

## Effects a Recommended Recreational Program for Racquet Sports on some Physical and Technical Variables and Self-Concept of University Athletes

Nihad Moneer Othman Al-Bateky

Department of Health and Recreation, Faculty of Physical Education, University of Jordan, Jordan

[dr.nihad\\_albatikhi@yahoo.com](mailto:dr.nihad_albatikhi@yahoo.com)

**Abstract:** The current research aims to identify the effects of a racquet sports recreational program on some physical and technical variables and self-concept of student athletes. The researcher used the experimental approach (one-group design) with pre-, intermediate and post-measurements. The researcher purposefully chose (46) recreational student athletes – Faculty of Physical Education – Jordan University during the second semester. Only (39) students completed the program while (7) were excluded due to non-punctuality. The researcher used a test battery for physical and technical variables in addition to TSCS scale. Results indicated that: - The recommended racquet sports recreational program had positive effects on some physical variables of student athletes. -The recommended racquet sports recreational program had positive effects on some technical variables of badminton of student athletes. - The recommended racquet sports recreational program had positive effects on self-concept of student athletes.

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**Key words:** recreational program – racquet sports – self-concept

### 1. Introduction:

Several studies tried to understand self-concept and its relation to some variables in sport in addition to the effect of these variables on sports participation through modifying self-concept in individuals who participate in sport (4: 316). Self-concept is significantly related to body weight in adults. In addition, self-concept is related to gender as adult males have higher rates of self-concept axes compared with females (19: 69-79).

Mohamed Hassan Allawy indicated that during recent years several major developments occurred and became a major focus of sports psychology. One of these developments are self-concept, self-esteem and self-disclosure as major attributes of the character in sport control and identify individual's motivation and emotions (11: 5, 22). Therefore, self-concept is closely related to self-esteem and inner conviction of competency, moral and personal value and self-disclosure (2: 91-92). It is not a mere reflection of a what person can see in the eyes of others. Instead, it is a true complex psychological variable that actively affects and modifies human behavior significantly (1: 201) (20: 93).

Toma Khoury clarified Carl Rogers' opinion in self-concept as the individual does not respond to his/her objective environment. Instead, he/she responds to how he/she perceives it regardless any personal biases (17: 46).

There are several categorizations for self-concept since ancient Greek philosophers like Plato and

Aristotle who dealt with self-concept as an identity. This led to a long history of debate among thinkers. During the renaissance period they tried to distinguish senses from its mental perceptions like reasoning. James categorized self-concept into four categories: physical self, social self, martial self and spiritual self. The researcher tends to categorize self-concept into three categories: ideal self, public self and actual self.

Conflict may rise between actual self and ideal self, and sometimes public self also, and this leads to stress and anxiety when the individual self-concept is threatened by denial and ignorance from others so that the individual can protect his/her self-concept (2: 89).

Kamal Darweesh & Amin Al-Kholy indicated that play and recreational activities are major aspects in developing human behavior along growth stages as humans learn by playing more than any other activity (10: 4).

Tahany Abd El-Salam indicated that recreation promotes joy and satisfaction and eliminates shyness and this promotes self-confidence, self-assurance and self-value in addition to promoting social values acquired during participation like friendship, cooperation, optimism, desire to life, accepting others and adapting to the group (18: 118-119).

Accordingly, physical fitness is consistent with self-concept due to their mutual effects. Sports participation in recreational program has significant effects of self-concept. According to the researcher's knowledge, no previous research dealt with this issue for university student athletes (beginners) who use

modern training technology like ball canons in table tennis.

The researcher is trying to identify, scientifically, the effects of this technology on recreational participation in racquet sports and self-concept for specialized students. It is a try to prove that sports participation changes personality traits through identifying the effects of physical training through a recreational program for racquet sports on supporting self-concept, especially as this training technology is not familiar in Jordan. Also, individuals differ in their abilities to gain psychological benefits from recreational racquet sports programs.

This research provides a new recreational badminton program for student athletes that can be applied in Jordan that can replace other non-scientifically calibrated programs that may or may not achieve its objectives.

The current research may lead to some conclusions that identify the changes accompanying racquet sports recreational programs in the participant's character, especially self-concept, as physical ability is very important for self-concept.

**Aim:** The current research aims to identify:

1. The effects of a racquet sports recreational program on some physical variables of student athletes
2. The effects of a racquet sports recreational program on some technical variables of student athletes.

3. The effects of a racquet sports recreational program on self-concept of student athletes.

4. The difference between pre- and post-measurements of self-concept of student athletes.

**Research questions:**

1. What are the effects of a racquet sports recreational program on some physical and technical variables of student athletes?
2. What are the effects of a racquet sports recreational program on self-concept of student athletes?
3. Are there any statistically significant differences between pre- and post-measurements of self-concept of student athletes?

**Methods:**

Approach:

The researcher used the experimental approach (one-group design) with pre-, intermediate and post-measurements.

Participants:

The researcher purposefully chose (46) recreational student athletes – Faculty of Physical Education – Jordan University during the second semester. Only (39) students completed the program while (7) were excluded due to non-punctuality. Table (1) shows descriptive data on height, weight and age for all participants indicating data normality.

**Table (1): Mean, SD, median and skewness of participants on descriptive data (n=39)**

Variable	Mean	SD	Median	Squeness
Height (cm)	174.5	7.14	171.13	1.415
Weight (kg)	61.91	3.12	60.5	1.355
Age (month)	247.32	2.47	244.33	1.210

**Data collection instruments:**

A restameter for height – a medical balance for weights – stopwatch – table tennis robot for ball serve and receive in table tennis – authorized table tennis racquet – authorized table tennis balls – authorized squash racquet – authorized table tennis table – Tennessee Self-Concept Scale (TSCS).

Physical and technical tests:

1. Lay down bending trunk (abdominal endurance 30 sec)
2. Inclined prostration bending arms (arms endurance 30 sec)
3. Standing high jump (leg muscular power)
4. Standing long jump (leg muscular power)
5. Standing prostration (agility 60 sec)
6. Power agility test
7. Table tennis forehand serve velocity (5 balls) (by the researcher)
8. Table tennis backhand serve velocity (5 balls) (by the researcher)

9. Squash Front serve velocity (5 balls) (by the researcher)

Tennessee Self-Concept Scale (TSCS):

The scale was Arabicized by Mohamed Hassan Allawy and Mohamed Al-Araby Shamoun. It includes (100) items describing self on (9) axes:

1- Actual self	4- Physical self	7- Family self
2-Self satisfaction	5-Moral / Ethical self	8- Social self
3-Self perception	6- Personal self	9-Self criticism

The scale can be applied individually or in groups. It is suitable for all age groups from (12) years old. Each individual responds according to his/her own self-concept on five-point likert scale (1-5). Sum of scores for each axis identifies self-concept on this axis. The scale has no total score (2: 152-167). It is suitable for all socio-cultural backgrounds and demographic variables (age – gender) do not affect its scores (13: 634).

The scale was validated through content validity, distinct validity, comparison with other scales and personality changes under certain conditions (13: 8). It was applied in Jordania environment by Ben Al-Mokhtar, A., Helmy, R. & Eyd, H. and Al-Sokkary, A. (13: 7-10) (12: 126) (7: 62-63).

According to the researcher’s knowledge, this is the first study to use this scale in Jordan on athletic

participants. Therefore, the researcher recalculated validity and reliability of the scale to verify it again as validity and reliability are prerequisites for good scale (21: 26). Distinct validity was calculated through applying the scale to two groups (athletes = non=athletes = 20) from students of faculty of physical education – Jordan University. Table (2) shows difference significance between the two groups.

**Table (2): Distinct validity of Tennessee Self-Concept Scale (n1=n2=20)**

Axes	Athletes		Non-athletes		(t) calculated value	(t) table value	P
	Mean	SD	Mean	SD			
Physical self	56.66	6.84	53.23	7.13	2.10	1.68	*
Moral / Ethical self	53.78	5.63	49.44	6.48	3.39	1.68	*
Personal self	53.82	4.63	51.14	5.26	2.56	1.68	*
Family self	85.64	7.70	79.22	9.35	3.55	1.68	*
Social self	58.42	5.65	54.19	6.33	3.34	1.68	*
Self-Criticism	58.79	5.77	54.37	6.47	2.65	1.68	*
Actual self	21.33	4.28	18.13	4.98	3.26	1.68	*
Self-satisfaction	76.71	7.44	71.45	6.23	3.64	1.68	*
Self-perception	95.28	5.28	90.18	7.86	3.61	1.68	*

P<0.05

Table (2) indicated statistically significant differences between athletes and non-athletes in favor of athletes as (t) calculated values were higher than its

table value. This indicates the scale’s validity. Table (3) shows distinct validity of technical and physical tests.

**Table (3): Distinct validity of technical and physical tests (n1=n2=20)**

Tests	Athletes		Non-athletes		(t) calculated value	(t) table value	P
	Mean	SD	Mean	SD			
Lay down bending trunk	16.57	2.96	14.942	3.21	1.933	1.68	*
Inclined prostration bending arms	23.16	3.34	19.86	2.99	3.242	1.68	*
Standing high jump	23.33	2.12	20.67	2.18	5.523	1.68	*
Standing long jump	185.43	3.21	183.09	4.25	2.049	1.68	*
Standing prostration	24.644	2.64	22.35	2.79	2.512	1.68	*
Power agility test	2.78	2.88	26.40	2.18	2.974	1.68	*
Table tennis forehand serve velocity (5 balls)	9.43	2.25	12.55	2.64	3.532	1.68	*
Table tennis backhand serve velocity (5 balls)	12.853	3.07	15.28	3.47	2.331	1.68	*
Squash Front serve velocity (5 balls)	11.83	2.03	14.55	2.69	3.233	1.68	*

P<0.05

The researcher used test/retest to verify the scale’s reliability as she applied the scale to a group of student athletes (n=27) then repeated application after two weeks. Correlations were between 0.731 for actual self and 0.549 for moral/ethical self. This indicates the scale’s reliability.

The researcher used test/retest to verify the technical and physical tests’ reliability as she applied the scale to a group of student athletes (n=27) then repeated application after two weeks. Correlations were between 0.789 for standing prostration and 0.713 for backhand serve velocity in table tennis. This indicates the tests’ reliability.

The recommended recreational racquet sports program:

The program lasted for (12) weeks (3 units per week). It was divided into three stages as follows:

- **Preliminary stage** (4 weeks): this stage aimed to learning and mastering basic racquet sports skills. It included (13) exercises, (3) sets and (20) repetitions on 65% intensity and 2.30 minutes rest intervals.

- **Preparation stage** (4): this aimed to improving basic racquet sports skills. It included (11) exercises, (3) sets and (15) repetitions on 75% intensity and 3 minutes rest intervals.

- **Final stage (4):** this aimed to improving basic racquet sports skills. It included (9) exercises, (3) sets and (15) repetitions on 85% intensity and 3 minutes rest intervals.

The program was initiated from 10-2-2017 to 3-5-2017 under supervision of a measurement and evaluation specialist and a team of assistants. Pre-measurements were taken before application while the two intermediate measurements were taken after stage one and two then post-measurements were taken at the end of the program for physical and technical tests. For self-concept scale only pre- and post-measurements were taken.

**3.Results:**

Variance analysis (one-way ANOVA) indicated statistically significant differences among all measurements as (F) calculated values were higher than its table value for technical and physical tests.

This led the researcher to apply Tukey’s Honestly Significant Difference test (HSD) as seen in table (4).

Table (4) indicated statistically significant differences among the four measurements on all technical and physical tests as mean differences were higher than HSD value. Only inclined prostration binding arms did not show significant differences among first intermediate, second intermediate and post-measurements indicating that the program did not affect muscular strength or endurance of participants.

Next, the researcher calculated improvement rates of physical and technical variables among the four measurements according to the following equation:

$$\text{Improvement rate} = \frac{(\text{next measurement} - \text{previous measurement})}{\text{previous measurement}} \times 100 \quad (7: 79)$$

Table (6) indicated statistically significant differences between pre- and post-measurements of TSCS except for family self and social self.

**Table (4): HSD for pre-, first intermediate, second intermediate and post-measurements of technical and physical tests (n=39)**

Variable	Measurement	Mean	HSD	Pre-	First intermediate	Second intermediate	Post-
Lay down bending trunk	Pre-	31.33	2.73		3.23	6.79	9.83
	First intermediate	34.56				3.56	6.59
	Second intermediate	38.12					3.03
	Post-	41.15					
Inclined prostration bending arms	Pre-	174.62	8.86		9.64	15.46	21.84
	First intermediate	184.26				5.82	12.2
	Second intermediate	190.08					6.38
	Post-	196.46					
Standing high jump	Pre-	15.72	1.68		3.56	6.51	9.31
	First intermediate	19.28		*		-2.95	5.75
	Second intermediate	22.23					2.8
	Post-	25.03					
Standing long jump	Pre-	17.33	2.15		3.29	6.18	9.03
	First intermediate	20.62				2.89	5.74
	Second intermediate	23.51					2.85
	Post-	26.36					
Standing prostration	Pre-	22.41	1.93		3.21	5.82	8.36
	First intermediate	25.62				2.61	5.15
	Second intermediate	28.23					2.54
	Post-	30.77					
Power agility test	Pre-	9.31	00.45		1.25	2.49	3.59
	First intermediate	8.06				1.24	2.34
	Second intermediate	6.82					1.1
	Post-	5.72					
Table tennis Front serve velocity (5 balls)	Pre-	11.04	00.52		1.75	3.04	4.23
	First intermediate	9.29				1.29	2.48
	Second intermediate	8.00					1.19
	Post-	6.81					
Table tennis Back serve velocity (5 balls)	Pre-	11.21	00.67		2.43	4.2	4.94
	First intermediate	8.78				1.77	2.51
	Second intermediate	7.01					0.74
	Post-	6.27					
Squash Front serve velocity (5 balls)	Pre-	23.45	1.33		1.94	3.63	5.13
	First intermediate	21.51				1.69	3.19
	Second intermediate	19.82					1.5
	Post-	18.32					

**Table (5): Improvement rates among the four measurements for physical and technical variables (n=39)**

Variable	Pre-	First intermediate	Growth rate	Second intermediate	Growth rate	Post-	Growth rate	Final growth rate
Lay down bending trunk	31.33	34.56	10.31%	38.12	10.30%	41.15	7.95%	31.34%
Inclined prostration bending arms	174.62	184.26	5.23%	190.08	3.16%	196.46	3.36%	12.51%
Standing high jump	15.72	19.28	18.46%	22.23	15.30%	25.03	12.60%	59.22%
Standing long jump	17.33	20.62	15.96%	23.51	14.02%	26.36	12.12%	52.11%
Standing prostration	22.41	25.62	12.53%	28.23	10.19%	30.77	9.00%	37.30%
Power agility test	9.31	8.06	-15.5%	6.82	-15.38%	5.72	-16.13%	-38.56%
Table tennis Front serve velocity (5 balls)	11.04	9.29	-18.84%	8	-13.89%	6.81	-14.88%	-38.32%
Table tennis Back serve velocity (5 balls)	11.21	8.78	-27.68%	7.01	-20.16%	6.27	-10.56%	-44.07%
Squash Front serve velocity (5 balls)	23.45	21.51	-9.02%	19.82	-7.86%	18.32	-7.57%	-21.88%

**Table (6): Difference significance between pre- and post-measurements on Tennessee Self-Concept Scale (TSCS) (n=39)**

Variable	Measurement	Mean	SD	(t) calculated	(t) table value	P
Physical self	Pre-	53.4359	0.86528	-10.529	1.68	*00.00
	Post-	58.5897	0.6761			
Moral / Ethical self	Pre-	53.1795	0.73184	-11.087	1.68	*00.00
	Post-	57.2308	0.67083			
Personal self	Pre-	50.7949	0.70585	-10.177	1.68	*00.00
	Post-	55.7179	0.76878			
Family self	Pre-	59.2308	0.87279	0.566	1.68	00.574
	Post-	59.0256	0.74247			
Social self	Pre-	54.4359	0.8838	-2.471	1.68	00.018
	Post-	54.8974	0.82863			
Self-criticism	Pre-	23.4872	0.59787	-13.137	1.68	*00.00
	Post-	28.1282	0.53763			
Actual self	Pre-	90.6667	1.06175	-9.843	1.68	*00.00
	Post-	99.9487	1.3799			
Self-satisfaction	Pre-	104.5128	1.75753	-5.979	1.68	*00.00
	Post-	111.2564	1.47618			
Self-perception	Pre-	97.4103	1.34311	-11.354	1.68	*00.00
	Post-	106.8462	1.28918			

#### 4. Discussion:

Results indicated statistically significant differences among the four measurements of physical and technical tests. Table (4) indicated statistically significant differences among the four measurements in favor of the higher mean on physical and technical tests. This clearly indicates the significant effects of the recommended recreational program on physical and technical variables under investigation. Table (5) indicated that this increase in improvement rates was continuous between each two stages of the recommended recreational program.

Table (6) indicated statistically significant differences between pre- and post-measurements of TSCS, except for family self and social self, in favor of post-measurements. This means that the

recommended recreational program had significant effects on self-concept of participants. This means that such programs for beginner student athletes reveals their abilities and maximize their potentials especially in a society where such recreational programs are lacking. Participants of this research never participated in recreational programs before. This made them willing to achieve a main objective of reaching to their maximum potentials in sports participation.

Psychologically speaking, the gains participants felt in on several aspects led to improving their self-concept. For example, physical self improves individual's feeling of abilities, motives and objectives. Allawy and Al-Naggar indicated that athletes seek personal success, self-actualization, excellence and high level among group to be famous

and distinct (4: 210) (5: 133). The lack of statistically significant differences on family self and social self as seen in table (6) can be due to the nature of recreational program which is individual in nature. Racquet sports are individual sports and have no significance in groups as individual sports only interest the athlete and this has no effect on family self and social self. Allawy and Chang indicated that family self is the individual's sense of being a family member and social self is the value of an individual during interaction with others (3: 153) (9: 91).

The researcher thinks that such recreational programs have significant effects not only on physical and technical variables but also on the psychological variables affecting athletic performance especially for beginner athletes.

### Conclusions:

According to this research aim, methods and results, the researcher concluded the following:

- The recommended racquet sports recreational program had positive effects on some physical variables of student athletes.
- The recommended racquet sports recreational program had positive effects on some technical variables of badminton of student athletes.
- The recommended racquet sports recreational program had positive effects on self-concept of student athletes.

### Recommendations:

According to these conclusions, the researcher recommends the following:

- Designing more recreational programs for beginner athletes to improve their physical and technical skills
- Studying the effects of recreational programs on other aspects of personality for beginner athletes
- Applying the recommended recreational program on female athletes to identify its effects on females

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