year	11	9	Jalogh
Wet year	11	9	Nahook
Wet year	9	11	Ghasr ghand
Wet year	9	11	Daman
Wet year	11	9	Bampour Dam

Directions & Suggestions

1- Long and short term plans should be hold in the field of direct and create new sights to develop field works and studies in the Geographical Department.
2- Far measurement in the studies to increase level of analyzing and interpreting data.
3- Developing new methods of studding as a new sciences and technique regarding the important studies such as drought
4- Increasing number of synoptic stations in the considered area
5- Educating and informing people the correct methods of irritation and water consumption
6- Using environmental components of surface moisture to study on drought climate
7- Paying attention to the environmental information basics to increase ability level of analyzing and interpreting the results

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The connection between managers' relationship style and production efficiency of knowledge in the Islamic Azad University of Iran's 4th region (2006-2010)

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Abstract: Given the strategic policies of the Islamic Azad University in the 4th decade of activities named the decade of global competition and quality with the main components such as diversification of income sources and quality competitiveness at the international level, it takes leader-like and qualified managers to be born in the universities in order to improve the quality indicators, increase research activities based on the productivity of knowledge and technology, and eventually turn knowledge to wealth. Therefore, this survey is done in order to study the correlation between managers' leadership style and productivity in science in the Islamic Azad University of Iran's 4th region from 2006 to 2010. The survey method is field study, and the population consists of 589 senior, middle, and executive managers of 6 universities. Using Cochrane's formula, 120 people have randomly been chosen to be stratified appropriately with the volume as simple. Information has been collected through two ways, 30-question questionnaires of Likert's leadership style test and gathering science productivity indicators from the universities being studied. For data analysis, methods of descriptive statistics (mean and standard deviation) and inferential statistics (Spearman rank correlation and Kruskal-Wallis ANOVA ranks) have been used. The validity and reliability of this survey have been estimated equal to 85% using Cronbach's Alpha. The results indicated that in every university being studied, managers had the tendency to apply the leadership style in an autocratic way, and there was a direct relationship between managers' autocratic leadership style and lower science productivity indicators ($p<0.05$), and an inverse relationship between the cooperative leadership style and these lowe indicators ($p>0.05$). Hence, it can generally be concluded that one of the major challenges facing universities being studied is applying inappropriate leadership style by the managers in order to enhance the productivity of science and technology.

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Keywords: leadership style, efficiency, production efficiency of knowledge, the 4th region of Islamic Azad University

1. Introduction

Universities and higher education institutes, as the most obvious scientific establishments which attempt to educate human beings, are the driving force and mastermind of the society and the steersman of movement toward an overall stable development. These institutes are complicated organizations bearing special features such as having scientists who make them distinguished from other institutes, according to Peter Draker. Undoubtedly, changes, varieties, and internal and external pressures of the environment affect the general management of the university, and it shouldn't be ignored that management and leadership have a dominant role in creating changes. Hersey and Blanchard believe, "The successful organizations bear a feature distinguishing them from unsuccessful ones, and it is nothing other than dynamic and efficient leadership." Strong managers and leaders who do not fear change and have the specialized knowledge and information on management are able to make the most of limited resources, equipment, and opportunities, a fact which associates the real meaning of organizational efficiency. Now, the necessity to know how to run universities is felt more than any other time, and it seems the enthusiasm of internal and external forces, especially the government's, to manage and lead the universities has increased. Hence, the Islamic Azad University has started to design educational plans with a new look at management and leadership of higher education as a specialized ability inside or outside of country, which constantly present the different dimensions of the matter continuously and with the help of the world-class knowledge in the form of extended programs such as specialized and scientific meetings, question and answer sessions, weekly and monthly classes, and educational workshops and short courses to improve the leadership quality and management of the

universities, which finally lead to organization efficiency.

1.1. Leadership

The essence of many myths and legends of different nations has been the presence, tact, and decision power of audacious and clever leaders who managed lead nations, groups, and organizations home safely at difficult times. The impact of leadership is so significant that mostly there is no place in mind to ponder on the other factors of success or failure of organizations.Ralph Stogdill states that studying leadership is a mythical art, and thinkers like Plato, Caesar, and Plutarch noted this matter in their historical writings. The previous Persian literature is considered one of the richest literatures on leadership in the world, too, for instance, Saadi dedicated the first and longest chapters of his both valuable and wonderful books Bustan and Gulestan named "Wisdom, Justice, and Will" and "The Morality of the Kings" to explain the admired methods of statecraft and leadership (Galbreath, J. and Rogers, T. (1999). The manager as the official representative of organization is at the head to coordinate and enhance efficiency. The success of organization and fulfillment of goals depend on how the management is applied and what choices are made for the efficient leadership styles. The manager in the role of organization's leader can choose different styles to lead the organization. Manager appropriate behavioral patterns result in creating an appropriate organizational atmosphere and enhancing the spirits and motives of staff. How to use the correct leadership style can increase job satisfaction, staff organizational commitment and productivity (Lin WB (2008). The subject of leadership has been noted by many researchers. The results of these researches have led to presentation and development of various theories in managers' leadership styles. Studying these theories includes a broad spectrum of leadership styles from domineering and authoritarian styles to participatory, development-oriented, servant, and etc. However, it should be noted that one specific leadership style is not suitable for all the organizations and opportunities. Therefore, a manager can pick various styles to lead the organization, considering the dominant organizational culture and staff organizational maturity.

2.1. Efficiency

Universities and higher education institutes have always been considered the highest thinking and knowledge-producing in the society. They also have a major role in enhancing science and directing intellectual, credential, cultural, and social movements with thoughtful presence and activities of thinkers, scholars, researchers, and students in the society. In order to do their dangerous tasks, stay dynamic, and improve them, universities need to present an appropriate tool and pattern to make sure of improving the programs and respective processes. On the other hand, programing the educational and research affairs precisely and training manpower, the higher education system should attempt to enhance the efficiency and optimal use of available capital and be more promising about the development and cultural and scientific authority. The Cultural Revolution High Council has started to provide the indicators of science productivity in quantity and quality dimensions including 25 indicators in order to study and evaluate the efficiency of higher education and providing indicators and rules of assessment with the help of global studies in the realm of specialized higher education (such as patterns for higher education evaluation, patterns for the international quality guaranteeing network in higher education, indicators presented by UNESCO, and etc.), but due to some limitations, the researcher has sufficed to the five major indices.

3.1. Pattern of measuring efficiency in universities

Functionality measurement indices are directly related to what the organization does. However, what an organization does is meant to achieve the objectives and determined goals of that organization. Therefore, a public pattern of what the universities do must be available so that efficiency indices can be considered alongside the functionality measurement. In other words, universities can develop their desired indices with regard to their strategic goals. In the following pattern, every university is considered as a system in which a set of processes are interacting with one another to turn a set of inputs to a set of outputs. Hence, an effort has been made so that the functionality efficiency indices of the output current measure the input process.

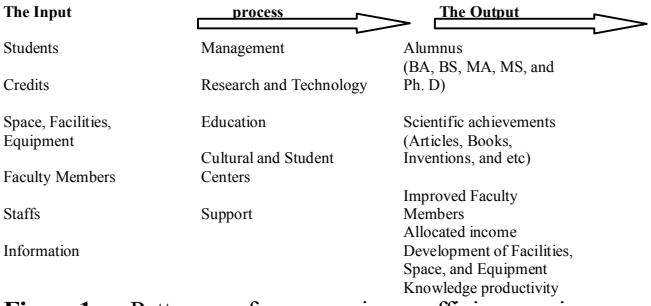

Figure1: Pattern of measuring efficiency in universities

4.1. Measurement of research productivity

The most sensitive and important part of studying efficiency is the measurement through evaluating efficiency correctly at different levels, investigating its changes in various periods, and also comparing the calculated efficiency with the determined or standard indices, pre-determined goals, or functionality quality at different levels of the institute, section, and nation, therefore, productivity measurement is considered the necessary part, or in other words, the starting point of the scientific process of productivity management, and an efficient tool in the management. Productivity measurement provides information which makes it possible to judge an evaluate how to move toward the goal (the desired situation) from the starting point and the previous condition (the available situation). In the institutes, productivity is evaluated to analyze efficiency and effectiveness. Productivity measurement can sometimes increase the efficiency 5% to 10% without organizational changes or investment (Belussi. F.1999**).** the role of research is high of importance in the university environment. Dill, 1986, says, "Many discoveries happen in higher educational environment." The researches have indicated that survey productivity bears the major role to succeed in formal employment, promotion, and increase in wages and benefits in higher education (Cutter lake et al.).There are a few methods to measure the survey productivity in the research and technology section, which include publications and reference count of the articles in other papers, presenting papers in conferences, awards, prizes, and the amount of financial support (Yin X, Zajac E. 2004). Accordingly, educational groups and institutes have collected a lot of information on faculty member publications, gaining financial help, making their researches and publications reference, and used them to achieve different goals like promotion, official employment, and increase in salary (Woodruff, R.B. (1997)).

There are many subjects on the method of measuring productivity in the research and technology section of universities. For example, is the reliability level meaningful? Are the papers more important than books or vice versa? How much value should be given to a particular journal? How can the reliability of a journal be determined? Stating questions like these indicates measuring the research productivity is faced with many problems (Mavondo. Felix T. et.al.2005).

The productivity of research in the form on financially supportive publications is a quantitative factor which is well measurable, but the important point is that the quality of the research is also important, although it can be mentioned by rankings of different journals. Although, surveys show that universities do not simply measure publications quantitatively as research productivity which is executed in the universities, major factors can be prioritized. Regarding measurement of research productivity in the universities, many surveys have been conducted in different sections, and more of them include the count of published journals in particular journals (Jensen M, Meckling W. 1992). Hax , 1969, says, "The published surveys are the best touchstone to evaluate faculty members quality." Henry and Barch, 1974, realized that the published surveys in most of the universities are the main indices for productivity measurement. Cargill and Bailey Tez realized that faculty members consider surveys the main factor for decisions of salary allocation. At some occasions, researching is worth two times teaching and five times servicing in the process of promotion and official employment (Venkatraman N, Ramanujam V (1986).).

Given the fact that the share of research and survey in the ranking of most universities is high, for instance in the ranking of journal "THA" which is done with the help of Thomson Routers institute, the weight of factor representing research and scientific productivity is 30 points, referring to university findings in the world or the world scientific leakage is 30 points, and innovation through using the researches is 3 points, so that paying attention to research is 63 points out of 100 in THA ranking, or in the universities of Islamic world, the weight of research factor is 64 out of 100, which shows the high importance of studying and researching in university rankings. The importance of management and leadership alongside its impact on university productivity, paying attention to the success of Islamic Azad University as the largest non-governmental university in the world and its promising development in almost three decades, given the competitiveness and commercializing science, increasing number of students, especially at high ages for higher education, and higher education becoming a mass, it is necessary to pay attention to the strategic policies of the 4th decade of activities in this university, called the decade of world-class competition, bearing main features like competitiveness and differentiating sources of income. In this regard, promoting quality indices, increasing research activities based on productivity of science and technology, and finally turning knowledge to wealth are quite vital, a matter of significance which need leader-like managers to be reborn strongly in the managing body of universities. Despite of main challenges in the realm knowledge and technology productivity in universities, which is one of the most important components of countries'

economic development and growth, correct and logical leadership of managers is necessary over scientist as human assets to increase productivity in this sensitive and strategic realm. Hence, this paper aims to study the connection between managers' leadership style with the indices of technology and science productivity in the Islamic Azad University in Iran's 4th region from 2006 to 2010 and present an appropriate approach to improve it.

2. Material and Methods

The available method is applied in terms of purpose, due to using the theoretical bases and models, scaling (field) in terms of plan, and descriptive-analytical (inductive) in terms of collecting information and deduction. The statistical society in this survey consists of 589 people of major, middle, and executive managers in 6 universities studied, in which 120 people have been selected with Cochrane's formula as the statistical sample to be studied. The method of collecting information was through the standard questionnaires including 30 questions of Likert's leadership style evaluation regarding human-oriented and task-oriented dimensions, which the researcher drew the frontal look of leadership of the managers in the statistical society after collecting and analyzing data. On the other hand, gaining the indices of science productivity from universities studied, the researcher studied whether there was a relationship between them or not, and even the impacts of demographic variables of the survey on the managers leadership styles and also science productivity using the descriptive and deductive statistical methods through applying the statistical software SPSS.

1.2. The main hypothesis of the research

There is a connection between the managers' leadership style and efficiency in research and technology in the branches of Islamic Azad University of Iran's 4th region.

2.2.The secondary hypotheses of the research

1. There is a connection between the managers' leadership style and the indices of authored or translated books in the statistical society.
2. There is a connection between the managers' leadership style and the indices of ISI, ISC, and scientific-research articles printed in renowned journals in the statistical society.
3. There is a connection between the managers' leadership style and the indices of presented and printed papers in the international and national scientific conferences in the statistical society.
4. There is a connection between the managers' leadership style and the indices of finished research plans in the statistical society.
5. There is a connection between the managers' leadership style and the indices of held scientific conferences in the statistical society.

3. Results

There are five main axes in the twenty-year cultural, scientific, social, and economic vision document of Islamic Republic of Iran, which are A) economic axis, B) science and technology axis, C) Iranian identity axis, D) inspiration axis in the Islamic world, E) having a constructive interaction with other countries. The importance and necessity of science and technology in line with country's economic development is crystal clear, since it is among five main axis of the vision document. However, this role is heavily on the burden of universities and higher education institutes as the driving force of stable development, therefore, we should change our traditional point of view which says university is an educational space for education, and move toward the entrepreneur and finally civilizing universities. Since, research is less colored than education in our educational system, and unfortunately, we are consumers in the educational system, a fact which does not befit our nation and country, the only way of survival from this mustiness is to invest and prioritize the matter of science productivity which is the same as research and technology in society, especially in the universities.

What can be referred to as a challenge blocking the way of enhancing science productivity in this research is the leadership method applied by many managers over human assets which means scientists in an authoritarian way which is less cooperative, the main obstacle in the way of enhancing science productivity. Despite of skillful scientists in these universities, the number of five indices of science productivity must be more than the mentioned number in this survey. In this regard, we can point out to refusal to participation or low ranks of Iranian universities, which shows the weak indices of science productivity. Thus, as one of the main recommendations to resolve the problem, replacing the appropriate cooperative leadership style with regard to the situations and culture of universities instead of applying the leadership style which is almost authoritative, which can bear positive impacts on enhancing the efficiency of science productivity indices.

The present paper titled leadership and its role in organization productivity (in research and technology section in the Islamic Azan University of

Iran's 4th region from 2006 to 2010) has been conducted in a field way. Since the main purpose of the survey is studying the connection between managers' relationship style and production efficiency of knowledge in the Islamic Azad University of Iran's th region, the following results have been obtained.

Table1: The table of Pearson's correlation coefficients for science productivity with the leadership style (** Correlation is significant at the 0.01 level (2-tailed).

		Book	Paper in renowned journal	Paper in scientific conference	Research plan	Scientific conferences	Cooperative score	Authoritative score
Book	Pearson's correlation	1	.906(**)	.779(**)	.828(**)	.917(**)	-.023	.762(**)
	Sig. (2-tailed)		.000	.000	.000	.000	.904	.000
	N	30	30	30	30	30	30	30
Paper in renowned journal	Pearson's correlation	.906(**)	1	.763(**)	.904(**)	.896(**)	-.011	.741(**)
	Sig. (2-tailed)	.000		.000	.000	.000	.955	.000
	N	30	30	30	30	30	30	30
Paper in scientific conference	Pearson's correlation	.779(**)	.763(**)	1	.789(**)	.854(**)	.224	.520(**)
	Sig. (2-tailed)	.000	.000		.000	.000	.233	.003
	N	30	30	30	30	30	30	30
Research plan	Pearson's correlation	.828(**)	.904(**)	.789(**)	1	.811(**)	.032	.523(**)
	Sig. (2-tailed)	.000	.000	.000		.000	.868	.003
	N	30	30	30	30	30	30	30
Scientific conference	Pearson's correlation	.917(**)	.896(**)	.854(**)	.811(**)	1	.078	.836(**)
	Sig. (2-tailed)	.000	.000	.000	.000		.682	.000
	N	30	30	30	30	30	30	30
Cooperative score	Pearson's correlation	-.023	-.011	.224	.032	.078	1	-.234
	Sig. (2-tailed)	.904	.955	.233	.868	.682		.214
	N	30	30	30	30	30	30	30
Authoritative score	Pearson's correlation	.762(**)	.741(**)	.520(**)	.523(**)	.836(**)	-.234	1
	Sig. (2-tailed)	.000	.000	.003	.003	.000	.214	
	N	30	30	30	30	30	30	30

1. The mean of acquired scores from managers' leadership style based on the questionnaires show that managers tend to apply the authoritative style to some extent in all the surveyed universities, and among them, the University of Khorasgan bears the highest and the city of Majlesi has the lowest of authoritative leadership style.
2. The acquired correlation coefficients from data analysis on the five indices of science productivity used in the survey indicate that there is a direct relation between the somewhat autocratic leadership style of managers and the mentioned lower indices, an inverse relation between the cooperative style and these indices. This suggests that unfortunately, applying the less authoritative style of leadership during the five-year period of the survey, the managers of these universities caused the slow increase of science productivity unfortunately. However, the surveyed universities possess high physical, financial, and human equipment which could benefit from the cooperative leadership style in order to enhance the science productivity.
3. While analyzing the demographic variables of the survey and their relation with managers' leadership style with Kruskal-wallis nonparametric test, the following results have been acquired:

3.1. The autocratic leadership style of the managers considering their majors are as follows: Science and agriculture> engineering and basic sciences> humanity> Medicine. This means that the educated managers in majors such as science and agriculture tend to apply more the autocratic leadership style and less the cooperative one, while the educated managers in majors like medicine act inversely.

3.2. There has not been a meaningful connection observed between the surveyed managers' leadership style and the academic rank of their universities.

3.3. There has not been a meaningful connection observed between the surveyed managers' leadership style and the universities in which they studied.

3.4. There has not been a meaningful connection observed between the surveyed managers' leadership style and their bureaucratic positions.

3.5. There is a direct relation between managers' leadership style and specialized management training of serving managers, which means the more managers use this type of training, the less the autocratic leadership style is applied in their field of expertise and the tendency to apply the cooperative leadership style grows.

There is a meaningful connection between the variable of surveyed managers' ages and their leadership styles, in a way that managers from the age 25 to 34 and 55 to 64 tend more to apply the

1.1. Autocratic leadership style, which means managers use the autocratic leadership style more than the cooperative one in their first and last years of managerial services.

1.2. There has not been a meaningful connection observed between the surveyed managers' leadership style and the years they have served.

1.3. There is a meaningful connection between the variable of university size and managers' leadership style, in a way that the smaller the university is, the more autocratic the leadership style applied by the managers gets, and the larger the university is, the more cooperative the leadership style applied by the managers gets.

2. While analyzing the demographic variables of the survey and their impacts on the indexes of

science productivity, the following results have acquired:

2.1. There is a direct relation between the variable of managers' education level and the five indices of science productivity, which means the higher managers' education level get, the more science productivity increases.

2.2. There is a meaningful relation between managers' major and the five indices of science productivity, which means the more we move from managers with humanity majors toward those with medical majors, the more the research indices increase. (Medicine> Science and agriculture> Engineering> Humanity)

2.3. There is a direct relation between the academic rank of the managers and the research indices , which means the higher the academic rank of the surveyed managers is, the more the research indices of the university grows.

2.4. There is a direct relation between the variable of the university in which the managers studied and the indices of science productivity, which means the managers who studied in more renowned universities, caused the indices of science productivity to increase more.

2.5. There is a direct relation between the variable of managers' bureaucratic position and the indices of science productivity, which means managers with higher positions help to increase the indices of science productivity more than managers with lower positions.

2.6. There is a direct relation between the variable of education while serving and the indices of science productivity, which means the more the managers get specialized educations at each level, the more positive impacts it has on increasing the indices of science productivity.

2.7. There is an inverse relation between the variable of age and the research indices, which means the older the surveyed managers get, the more the indices decrease.

2.8. There is a meaningful relation between the variable of managers' experiences and the indices of science productivity, which means less experienced managers, tend to print papers in renowned journals or do researches, while more experienced managers tend to print books and present papers in internal or external scientific conferences.

Table2: The table of mean and SD of the studied universities

The Branch		Cooperative score	Authoritative sore
Naeen	Quantity	9	9
	Mean	7.8889	10.8889
	Total	71.00	98.00
	SD	2.02759	2.31541
Ardistan	Quantity	8	8
	Mean	7.2500	10.8750
	Total	58.00	87.00
	SD	3.10530	3.09089
Majlesi	Quantity	22	22
	Mean	7.7273	10.0909
	Total	170.00	222.00
	SD	1.42032	2.32807
Khozistan	Quantity	39	39
	Mean	7.3077	12.5897
	Total	285.00	491.00
	SD	1.74949	2.81647
Felavarjan	Quantity	22	22
	Mean	7.6364	10.5455
	Total	168.00	232.00
	SD	1.73330	2.55841
Natanz	Quantity	7	7
	Mean	6.5714	10.8571
	Total	46.00	76.00
	SD	1.61835	2.34013
Total	Quantity	107	107
	Mean	7.4579	11.2710
	Total	798.00	1206.00
	SD	1.81337	2.76286

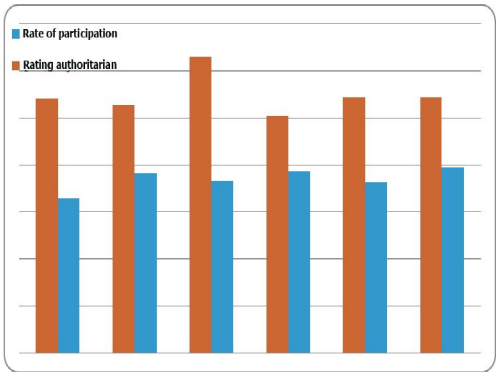

Figure 1: scores' mean on leadership styles of managers in the surveyed universities

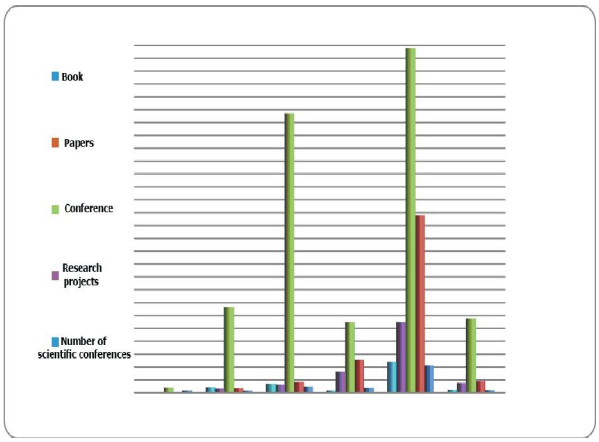

Fig2: mean on science productivity in the surveyed universities from 2006 to 2010

4. Discussions

1.4. Practical suggestions in order to increase the productivity of science in universities and research centers

1. **Diversification of income in universities and research centers for the prosperity of science through commercialization of science:** The surveyed universities and higher education institutes are private, so it seems that the officials of the Islamic Azad University must attempt to diversify the incomes apart from the tuitions, because there will be difficulties spending money on education due to global economic crisis, its impact on Iran's inflation rate, gradual increase of inflation rate, and creating a gap between people's income and the inflation rate of country. The solution could be the diversification of university revenues apart from students' tuitions.
2. **Increasing research and technology share of GPD:** Given the fact that research credits and their ratio to GPD is one of the constant factors of evaluating development indices in the world, this ratio is unfortunately very poor in Iran. On the other hand, the way research credits are distributed among universities and other governmental bureaus is not appropriate, so that the maximum research credits are available for organizations which have neither professional researchers nor a well-firmed determination to apply the scientific potential of universities in their research activities. While, some organizations have credits for which they are responsible to use them in any way at the end of fiscal year, a purpose which forms shade knowledge whose frequency is usually more than the original scientific work. Additionally, investments are concentrated on this kind of science and semi-scientific works.
3. **Using the state grant:** Currently, there is no work commissioned by the government in universities. The genuine researcher is not different from the ostensible one and passes the same path to define and ratify the project. Consequently, this contract ends up in favor of ostensible researchers, because they both know the ways of absorbing the budget and have plenty of time and number. The real and necessary works for the country, apart from organizations and executive agencies, must be commissioned directly, and the research system in its macro forms must be organized in this way.
4. **Supporting the private sector to enter the realm of science:** It seems that the private sector has a little share to enter the realm of research and technology, while the major research investment is done by the private sector, and governmental investments are mostly in the span of sciences and strategic researches. However, in our country, the major part of research credits is afforded through the public budget by the government, and the role of private sector is limited in this area.
5. **Practical fieldwork courses for management students:** One of the main challenges of our educational system is training for education. Although students learn fine theoretical materials in the universities, they have problem taking practical actions. It seems that fieldwork courses should be designed for management students, especially MA and Ph. D ones, as the future managers, so that they can practically get familiar with the ways managers and leaders work in the organizations and become the necessary asset for the future alongside the useful experience.
6. **Educating and training postgraduate students in three categories:** Universities and higher education centers should prioritize educating three groups of postgraduate students (MA and Ph. D) based on the individual's abilities and capabilities. The first category includes the research-oriented students who have are able to do research projects and produce knowledge. The second one includes students who are merely education-oriented and are used to do educational work in the universities and science centers. The third one includes students who are both education-oriented and research-oriented.
7. **Meritocracy in selecting managers, universities, and research centers:** The

selection of university managers should be meritocratic rather than imperative. It seems that the senior officials of the Islamic Azad University should design a structure in the form of a comprehensive and strong questionnaire to select university managers and investigate every angle of their cultural, scientific, research, economic, experiential, and social lives thoroughly so that they can lead research and science centers without any political, ethnic, and party intervention, or even without religious dogmas to enhance the science productivity in these centers in the society.

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Effectiveness of Assessment patterns in chemistry Learning

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Abstract

This study aims at determining: (a) whether there is any difference between chemistry learning achievements of students taking the chemistry class with the implementation of Performance Assessment and ones joining the class without the implementation of Performance Assessment if the prior knowledge was statistically controlled, (b) Differences of scores in male and females' students after the implementation of performance assessment and traditional assessment in class. The experiment was conducted in 2 high schools in Malayer. The subjects were 92 pre-university science students (46 boys and 46 girls) that were selected from population through random, multi-step and cluster sampling methods and then randomly assign patterns to experimental group and control group. Research instruments used included academic achievement pretest and post test that was prepared by researcher and teachers. The results have provided sufficient evidence for the context validity of these two instruments. Cronbach coefficient alpha reliability of chemistry academic achievement pre test was .81 and post test was .83. Two- factor covariance analysis method (ANCOVA) was utilized for data analysis. The results showed: (a) there were significant differences on chemistry learning achievement with and without the implementation of Performance Assessment on pre-university chemistry students. (b) Based on the statistical analysis of ANCOVA of same subjects, it showed that there was a significant increase of scores of females' students to learn chemistry in classes with the implementation Performance Assessment. [Omidi M, Sridhar Y.N., Azizmalayeri K, **Effectiveness of Assessment patterns in chemistry Learning.** *Life Sci J* 2012;9(3):1979-1982]. (ISSN: 1097-8135). http://www.lifesciencesite.com. 285

Key words: Performance assessment, Traditional assessment, Academic achievement, Chemistry

1. Introduction

In the classroom, teaching cannot be truly effective if it is not linked to some form of authentic assessment (Joughin, 2010). Likewise, assessment is useless if it is not based on what has been, or is to be, taught. Although this may sound obvious, teachers sometimes forget the close relationship between the two. Assessment is one of the crucial components of the instruction (Cooper & Coweive, 2010). People within the educational community have different ideas regarding the implementation of assessment strategies. While some believe traditional assessment methods are more effective, others think that alternative assessment tools are superior. Researchers and educators use the term performance-based, alternative, and authentic assessment inter-changeably. Performance- based assessment is suitable for assessing nearly all types of science learning. Performance-based assessment allows the student to construct his or her own answers as opposed to choosing from a group of answers (Lingtan & Towndrow, 2009). Performance-based assessments "can be a learning experience in themselves. They can actually motivate students to learn more about the subject matter"(Doane, Rice, and Zachos 2006). Assessment tasks must be a part of the regular teaching and learning program. There is a widely held belief that assessment drives student learning (Joughin, 2010).

Many of researches have shown strong links between the implementation of performance assessment and high quality learning (Wang, 2010., Azar, 2009., Yi Chang & Ting Chen, 2009., Ashwin, 2008., Tapia & Pardo, 2006., Bailey, 2005., Brown, 2005., Darling-Hammond & Snyder, 2000). The use and implementation of performance assessment has two significant features; it has the ability to reengage students in the development of content-based knowledge through strengthened links with the outside world (Kearney & Perkins, 2011); and, it has the capacity to enhance student learning through the provision of skills such as metacognition, critical thinking and creativity (Darling-Hammond & Snyder, 2000).

Sari & Wiyarsi (2011) investigated the effect of performance assessment on chemistry learning achievements of students in Yogyakarta. The results showed a significant difference on chemistry learning achievement with and without the implementation of Performance Assessment on students of class.

Kearney & Perkins (2010) examined the relationship of performance assessment and students learning in the classroom. The results indicated students that were more engaged, had increased efficacy and felt that they were a part of the educative process, rather than being subjected to it. Bedir, Polat & Sakacı (2009) studied that using the performance assessment in one lesson, improve students' learning, and eventually serve students to become lifelong learners.

Chuang (2009) investigated the effect of oral performance assessment in class. The results showed that using oral performance assessment as a necessary and practical way to enhance students' speaking skills and ability.

According to Kabba (2008), Performance-based assessment requires students to demonstrate their

learning and understanding by performing an act or a series of acts.

Muller (2005) conducted a study that indicate application of performance assessment promote student engagement in substantial learning that connects to real-world. Lubezky**,** Dori & Zoller (2004) indicated that switch from traditional assessment to performance assessment promote chemistry higher cognitive learning in students. Klein & et al., (1997) examined whether the differences in mean scores among gender on science performance assessments are comparable to the differences that are typically found among these groups of traditional multiple-choice tests. To do this, several hands-on science performance assessments and other measures were administered to over 2,000 students in grades five, six, and nine as apart of a field test of California's statewide testing program. Girls tended to have higher overall mean scores than boys on the performance measures.

According to Ricketts & Rudd's study (2002), there is a significant difference in cognitive skills such as critical thinking in boys and girls.This research seeks to investigate whether the using performance assessment method can be effective in the improvement of students' chemistry academic achievement? In order to respond to the question above, the following hypotheses were outlined and examined:

1. There is a significant difference between the performance assessment group and the traditional assessment group in chemistry academic achievement.
2. There is a significant difference between boys and girls in chemistry academic achievement in performance assessment group and traditional assessment group.

2. Materials and method:

2.1 Participants

Participants in the present study were 92 chemistry pre-university students studying in Malayer city of Iran. Forty six of the participants were male students, and 46 were female students.

2.2 Design of the study

This research with a design including two patterns of performance assessment and traditional assessment was a quasi-experimental research to determine the effect of these patterns on academic achievement in chemistry. The best design for this research from among different kinds of quasi experimental design was an independent bi- group design with pretest and post test. The most common quasi experimental research design includes two groups: An experimental group and a control group. The researcher selected the sample from population by multi-step and cluster sampling methods and then randomly assigns patterns to experimental group and control group.

2.3Instruments

Academic achievement pretest and posttest in chemistry**:** The academic Achievement pretest and post-test in chemistry were prepared by the researcher and teachers and were used to measure the academic achievement of pre university students on the subject chemistry. Context validity of the academic achievement pretest and post-test were investigated by teachers who were professional in chemistry. The results have provided sufficient evidence for the context validity of these instruments. Cronbach coefficient alpha reliability of chemistry academic achievement pre test was .81 and post test was .83.

2.4 Sample and population

The sample included for this research was 92 students from pre university students who were studying in 4 schools in Malayer city (2011-2012). At the first stage from among 20 schools (1050 students), 4 schools were selected randomly (boys and girls pre university schools). At the second stage from each school 1 class was selected and assigned to experimental and control group randomly.

2.5Procedure of data collection

Multi stage cluster random sampling in selection of schools and classes of Malayer city was used. After choosing the samples, in the first step the teachers were acquainted to the performance- based assessment method and the experimental group students have also been completely justified on the new method and their participation. Before using the method a test was taken on chemistry as a pre-test on both groups (male and female). Because the test was done in the second half of the academic year, the chemistry pretest was only from the first half of the book. The tests were same in this stage for both groups. In the second step, in both classes of experimental groups the teaching and the other activities of the teachers by performance- based continued for 4 months to assess the level of learning of the students and planning on reactions to improve their learning.In the third step at the end of the semester, post-test in chemistry was done on both groups in the same condition. The post-test was contained the second half of the book.

2.6. Analysis and Interpretations of results

In the present study, descriptive statistics were used to show mean and standard deviation of chemistry achievement in both groups. Two factors covariate analysis (ANCOVA) were used to investigate the impact of performance assessment on chemistry achievement with regarding to effect of pretest and IQ.

3. Results

Mean and standard deviation of chemistry academic achievement post test based on the gender and group before controlling pretest are presented in the following table.

As seen as table 1 the mean of girls' post test of chemistry academic achievement scores in performance assessment group is about 6 scores higher than the mean of girls' scores in traditional assessment group, as from

the table 1 it is evident that mean of chemistry academic achievement scores for boys in performance assessment group is about 5.5 scores higher than boys' mean in traditional assessment group. A close look at the table further revealed that girls' means in both group of experimental and control group were higher than the boys' means. Two factors covariate analysis test to comparison of mean of the students' post test of chemistry academic achievement scores in performance assessment group and traditional assessment group based on the gender are presented in the following table.

According to (table 2) two factors covariate analysis, it is found that the performance assessment has significant influence over mean scores on post test of chemistry academic achievement, as the obtained F value was found to be statistically significant (F=59.075; p=.000) and also significant at 0.05 levels, indicating that a significant difference is between the performance assessment group and the traditional assessment group in post test of chemistry academic achievement. So it is found that the gender has significant influence over mean scores on post test of chemistry academic achievement, as the obtained F value was found to be statistically significant (F=5.944; P=.017) and also significant at 0.05 levels. The interaction between performance assessment group and gender was found to be non-significant (F=.345; p=.559).

4. Discussion

This study investigated the effects of performance assessment on chemistry achievement of pre university students and analysis of results showed that there is a significant influence of performance assessment on academic achievement, in traditional assessment groups scored significantly lower than students who were in performance assessment group. In other words, performance assessment had positive impact on chemistry achievement of students. In order to confirm or reject the hypotheses formulated, we have tried to compare our results with further studies done in the same area.

Sari & Wiyarsi (2011), Kearney & Perkins (2010), Wang (2010), Azar (2009), Yi Chang & Ting Chen (2009), Bedir, Polat & Sakacı (2009), Chuang (2009), Ashwin (2008), Tapia & Pardo (2006), Bailey (2005), Brown (2005), Muller (2005), Lubezky**,** Dori & Zoller (2004), Darling-Hammond & Snyder (2000), studies' showed effectiveness of performance assessment on academic achievement in students. In regard to coordination research results of other researchers and the result of this study, the first hypothesis "There is a significant difference between the performance assessment group and the traditional assessment group in chemistry academic achievement", is confirmed. These results are due to performance assessment features in comparison with traditional assessment. Performance-based assessment allows the student to construct his or her own answers; Performance-based assessment is an active learning experience and actually motivates students to learn more about the subject matter, they demonstrate scientific knowledge and understanding through performance. This method of assessment is coordinated to constructivism view of learning, while traditional assessment is adjusted to behaviorism view. Also the results of this research indicate that the second hypothesis "There is a significant difference between boys and girls in chemistry academic achievement in performance assessment group and traditional assessment group", is confirmed. In regard to differences between two genders in learning, the following researches results (Ricketts & Rudd, 2002; Klein & et al., 1997) were consistent with the findings of this study. Girls' higher scores mean can be due to more tendency of girls to participate in cultural activities. As seen rate of girls' participation in higher education have increased. Also more females' tendency to social activities can be due to their warm reception in academic achievement. Most of teachers do not have awareness about the new forms of assessment, so they are not interested in this method of assessment. Furthermore some suggestions may be addressed to the concerned educators in order to increase students' learning. The organization of some training, seminars and workshops of pre-university school teachers have to be organized in order to learn them some updated method of assessment and improving their experience. The school headmasters have to create a good environment to facilitate the pre-university teachers to perform new method of assessment as possible as they can.

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Table 1: Mean and standard deviation of chemistry academic achievement post test before control based on the gender and group

Sex	Group	Mean	S.D
Boy	Experimental	12.19	1.83
	Control	6.81	3.04
Girl	Experimental	14.19	2.62
	Control	7.92	1.86

Table 2: Covariate analysis to comparison of mean in post test of chemistry academic achievement based on the gender

Source	SS	df	Ms	F	Sig
Covariant (Pretest)	36.8	1	36.8	9.14	.003
Covariant (IQ)	54.3	1	54.3	13.50	.000
Group	237.4	1	237.4	59.07	.000*
Gender	23.9	1	23.9	5.94	.017*
Interaction	1.38	1	1.38	.345	.559

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Disease- Based versus Patient- Based Approach in Epilepsy Management from the Patients' Point of View: A Qualitative Research

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Abstract: To investigate patient, family and the healthcare provider's perspectives on disease-based and patient-based management of epilepsy as one of the most common neurologic disorders. Epilepsy is a chronic disease with psychosocial and cultural ramifications unseen in any other condition. This study highlights the importance of holistic approach in medical management of epilepsy. In a qualitative study participants' perceptions of epilepsy and its medical management were explored. The purposely selected 33 participants were epileptic patients (23), family members (5) and healthcare providers (5). Recruitment sites were the Iranian Epilepsy Association, private practice offices and hospitals. Data were collected through semi-structured in-depth interviews and analyzed using arbitrary qualitative content analysis. Three main themes emerged as: 1) absence of holistic health views; 2) lack of therapeutic and healing approach; and 3) fragmented healthcare and communication systems. Results identified a need for patient-based approach to epilepsy along side medical management. Although healthcare systems recognize the importance of holistic patient care and disease management, epileptic patients in Iran with greatly benefit from a coherent and specialized team of healthcare providers who can address epileptic patient's concerns and communicate with their family members. Cultural taboos associated with epilepsy in countries like Iran, has not been explored and disease management by a neurologist is mainly focused on medical treatment. Thus, a cohort team familiar with holistic and patient-based approach can improve the quality of care for epileptic patients by enhancing their overall quality of life.

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Keywords: Epilepsy; Disease management; Healthcare team; Holistic care; Patient-based approach; Disease- Based

1. Introduction

Epilepsy is one of the most common neurological diseases with impact on many aspects of a person's life such as financial, socio-cultural, physical and psychological. The influence of epilepsy as a chronic disease on the family and society is undeniable (1). Epilepsy is not just a simple clinical diagnosis -- it is a cultural phenomenon and in some parts of the world epilepsy can have a negative and life changing implication for the patient and the family as a whole (2). Thus, epilepsy could be considered a medical diagnosis with a significant social prognosis which at times could be worse than the disease itself (3). Epileptic patients are predisposed to a wide range of psycho-social maltreatments, more harmful and debilitating than the accompanied medical condition (4). Psychological and social consequences of epilepsy include high rate of mental health problems, mood disorders, suicide, social isolation (5); feelings of shame and guilt (6); family and social dishonor, low self-respect, anxiety, depression, and pessimism (7). About 50 to 60 percent of patients have clinical signs of depression, anxiety, and psychological disorders (8). The disease also can lead to restriction and life style limitations in family life, marriage, occupation, education and learning, driving, economical and recreational activities for the patient (9, 10).

While most studies suggest that controlling the onset of epilepsy is a fundamental issue, some have stated that disease onset is just a part of the story, while many complex factors are involved. A multidimensional disease management can improve patient's lifestyle. Therefore, psycho-social aspects of the disease are as important as the medical management of epilepsy. A healthcare plan must be developed according to the patient's lifestyle and the acceptance of epilepsy as lifelong a medical diagnosis (11). Georgi (2010) reported that patient-based care is more necessary than disease-based approach by including patient's physical, psychological, social, mental, and spiritual needs for a holistic care. Patient-based care helps the patient to assume responsibility to effectively manage their disease (12). According to the results of several studies, the interaction between physicians and other

healthcare members would improve the continuity of patient care and disease management (11). Lawn and Schoo (2009) asserted that patient education and participation in treatment decisions and consultation could improve team efforts for the management of a chronic disease through a set of interactions with the patient and family members (13).

Although there has been some studies analyzing the concept of self-management for epileptic patients, other studies have mainly used quantitative approach with focus on the medical treatment and disease management. There has been no comprehensive study on patient-based management of epilepsy particularly for Iranian patients. Although medical management of epilepsy has been well investigated, the socio-economic and psychological problems associated with epilepsy have not been addressed for those suffering from the disease and many life challenges they face. Most studies discuss epilepsy as a disease and neglect to examine this life altering condition holistically.

Majority of studies have reported a disease-based approach and the paucity of information on patient perceptions was limiting to researchers in this study. Kersol, Green and Thorogod emphasized the importance of qualitative approach to highlight social processes and specify patient's lived experiences with various aspects of the disease and how it can change life meanings (14). We are hopeful the results of this study will provide information on the holistic management of epilepsy and introduce multidimensional perceptions of the Iranian patients, their families and the healthcare team. We focused on the subject from medical, social and cultural perspectives in Iran.

Finally, we urge healthcare providers to consider disease-based management with patient-based approach. A better patient perception of epilepsy and its medical management could help assess the effectiveness of treatment plans and improve patient's condition physically, socially, mentally and spiritually. Adequate holistic management of epilepsy can help control onset and therefore better life quality.

2. Material and Methods

Using qualitative research method, researchers aimed to investigate participant's perspectives on the management of epilepsy as a disease-based versus patient-based approach. The key participants in this study were 23 purposely selected epileptic patients from a list provided by the Iranian Epilepsy Association (IEA), neurology private offices, hospital neurology wards and the Isfahan Epilepsy Monitoring Ward (IEMW). Patients were identified by physicians according to the research defined inclusion criteria consisting of at least 2 years diagnosis of epilepsy by a neurologist, being over the age of 18 years and having the ability to communicate. Twenty three (23) epileptic patients in different age groups and with various disease severities were selected. Researchers included 5 family members of the patients and 5 members of the healthcare team for a total of 33 participants.

In-depth semi structured interviews reached category saturation (no new information was revealed). The interviews occurred at home, in physician's offices, at the hospital epilepsy center, in the Iranian Epilepsy Association office, and at home according to the participant's preferences. Interviews started with general questions such as "tell me about your experiences with epilepsy. How have your disease been managed? What did they do for you?" and then asked follow up questions. Each participant was interviewed 1 to 3 times for 45 to 120 minutes according to their mental health state, as well as their ability to share information.

Participants signed a written informed consent and assured of respect for their privacy and confidentiality regarding personal and medical information. Voluntary participation was emphasized as interviews were recorded on an Mp3 player and later transcribed verbatim for optimum accuracy. Data were analyzed using arbitrary content analysis. Four qualitative research criteria of credibility, dependability, conformability, and transferability were considered when raw data were evaluated for accuracy and consistency. Content review by 10 external qualitative research specialists helped establish validity and reliability of data collection approach. Various views from a diverse group of faculty researchers and the major advisor verified method validity and reliability. The arbitrary content analysis method was used (14) and multiple reviews of the transcribed data helped categorize perceived expressions as stated by participants. Meaning units were extracted and 483 primary codes were recorded. Coded data were categorized according to their meaning and conceptual similarities. The categories were then summarized in interpretative levels so that they stated the main concept of each category. Finally, major themes and sub themes from abstract concepts were identified.

3. Results

The research participants were 23 patients (11 men and 12 women), 5 medical staffs (3 nurses, 2 physicians), and 5 family members of epileptic patients. Findings reached 3 major themes and 4 sub themes as follows (table 1).

Table 1: perception of participants about medical management of epilepsy

Theme	Subtheme
1. Absence of holistic health views	
2. Lack of therapeutic healing approach	a. lack of professional behavior
	b. mistrust
3. Fragmented healthcare and communication systems	a. inadequate professional competency
	b. incomplete course of treatment

1. Absence of holistic health views

Participants shared personal stories which indicated lack of holistic approach by the healthcare team. Expressed views revealed staff negligence to recognize patient's in social, psychological and cultural needs for an effective medical management of epilepsy.

The following statements are participants' expressions regarding disease-based approach:

Participant #11: ward nurses do not pay attention to us. They just take the blood pressure, give medications and take blood samples. That's it. Like other patients. Mom has told them several times about my severe headache but, they don't seem to care. They don't ask us how we are doing nor is there any problem. We don't say anything and they have no idea how we suffer (Patient).

Participant #2: my physician just would tell me to take medications regularly and doesn't even change the dose most of the times. I wish he would sometimes listen to my confabulations. They think the disease is just physical, while it has battered my soul and mind (patient).

Participant #4: my problem is much more than having convulsions. But I don't know whom to talk to. Medications do not relieve my pain. (Patient).

2. Lack of therapeutic healing approach

Under this theme participant's perceptions formed 2 sub-themes as listed below:

a) Lack of professional behavior

Those who suffer from epilepsy have a delicate and fragile spirit due to abhorring nature of the disease which threatens their identity. They thrive on forming human relationships and seek respect for human values by the healthcare team. They expect educated people to be kind and respectful and treat them as a human being so that it would be ascertain they are not any different from others. Lack of professional behavior and poor temperament by healthcare providers was a frequent voiced expression by patients:

Participant #16: nurses are ill-tempered. They don't come to see whether you're dead or alive. They take a blood pressure and give medications. They don't treat us as humans and don't think we have other problems. I'm devastated. I wish someone would ask why I am in low spirit or what has disturbed me? I convulsed yesterday. I didn't realize what happened. But after that, I was so sad. I wished somebody would ask about my grief (patient).

Another patient shared experiencing hysicians' inattention and poor communication skills:

Participant #13: as soon as you say hello, they start to prescribe without asking anything about the disease. They don't ask how long the attacks are, how they are, where do you occur, do I bite my tongue, do I bite my lips…? I don't know…. They don't ask how do you feel before and after an attack. Of course a good physician would ask such questions (patient).

A participant from the healthcare team stated the need for better relation with patients as stated below:

Participant #22: patients like to talk about themselves. It should matter what they do, where they are from, what's their occupation, and they want to be asked. They want to communicate. I believe the most important thing is that patients feel they are not dead bodies and treated as a living being with good temper (nurse).

b) Mistrust

Experiencing mistrust towards medical team and the given diagnosis inhibits the healing and therapeutic efforts between the patient and healthcare team. Lack of trust breeds pessimism among patients and their families. Participant #15: every time I went to my physician, he sent me for another EEG without any questions. There was no change. We just have to spend a lot of money each time. These repeated EEGs have just become their business. Yet we have seen no improvements (patient).

Discordance between the primary and the consulting physician for a second opinion often adds to patient mistrust in the diagnosis and medical management approach. A participant who felt a need to get a second consult was confused by the dichotomy of medical opinions as stated here:

Participant #10: how would I recognize whom to believe after a second consult? I talked with my physician who said no, no, no. don't go for a consult, they can't do anything for you. I got a consult and was told no, no, no. don't go back to your physician. The medications you are taking are ineffective and you are washing yourself out. What should I do here caught in the middle (patient)?

Despite sporadic patient education sessions, participants complained about being unaware of their health condition and treatments given by the staff as an expression of mistrust.

Participant #16: my husband asked a midwife about being pregnant and treated for epilepsy. Looking at the lab results and what medications I was taking, we were told of carrying a malformed fetus. From that day on, my fear started. I couldn't sleep at all that night. I cried often. I told my husband that if my child was to be malformed, I didn't want such a child. He told me to go to an obstetrician. I went and was assured of other similar patients having a child and they have no problems (patient).

3. Fragmented healthcare and communication systems

This theme evolved into 2 sub-themes as listed below:

a) Inadequate professional competency

An important factor for achieving the best treatment results is by developing a trusting relationship with the patient in order to provide education and partnership. When a patient and his family experiences an epileptic convulsion for the first time, they are in fear and eager to know everything about the disease, its etiology, triggering factors, physiology, what to do when an attack occurs, what to do after the convulsion subsides, what is the appropriate nutrition and much more as many participant expressed frustration with the healthcare team for not providing patient educate.

Participant #9: physicians immediately prescribe medication and they don't care or say anything about what to eat or not to eat. They just treat with medications. A good physician should try to tell the patient how they can be treated without medications as much as possible. They don't tell us a word about what to do or not to do (patient).

A healthcare provider described the significance of public and patient education regarding epilepsy to help remove the social stigma.

Participant #23: the conditions of epileptic patients are such that people fear them and wonder why they get convulsions and change instantly. Well, this is a real social stigma which can be removed through education (physician).

Beside public and patient education, epileptic patients need someone who can heal their injured spirit and identity due to people's rebukes. Psychological counseling is among strategies used to effectively deal with erroneous viewpoints and help patients talk about their perceptions.

Participant #10: I believe if a physician tells me that I might have psychological issues without any other problem, then, it would be better to consult with a psychologist rather than a neurologist (patient).

Participant #1: people like us need lots of counseling. We should go through emotional counseling every now and then – in some situations, going through counseling is cool. Counseling can be comforting and helpful in finding a way to solve the problems… it is good to talk to someone who understands you (patient).

Physicians are aware of the patient's needs for psychological counseling but, they don't want to or have the time for it.

Participant #23: since I can't afford the time to do counsel my patients myself, I send them for psychotherapy. Three of my patients have achieved good results. I just couldn't afford the time to do it (physician).

b) Incomplete course of treatment

Adding a psychiatrist to the healthcare team for managing epileptic patients seems to be a prudent decision and yet, the neurologists do not consider it as being necessary unless a patient develops severe psychiatric problems to obligate a referral. However, the devastating psychological effects of a chronic disorder such as epilepsy frequently necessitates a psychiatrist consult. The following description by participants reveals sub-standard and incomplete course of treatment for those who were not referred for psychiatric consult despite having major depressive disorder.

Participant #11: my problem is mostly my temper. I've become brainsick. I want to kill myself. I'm so depressed, and do nothing but crying. However, all they do for me is just increasing the medication dose, and there is no use. Tell them to do something else for me (patient).

Participant #18: I am losing my temper and feel frustrated. These medications do not calm me. I'm tired of life and everything. I think I've become more depressed. I don't know if I really need a psychiatrist or I should go to the neurologist. I talked to my physician but there was no improvement (patient).

Participant #30: with my experiences in Canada a healthcare team working with epileptic patients consists of a clinical psychologist, psychiatrist, physician, neurologist, nurse, and a social worker (physician).

Although patients did not state their expectations of nurses, and unaware of nurse's significant role, the inconspicuous role of nurses in care management of epilepsy is inferred from the following statements:

Participant #24: there's a vacant place for epilepsy nurse in treatment team, (it mean we need more nurses) (physician).

Participant #25: nurse is a good example of someone who cares. Having a clinical nurse specialist or a graduate nurse would be very good. Also, having psychologists with knowledge of epilepsy would be helpful. Studying medicine and knowing psychology of epilepsy will help provide appropriate consult for patients. Frankly speaking, I prefer nurses to counsel patients (physician).

The healthcare team members believed an admission, discharge and follow-up system would be necessary, especially to educate, counsel, and support patients and their family.

Participant #24: unfortunately, our standard care system is weak and our follow-up system non-existent. We have a long way to go to reach an efficient level of care. However, talking to patients and educating them would improve their awareness. But it would be much better if there was a follow-up system (nurse).

Participant #22: unfortunately, in Iran we don't have a patient followed up system. This is a plan I've proposed, which consists of two parts with patient education and patient follow up (nurse).

4. Discussions

Participants in this study expressed their viewpoints openly to inform healthcare providers that disease-based approach is insufficient without a holistic patient-based plan of care for patients suffering from epilepsy. In a study by Sample and et al (2006), epileptic patients reported receiving healthcare service including mental health and spiritual care but, services had limited accessibility (9). George (2010) believes that management of a chronic disease such as epilepsy requires holistic care by a team of experts and medical treatment alone does not satisfy patient's need for emotional, psychological, spiritual, and social support (12).

Considering epilepsy as a cultural shame and embarrassment to self and family has been a neglected issue in many studies. The Iranian epileptic population receives medical treatment without holistic care. Similarly, Jacoby, Wang and et al (2008) stated that in clinical medicine, the treatment team uses its all powers to diagnose epilepsy, its related signs and symptoms, and the healthcare providers don't care about the negative social stigma associated with the disease (15). Likewise, Mc Evan, Espie et al (2004) believed services focused on medical treatment may decrease disease onset but, remain sub-standard for not offering a holistic approach with consideration for psychological and social effects of epilepsy. Perhaps inattention to comprehensive care of a patient remains unforeseen for many other life changing chronic conditions throughout the global healthcare systems (16).

In contrast, Robinson, Callister et al (2008), reported a group of physicians participating in disease management by increasing holistic care and patient-based approach. Another study reported the difference in medical management by additional patients participate in treatment decisions (17). Also, Pittz and Phillips (1998) stated that one reason for patient dismay with the healthcare plan was lack of attention to patient's psychological and social needs and too much focus on the medical treatment. As suggested, there is a need to add holistic care to medical management of patients diagnosed with epilepsy (18).

The healthcare team's lack of attention to patient's cultural values, and need for respect and exhibiting no interest to communicate with the patient or poor communication skills were among many concerns and complaints expressed in this study. Patients voiced their mistrust in the healthcare team. In their qualitative study, Campbell, Scot et al (2011) reported patient perceptions of those suffering from AIDS with respect to the way nurses provided care, introduced themselves with regards for confidentiality, showed mutual understanding, treating them the same as other patients, and offered kindness as an important part of treatment and care components (19). While in our study, epileptic patients found emotional barriers and disconnect with the healthcare team as a prohibiting factor to healing. Although patients in our study expressed non-existent relation with physicians, their perceptions of nursing staff were positive. However, nurses in other studies have received higher patient satisfaction score in particular with communication skills, providing information and patient guidance (20-23). The difference might be due to the significant differences in nurses' role and autonomy when caring for epileptic patients in other countries. In Iran, professional autonomy for nursing role is minimal and there are no specialized epilepsy nurses to be a more active part of the healthcare team.

According to the patient's views in a study by Mills, Bachmann et al (2000), effective relation with clinicians are more effective than epilepsy control and the clinical demonstration(24). Therefore, establishing staff communication skills along with emotional awareness can improve healing of patients' pains.

Sub-standard performance and incomplete course of treatment caused disruption for everyone involved. Holistic approach to patient care required patient involvement in their care through education and counseling and most participants in this study complained about the missing essential components of care. They viewed holistic and comprehensive care as a significant part of epilepsy management. In their

study Dickert and Kass (2009) discussed patients' perceptions on respect where patients considered informing on their condition a form of respect for personhood (25). Wells in Moyer (2007) stated that families and patients need correct information and unfortunately we as neurologist neglect by proxy due to professional restrictions to provide sufficient and direct information to patients (26). Meanwhile, Wagner, Semple et al (2009) expressed that physicians and the healthcare team can make a difference by establishing a coherent team for the care of epilepsy patients in a specialized epilepsy clinic run be expert epilepsy nurses to care, inform and educate patients and their family members (27).

Although patients in this study did not have the opportunity to experience the benefits of individual consults, participants were very open and hopeful that expert consultation could offer them a chance to better understand the disease process, communicate their concerns, have someone listen to their life changing experiences and help their stress levels to be able to live a normal life. Also Campbell and Scott (2011), Taylor, Readman et al (1994) , Clark, Stoll et al (2010) in their studies on the management and treatment of epilepsy wrote, it necessary to refer patients for psychological consult (19, 28,29) while this important need has not been considered by many epilepsy management teams in our study. Mental and psychological care of epileptic patients require expert consultation and yet, they are not considered as a regular part of the team by Iranian physicians.

Charyton, Elliott et al (2009), stated that epileptic patients should be counseled for their emotional needs by a psychologists and a social worker while medically managed by a neurologists (30). In their study, they found that participating physicians rarely considered psychologists as a suitable choice for consultation due to their insufficient medical knowledge on epilepsy, and proposed a specialized epilepsy nurse as a better choice to counsel patients suffering from epilepsy. In another qualitative study, patients were satisfied with nurses' level of competence to decrease their fear, elevate their depressed mood, reduce their anxiety and majority of general practitioners in Britain would refer epileptic patients to nurses for consultation (31-32) . Thus, a well prepared and educated nurse can serve on the healthcare team as epilepsy consult to provide comprehensive and holistic care.

This study identified a broken chain in the Iranian management of epilepsy where patients are offered incomplete care without consideration for their psychological, social, cultural and financial needs by a group of neurologists who resist change. Vahey, Aiken (2004) wrote, according to research evidence, apart from the prescribed medication by a physician, other care modalities seem significant (33). Mills, Bachman et al (1999) stated that multidisciplinary team of healthcare professionals should be involved in the care epileptic patients, among which are the physicians and nurses responsible for establishing and maintaining partnership with epileptic patients as a team approach (24).

In contrast, Taylor, Readman(1994) supported a participatory approach. They suggested development and creation of a care network in epilepsy clinics to include general practitioners, neurologists, general physicians, pediatricians, British Epilepsy Association, social workers, school nurses, social workers, specialized epilepsy nurses, regional nurses, nursing supervisors, and psychological healthcare team in collaboration with self-help organizations of nursing faculties, hospital wards, epilepsy nurses association, and supporting groups to help improve epilepsy management and treatment in the region. Finally, the need for specialized epilepsy clinics and extensive society-based services by specialized nurses are highly recommended (34). Therefore, providing a cohort team with a clear job description seems necessary to improve the quality of care for epileptic patients.

Participants' views of epilepsy medical management highlighted the need for comprehensive and holistic approach to the treatment of epilepsy to address patient's physical as well as mental, psychological, and social components. Our results indicate disease-based management in Iran should be revised to include a patient-based approach. Patient mistrust of healthcare team is disruptive to achieving best health outcomes and Iranian physicians should consider a holistic approach and see their patients as a human being with mental and psychological pains associated with the disease.

On the other hand, medical management should not be void of patient education and consultation. A healthcare team with specific role designation may include healthcare professionals in partnership with the patient and family members. It seems reasonable to form a cohort team of experts to offer the best comprehensive health services including education on medical treatment, mental, psychological and social consultation and follow up. As proposed, Iranian nursing leadership may establish a coherent team of specialized epilepsy nurses, develop job descriptions and help improve the quality care for patients with epilepsy. As well, a sub-specialized educational program may be developed with an emphasis on professional communication skills to educate and consult in a patient-based model of care. Also, a suitable solution may be found to

educate physicians on a more competent epilepsy management. Lastly, a nationwide campaign should be formed to educate the Iranian public about epilepsy to eliminate the social stigma.

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The development of critical thinking skills in physics and sociology curricula

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Abstract
The present study aims to compare the impact of guided inquiry and traditional teaching methods on critical thinking skills of second-grade high school students in physics and sociology courses. Given the purpose, a total of 190 second grade high school students were chosen through random, multi-step and cluster sampling methods in the form of 8 classes and placed into 8 experimental and control groups in physics and sociology courses. A pre-test post-test design was administered to the control group. In order to collect information about participants, two tools were employed. The demographic information was collected by a researcher–made questionnaire and the thinking skills information was determined by Watson - Glaser test. Two- factor covariance method was utilized for data analysis. Results showed that the impact of guided inquiry teaching method on the critical thinking skills of students in inference and conclusion subscales, and the effect of subject in conclusion and interpretation subscales was significant.
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Keywords: critical thinking, physics curriculum, sociology curriculum, guided inquiry teaching method, traditional teaching method.

Introduction:

One of the main objectives of teaching is to further stimulate the mental capacity of the learner as a researcher (Lu & Ortlieb, 2009). In this regard, the primary goal of education is considered as training scholars (Reed, 1998; Murphy, 2004). As for the critical thinking concept, a great number of definitions have been offered. For instance, the critical thinking can be defined as an implicit reasoning in critical research, an important tool for social responsibility, consideration of evidences in background information, theories, methods and criteria, and also critical thinking as reflective thinking (Carter et al., 2006). It is also a combination of attitudes, knowledge and skills (Behrens, 1996). According to Watson – Glaser, critical thinking skills include subscales such as inference, deduction and recognition of assumptions, interpretation, and evaluation of arguments (Sendag & Odabas, 2009). Despite being of great importance, the critical thinking is often neglected. Research findings indicate that most individuals are poorly skilled at basic reasoning skills (Van Gelder, 2004), identifying and solving complicated problems (Eyler & Giles, 1999; Wolcott & Lyntch, 1997; King & Kitchener, 1994; Suliman & Halabi, 2006). Cultural and educational factors play a key role in this regard. Individuals' poor thinking skill is associated with the kind of education they receive. Content teaching is not scientifically sufficient by itself (National research council, 2007). Studies show that in most of schools, the learners have no critical intellectual challenge with their courses and are not supported to improve and develop their conceptual reasoning skills (Goodlad & Keating, 1994). Two of distinctive human features can be learning and thinking abilities, on the basis of which two teaching models of learning oriented and reflective oriented models are created. The main goal of education is to transfer cultural heritage and develop thinking ability, regarding the first and the second models respectively (Lipman, 1991). According to some experts, the students' poor thinking skill arises from the dominancy of traditional teaching methods or learning oriented model (Mangena & Chabli, 2005).Traditional teaching method of sciences, as expected, does not increase high-level thinking skills (Halpern, 1999). Instructors are not very interested in research-based teaching methods because of being more time consuming compared to lecture-based model (Lujan & Dicarlo, 2006; Lewittes, 2007). Due to this process, educating students to be critical and creative thinkers has been failed (Lu & Ortlieb, 2009).An extensive modification in teaching must be noted. The proposed modification causes students to develop understanding of scientific concepts along with reasoning and thinking skills (Jan, Van, Douwe & Nico, 2001). Teachers, as curriculum

administrators, play an important role in developing thinking skills (De leon- carillo, 2007). Ennis (1997) considered the promotion of critical thinking in its curriculum; two questions always seem to arise. The first question is "Should we have separate course, or should we embed critical thinking in standard course that we are teaching anyway?" he considered a third alternative that is called the mixed approach. So the curriculum question become "Should critical thinking taught separately, embedded or both?" He distinguished between two types of embedding of critical thinking in subject-matter instruction: infusion and immersion. Infusion take place when critical thinking principles are somehow made explicit with immersion although the treatment of the subject matter might will be very deep and involving critical thinking principles are not made explicit.Some exports believe that critical thinking must be improved through variant courses. They think that content knowledge in each course is correlated with thinking skills and research methods thereof and consequently, these two can not be thought separately. In this respect, research findings indicate that adding one critical thinking-related course to curriculum content does not increase critical thinking skills (Grriffin & Everett, 2002). Regarding this issue, the utilization of guided inquiry method has been supported with the purpose of improving critical thinking skills (linn, 1983; Paul & Elder, 2003).In inquiry methods, students are encountered with one challenge out of different problems and afterward, other students pursue the appropriate principals and methods (Bullard & Felder, 2007). Focus on active learning methods, especially the inquiry method, is the basic solution for the problems arisen from applying traditional methods (Lujan, Heidi & Dicarlo, 2006).This proposed teaching method encourages students to learn independently, get involved in critical thinking, solve the problem, ask question, search, and discover the solution (Unesco, 1999). Teaching through the inquiry method results in increased understanding of sciences, improvement of academic achievement, more utilization of critical thinking, development of skills to achieve and analyze the information, and improvement of laboratory skills (Prince & Felder, 2006). The research results indicate the significant effect of problem-solving on the learners' critical thinking (Sendag & Odabas, 2009). The research results also represent that critical-based writing assignments and participatory teaching methods are positively correlated with critical thinking skills (Asgari, 2007; Hoseini, 2009).Regarding the continuous weakness in critical thinking, and considering the overlap of science structure and scientific research method with thinking structure, this research seeks to investigate whether the guided inquiry teaching method within the curriculum framework can be effective in the improvement of students' critical thinking skills? In order to respond to the question above, physics and sociology courses were selected among high school courses, and the following hypotheses were outlined and examined:

1) There is a mean difference between critical thinking skills in guided inquiry and traditional groups.

2) There is a mean difference between critical thinking skills in two courses of physics and sociology.

Treatment procedure:

The teacher's teaching method and lesson plan in the present study was developed on the basis of guided inquiry strategy. First, the researcher attempted to instruct the experimental group's teachers and thereafter, justify and teach the students to cooperate with the teacher. The treatment classes were managed with inquiry method together with collaboration in group arguments. In this model, after the subject was proposed by the teacher, the students in groups attempted to define the problem, study available sources and offer their viewpoints. In sociology, students offered solutions and argued them among the group. Afterward, each group's representative reported the results to the whole class. The teacher directed the students through offering essential clues. The students took notes of their viewpoints in their individual or group work folder. The results of group activities were written on the class board and were reviewed by the class in a teacher-led process. Later, being directed to modify their proposed solutions into correct ones, the students wrote the final results on the board. Finally, the students analyzed the problem-solving process by their teacher's assistance and offered other models and applied solutions. At the end of each session, the instructor introduced the main problem to be examined in next session and asked them to study about it using the internet and other available sources. The class was organized in small face-to-face groups. Each group's members were selected through group assessment and each group chose a director responsible for coordinating with teacher, summarizing, and presenting group activities to the class. Superior groups were privileged with marks assigned by the teacher. Physics course was instructed through group inquiry method within the framework of proposing problem, collecting and classifying information, theorizing, examining, conducting group arguments about the results, presenting the results in the form of an organized phrase or a formula, and analyzing performed stages to reform them. In traditional groups, teachers continued the usual teaching method.

Materials and methods

To conduct the present study, the quasi-experimental research design was applied. From the variant quasi-experimental designs, non-equivalent pretest-posttest controls design seems very appropriate. The most common quasi-experimental research design consists of two groups of experimental and control. The proposed design is a two-factor design consisting of the independent variables of teaching method and course as its factors. Given the design, the selected classes are randomized into two experimental and control groups. The critical thinking pretest was taken by both groups. Following the pretest, the experimental group received an instruction based on the guided inquiry teaching method, whereas the control group was instructed in the common traditional way. At the end of the treatment period, all participants took the critical thinking posttest.

Participants

Participants of this study were drawn from the whole second-grade high school students of Malayer city (a total of 3341 students, 1548 females and 1793 males), in 2010-2011 academic year.

Sample and sampling method

Sampling method used in this study is a combination of simple random, multi-step and cluster samplings. Given this purpose, through the utilization of random sampling, four high schools were selected out of the city high schools and afterward, four classes (two physics and two sociology classes) out of second-grade classes in each high school, were randomized into two experimental and control groups. Therefore, the class as a cluster was the last sampling unit. The selected sample included a total number of 190. Of these, 95 participants were female and 95 participants were male. In addition, the participants were homogeneous in a number of controllable features, such as age, academic grade, field of study, intelligence, and, place of study. Number of participants in each group (experimental and control), was recommended to be 15 at least (Cohen & Manion, 2000), following other previously-conducted researches which have utilized the same sample size.

Data Collection Procedure

In this study, the data was collected using two measuring tools. The data related to critical thinking skills was determined through Watson-Glaser test (form A) and the participants' demographic information was collected by a researcher-made questionnaire.

Watson-Glaser test of critical thinking

The Watson-Glaser test of critical thinking is a paper-pencil multiple-choice test with 100 questions, suiting to the reading level of a first-grade high school student. The test questions cover two substances: usual topics such as weather-based topics or scientific facts, and controversial topics concerning economy, politics, and social issues. The Watson-Glaser test of critical thinking essentially consists of 5 subscales to assess the critical thinking components, including conclusion, inference, recognition of assumptions, interpretation and, evaluation of arguments. The participants selected the best choice for each of the above five skills. These tools were repeatedly used in measuring the school and university students' critical thinking at the beginning and end of a curriculum, comparing the participants' critical thinking in different educational levels, and examining the correlation between the critical thinking and other variables (Behrens, 1996).

The validity and reliability of Watson-Glaser test of critical thinking test

The convergence method was applied to determine the construct validity of the Watson-Glaser test of critical thinking test. The correlation between California critical thinking scores and Watson-Glaser test scores was estimated to be 64% (r=64%). The significant and positive correlation indicated both tests measure the same construct. As a result, the Watson-Glaser test of critical thinking test has convergent validity. The test reliability was determined by Kuder-Richardson (73%) and test-retest (68%) methods (Asgari, 2008). In the present study, test reliability was also computed through Kuder-Richardson on the research sample (66%).

Findings

A) Descriptive: table 1 shows posttest mean scores and standard deviation for critical thinking in guided inquiry and traditional groups.

Table (1) shows that critical thinking mean score for students in the experimental group was approximately two scores higher than that in the control group. Table 2 shows Mean and standard deviation of critical thinking posttest in guided inquiry and traditional groups based on the subject.

Table (2) shows that critical thinking mean score for physics students in the experimental group was approximately three scores higher than that in sociology.

B)Inferential: Table 3 shows the results for analysis of co-variance test comparing posttest mean scores of critical thinking in two groups of experimental and control based on the subject. Regarding the findings shown in table (3), the impact of guided inquiry teaching method on critical thinking skills was significant. Therefore, the first hypothesis was confirmed on the account of the revealed mean difference between the critical thinking skills in guided inquiry and traditional groups. The impact of subject was significant, whereas its interaction with the teaching method was not so. Therefore, the second hypothesis was confirmed on the account of the revealed mean difference between the test results of critical thinking skills in physics and sociology courses, showing that the students in physics obtained a higher posttest mean score in critical thinking skills. Table 4 indicates analysis of co-variance test for comparing posttest mean scores related to critical

thinking subscales in experimental and control groups based on the subject.

According to the results stated in table (4), the impact of guided inquiry teaching method on conclusion subscale was significant. But the subject impact was non-significant, the interaction between subject and teaching method was not so. The impact of guided inquiry teaching method on inference subscale was significant. However, the subject impact was non-significant, the interaction between subject and teaching method was not so. For interpretation subscale, the impact of teaching method was not significant. Concerning the interpretation subscale, subject was significant, however the interaction between subject and teaching method was not so. Regarding assumptions subscale, the teaching method impact was not significant but the subject was significant and their interaction were not significant. Regarding argument appraise subscale, teaching method, subject and their interaction were not significant.

Discussion

Data analysis lends credence to the fact that guided inquiry teaching method had significantly increased critical thinking of second-grade high school students. These findings were in line with the other researchers' findings on thinking skills teaching (Schwartz, et al., 2003; Prince, Michael & Felder, 2006; Lu & Ortlieb, 2009; Lewittes, 2007). The results of test analysis related to critical thinking skills subscales indicated that the mentioned impact was created in conclusion and inference subscales. Therefore, we can conclude that students' critical thinking skills in both conclusion and inference subscales can be increased through the utilization of guided inquiry teaching method, yet in other subscales no considerable difference was observed. Critical thinking is a complex time-consuming process, requiring preparation for high-level intellectual functions. According to some researchers, being a long-term process, critical thinking must be improved from elementary school (Badri, 2007). Thus, 12 treatment sessions was less likely to create sufficient impact on critical thinking components.

In addition, the utilization of traditional method in other classes and cultural backgrounds can be considered as other factors that restrict the improvement of students' critical thinking skills and avoid realization of some subscales. In this respect, a number of theorists believe that critical thinking is a culture-related feature (Durkin, 2008; Atkinson, 1997). In the present study, critical thinking instruction was administered in relation to the curriculum. Many of experts assume that content knowledge in each course is correlated with the thinking skills and research methods thereof. As a result, these two can not be separately instructed (Paul & Elder, 2003; Lipman, 1991; Linn, 1983).

As results show, the impact of subject in assumption and interpretation subscales was significant. Physics students indicated higher improvement in these skills. This distinction can stem from the laboratory nature of physics course. According to experts, laboratory activities play a distinctive role in sciences curriculum and students' involvement in such activities is greatly advantageous.

These activities are sufficiently capable to improve critical thinking skills in form of research experiences. The main components in the structure of a scientific discipline have been formed through employing scientific research methods and thinking about that discipline, and the only way of understanding and applying these components can be through the utilization of thinking skills in that scientific discipline. Therefore, the course nature influences research and teaching methods affecting students' thinking skills (Linn, 1983; Paul & Elder, 2003). The guided inquiry teaching method in this study was proposed and administered using structure-oriented perspective, especially the social one. In this perspective, students' collaboration in knowledge building, utilization of problem-solving, and group discussion were emphasized, resulting in the improvement of students' thinking skills.

Table 1: Mean and standard deviation of critical thinking posttest in guided inquiry and traditional groups

Group	Mean	S.D
Experimental	52.97	6.78
Control	50.76	5.61

Table 2: Mean and standard deviation of critical thinking posttest in guided inquiry and traditional groups based on the subject

Group	Subject	Mean	S.D
Experimental	Sociology	51.45	6.86
	physics	54.52	6.39
Control	Sociology	49.36	6.90
	physics	51.95	4.92

Table 3: Covariate analysis to comparison of mean in post test of critical thinking based on the subject

Source	ss	df	Ms	F
Covariant(pretest)	281.83	1	281.83	8.23*
Covariant(mean)	176.23	1	176.23	5.15*
Covariant(intelligence)	20.30	1	20.30	.593
group	165.76	1	165.76	4.84*
subject	128.07	1	128.07	3.74*
interaction	.389	1	.389	.011

p<.05

Table 4: Covariate analysis to comparison of mean in post test of critical thinking sub scales based on the subject

Sub scale	source	ss	df	Ms	F
Conclusion	**Covariant(pretest)**	107.85	1	107.85	14.85*
	Covariant(mean)	15.07	1	15.07	2.07
	Covariant(intelligence)	19.39	1	19.39	2.67
	group	32.85	1	32.85	4.38*
	subject	14.32	1	14.32	1.97
	interaction	1.62	1	1.62	.223
Inference	**Covariant(pretest)**	28.11	1	28.11	7.47*
	Covariant(mean)	50.28	1	50.28	9.65*
	Covariant(intelligence)	.207	1	.207	.04
	group	22.28	1	22.28	4.27*
	subject	4.71	1	4.71	.905
	interaction	5.63	1	5.63	1.85
assumption	**Covariant(pretest)**	63.65	1	63.65	16.53*
	Covariant(mean)	5.51	1	5.51	1.43
	Covariant(intelligence)	2.15	1	2.15	.559
	group	1.60	1	1.60	.418
	subject	16.8	1	16.8	4.36*
	interaction	.229	1	.229	.o6
interpretation	**Covariant(pretest)**	38.31	1	38.31	5.86*
	Covariant(mean)	7.58	1	7.58	1.16
	Covariant(intelligence)	3.5	1	3.5	.535
	group	4.04	1	4.04	.619
	subject	17.15	1	17.15	2.62*
	interaction	16.48	1	16.48	2.52
Argument apprise	**Covariant(pretest)**	24.13	1	24.13	5.136*
	Covariant(mean)	10.02	1	10.02	2.13*
	Covariant(intelligence)	.084	1	.084	.018
	group	2.13	1	2.13	.453
	subject	.136	1	.136	.029
	interaction	1.57	1	1.57	.339

P<.05

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The Nights of Siavash Kasraie

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Abstract: The Night and its synonyms have always had beautiful manifestations in Persian speakers' poems, and this issue has been different in terms of approach and time. The poets of the despotism era, have seen the blackness and the oppression governing the society in the darkness and blackness of the nights in the nature, and took the refuge in it, inevitably, and by its help and other synonyms and antonyms and by the use of a code and symbolic language have described the situation and condition of people in that period. The result of such expression and description was the collection of poem, which were full of the word of the night and therefore, it created "the literature of the night." Siavash Kasraie, is one of these poets, who had a significant role in creating the "Night Literature."His nights are the nights, which ended with the hope of the morning
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1. Introduction

"Night" is one of the time keywords; however, it is not always used in the concept of time. There are few poets who have used this word in their poems; however, each of which have described it in accordance with the type of thought. Most of the classic poets' interpretations of the night are the phantasm, i.e., the night which has been formed in the poet's imagination. From the perspectives of the contemporary poets, especially the poets of Nimaie poem, the night has an objective image. When Nima and Nimaie poets describe the night, feel all the characteristics of the night completely. Yet, on the other hand, in the contemporary literature of Iran and especially in the She'r-No' "the night" finds a specific place as the result of events, hard and stressful conditions of despotism. The contemporary poet who could not express his ideas and thoughts clearly, and talk about people's hardships and pains, and criticize without any fear, took the refuge in the night to extract the symbols from its heart and behind the nested curtains of darkness and be able to show the depth of darkness and blackness of despotism. Therefore. He was forced to take the advantage of a special, and symbolic language to express the facts. The night, its synonyms, antonyms, and combinations were applied as the best tools by the poets, because the night with all its faces, and fundamental specifications, was the most suitable word with which the poet had the opportunity to state the oppression of authorities, as well as the dominant pressure on the society. The poets of these periods created thousands combinations, images, with the night in turn, paved the way to create a new literature, and caused resistance, and stability, and created the "night literature."

1.1. Siavash Kasraie and His Nights

Siavash Kasraie is one of the Nima's new verse (She'r-e No') "night composes composing" in this era, who had a significant and extremely high position in the creation of "Night Literature." Although his poems were published after the thirtieth century, he could open a new position among the peaks of poem and literature of his time, especially critical, social, and political poems. Ehsan Tabari has written in the introduction of the "The America, the America!" book:

"Since Siavash Kasraie started his own aware life, he entered the life battleground, with the provision of poems. The poet's spiritual survival was in the periods, which are regarded as the odd and tragic periods of human history. In such periods, in accompanied with other contemporary modern poets, Siavash created "the night literature." Symbolic and complex poems are full of grief and bitter streaks of pain and dysphoria, in its silent ash, the sparks of hope and quarrel flicker (Kasraie, Siavash, The America, The America!, pp. 6, 7). On December, 1953, only four years after the shameful coup, and at the time of repression, silence, wrote in a poem

silently, and quietly:
Take these cressets from the ceiling
Overthrow the light so that it dies
Take the eye-harming smoke
Pull down the flame, so that it survives (Kasraie, Siavash, Ava, 29).
He wants to turn off the lights the house similar to the lights outside the house, in the society, so that the society gets rid of darkness and blackness.
Cover, cover that aperture!
Make the dark night, darker

That it's not a long time the enchanter has been asleep
Leave them all, and pass this night!

One of the hard specifications of the life and political pressure is that one has nightmares. In the September, 1953, one month after the coup, he explained that he composed the night poem (Sher-e-Khab), and explained his confusions as the following: he has seen in his dream that "the sea was immersed into my bed," "the songs," "the colorful happy songs," and "his cries" all escaped from him.

And on the moonlight "a river of poison was poured" and "What happens to me with this dream wine?"

Being worried about this dream, he says "a red, bloody sunset will come, and turn into a bitter night. Whiteness leaves the day, and blackness overcomes, the clouds swallow like a lagoon, the spring of the Sun, and the night and darkness will govern the society, and the bureau of despotism will start taking the liberals' lives:

The sun melted into the lagoon of clouds
The night's daemons
Carved graves at the back of each wave
The sea cries into my bed

In people's silence, people take the liberals and intellectuals' coffins, which is followed by the happiness of daemons:

Silence and quiet
The moon's coffin are being carried in the silence of the city
The shadows are happy

While life is like a savory cup of poison for the poet, the coffin opens its mouth, follows him here and there. A hand follows him from the back of his head to press his throat; it seems that his feet have sunk in the tar, and his hands in the mud. However, he sees that the wings are fallen, and the sun of hope flames in the house of his heart.

Similar to a savory cup of poison, the sea
Comes to the lips of mine
The coffin runs after me with an open mouth…
A hand similar to the dried root of the trees
Grabs me from the back
My feet into tar
My hands in mud
The sun is flaming in my heart

At this moment, he calls his companions and fellows, but hears no voice, because his helpless fellows and those who should compose the poems of his dark night have ran away:

"The helpless fellows of mine!"
I call you, but hear no voice
"The fellows of mine, the dawn composers of my night!"
The fellows of my pain, escaped all from me (ibid, 38-9).

Inevitably, he takes the refuge in his tears to make him relaxed, and the winged-horses take him from the earth.

"The diamond of tears, come out of pearls"
"O, winged horse, releases me from the earth."
(ibid.)
Although he sees himself sinking in his dream, he observes a hopeful light with his worried heart among the jungle of waves in the horizon of his heart's window:
In the immersed bed of mine, in sleep
With the night light of the heart
The disturbed heart of mine
I run among the jungle of waves
Cries, cries
The day is clear from the window on the horizon.

In such a time when pressure and repression have closed all the mouths, and oppression has broken all the pens, the intellectuals and poets have made themselves busy with low-grade funs, some have been lost in the seclusion of their houses, while some others have found their interest in a meaningful silence. The darkness and blackness, winter and coldness, and silence and still do not have nay meaning for him, so he seeks light in the heart of darkness.

The author of "*Mosafer-e-Jadey-e-Khish [The passenger of his own Road]"* has written on this issue; "Kasraie is among the poets, who fly to the light and brightness at the heaviest moments of time, with his thoughts and notions. Even when, he does not have any interest in light out of everything, and in the cache of his own existence is the roommate with the sun (*Omr-e-Safar, [the age of Journey, Mosafer-e-Jadey-e-Khorshid [The Passenger of the Road of Sun]*, 59). The brave and liberal poet talks about "a dark and depressed night in a cold winter, in whose coldness, no flower except "the ice flower" is grown, and the light of no hope can be observed:

In such a narrow passage
In a such dark and depressed night
That from thousands of closed-lip buds of hope
No flower, except the ice flower, is grown in the snow and cold (Kasraie, Siavash, Ava, 71)

The poet looks at the nature and thinks about the winter of the nature, the grass rises below the soil, the springs comes out from the heart of the mountains, the morning smiles at people every day, and says a hello. The cloud is still moving angrily.. Yes, the end of the winter of the nature is the spring, and the migration of swallows, and new life of the nature. Therefore, the winter governing the society will end in the spring of freedom.

With the uprising of the grass from the soil
With the rise of springs from the rock

With the pleasant hello of the morning
With the escape of angry-voiced cloud
I'll open my heart
In accompanied with the wings of swallows
I'll fly the hidden scent of my thoughts

And finally, with a doubled hope, he talks about the flowers in this flowerbed on which the coldness of winter is not effective at all, and the scents of which will fill everywhere:

There are flowers in this flowerbed, which do not die of cold
And in this darkness of night until the morning
The scent of the desert does not take its expansion from us (ibid, 72).

As it was mentioned earlier, despite the fact that the poet, Kasraie, talked a lot about the night and lived in the dark oppressive night, did not take the black color, and did not surround by blackness. He believed in blackness, but not staying at night. He always believed to be hopeful, to live hopeful, and to stay hopeful. As the well-known researcher, Dastghaib, has written: "to be hopeful in the future, and to be happy somehow, and to look for the good day, when the ending part of the dark night is, all has differentiated Kasraie's poems from the poems of those who think an end has come into the world, and there has left no hope" (Dastgheib, A, *Ba Damavand-e-Khamoosh [With the Silent Damavand]*, p. 1).

Therefore, all his works prove that despair and death have not shadowed over Kasraie's life sky. Kamyar Abedi has indeed stated this point very well. He says: "in the Kasraie's mental continuity with life, pleasant continuity, despite the style of his poem, the political poem, we are faced with the poet, who understands the moments of life, and prefers the beauty of extended existence to not being darkened. His poem is political, yet not darkened. He gives news and talks about special painful spaces; however, its gift is not the darkness:

The sunlight helps me today
To get taller again
Help me to submit myself to your warm smile
More colorful than yesterday
My eye, did not sleep at night, every night
The sunlight, overturn the bowl
The night-color washed cheek of mine
The true-hearted butler fill it with blood (Abedi, Kamyar, Shaban-e-Bozorg-e-Omid [The Big Nights of Hope], 46-7).

Kasraie's groans and cries, are not due to his own pain and hardship. He does not care only about himself, or how making a living! And he thinks about the people and populace, and he wants to guide the wrecked ship of the society, which has tasted the coup and has fallen into the whirlpool of darkness, and is sinking in the horrible waves, to the safe seaside of rescue. Therefore, he goes to see the captain, who is experienced, and is one of the national epic-mythic champions. This savior is "Arash Kamangir," the one, who has placed all his existence and power in a warp arc to throw an arrow to the Oxus beach, and disappointed his enemy and has made his people happy. "Yes, Yes, his life in his deed's life/ he did the job of hundred thousand sword blades, Arash" (Kasraie, Siavash, *Arash Kamangir*, p. 27). Kasraie vivifies Arash in his poem, and puts him in front of people's eyes to resurrect honor, zeal, patriotism, in the society, man, women, child, and adult, oldster and youngster, boy and girl. First, he remembers the good last years of Iran:

"... I'd told, life is beautiful
To say or not to say, the point is here
The open sky;
The golden sunlight;
The gardens of flower;
The Huge plains;
Coming, going, running;
To make love;
To stomp with people's happiness;
To work, to work;
To relax (Kasraie, Siavash, Arash Kamangir, p. 12)

However, all those happinesses have gone today, and people's life has become dark and bitter. Yes, we should hear the rest from the poet, although he narrates the story according to the narrator in the past tense, because stating the people and country's situation is not possible and he should quote it.

There was a time;
A dark and bitter time
Our fate was dark, just like the day of our rancor;
The enemies were dominant in our life;
Life was as dark and cold as the rock;
The day of infamy;
The closed time (ibid., p. 15).

This bitter and black time, gets darker and bitter much more, and the cold, silent, and dark winters come, so that:

There were fears and the death wings
Nobody moved, even a leaf on the branch
The liberals' trench was silent
The camp of enemies was restless (ibid., 16)

At this time, the poet looks for a champion and says: Ah, where's the steely arm, and where the faith's hand is Arash enters the scene, introduces himself, and states that he is like a meteor, who will leave this dark cruel night behind:

I'm Arash, the liberal army
Elusive, like a meteor from the night
Like the ready-morning of visit (ibid, 19, 20)

However, he does not know the championship as the remedy for these hardships, but in order to achieve

the goal, one should sacrifice himself; the today's remedy of Iranians is sacrifice.

Yet, today's remedy is not power and championship
In this battle
On this existence-burning, order-making arrow
A feature should be taken from the existence to not stop flying (ibid. 21)

The beginning of the story is with snow, and cold, similar to its end. The ones who have been gathered in the cottage are the people of Iran who are kept waiting for the caravan alarm, and the hopeful poet, keep the flame inside the cottage, with putting firewoods. In order to vivify the glorious history of the Iranians, in the minds of Iranian's children, and to remind them the position and level of their history, and to warn them to observe what we were in the past and what we are today, permanently kooks at the back. Kamyar Abedi has written in the analysis of this story that :" the first interpretation of the poem is as the following, the song of hope, the poem, which brings hope to the hearts, and the wishes, which should not be forgotten. However, one cannot deny that the narrator starts in despair and darkness, and then he arrives at hope and light. In this passage to the light, a national epic is placed as the theme. The charm of the word is searched in a mythic hero. Arash Kamangir is a great hope and faith, which is composed at the end of the 50s, despite all the despairs" (Abedi, Kamyar, *Shaban-e-Bozorg-e-Omid [The big Nights of Hope]*, 61-2). Another type of these poems is the poem of "*Mojasamey-e-Ferdowsi [Ferdowsi's Statue]*." In this poem, he talks about the Ferdowsi's masterpiece, and the fire of his word. It is interesting to know that, Kasraie has known the time of Ferdowsi's performance in creating his eternal-letter, in a dark and febrile night, and it is the reminder for those who struggle in the dark night of darkness, and have kept silence:

One night here, in a burning fever
The earth has shaken, it is broken, and rubbed out
Has opened the mouth, and gave birth to a spring
On which there is a lip, a boiling lip
(Kasraie, Siavash, Ava, 9)

He believes that the words, which have come out of the Ferdowsi's lips, are the enemies' eradicator, and his mouth is the eternal volcano of the history. The pearls of his words are like the darkness-burning galaxy of the oppressor's despotism nights and etc, and the god of victories has sworn on those lips, and has kept them alive:

A lip, which
Has eradicated the root of the enemy
A lip, volcano, the eternal, invulnerable
The lip of history
A lip similar to the galaxy, the torch-taker of the nights
The god of victory has sworn on this lip many times (ibid., 9, 10).

The inexhaustible combatant, the liberal poet, continues his attempt in this regard. This time, he asks Kaveh Ahangar (the blacksmith) for help, the leader of people's revolution who have been suffered from the Zahhāk's oppression, and asks him to raise his leather apron on a spear, and make people uprising.

O', oldster, Kaveh Ahangar
You heated many furnaces with your warm breath
What iron bars you smelt to make swords
The children are murdered one by one
When you'll raise the leather apron, O' old,
O' father?! (Kasraie, Siavash, Vaght-e-Sokot Nist [There's no time to be Silent], 27-8).

Yet, Kasraie's other method to fight against the night, is to invite people to unanimity and struggle. He believes that people with their sunny hands, which are long and strong, will press the throat of the dark night and murder it:

It's time to shake the night's fence
From the fear of our anger
It's time to press the throat of the dark night
The hands of the sunlight
In front of our eyes
Believe o' comrade!
With our silence
We open the battlefield
For the night's darkness… (ibid. 54)

In fighting with "Shaban-e-Dir Pa" (long-term nights) which are hard and tiring nights asks Damavand for help, and he invites Damavand to break its silence. "However, the most painful thing for the poet is that everyone is silent against these deathlike nights. The silence, which burns all the past words of the stump. For this reason, the poet has talked about the Mountain Damavand, which is the secret of the glory and greatness of Iran, and calls people to resist and fight, in the poem "*Ba Damavand-e-Khamoosh, [with the Silent Damavand]*."

Hello, O' glorious,
Hello, O' morning-riser, glorious peak,
The naked night left with no star
The look of our hands, blank
The silence of burning of the roots of the past green words,
Say, say, that it's your time to speak
You say with the language of tiny flame, and heavy words,
That tonight, is much harder than our long-term nights
Talk, do not close your mouth on talking; (Kasraie, Siavash, Ba Damavand-e-Khamoosh [with the Silent Damavand], 71-3).

This poem, reminds us the Malak Al-Shoara' Bahar's "Damavandieh" poem, in which he also asks the silent Damavand to break its silence like the old times, and rains the volcano of its message over people. "Don't be silent, speak/ don't be depressed, laugh." The events, revolution, and great social-political events, which change the society, affect the poetry and literature. One of those events was the uprising of Siahkal in February, 1970. It is natural that after this uprising, many new words, idioms, and expressions entered our literature and poem. According to the contemporary writer of the Iran's literature "the commitment to the party and ideology has always determined the nature and destiny of Kasraie's poem" (Roozbeh, Mohammad Reza, 96).

He was mostly affected by this event, and this impact manifested in his poems. "In the poem of Moghavemat *[Resistance]* the addressee is the populaces. Therefore, the poet, puts the poem as a furious weapon in the service of social and public ideals. Therefore, the low-interest poetry of complex and intellectual symbols turns into a heavy and strong expression, to be a raiser, and a motivator. Such an expression requires explicitly and slogan-likeness partly, in turn, is regarded as the components and characteristics of the poetry in the 50s (70s). (ibid. 97).

Another description of the night can be observed in the poem "Safar-e-Daryaee" (the Cruise). In this poem, the poet talks about the night in which the fire is flaming, but the sea (the society) is quiet, and under the shadow of the cloud, and by the pleasant music of the waves, and the cradle of the water, the moon has slept deeply.

The night's body is burning
The bud of cloud has opened over the night
The lullaby of the sea breath
Has made the moon sleep,
Above the cradle of the water, (Kasraie, Vaght-e-Sokot Nist, [It's not Time to Be Silent], 93).

However, the poet's benighted heart cannot sleep and relax, and it is burning with hot fever, and this fever is because of the fever of the night's body. He has packed the luggage, but he doubts:

In the benighted heart of mine, but
Sleep doesn't give any relaxation to me
My body's burning of the night's body
The darkness has lost the color in the depth of the night
I've packed my luggage on the sea;
I can see the footprints of all the passengers on the sea
Why I have doubts, then? (ibid., 94).

Another of the poet's trip is the "Safar be Ghare Shab dar Taboot" *[Travel to the Depth of Night in the Coffin]*. The travel to where it's hard to breathe, and the mobility is low

We travel to the depth of night in the coffin
The weather is bad
It's hard to breathe
Mobility is less (Kasraie, Be Sorkhi-e-Atash, Be Tam-e-Dood [As Red as Fire, With the Smoke Flavor], 17).

The city again is living in a cold fever, and the travelling is very slow, the poet sees himself a benighted meteor, who is rotating around a dark orbit; He asks himself, what to do, and where he is, and where the safe city is for him:

The dumb city is sitting in the cold fever
And there's not a way out of the hole of the coffin
We travel to the depth of the night slowly
What are we doing?
Where are we?
A benighted meteor in the orbit of darkness (ibid., 17)

Now, he is threatened from right and left, and a trap is placed in his way. He is wandering like a fish in the black waters of the ocean.

Attacks from right and left, traps in all ways
The move of fish's terror in the black waters
But, it's not lost the hope, anyway
Hiding the bony body of hope in the hug
We travel to the depth coffin-like of the night (ibid. 18).

The most significant point, which should not be overlooked, is the Kasraie's beautiful descriptions and combinations of the night. The creator of the valuable work of "*Mosafer-e-Jadey-e-Khorshid, [the Passanger of the Sun Road]*," the researcher of the Kasraie's works has written: "the combinations and descriptions that Kasraie has seen in the face of the night, are very pleasant and interesting. The fence of the night, the flower of the night, the mountain of the night, the paving of the night's tad, the burning night; however, the most beautiful one is the emotion that the poet feels "dropping of a bitter night in the cup of his own eyes" in a red sunset. Has shaken in the seaside, the red sunset A bitter night dropped in the cup of the ways of mine and went to sleep (*Omr-e-Safar, [The Age of the Travel]*, *Mosafer-e-Jadey-e-Khorshid [The Passanger of the Sun's Road]*, 130).

The descriptions of the plains' nights are one of the most beautiful Kasraie's descriptions. When he knows the nights, eternal, boundless, infinite, and free from all the bonds:

The plains' nights are free from bonds
The silent plains' nights are the silence of the winds
O' infinity,
I'm that plant, with the hope of living
Have roots to everywhere in the soil
O' infinity

Even, one flower hasn't been flourished by the hands of mine, thorns
I've flourished a flower with reed everywhere
(Kasraie, Siavash, Khoon-e-Siavash, [Siavash Blood], 99).

He, who believes himself, deprived of everything he has, whose wishes have all gone with the wind, states that the only reason for his staying is his interest in and attachment to his country.

Yes, it's me who is burnt in thirst of water
I'm waiting for a cloud and rain, but, alas!...
If a cloud reaches for me, is the clipper horse
If this rope hasn't been tied to my foot
I wouldn't have ran someday like a pigeon
If I weren't interested in my country
I would tear my robe like the wind on my body, one night (ibid,. 100).

Of course, Siavash Kasraie's the night letters are so high in numbers, that it can be regarded as an independent issue of a book. However, we have to suffice to this amount. The last part of this discussion is allotted to "the Lyrics for the Tree," where he addresses the tree and the tree is no one just the poet himself. He says:

You're the tall stature of desire, O' tree
Here is the night, and all you see are the benighted ones
Here are the night and the benighted ones, whose eyes
Haven't seen any morning
When you've seen the day?
The sun?
You're sunk in watching in the plain of eyes, O' tree (Kasraie, Ba Damavand-e-Khamoosh [With the Silent Damavand], 17).

2. Discussions

Regarding the above-mentioned facts, it can be concluded that these poets, scholars and intellectuals, took the refuge in the inside of themselves when they were placed in the closed space, and the oppression of tyranny, and stated their and other people's hardships and problems with creativity and their symbolic language. One of these symbols is the contemporary periods are the word of "night." Applying the word of "night," and creating thousands words, combinations, and images became a basis for the modern literature in the poetry and creating the poems, which were later called "the night's literature." Some of the Nimai poets, including Nima, himself, have more roles in this field. After Nima, Sivash Kasraie, resisted more than the others in this regard, he talked about the night, and did not take the color of night, and stayed hopeful for the morning of the victory.

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The Comparison of "intellectuality" in Ibn Khaldun and Imam Muhammad Ghazali's Viewpoints

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Abstract: Discussing and arguing the range of intellectual knowledge and its boundaries, are not a new issue among the scholars; however, this discussion has been among them, and has arranged one of their significant mental concerns. On the other hand, this discussion has existed among the followers of all the religions including Judaism, Christianity, and Islam; and it can be stated that this discussion has affected the history of human thought. In the range of religions, there has always been a difference among the types of followers' viewpoints on this issue; some group has relied on the sanctity and dignity of the religion, and believed that rationality can never touch religion. The other group has decreased the dignity of religious doctrines and has denoted superiority to the intellect and its data, and the third group, have continually tried to match and harmonize these two tools. Therefore, the present article, tries to conduct a comparative study on intellectualism from the perspectives of Ghazali and Ibn Khaldun, as one of the basics of these two scholars' anthropology.
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1. Introduction

"Intellectualism" in Persian has been translated as "wisdom," in French it has been translated "Raison," and in English "Intellect Intelligence," and in Latin "Ratio Intelligentia" however, in the lexicon, it means "forbidden and prohibited." It is named in this way, since it is like the camel tethered, because the intellect deters its owner deviating from the right way, similar to the tethered, which stops the camel. The populace applies the rationality in three meanings; first: it means the human's dignity, so, its definition is that the intellect limits the human in speech, gestures, behaviors, and authorities. Second, it is said to the general sentences, which are achieved by the human. Therefore, the intellect is a collection of meanings, which are collected in the mind, and it is like the preparations through which all the purposes and materials are perceived. Third, it means the correctness of the basic nature in the human. Therefore, it is defined as the power, which perceives the good, evil, defect, and perfection of things. The philosophers have used the intellect in the following meanings: 1. the first meaning is that they have been stated that the intellect is the extensive essence, which perceives the facts of objects. This compound essence is not perishable from the faculty. This essence is naturally immaterial, and is simultaneous with it in practice. Quoting to the immateriality of the intellect exists in most of the philosophers writing: Farabi says that the intellect faculty of the extensive essence is symmetrical with the material, which exists after the death of the body, and is a unique essence and is the human's fact. Wherever Ave Sina names the intellect faculty, the title of essence is given to it. He believes that the essence that is far from the intellect faculty is the intellect, and it is just the self of speech, to which everyone is mentioned. 2. The second meaning is defined as: the intellect is the faculty of the self, from which the meanings, imaginations, compounds, and the comparisons are derived. The difference between the intellect and sense is that the intellect can separate the form of the material and formats, but the sense cannot. Therefore, the intellect is the immateriality and abstraction faculty, which separates the forms of the objects of their materials, and perceive the general meanings such as essence, body, cause and effect, fate, and good and evil means. This faculty owns different stages for the Islamic philosophers. First, is the monstrous intellect, or the absolute talent of perceiving the comprehension? It is attributed to the monster since the self is similar to the superior monster, which is free from the general forms in its nature at this stage. It is synonymous with the potential intellect and it is the intellect, which is like a writing tablet with nothing actually written on it. Second, is the acquired intellect, which includes the intellect to the necessities and the self-talent to acquire the theories with the necessities? Third, the actual intellect, which means that the theories are acquired through repetition in the intellectual faculty, so that superiority is achieved for this faculty and the owner, is able to present the meaning forms whenever he likes without any effort for recalling. Four, the Active intellect: where all the theories are present in the intellect and they do not get absent. In the Islamic scholars' beliefs, the active intellect is

present beyond the human intellect which imparts the meaning forms to the existence and perishable world. These forms are present in the active intellect since it is active. However, these forms are only received as the result of passivity of the universe. When the connection of human intellect to the active intellect intensifies, it knows everything on its own, which is called the divine intellect. According to Aristotle, all these issues indicate that the agent intellect is the intellect that abstracts the general meanings or forms from the sensual and slight formats; while the passive intellect is the intellect in which impression is formed. 3. The third meaning of intellect is that it is the faculty of impact on decision making, i.e. it is the power to distinguish good from evil, and right from wrong. This discrimination is not acquired through comparison and thought, but it is achieved directly and naturally. It seems that as "Razi" believes, it is the instinct, the requirement of which is the knowledge of general and obvious affairs. "Descartes" has this meaning in his consideration, and stated that the first principle of his method is that nothing is regarded as the right, generally, unless its facts turned on as the intellect improvisation. In this regard and in this meaning, the intellect is against velleity, which prevents the human from the discriminating faculty. The fourth meaning of intellect is that intellect is the natural faculty of the self, which prepares it for acquisition the scientific cognition. This scientific cognition is separated from the religious cognition, which is based on revelation and faith (Gottfredson, L. S. (2004).

The fifth meaning of revelation is assuming that the regular a priori collection of intellect is the cognition, such as the principle of contradiction, the principle of causality, and the principle of finality. What distinguishes these principles is that, they are general and independent in comparison with the necessary experience. Lebniz believes that a human is distinguished from a non-human through perceiving the eternal and necessary facts. Therefore, the human is created and formed in the intellect and science, and soars to the cognition of his nature and perception of God. Monadologie is the meaning, which has been expanded under the influence of Kant in a new philosophy. The sixth meaning of intellect is that: the intellect is the faculty by which the direct intellects to the absolute facts are achieved for the self. If we believe in the unity of intellect and its subject, intellect means the absolute self. In this meaning, the intellect is something independent of us, and we perceive it from the outside, such as breathing the air. Any of us knows that in his body, some intellect is limited, the laws of which cannot be right, unless they are derived from the stable eternal general intellect. 7. The term of intellect refers to the total collection of the self-duties that belong to the achievement of cognition including imagining the law, and the arguments to name a few. Its synonym in French is "Intelligence," and its synonym are mind, and understanding, and it is something except intuition and instinct. The faculty of fast understanding is called intelligence. 8. The absolute and the practical intellect: Kant attributes these two terms to what is in mind in comparison with the previous experience. By this, he means a transcendental faculty, which implies the previous basics and is independent of experience. If we consider that it is including the previous basics of scientific cognitions, it is called the theoretical or reflection intellect, and if we consider it, according to the previous basics of the ethics laws, it is called the practical intellect. Kant has applied the intellect in one absolute and specified meaning, and has attributed it as the faculty of higher intellectual, which creates some abstract meanings in our existence, including the meaning of self (ego), the meaning of God, and the meaning of universe. By this meaning, the intellect does not stand against experience, but it stands against the cognition (engenderment). This intellect has a specific scientific arena including the ethical certainties such as the meaning of the freedom of the eternal self, and the existence of God. 9. The constitute et raison Constituent Raison, according to Lalande, the Constituent Raison is the faculty, by which every human can extract the general and essential principles of the relations. This intellect is the same for all the people. However, the constitute et raison is the collection of rules and regulations that we trust in our reasoning's. This intellect is different in terms of people and time. Despite these issues, it is always tending to the unity. It seems that the Constituent Raison is wise, and the constitute ET raison, the rational. 10. Is the intellect attributed to the intellect? It is named as intellectual bases, intellectual sciences… Hegel says that every rational is really the existence, and every real existence is rational. And it is an intellect, which means theoretical, and reasonable. In psychology, the intellectual life stands against the passive or the conscious life and the active life. The intellectual values are against the artistic and ethical values. 11. The wise, is the orator existence or the one who is characterized by intellect. Everyone who says the human is the wise existence, he means that the human is distinguished from the animal by the intellect. Moreover, the wise means the one who think correctly and his sentences are correct about the objects, and do the correct job, and the condition for being wise is that the person is benevolent opposite to the unwise who uses his thoughts in evil deeds, and therefore he is not called

the wise, but he is called smart or cunning. 12. The originality of intellect, means the priority of the intellect, and is applied as the following meanings: first, the belief that every existence owns some cause, so that there is nothing in the world without the absolute reference. Second, is the belief that the origin of cognition is the previous and necessary intellectual principals, not the emotional experiences, because these experiences do not get the general intellect? In this meaning, the originality of intellect equals with "ampirisme," and its followers believe that whatever exists in the intellect is as the result of emotion and experience (ampirisme). Third, is the belief that the intellect is the condition of experience (ampirisme) possibility? Fourth, faith and belief in the intellect faculty to discern the facts, the reason of which is that the rules of intellect are according to the rules of external objects, and every existence is rational, and every rational is the existence. Therefore, when it is stated that: the intellect is able to dominate all the objects, it is without any assistance or help from the heart, instinct, or religion. Their theory is against the theory of fideistes, who believe that the intellect is not able to discover the fact, and the inspiration and revelation are only able to discover it. 4. The originality of intellect in some of the religious scholars' term means the faith belief is in accordance with the precepts of intellect. The originality of intellect is in three parts according to this definition: first: the intellect is the necessary and adequate condition for recognizing the religious truths. Second: avoidance of any opinion, the proof of which is not possible by the intellectual principals. Third: advocating the faith opinions when their religious validity was assumed so they can be proved intellectually. 13. Intellectualism is to say that whatever is existence is returnable to the intellectual principals. It is the religion of Descartes, Spinoza, Lebniz, Wolf, and Hegel, and is specifically attributed to a theory, which attributes the sentence to the mind, involuntarily. Therefore, there's no chance for the conscious and voluntary phenomena in the deed of the mind. Intellectualism is against the voluntarism, which means it knows the effect of will in sensual life more than the effect of intellect (Taitslin, Anna (2004).

2. The Intellect from the Perspective of Ghazali

One of the hardships that one might face in Ghazali's works is the incompatibilities that are seen in his works, and one of them is his various statements about "intellect". Ghazali, sometimes limits the intellect in terms of reasoning, and sometimes he enters it into the realm of faith, and it seems that the meaning he infers from the intellect is not the previous-stated meaning. Sometimes it seems that his confidence in intellect is weakened or limited, and sometimes he denotes a full consideration to it in all the fields (Hughes, A .2002). Anyway, according to Ghazali, the intellect is led in the beam of Sharia, and the one who has not collected the intellect and Sharia together, has lost something; the intellect is the interpreter and the explainer of the Sharia and Sharia is the leader. He believes that in the conflict of quoted evidences with intellect, the intellectual reason is prior, and where some frequency, conflict exists is impossible to be created between the intellectual and the quoted reasons. Ghazali analyzes the intellect in this way: Be aware that there is an eye in the human's heart, whose perfection attribute is exactly in this way, and it is the one, which is sometimes interpreted as the intellect, soul, or the self (ego). Leave the expressions alone, because whenever naming is abundant, synonymy increases for less knowledgeable people. By this expression, we mean, the meaning by which the wise is distinguished from the baby, animal, and insane. According to the philosophy, it is called "intellect."(Morris, James W. 2008). One of the most significant issues under the tile of intellect is the relationship between the intellect and the Sharia. Despite all the Ghazali's analysis on the intellect, he believes that its insight is limited and the way to the oracular issues and heavenly universe, is blocked. Moreover, he believes that the foot of intellect and reasoning, and discovering the secrets of creation, and recognizing the existence is lame and non-obedient. According to Ghazali, above the stage of intellect, there is another stage of perfection, at which another eye of intuition opens, and the human is able to perceive the unseen, and the future issues, and all the other issues, which are not possible to be perceived by wisdom. He knows Sharia as the external intellect, and the intellect as the internal Sharia, which are united, and unanimous. Despite this issue, he believes that the boundary of Sharia and intellect in terms of recognition and cognition is different, and believes that they are separated from each other, and states that the arena of intellect is limited in recognition of the objects and cognition of the facts, and the radius of its perceptions is limited at a certain distance. The intellect is able to discover only the generalities, without perceiving its details as they are; however, the Sharia, is both aware of the generalities, as well as their nature and details, and the difference between these two is clear. Therefore, as Ghazali believes, the cognition of Sharia is more complete than that of the intellect, and therefore, it is necessary for the intellect to seek the Sharia in the minor issues, and in fact the Sharia is the intellect higher and premiere than the nature of the intellect, itself. Therefore, if these two become united, they will turn into a united intellect, which make no

mistake in their perceptions and mysticisms. However, if they are separated, the intellect will make mistakes and errors in the minor issues[6]. Furthermore, on one hand, Ghazali criticizes the absolute imitator, who has removed the intellect from the judgement completely, and knows him unwise and unaware, and on the other hand, he criticizes the followers of the absolute intellect, who trusts only in the intellect, severely, and discouraged the humans from this extreme, and suggests that the both factors should be considered (Hennig, Boris (2007).

3. The Intellect in the perspective of Ibn Khaldun

In order to study the intellect in the perspective of Ibn Khaldun, we first state the issue of causality in his perspective slightly. "Taha Hossein" stated that Ibn Khaldun believed in the issue of causation, it is stated on the issue of intellect, and not similar to the perspectives of the opponents of the intellectual philosophy such as Ghazali, and Hume. Although "Taha Hossein" declared that in the origin of causation, Ibn Khaldun believes that there are some exceptions such as the things that take place in the field of miracles, and greatness[8]. Anyway, it is possible to state Ibn Khaldun's opinion about the origin of causation, regarding the chapter that he has written on the issue of the word. When he writes: "all the incidents in the universe, whether the human or the non-human deeds, are inevitable of the means and reasons prior to them, with which they have been created in the place of habits, and the existence is completed with them…, and the form of the effect of these means is unclear in many of their causes. Because recognizing those means is stopped on the habit and their companionship is through the citation to the appearance and the fact of its effect and impact is passive. "What is given is only a bit of science." Therefore, we are ordered to deny it and pay attention to Allah, the creator of the means (Weiss, Dieter (1995))."In these expressions, the effect of Ghazali on Ibn Khaldun is completely clear, and it can be stated that Ibn Khaldun, is higher than Ghazali in terms of emphasis on the inability of the human reason in understanding the quality of the means impact in creating the incidents. Therefore, Ibn Khaldun gets closer to the contemporaneous scientific tendency. Similar to Ghazali, he believes that we perceive the origin of causation through habit; however, he mentions to the issue that this habit is not safe from errors and mistakes, because our knowledge is limited to the means and therefore it is necessary to be attentive to "Allah", the creator of means. Therefore, according to Ibn Khaldun, the sciences which human investigates and distribute with the purpose of education and training is in two types; One type: is the natural sciences, which is understood by his own thought, the second type: is the sciences quoted, and the human understands them from the one who has created them. The first type: is the cognition and philosophy and it is the cognition to which the human can find a way with the nature of his own thought, and recognize the issues, the reasoning method, and the kinds of its trainings with the perceptive faculties of his own so that the human is able to recognize good from evil since he owns the faculty of thinking. The second type: Are the traditional (quoted) sciences. These sciences are all documented to the awareness of the religious legislator. There is no place for intellect in these sciences, unless the secondary issues attach them to the principals. It means that the issue of religion is based on the facts that have been revealed by God. However, the issue of science is based on the facts that are possible to be recognized with the natural intellect without any external help, and this natural intellect has three stages in the perspective of Ibn Khaldun: 1. the distinguishing intellect, 2. the experiential intellect, 3. the theoretical intellect.

4. The Similarities and Differences between Ghazali and Ibn Khaldun viewpoints about the Intellect

It seems that Ghazali's viewpoint about the originality of intellect has been more effective than his viewpoint about the originality on causation on Ibn Khaldun. Similar to Ghazali, Ibn Khaldun believed that the human intellect is limited and it is not able to perceive the existence facts, except in a limited area, from which it cannot go further. This opinion has been stated in a dispersed way in the introduction and in different positions. In one of these positions, he has stated that "do not imagine that your wisdom is able to govern the universe, its means, and the explanation of the whole existence, because it is a foolish imagination. It should be noted that at the outset existence is limited for any perceiver to the perceptions of his feeling (Ibn Khaldun.2008) and does not exceed from that, while the fact of the issue is something contrary to that, and the right is beyond that". There is no doubt that Ibn Khaldun has obtained this opinion from Ghazali, because one can see some strange similarities between the sentences of Ghazali and Ibn Khaldun especially in stimulating the intellect to a pair of balances. However Ibn Khaldun has gone much further than Ghazali in interpreting the intellect. As we observed, Ghazali believed that the intellect is incapable of perceiving the divine issues. However, Ibn Khaldun believes that in addition to the divine issues, the intellect is incapable of perceiving the social issues. Ghazali stated that those, who only study the intellectual sciences, will decrease the perceptions and intuitions as much as they scrutinize the divine sciences. While,

Ibn Khaldun believes that in addition to that, their insight will be decreased in the perception of politics and other social issues (Ibn Khaldun.2008).

Ibn Khaldun has written a chapter in the introduction under the title of "on the issue that scientists are the farthest people in terms of politics and its methods[12]" By scientists, he means the ones who follow-up the postulates. He says about them, that they are used to scrutinize the concepts and separate them in their mind and abstract them as the general issues, to decree on them generally, and try to match the general implementation above the politics and other policies of the community; therefore, they are absolutely unsuccessful in politics. In the viewpoint of Ibn Khaldun, politics make the researcher needy to the stages of development- as it is found in the external universe. It happens many times that the common intellectual generalities are contrary to the minor issues existing in the external world. Therefore, a common man with an average IQ is more successful than a philosopher, because he has observed the issues with his emotional nature, and he does not predicate the sentence with the analogy or generalization. In fact, he is like a swimmer, who does not keep distance from the seaside when the sea is wavy. At the end, Ibn Khaldun writes that "… based on this, it is made clear that the philosophical talent is not free from mistakes and errors, because there are many abstractions in it and no one pays attention to the perceptible issue…" Ibn Khaldun has stated his idea more clearly at the end of another chapter of the introduction under the title of "Annulment of the philosophy and the destruction of its followers." He mentions the philosophy that is followed by the philosophers is incapable in two respects: one from the angle of theology and the other from the angle of physical creatures, which is called as the natural generality by the philosophes. The inability phase of logic from this angle is that the mental results achieved from definitions and analogy is uncertain and not compatible with the external facts. "Except in the issues in which the intuition is evidenced, and in this case that the intuitive evidence is superior. Therefore, where are the proofs for which they are looking? (Ibn Khaldūn. 1967)

It gets clear, from here that Ibn Khaldun has expanded Ghazali's thought and has placed it in a position upon which Ghazali does not agree, because Ghazali does not credit the sensory perception and similar to the predecessors, he believes it is insignificant and abolished. It even can be stated that Ghazali believes in two kinds of logic in the thought. One of them is the "Aristotelian Logic," which is valid in all the sciences-except-theology. Yet, the other one is the "intuitive logic" that is stated in the issues related to theology. While, Ibn Khaldun adds another logic named "sensory logic" to these two logics, which is valid in perceiving the social issues. It seems that Ghazali wanted the social issues to be subordinated by Aristotelian logic similar to natural sciences. While Ibn Khaldun states that although such sciences as geometry, and mathematics, are affected by the Aristotelian logic, recognizing the society is not subordinated by the above-mentioned logic. In his idea, recognizing the society is necessarily derived from the senses. And if "abstraction" increases, no one can escape from its negative consequences. In Ibn Khaldun's viewpoint, sense is much more suitable than the logical induction/deduction and intellectual abstraction in perceiving the social affairs; therefore, Ibn Khaldun believed in three kinds of logic rather than two kinds (Ibn Khaldun.2008):

1. Intuitive logic: which is suitable for the divine and spiritual affairs?
2. Intellectual logic: which is suitable for inductive/deductive issues such as Maths, Geometry?
3. Sensory logic: which is suitable for social and political issues?

5. Discussions

Nowadays, the comparative study is highly significant in the field of research. Since the comparative studies like the present one, supply the reader with the common and distinguishing points as well as the strengths and weaknesses of the scientists and scholars and furthermore, provide the intellectual contexts among the followers of religions, these studies are more significant. This issue, however, seeks to provide a major purpose, which is the comparative assessment of the verbal opinion of Ghazali with that of Ibn Khaldun. Therefore, exploring their viewpoints, is in fact exploring the viewpoints of the two Islamic scholars, especially by regarding the fact that both Ghazali and Ibn Khaldun are philosophers, speakers, and the heirs of Islamic tradition. Of course, it is highly significant to know that Ghazali's life has been the incursion arena of different courses of thought, and some part of his life has been spent by learning the knowledge of language and word, and he has been regarded as the theologians of Ash'ari School. Yet, another part of his life has been spent in the jurisprudence. He has spent the end of his life to mysticism by ignoring all the previous knowledge. This article paid more attention to the final part of his life, which is the period of mysticism, and this period of his life is the aim of comparison with that of Ibn Khaldun. Therefore, it can be concluded that although Ibn Khaldun is affected by Ghazali in some issues, there are clear differences between their viewpoints. In the

field of intellectual sciences and discussions, Imam Muhammad Ghazali has priority and precedence to Ibn Khaldun, both qualitatively and quantitatively. Ghazali owns more works and he has entered the issue of intellect much deeper than Ibn Khaldun. However, the framework of both discourses is traditional, and the both scientists criticize the issues of intellectual field from different perspectives.

Table1: The comparison of Intellect in Ibn Khaldun and Ghazali Viewpoints

Distinguishing Points	Common Points	The common and distinguishing points between the viewpoints of Ibn Khaldun and Ghazali
1. Ibn Khaldun has gone much higher than Ghazali in the review of intellect. Ghazali believed that intellect is incapable of perceiving the divine issues. However, Ibn Khaldun believed that in addition to the divine issues, intellect is incapable of perceiving the social issues. 2. Ghazali stated that the people, who just focus on intellectual sciences, will decrease their perception, as much as they scrutinize the divine sciences. 3. Ghazali believed in two kinds of logics: one of them was the Aristotelian logic that is valid in all the sciences-except theology, and the other one, the "intuitive logic", which is related to the theological issues. While Ibn Khaldun added another logic named "sensory logic" to them. 4. Ghazali believes that the sensory perception is not valid, and similar to the previous philosophers regards it insignificant and abolished; however, Ibn Khaldun, believes that the sensory perception is valid in perceiving the social issues. 5. Ghazali wanted the social issues to be subordinated by the Aristotelian logic similar to the natural sciences; however, Ibn Khaldun states that although such sciences as geometry and mathematics are affected by the Aristotelian logic, recognizing the society is not subordinated by the above-mentioned logic. In his idea, the social recognition, is necessarily derived from the senses, and in the case of increasing the "abstraction" and the distance of sense, there is no escape from its negative consequences.	1. They both believed that the human intellect is limited, and believed that it is incapable of perceiving the existence facts 2. On the issue of intellect, neither of them had serious innovation, and each of them quoted some part of the predecessor. 3. Each of them is the critic of philosophers and philosophy from a specific perspective. 4. They both, believed that the Sharia is the winner in the discussion of intellect and Sharia, and believed that the intellect should be in accompany with the Sharia. 5. One can see a close similarity between the expressions of Ghazali and Ibn Khaldun, especially in the simile of intellect to a pair of balances.	

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Review and identification of tourism potentials of Isfahan using SWOT model

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Abstract: Understanding of potentials and capabilities of each geographical area in all economic, human, and natural fields helps researchers and planners to identify and introduce the directions of development in that area according to current state and local strengths. Tourism is an effective part in the process of economic development. This industry is the world's largest and most popular service industry that inattention or less attention to its tacit and explicit achievements is inexcusable. Reasonably, this industry should be seriously taken into account in order to achieve short-term and long-term economic gains. This paper aims to study the tourism strengths of Isfahan Province. Isfahan is of great importance due to the many tourism attractions and its position in national and transnational level. The research was done in form of a survey and data were collected using questionnaires. Obtained data and information was analyzed using SWOT model. The results showed that Isfahan, given its unique environmental, historical, and cultural capabilities and talents, can become a national and regional tourism hub by proper planning with investment of public and private sectors.
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Keywords: Tourism; Natural potentials; historical attractions; Isfahan; SWOT model

1. Introduction

In today's world, humans need rest and recreation more than any time. Recreation and fun are vital to reduce physical and mental stresses caused by working day and night. Travel and leisure have become a serious necessity since the 17th century. Human has always thought about visiting the new lands. Creation of IT, cultural, social, political, and economic infrastructures has caused tourism phenomenon an undeniable reality. Traveling with various incentives is one of the necessities of life in the 21th century. So, a current has come to existence which sweeps the national and international boundaries. Special look to tourism industry indicates that it creates a series of cultural, economic, social, and environmental effects and changes in each country. The approach of tourism towards geographical areas has created significant impacts in tourism destinations. Common behavior of human groups that have geographical and spatial dimensions and reflections of this behavior can affect geographical environment. Comparative studies on tourist attitudes and policies play an important role in national development of each country. Tourist movement between geographical areas as tourism destinations involves an exchangeable business. This industry has created a large economic process in cooperation with organized capitalism. Consequently, tourists achieve one of their most critical needs which is leisure activities. Nowadays, tourism has become one of the most job providing and profitable service industries. Tourism organizing in one place is a critical and scientific necessity, since tourism planning involves understanding the behaviors of tourists in a place. Many believe that local communities and geographical areas are the central core of tourism destinations and a successful and healthy plan is an appropriate criterion to measure the success of tourism industry. Unique geographical and historical capabilities of Isfahan caused this region to be considered as one of the most attractive tourism destinations domestic and foreign tourists. Emphasizing on history and culture of Isfahan, this paper aims to describe the available evidence. The study of strengths of this area and literature, processing their content, information and data collection from internal and external resources, and the use SWOT model helped us to come to a conclusion. Isfahan is one of the most attractive areas of Iran. This article is adapted from a thesis centered on tourism potentials of Isfahan. SWOT model was used in this study to analyze the results. Firstly, the current situation and the past trends including the role and importance of tourism, tourism attraction and tourism development bottlenecks were reviewed by descriptive analysis of statistics related to the topic and then some issues such as development strategies of local and foreign tourism, credit policies, and administrative, executive, educational, research, and cultural investment were discussed.

1.1. Theoretical foundations of research:

Tourism is studied with certain diversity by experts and researchers due to its interdisciplinary

features. The distance was emphasized in tourism and tourists were divided according to their distance from home. America's National Commission on Tourism (1973) defines domestic tourism as all trips that their distance is more than 50 miles except business trips. From the perspective of geographers, tourism is defined as the time to rest and do leisure and recreational activities which require overnight absence (Burkart, A., & Medlik, S. (1989)). This includes any activity such as travel planning, going to destination, accommodation, return, and even reminiscence of travel. World Tourism Organization (WTO) has proposed technical and comprehensive definitions of tourism which are based on differences in perspective and approach to the visiting places and parameters affecting tourism and also different perceptions of the concept of tourism. According to WTO, tourism is the activity of people who leave their home for leisure, work or other reasons and accommodate in the destination there for one consecutive year. WTO also defines domestic tourism as the travel of native people who travel within the borders of their country for less than 12 months for different reasons except business. This organization also defines international tourism as the travel of people to a foreign country for at least 12 months for different reasons except business. From a sociological perspective, tourism is a series of relationships that a tourist develops with people living in that area in his/her temporary accommodation. Honzicker Cruyff believes that tourism is the development of a series of relationships as a result of travel and accommodation of a non-indigenous people without permanent stay and employment in a place (Kotler, P., Bowen, J., and Makens, J., 1996). From a systematic and holistic view, tourism is a set of phenomena and relationships arising from mutual interaction between tourists, capital of host governments, host communities, universities of host countries, nongovernmental organizations in the process of attraction, transportation, reception, and control of these tourists and other visitors. The review of previous research on tourism industry indicates that limited but remarkable classical and academic studies have been carried out. The process of scientizing tourism was started from the 1960s. Tang and Rochanoud (1990) ranked top 32 countries. The results of this study showed that weather, natural attractions, social position, cultural situation, and life expanses are the most important factors in attractiveness of tourism destinations and trade facilities, transaction, and proximity of destination are less important, from the view of the respondents (Heath, E., Wall, G., 1992). Cloverdon (2002) studied the performance of tourism industry in developing countries of south of Africa and possible outcomes caused by effective factors in development and its obstacles. He used statistics of tourists in south of Africa and descriptive statistics method to evaluate and compare tourism industry in these countries. Prof. Ehlers Descartes, lecturer of Geography Institute of Philips University of Germany, studied the touristic structure and importance of Imam Square of Isfahan and effects of this industry on the growth of Isfahan. Alireza Esmaeilian, in the Journal of Research and Economic Policies, introduced tourism attractions of Isfahan and evaluated the capabilities of this industry. This study calculated the amount of employment in the accommodation, transportation, visited places, and existing markets and proposed policies, general strategies, and executive strategies in order to overcome the current problems of this industry. This study was adapted from a research conducted by the organization for Economic Affairs and Finance. Faranak Seyef al-Dini, Associate Professor of the Department of Geography of Tehran University, conducted a study entitled *Assessment of quality and capacity of urban tourism based on behavioral pattern of tourists and host communities in Isfahan* with the help of a group of students of this university. In this research which was carried out in 2009, historical, cultural, and religious potentials of Isfahan and touristic, industrial, and agricultural role of Isfahan as a major tourism hub with multi-functional role were studied.

Cultural Heritage and Tourism Organization, Isfahan's Academic Center for Education, Culture & Research, Isfahan Municipality, and Islamic Azad University have published papers, books, and research projects on tourism and its capabilities in Isfahan.

2. Materials and methods:

Library findings and theoretical foundations of research were collected by content analysis method. Tourism potentials and attractions of Isfahan were studied using a combination of survey, descriptive, and analytic methods. Data were collected using interview, observation, and questionnaire. Questionnaires were handed out among 300 foreign tourists in Isfahan's hotels in 2011. SWOT model was used to analyze the obtained data and propose a strategy for tourism development. According to this model, an analysis aimed at evaluation of environmental opportunities and threats and strengths and weaknesses is needed. In fact, analysis of the strengths and weaknesses in the internal environment and analysis of opportunities and threats in the external environment are discussed. According to studies done on internal and external environment of the area, a list of strengths, weaknesses, opportunities, and threats was prepared. Then, priorities were determined by asking the ideas of foreign tourists and finally appropriate strategies were proposed to reduce

weaknesses and threats and enhance strengths and opportunities. Isfahan has a surface of 15263 Km^2 and is 1570 m above sea level. Isfahan which is placed in the center of Iran consists of 6 counties, 19 villages, and 14 cities and has a population of 1986542 people. Relative population density of this area is 123 persons. Historically, this area has been a bridge between low-lying parts of the East of Iranian plateau and western mountainous lands and has long been a haven for the frostbitten coming from West and those tired of dry and hot air of East. The position of Isfahan plain in the deserts of central Iran and central mountainous block and the importance of its particular communicative situation in the Central Iranian Plateau have associated the history of this area with the history of Iran. Isfahan has been shining on the darkness of human civilization for centuries with a wealth of art and culture and the shining of its minarets and tiles has caused the admiration and wonder of the world. Historically, Isfahan is the place where art, technology, and spirituality were created in. Natural attraction such as deserts, Zayanderud River from origin to catchment, Gavkhouni Swamp, Sofeh Mount, protected areas, sand dunes, and etc alongside cultural and historical attractions including mosques, minarets, churches, historic bridges, dovecotes, squares, fire temple, the large market, historic schools, traditional architecture, and unique crafts annually attract thousands of domestic and foreign tourists to this area. Central position of Isfahan and being the intersection of north, south, west, and east and having a good network of roads, highways, railroad, and international airport have caused Isfahan to be the host of a huge number of domestic and foreign tourists every year. Daily traffic from all parts of the country in this area has made Isfahan an important passage intersection. A brief reference to the natural, cultural, and historical capabilities and potentials of this area is presented here. Zayanderud River is one of the largest rivers of Iran which flows from west to east and is the main cause of verdure and fertility of this region. After a 360-km journey through mountains, valleys, plains, orchards, woods, marshes, and farmlands, Zayanderud reaches its tomb in Gavkhouni Swamp and is the only river that does not end to the sea. Sides of the river are a lovely place to rest for travelers, tourists, and local residents. More than 28 bridges have been constructed on the river that besides the beautiful landscape, many of these bridges have an ancient history which attracts tourists. Gavkhouni Swamp is the catchment of Zayanderud River and a protected treasure of natural and cultural landscapes of the past. Touristicaally, Gavkhouni Swamp is interesting for both ecotourism enthusiasts who are in search of pollution-free and fresh air and tourists who love pristine natural landscapes of desert areas and observation of stars in desert nights. This swamp is a good recreational place and has interesting fields for research. Unique plant species, salt marshes, animal species, glider flight, camel riding, motorcycling, and wilderness hiking are some attractions of this area. Isfahan city, located in the center of this area and the heart of Iran, is a historic city that its monuments and architectural style has a global reputation. After Tehran and Mashhad, Isfahan is Iran's third populated city. Isfahan is known by different titles such as "Half of The World", "Paradise", "Museum of the Middle East", and the best, most comprehensive, and most prosperous region of Persia, according to Nasser Khosrow, a famous tourist. Valuable historic collections of Isfahan include the oldest and most valuable monuments which are architecturally unique. Isfahan has a high capacity to attract international tourists in order to present a better understanding of the history, culture, and natural environment of Iran to the world.

Naqshe Jahan Square had been one of the world's largest square in the 17th century AD. Jean Chardin, a French traveler, called this square the most beautiful square of the world. This square was a place for official ceremonies, Friday market, playing Polo, and so on during the Shah Abbas Safavi. European travel writers and tourists have written as lot about the greatness and functions of Naqshe Jahan Square. Sheikh Lotfollah mosque, situated on the eastern side of Naqshe Jahan Square, was the exclusive mosque of Shah Abbas family. This mosque is the most beautiful valuable architectural, artistic, and religious masterpiece of the world. The dome of this mosque is 32 meters high and its construction took 17 years. Qeysarieh portico is located at the main entrance of Great Market and north of this square. Since this portico was inspired from a building in Kayseri city of Turkey, it is called this. This complex is considered one of the attractions of Isfahan. Ali Qapu ((Turko-Persian word for Imperial Gate) mansion is a building which had been originally the entrance of State House of Safavids. Its height is 36 meters and has 6 floors. Ali Qapu Palace is located on the west side of Naqshe Jahan Square with a area of approximately 1800 m^2. Churches are other tourism attractions of Isfahan. Armenians have lived in Iran from very past and mostly and most of them are living in the neighborhood of Julfa in Isfahan. They have constructed many churches for their ceremonies prayer. Vank Cathedral is one of the oldest and most famous of them. Building materials and architecture of this church is different from stone churches of Armenia. The building of this church was built by local materials and raw clay. The dome of church is circular and like the dome of mosques. There are 8 windows around the dome that images of the creation of Adam and Eve, eating the forbidden fruit, and the

death of Abel can be seen between them. This church today is more a cultural-religious complex and tea house, library, museum, and offices have been created there. Vank Cathedral is one of the most beautiful and famous churches of the world and one of the most spectacular tourism attraction of Isfahan that clearly demonstrates the peaceful coexistence of different ethnic and religious groups in this city. Dovecotes are another tourism attraction of this area. Dovecotes were built by farmers in the desert for pigeons to rest in. There were more than 3000 dovecotes in this region but in 2011 only 300 of them were identified and 65 of them has been recorded in the national index of cultural and tourism heritage. Dovecotes were built for many reasons such as keeping pigeons away from farms, the use of pigeon's droppings as fertilizer, and preying on harmful insects. They are artistic masterpieces and were built by clay, straw, and salt which were resistant against heat and cold and also were thermal and sound insulation.

1.2. Typology and type classification of tourists that visit Isfahan:

Due to favorable natural condition, being located in the geographical center of Iran, ability to communicate with other parts of the country, and cultural and civilization manifestations, Isfahan has long been a good place to attract tourists. Throughout the history, Isfahan has repeatedly been the capital of Iran and now is an architectural treasure that magnificent works of historical period's especially Islamic civilization can be seen in a corner of it. These buildings and attractions are the resultant of some arts like tiling, brickwork, plasterwork, woodcarving, decorative arts, painting, calligraphy, etc. There are a variety of tourism attractions in this area. Historical, artistic, and religious attractions and natural landscapes have been combined in such a way that is unique in the country. According to previous studies and considering environmental condition and capabilities of Isfahan areas, 10 touristic categories are active in this area that will be briefly described (Figure 2). Some believe that Isfahan is the kiblah of historical and cultural tourists, because Isfahan is a collection of historic buildings with architectural styles of various historical periods. Historic monuments, religious buildings, traditional architecture, historic cemeteries, museums, palaces, mosques, churches, and old houses are some of these attractions. Those who travel to know about culture and civilization of nations and see cultural patterns, rituals, traditional economic activities, architectural styles and visit the museums are called cultural tourists. Numerous university students, many museums, theaters, cinemas, population diversity, special local dishes, souvenirs, and unique handicrafts are some features that attract many historical and cultural tourists to Isfahan (Table 3). In urban tourism, travel and movement of people is intended to gather information, gain experience, meet the wishes that are the incentives of travel. This can include visiting a historical site like a mosque or church, attending a fair or a scientific, athletic, and artistic festival, or travel in order to enjoy places such as parks, a new monument, and watching a sporting event. Isfahan is one of the Iranian cities which have a global reputation. Isfahan city, the center of this area, is adopted sister of 15 cities of the world due to cultural conditions. Isfahan has been introduced as the cultural capital of the Islamic world by Organization of Islamic Conference (OIC). Shores of Zayanderud, numerous parks and gardens, four-season weather, and beautiful landscapes attract many tourists from all parts of country that travel to this area for rest and doing leisure activities. Additionally, due to the central location of Isfahan and as thousands of passengers from north, south, west, and east pass through this area every day, they usually have a layover in this area to rest and visit tourism attractions of Isfahan. Large populations of people that sometimes reach a few million visit this area at different time and in all seasons, especially during March, April, and May. Desert hiking is one of the types of ecotourism in Isfahan. A large part of this region is covered by desert. These areas have the potentials of ecotourism and geotourism. Nowadays, these attractions have a lot of fans in the world. Unlike physical violence, deserts have extraordinary potentials such as moonlit nights, starry and smooth sky, ability to produce clean energy, and so on which have made deserts an appropriate place for excursion and scientific trip for nature lovers. Walking on the desert soil is the easiest sport that can be enjoyable. Bicycling, motorcycling, camel riding, skiing, and Rally racing are sports that have many strong supporters in this area. Existence of several centers for specialized and super specialized health care and medical and laboratory equipment have promoted health tourism in Isfahan. Existence of Alzahra, Dr. Shariati, Kaveh, and Milad hospitals and also construction of a large Health Town promise the development of health and medical tourism in this region. Historical-religious monuments from the reign of Safavids era, mosques and religious schools, and Armenians churches have given a special cultural and religious diversity to this area. This ethnic diversity and cultural and religious richness provide a variety of capabilities to adopt an appropriate strategy in order to organize different aspects of religious tourism which is a kind of cultural tourism. Takhte Foolad Cemetery is the second important cemetery of Islam world, because of it has a very old history and the tombs of many famous philosophers and mystics are located

there. This cemetery has an area of 175 Km^2 and is located in southeast of Isfahan. It was recorded as an historical-religious monument in the national index of cultural and tourism heritage in 1996. Several books have been written about Takhte Foolad Cemetery.

3. Results

1.3. Evaluation of tourism income for the area:

Costs that are paid by tourists, including the cost of meals, recreation, accommodation, local transportation, sightseeing, tours, internet, telephone, and souvenirs are like the export of goods and services to the country of tourists which is calculable as invisible exports and increase national income. Many countries acquire large incomes from tourism and tourism's share in national income is growing in some countries. Tourism revenues in an area can be calculated by different methods which depend on statistical data. Tourism income of Isfahan in one year is calculated in this paper. Total amount of money spent by tourists or the income of suppliers of tourist services besides the request to use accommodations, restaurants, recreation centers, historical monuments, transportation, and so on.

Revenue from tourism is calculated using the following equation

X =X 1 + X 2 + X 3 + X4 +X5 +..... +XN

Each of these variables is one of the above capabilities. Although this calculation is not free of error, incomes were calculated by this formula in order to present a defensible conclusion of tourism revenues.

1- Income from accommodation (hotels and guesthouses): According to available statistics, more than 90% of foreign tourists were staying in hotels and guesthouses of Isfahan in 2010. The income of this part was calculated 33600000 dollar.

2- Income from the purchase of souvenirs: If 50000 tourists (from 75000) arrived in Isfahan in 2010 have bought souvenirs (about 500 dollar), an income of 5000000 dollar must have been obtained.

3- Income from visiting tourism attractions: If any of the 75000 foreign tourists have visited tourist attractions for 5 times, 375000 tickets are sold and the revenue obtained from this part is 11250000 dollar.

4- Income from food: Foreign tourists have paid almost 7 dollar for both lunch and dinner meals which exceeds 2940 million dollar during the occupancy.

5- Income from transportation: If it is supposed that any of 75000 tourists stay in Isfahan for one week and if transportation cost for each person a day is 35 dollar, income obtained from this part will be 18375000 dollar.

So, the following equation includes all income of tourism in a year in Isfahan:

X =X 1 + X 2 + X 3 + X4 +X5 +..... +XN

X = X 1(33600000) + X2 (5000000) + X 3(1125000) + X4 (2940000) +X5(18375000) =61040000

4. Discussions

1.4. Analysis of findings:

The results of this study show that 75% of the respondents have a university degree and 70% of them were more than 40 years old. About 78% of tourists stated visiting historical and architectural monuments as their first incentive of their travel. So, this hypothesis that cultural and historical potentials attract many foreign tourists to Isfahan has been confirmed. Naqshe Jahan complex, Vank Cathedral, Isfahan Bazaar, and shores of Zayanderud are mostly visited by visitors. From the perspective of tourists, the facilities provided in tourism sites were investigated 45% favorable and 40% unfavorable. 52% and 45% of the respondents evaluated the accommodation facilities favorable and unfavorable, respectively. Travelers and tourists visiting Isfahan include 50% European, 18% from the Middle East, and others were from other parts of the world. More than 52% of tourists had planned a more-than-2-week trip which is a positive point. About 35% of tourists have traveled to Isfahan more than once. More than 90% of tourists had no problems with the police. More than 80% were satisfied with the behavior of local people. 72% have stated that they like to travel to Isfahan again. Travel agencies and friend and acquaintances were the information resources of 35% and 30% of tourists, respectively.

2.4. Analysis using SWOT model:

SWOT model assesses opportunities, capabilities, weaknesses, and threats. This assessment is derived from strategic planning of Harvard model which is applicable in both public and private sectors. According to this model, which emphasizes on capabilities of an organization, strengths and opportunities should be used to overcome weaknesses and threats. Emphasis on opportunities and strengths as the most important factor to achieve an effective strategy overcoming shortcomings and minimizing threats is the most positive aspect of this model. Analysis based on this model is a brief summary of the strategic analysis. External environment (opportunities and threats) and internal environment (strengths and weaknesses) are studied in this model. Recommendations and operational solutions for proper use of tourism potentials of Isfahan are proposed by prioritization of strategic issues.

Table 1: Analysis of tourism potentials (internal factors) of Isfahan using SWOT model

weaknesses	Strengths
Lack of scientific and expertise planning	Central position of Isfahan
Seasonal dryness of Zayanderud	High natural potentials
Intense migration to Isfahan	Unique historical potentials
Inadequate accommodation and welfare facilities	Ethnic and religious minorities and churches
Weak information systems	Unique handicrafts
The need for reconstruction and restoration of monuments	Gavkhouni Swamp and deserts
Inconsistency between decision makers and enforcement agencies	The historic city of Isfahan
	Grand Bazaar in Isfahan
Low quality and high price of handicrafts	More than 300 dovecotes
Inconsistency in historical part of city	High physical and financial safety
Low qualitative and quantitative capacity of facilities	High level of culture and hospitality of people
Lack of trained and skilled manpower	Zayanderud River
Vague objectives and policies of executive officials	Land and air transportation
	Big steel industries
	Being adopted sister of 15 cities in the world
	Birds, flowers, and butterflies gardens

Table 2: Analysis of tourism potentials (external factors) of Isfahan using SWOT model

Threats	Opportunities
Tremendous and non-normative growth of urbanization	Government assistance and support in investment
	Much enthusiasms for travel to Iran
Loss of old part of Isfahan city	Easy access to Isfahan from all parts of the country
Loss of quiet atmosphere of region	Global reputation of Iran's and Isfahan's art and culture
Environmental pollutions	
Improper exploitation of the bed of Zayanderud	Cultural, artistic, and scientific festivals
High density of population in this region	Increased private sector investment
Instability and multiplicity of prices	Construction of appropriate highways, railway, and airport
Fuel rationing	
High cost of domestic tours	Development of appropriate ways to access areas
Cynicism towards tourists	Deployment of trained guides
Negative propaganda against Iran	Introducing tourism as a scientific subject
Seasonal drought of Zayanderud	

Table 3: Matrix of strategic analysis of tourism potentials of Isfahan using

Strategies for utilizing opportunities to eliminate weaknesses	Strategies for utilizing the strengths to take advantage of opportunities
Conducting studies and scientific research on tourism	Reconstruction, maintenance, and restoration of monuments
Reducing or eliminating the strict rules of tourists' entry	Providing conditions for cultural tourism
Training courses for tourist guides	Holding cultural, scientific, and athletic festivals
Avoiding improper administrative and disciplinary treatments	Exploiting the potential of natural attractions
Appropriate advertising in abroad through Iran's executive agencies especially Cultural attaché of embassies	Ecotourism potentials of deserts
Establishment of an agency to attract tourists in cultural department of all embassies	Ecotourism potentials of Gavkhouni Swamp
Review the services provided to foreign tourists	Benefiting from the increased motivation of people to travel
Changing the negative views to tourists	Enjoying the beautiful landscapes
Unified decision making and serious accountability	Planning for low-momentum tourism
	Securing investment in tourism sector
	Easy and cheap access
	Creating incentive for travelling again
	Desert tourism facilities

Table 4: Matrix of strategic analysis of tourism potentials of Isfahan using

Reducing weaknesses to avoid threats	**Using strengths to avoid threats**
Paying attention to the capacities of historical, cultural, and architectural sites Reducing environmental pollution in the area Introducing the capabilities of Isfahan through internet, television, and satellite Allocation of funding for tourism development Discussing tourism as a scientific subject in the academic centers Supporting the tourist agencies and private institutions Efficient management between agencies involved in Tourism Pathology the way the local communities deal with tourists	Avoiding unnecessary construction around the historical sites and the river shore Removing the cultural effects of negative advertisement of competitors Treating tourists with hauteur and generosity Serving tourists as guests Diversification of tourist services in order to satisfy the tourists Preventing the uncontrolled growth of prices of goods and services Preventing any physical and mental cause of insecurity

Table 5: Matrix of SWOT model of tourism potentials of Isfahan

	Opportunities	**threats**
SWOT analysis	Government assistance and support in investment Much enthusiasms for travel to Iran Easy access to Isfahan from all parts of the country Global reputation of Iran's and Isfahan's art and culture Cultural, artistic, and scientific festivals Increased private sector investment Construction of appropriate highways, railway, and airport Development of appropriate ways to access areas Deployment of trained guides Introducing tourism as a scientific subject	Tremendous and non-normative growth of urbanization Loss of old part of Isfahan city Loss of quiet atmosphere of region Environmental pollutions Improper exploitation of the bed of Zayanderud High density of population in this region Instability and multiplicity of prices Fuel rationing High cost of domestic tours Cynicism towards tourists Negative propaganda against Iran Seasonal drought of Zayanderud
Strengths Central position of Isfahan High natural potentials Unique historical potentials Ethnic and religious minorities and churches Unique handicrafts Gavkhouni Swamp and deserts The historic city of Isfahan Grand Bazaar in Isfahan More than 300 dovecotes High physical and financial safety High level of culture and hospitality of the people Zayanderud River Land and air transportation Big steel industries Being adopted sister of 15 cities in the world Birds, flowers, and butterflies gardens	Competitive strategies Reconstruction, maintenance, and restoration of monuments Providing conditions for cultural tourism Holding cultural, scientific, and athletic festivals Exploiting the potential of natural attractions Ecotourism potentials of deserts Ecotourism potentials of Gavkhouni Swamp Benefiting from the increased motivation of people to travel Enjoying the beautiful landscapes Planning for low-momentum tourism Securing investment in tourism sector Easy and cheap access Creating incentive for travelling again Desert tourism facilities	Diverse strategies Avoiding unnecessary construction around the historical sites and the river shore Removing the cultural effects of negative advertisement of competitors Treating tourists with hauteur and generosity Serving tourists as guests Diversification of tourist services in order to satisfy the tourists Preventing the uncontrolled growth of prices of goods and services Preventing any physical and mental cause of insecurity
Weaknesses Lack of scientific and expertise planning	**Revised strategies** Conducting studies and scientific research on tourism	Defensive strategies Paying attention to the capacities of historical, cultural, and architectural

Seasonal dryness of Zayanderud Intense migration to Isfahan Inadequate accommodation and welfare facilities Weak information systems The need for reconstruction and restoration of monuments Inconsistency between decision makers and enforcement agencies Low quality and high price of handicrafts Inconsistency in historical part of city Low qualitative and quantitative capacity of facilities Lack of trained and skilled manpower Vague objectives and policies of executive officials	Reducing or eliminating the strict rules of tourists' entry Training courses for tourist guides Avoiding improper administrative and disciplinary treatments Appropriate advertising in abroad through Iran's executive agencies especially Cultural attaché of embassies Establishment of an agency to attract tourists in cultural department of all embassies Review the services provided to foreign tourists Changing the negative views to tourists Unified decision making and serious accountability	sites Reducing environmental pollution in the area Introducing the capabilities of Isfahan through internet, television, and satellite Allocation of funding for tourism development Discussing tourism as a scientific subject in the academic centers Supporting the tourist agencies and private institutions Efficient management between agencies involved in Tourism Pathology the way the local communities deal with tourists

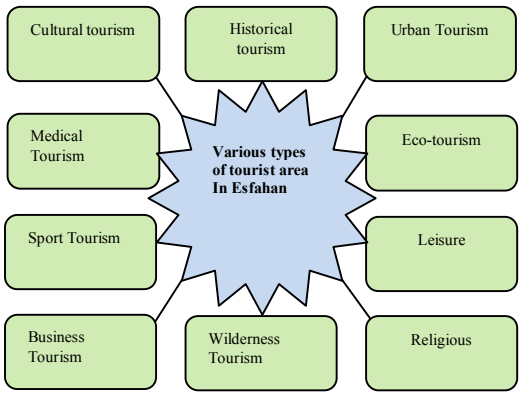

Figure1: Various Types of Tourist in Esfahan

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