Impact of Teaching Guidelines on Quality of Life for Hemodialysis Patients

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Abstract: Background Chronic kidney disease is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes, and high costs. The guidelines are an important step in the process of improving the quality of dialysis practice and improving ESRD patient outcomes. Therefore, the aims of the study were to develop, implement teaching guidelines for HD patients and evaluate the impact of guidelines on QOL for HD patients at the study settings. Methods A Quasi-experimental research design was conducted in the HD units at Urology and Nephrology Center at Mansoura University, Mansoura International Special Hospital and Nabarro General Hospital. The data were collected from 115 adult HD patients of both sexes who corresponded to inclusion criteria. Results The results indicates increased total knowledge score for patients at post more than follow up tests and increased total QOL score for studied patients at follow up test. Also it was found decreased KPS of patients at post and follow up tests. There were a positive correlation between QOL and KPS of studied patients in the three groups in relation to their knowledge. Conclusion The implementation of teaching guidelines has a positive effect on the studied patients' total knowledge scores and regarding almost QOL domains but there wasn't an effect on patients' KPS score.

1. Introduction

Health-related quality of life (HRQOL) refers to the measure of a patient's functioning, well-being, and general health perception in each of three domains: physical, psychological, and social. Along with survival and other types of clinical outcomes, patient quality of life (QOL) is an important indicator of the effectiveness of the medical care they receive. QOL of patients with end stage renal disease (ESRD) is influenced by the disease itself and by the type of replacement therapy. Numerous studies have identified the effect of such factors as anemia, age, comorbidity, and depression on QOL [1].

Although advances in dialysis treatment have contributed to improved survival of patients with ESRD, HRQOL is much lower for those patients than for the general population [2]. People on dialysis must be shown that they can control certain aspects of their lives and health, and that they indeed have the potential to live long and productive lives through engaged in coordinated program of medical treatment, education, exercise, counseling and diet management [3].

Clinical practice guidelines were established to provide recommended ranges for parameters associated with management of ESRD patients. These guidelines addressed the quality of care of ESRD with regard to the adequacy of dialysis, vascular access, anemia management, bone metabolism, and nutritional assessments [4]. Successful implementation of guidelines will provide kidney patients with a higher quality of dialysis. Patients can contribute to the success of the implementation process by his understanding to the procedures contained in the guidelines, the implementation team can tailor the procedures for optimum patient benefit and the patient education program can be focused for optimum patient participation [5].

Aim of the study:

The study was conducted to develop, implement teaching guidelines for HD patients and evaluate the impact of guidelines on QOL for HD patients at the study settings.

2. Materials and Method:
Material:
Design:

A Quasi-experimental research design was

utilized to reach the aims of the study.

Setting:

The study was carried out in the three HD units (Urology and Nephrology Center at Mansoura University, Mansoura International Special Hospital and Nabarro General Hospital).

Subject:

The present study included 115 adult HD patients of both sexes. The calculated sample size for Urology and Nephrology Center was 40 patients, the Mansoura International Special Hospital was 47 and for Nabarro General Hospital was 28. The patients were selected based on the following criteria: on maintenance HD not less than six months, who had three or two HD sessions per week and who consented to participate in the study. Patients who had complications that interfere with their self care activities (cerebral stroke, paralysis, handicapped and patients with malignancies) were excluded from the study.

Tools:

Four different tools were used in this study for data collection:

Tool I: Assessment sheet. Include the following:

Part 1: Patients' socio demographic characteristics:

This tool part consists of 8 items covering patients' age, sex, marital status, family size, educational level, occupation, monthly income per person and health insurance.

Part 2: Patients' medical history:

This tool part developed by Mohamed [6] and was modified by the researcher. It consists of 15 questions covering the following items: duration of illness, causes of renal failure, having other diseases, hospitalization during the past 6 months, family medical history, kidney transplantation history, duration of dialysis, number of hemodialysis session/week, time schedule of session, type of vascular access, its' number, occurrence of complication due to vascular access, the disease and dialysis treatment, urination problems and problems pre, during and after dialysis session.

Part 3: Objective data:

This tool part developed by Mohamed [6] and was modified by the researcher. It includes 8 items covering the following: Vital signs; pulse, temperature, respiration and blood pressure (pre and post dialysis session). Body weight (pre and post

dialysis session), patients' height, body mass index, mid arm circumference, dialysis adequacy index (kt/v), peripheral edema. Laboratory investigations: blood urea nitrogen, serum creatinin, sodium and potassium levels (before and after dialysis session). Also serum calcium, phosphorus, hemoglobin, hematocrit, WBCs, total protein level, albumin level, cholesterol level, SGPT level, and viral markers (pre dialysis session).

Tool II: Self care questionnaire:

It was developed by Mohamed [6], Ahmed [7] and was modified by the researcher. This tool was used to evaluate patients' knowledge related to disease and self care activities, includes 23 items covering the following: Kidney functions, renal failure, function of dialysis machine, things to be considered peri dialysis, fistula care, having bleeding, edema, muscle cramps, hypertension, hypotension, itching, how to maintain healthy nutrition, protection of the body and dealing with some disease complications, exercise and regular maintenance.

Tool III: Kidney disease and quality of life short form scale:

The KDQOL-SF scale was developed by Hays et al.[8] and was modified by the researcher by combining sub items of KDQOL-SF scale of version 1.1, 1.3 and from Hemo Study Form 48 questionnaire. This scale will be used to assess HRQOL for hemodialysis patients. It consists of 106 items divided into 19 dimensions covering the following: short form health survey (SF-36) includes (8 dimentions/36 items) which are: general health, physical functioning, physical role, emotional role, pain, social function, emotional well-being and energy/fatigue. kidney disease specific items includes (11 dimentions/70 items) which includes: symptoms/problem list, effect of kidney disease, burden of kidney disease, work status, cognitive function, quality of social interaction, social support, sexual function, sleep, dialysis staff encouragement and patient satisfaction.

Tool IV: Karnofsky performance scale:

The scale was described by Dr. Joseph H. Burchenal in 1949, and adopted from Mohamed [25]. The scale used to measure the patients' ability to carryout activities of daily living. It consists of 11 levels of performance covering the patients' maximum and minimum ability. Patients' percentage scores were given according to the performance ability and the grades ranged from 0% to 100%, score zero indicating a moribund functional state and score 100 indicating normal activities.

Methods:

Official permission was obtained from the head of the hemodialysis department and from the head nurse at the three study settings to conduct the study. A verbal consent obtained from the respondents before their inclusion in the study. Nature and aim of the study was explained to each member of the participants.

The data were collected throughout three phases of assessment. The first phase was done prior to conducting the teaching guidelines. The second phase was done immediately post implementing teaching guidelines. The third phase was done three months after implementing teaching guidelines. Teaching guidelines was conducted to patients throw eight sessions for 8 weeks as one session per week which lasted from 30-45 minutes.

The teaching guidelines were applied for the patients during hemodialysis session after the beginning of the session by one hour for every group of patients of four persons and sometimes for each patient according his condition. The media which used includes: illustrative pictures, video tape and handouts which constructed in a suitable manner for educated and illiterate patients and given for every patients as a gift.

Statistical analysis

Data was analyzed using SPSS (Statistical Package for Social Sciences) version 10. Qualitative data was presented as number and percent. Comparison between groups was done by Chi-Square test. Wilcoxon singed ranks test was used for comparison within group. Quantitative data was tested for normality by Kolmogrov-Smirnov test. Normally distributed data was presented as mean ± SD. Paired t-test was used for comparison within groups. Student t-test was used to compare between two groups. F-test (One Way Anova) was used to compare between more than two groups. Pearson's correlation coefficient was used to test correlation between variables.

3. Results:

The data collected were analyzed statistically and the results are categorized into 3 main parts which are: Assessment part, Impact of implementing guidelines part, Correlation part.

Table 1:

This table illustrates that nearly one third (32.2%) of the patients aged between 30 to less than 40 years old, more than half (67%) of them were male. Majority (73.9%) of the patients were married while 1.7% of them were widow. In relation to the educational level, above one third (39.2%) of the

patients had basic education while 13% of them just read and write. For job, above one third (40.9%) of the patients had skilled work while 3.5% of them were student. Concerning monthly income, near one third (34.79%) of the patients had monthly income from 100-200 LE/month. Also near one third (34.78%) of the patients had monthly income from >200-500 LE/month, while 11.30% of patients had monthly income >1000 LE/month. Moreover (32.2%) of the patients had enough monthly income and also 32.2% of them didn't have. Above half (60.9%) of patients didn't have enough income that cover treatment costs.

Table 2:

This table shows more than one third (47%) of the patients had hypertension and 29.6% of them had co-morbid disease. Only 0.9% of patients had Systemic Lupus Erythematosus (SLE).

Table 3:

Regarding vascular access complications, this table illustrates that, more than one third (39.5%) of the patients had thrombosis while 2.3% of them had rupture fistula. Aneurysm and infection were reported for 14% and 11.6% of the patients, respectively.

Table 4:

This table shows that, decreased patients' weight after HD session to reach ideal body weight with highly statistical significant difference at pre vs post test and for pre vs follow up test (P<0.05). Regarding body mass index, the table shows mild increase in body mass index within normal range at post and follow up test with statistical significant difference at pre vs post test and at pre vs follow up test (P. value = 0.045 and 0.012 respectively). Concerning mid arm circumference, the results shows increase in MAC within normal range at post and follow up tests with statistical significant difference at pre vs post test (P. value = 0.028). The table clarifies also, mild increase in dialysis adequacy index at post and follow up tests of implementing teaching guidelines.

Table 5:

The table revealed an increased QOL for G (A) than G (C and B) with statistically significant difference at pre test (P. value = 0.021). Also the table illustrates decrease in QOL for G (A) at post and follow up tests and for G (C) at post test but shows increase in QOL for G(B) at post and follow up tests and for G (C) at follow up test (54.15 ± 8.43) of implementing teaching guidelines.

Table 6:

The table clarifies decreased KPS for studied patients at post and follow up tests for G (A and C) with statistically significant difference at pre vs post and pre vs follow up tests with mild increase KPS score in G (B) at post test (74.47 ± 6.53) of implementing teaching guidelines.

Table 7:

The table illustrates an increase in total knowledge of studied patients for G (A) than G (B and C) at post test. The knowledge score slightly decreased in the three groups at follow up test with highly statistically significant difference (P<0.01).

Table 8:

The table revealed positive correlation between QOL of studied patients in the three groups in relation to their knowledge at per, post and follow up tests for G (A) with statistical significant difference at pre, post and follow up tests (P. value = 0.028, 0.050 and 0.009 respectively). There is statistical significant difference of patients' knowledge and their QOL of G (B) at post test of implementing teaching guidelines (P. value = 0.012). The table illustrates positive correlation between Karnofsky score and patients' total knowledge score with negative correlation at follow up test for G (B) (r = -0.126) and at pre test for G (C) (r = -0.054) with no statistically significant difference.

Table (1): Distribution of the studied patients as regards their socio-demographic characteristics.

Variables	No. (115)	%
Age groups (years)		
18 - < 30	16	13.9
30 - < 40	37	32.2
40 - < 50	34	29.6
50 - 60	28	24.3
Gender		
Male	77	67
Female	38	33
Marital Status		
Married	85	73.9
Divorced	8	7.0
Single	20	17.4
Widow	2	1.7
Single or divorced due to disease		
No	13	50
Yes	13	50

Educational level		
Illiterate	24	20.9
Read &Write	15	13.0
Basic education	45	39.2
University	31	26.9
Family size	**Mean ± SD**	
	4.70 ± 1.96	
Job		
Employee	27	23.5
Skilled worker	47	40.9
Student	4	3.5
Housewife & No Job	37	32.1
Monthly income (LE)/ family		
100 – 200	40	34.79
>200 – 500	40	34.78
>500 – 1000	22	19.13
> 1000	13	11.30
Income satisfaction		
Enough	37	32.2
Enough & save	2	1.7
Not enough	37	32.2
Borrow sometimes	24	20.9
Always borrow	15	13.0
Monthly income cover treatment cost		
No	70	60.9
Yes	45	39.1
Insurance type		
Complete insurance	8	7.0
Partial insurance	4	3.4
Governmental paid (Free)	103	89.6

Table (2): Percentage distribution of the studied patients as regards causes of CRF.

Variables	No. (115)	%
Recurrent nephritis and pyelonephritis	13	11.3
Inflammation and infection in urinary system	10	8.7
Obstruction in urinary system	23	20
Polycystic kidney disease	2	1.7
Diabetes mellitus	8	7
Hypertension	54	47
Systemic lupus erythematosus	1	0.9
Bilharziasis	13	11.3
Eclampsia	2	1.7
Others	9	7.8
Co-morbid disease	34	29.6

Table (3): Percentage distribution of the studied patients as regards vascular access complications.

Vascular access complications	No. (115)	%
Thrombosis	17	39.5
Aneurysm	6	14.0
Infection	5	11.6
Stenosis	2	4.7
Edema	3	7.0
Infiltration	3	7.0
Steal syndrome	2	4.7
Rupture	1	2.3
Fistula failure	4	9.3
Total	43	100.0

Table (4): Anthropometric measures among the studied patients at pre, after and follow up phases of implementing teaching guidelines.

Variables	Pre test X ± SD	*Post test* X ± SD	FU test X ± SD	P-value Pre vs post	P-value Pre vs FU
Weight					
Before HD Session	67.20 ± 13.17	67.97 ± 13.48	68.52 ± 13.69	0.001**	< 0.001**
After HD Session	64.57 ± 13.05	65.10 ± 13.25	65.34 ± 13.36	0.016*	0.003**
P-value	0.000	0.000	0.000		
Height	165.51 ± 9.83	165.59 ± 9.84	165.59 ± 9.84	0.532	0.532
Dry body mass index	23.57 ± 4.53	23.76 ± 4.61	23.83 ± 4.59	0.045*	0.012*
Mid arm circumference (MAC)	26.10 ± 4.44	26.59 ± 3.65	26.35 ± 4.10	0.028*	0.396
Dialysis adequacy index (Kt/V)	1.09 ± 0.42	1.10 ± 0.42	1.15 ± 0.40	0.916	0.064

(*) Statistically significant (P<0.05
(**) Highly significant (P<0.01)

Table (5): Distribution of the studied patients in the three settings as regards total QOL score at pre, post, and follow up phases of implementing teaching guidelines.

Total QOL score	Group A (n = 40)	Group B (n = 47)	Group C (n = 28)	P-value
Pre	56.86 ±10.85	50.78 ± 9.76	51.26 ±11.90	0.021*
Post	55.08 ±11.97	52.53 ±10.29	48.77 ± 9.27	0.133
Follow up	54.75 ±11.42	52.47 ±10.70	54.15 ± 8.43	0.577
Pre vs Post	0.166	0.201	0.343	
Pre vs FU	0.141	0.215	0.123	

(*) Statistically significant (P<0.05)

Table (6): Percentage distribution of the studied patients in the three settings as regards activities performance status score.

KPS	Group A (n = 40)	Group B (n = 47)	Group C (n = 28)	P-value
Pre	77.25 ± 9.60	74.26 ± 8.27	69.64 ± 10.36	0.005**
Post	74.75 ± 8.16	74.47 ± 6.53	67.14 ± 9.76	< 0.001**
Follow up	73.75 ± 7.05	73.83 ± 6.44	67.50 ± 7.99	< 0.001**
Pre vs Post	0.040*	0.830	0.032*	
Pre vs FU	0.014*	0.622	0.206	

(*) Statistically significant (P<0.05)
(**) Highly significant (P<0.01)

Table (7): Percentage distribution of the studied patients in the three settings as regards total knowledge score of implementing teaching guidelines.

Total knowledge	Group A (n = 40)	Group B (n = 47)	Group C (n = 28)	P-value
Pre	59.76 ± 11.88	49.79 ± 11.28	33.59 ± 6.92	< 0.001**
Post	72.78 ± 10.01	70.07 ± 9.77	62.96 ± 7.10	< 0.001**
Follow up	69.53 ± 10.79	65.82 ± 14.80	53.84 ± 6.87	< 0.001**
Pre vs Post	< 0.001**	< 0.001**	< 0.001**	
Pre vs FU	< 0.001**	< 0.001**	< 0.001**	

(**) Highly significant (P<0.01)

Table (8): Correlation between patients' total knowledge score in the three settings as regards total QOL and Karnofsky score.

Variable	Group A (n = 40)		Group B (n = 47)		Group C (n = 28)	
	r	P	r	P	r	P
Quality of life						
Pre	0.347	0.028*	- 0.225	0.128	- 0.185	0.299
post	0.312	0.050*	- 0.362	0.012*	- 0.072	0.716
follow up	0.406	0.009**	- 0.249	0.091	0.205	0.296
Karnofsky scale						
Pre	0.118	0.469	0.168	0.260	-0.054	0.784
post	0.294	0.066	0.274	0.062	0.210	0.282
follow up	0.047	0.773	-0.126	0.400	0.330	0.086

(*) Statistically significant (P<0.05)   (**) Highly significant (P<0.01

4. Discussion:

End stage renal disease is not only a clinical concern, but also a growing economic and organizational problem. Therefore, any early stage medical intervention that may prevent the initiation or progression of ESRD is extremely important [9]. clinical practice guidelines for HD serve to identify and promote best practice in the delivery of HD and have set clinical standards to allow comparative audit of the key aspects of the HD prescription, laboratory data and patient outcomes [10].

The present study revealed that, nearly one third of the studied patients aged between 30 to less than 40 years old which came inaccordance with Badheeb [11], who found the mean age range of the HD patients was 42 years. Near three fifth of the studied patients were males and nearly two thirds of them were married. These findings were inaccordance to the results of El-Sayed and Lutf [12,13] respectively.

The study results revealed that, above one third of the studied patients had basic education and above one third of studied patients were skilled workers.

This result was in agreement for the finding with Lutf [14] and disagreement for the finding with El-Sayed [12] who found that, most of the studied patients had no work that attributed to physical disability of patients due to sever bone ache and generalized pain. The present study revealed that below one third of the studied patients had monthly income between 100-200 LE/month. This finding was inagreement with Yousif [15], whose study finding showed two thirds of the study subjects had monthly income below the average rate (150-200 pound/ person).

In our study more than one third of the studied patients had hypertension and above one quarter of them had co-morbid disease (Table 2). This finding was inagreement with the study of Al-Garini and El-Sayed [16,12], who found the common co-morbidity was hypertension, diabetes mellitus, followed by cardiovascular disorders.

The present study showed that, the most common vascular access complications are thrombosis of more than one third of studied patients followed by aneurysm, infection and failure of fistula. This finding was in accordance with Abd-El hamed and Mc Millan [17,18] who reported that, vascular access complications such as infection, thrombosis, and aneurysm limit the quality of hemodialysis that can be delivered, increase long term morbidity and mortality of patients.

Regarding CRF complications, the present study clarified that, Majority of studied patients had fatigue, excessive thirst, anemia, anorexia, trouble sleeping, blurred vision, joint pain, dizziness and headache. This finding is inagreement with the result of Yousif [15] and supported by Himmelfarb [19], who reported various complications for HD patients which are, anemia, cardiovascular disease, protein-calorie malnutrition, infection, renal osteodystrophy, vascular access complications, and intradialytic complications.

Regarding nutritional status, the present study revealed statistical significant difference of body mass index between pre, post and follow up tests of implementing teaching guidelines, they were 23.57, 23.76 and 23.83 respectively. Also the mid arm circumference showed statistical significant difference at pre vs post test of implementing teaching guidelines as 26.10 cm and 26.59 cm respectively. These findings is supported by the results of Mostafa et al. [20], who reflect normal limits and adherence of studied HD patients to normal nutritional status.

In relation to dialysis adequacy index (Kt/V), the present study revealed mild increase in Kt/V for studied patients from pre, post and follow up tests as the means were 1.09, 1.10 and 1.15 respectively. This finding comes inaccordance with the finding of Covic et al. [21] who found increased Kt/V from baseline test to follow up tests with the means 1.41 and 1.42 respectively.

The current study results showed increased of total knowledge score related to CRF, its management and self care activities at post more than follow up test with highly statistically significant difference. These finding came inagreement with the result finding of Saelim et al. [22] who revealed that, the health education program significantly improved HD patients' knowledge of the diseases, dietary behaviors, weight control and clinical parameters.

The finding of the current study clarified an increase in the total QOL score for G(B) at post and follow up tests and for G(C) at follow up test that may relay on the success of the teaching guidelines for those patients who known to haven't enough knowledge as G(A) before implementing teaching guidelines. The finding of Mohamed [23]concluded that, after implementation of the self- learning package program on HD patients, statistical significant increase were revealed in the total scores of QOL domains. However, the physical QOL domain scores have shown a statistically significant decrease, compared to pre-program level.

The results revealed decrease the score of KPS for G(A and C) and mildly increase the score for G(B) after implementing teaching guidelines. This result may be due to effect of CRF and its complications, dialysis and co-morbidities which associated with studied patients that affects their performance of their activities. In this field Amer et al.[24] reported that, the initiation of dialysis is associated with a substantial and sustained decline in functional status.

As regards correlation between patients' knowledge in relation to total QOL score and karnofsky score, the current finding denotes increased correlation between patients' knowledge in relation to total QOL score and karnofsky score for G(A) more than G(B and C) that clarified the impact of increased quality of care on knowledge and QOL for G(A) than G(B and C). In this aspect Mohamed [25] found that, there was no statistical significant relation between health education and QOL domain as well as for functional status scores of HD patients.

5.Conclusion:

The implementation of teaching guidelines has a positive effect on the studied patients' total knowledge regarding CRF with its management and self care activities. Teaching guidelines had a positive effect on increasing QOL for studied patients regarding almost domains except decreased QOL concerning cognitive functioning, social support, sexual functioning, vitality, burden of

kidney disease and for symptoms/problems. Increased total QOL score at follow up test of implementing teaching guidelines. Teaching guidelines had no effect on patients' activities performance status.

Recommendations:
The current study projects the following recommendations:

For patient:

A simple manual of guidelines of care for patients undergoing hemodialysis should be available in all units to be provided to newly admitted patients.

Educational program should be ongoing for patients with ESRD initiated during the predialysis stage and continued after maintenance dialysis with their caregivers to enhance their knowledge and skills about the illness and its treatment, complications and ways to alleviate it that consequently improve their QOL.

For caring staff:
The need for continuous monitoring and evaluating QOL of dialysis patients by using suitable assessment tools for early detecting and solving any problem.

Continuous educational program for health team throw organized in-service training to increase their knowledge and skills about the importance of improving QOL of HD patients through improving quality of care and administration of the self care guidelines.

Administrative:
Develop and coordinate multidisciplinary team approach in the hemodialysis unit that include the primary nurses, renal physicians, social workers, dietitians, psychotherapists and physiotherapists to assist patients in maintaining near normal life style at the highest possible level.

Set up a counseling room in the HD units provided with needed resources to enhance QOL for HD patients with appropriate referral system.

Develop a nursing manual of standard care for ESRD patients and be available in all dialysis units.

For further research:
Further studies are needed to determine the effect of applying standard of care on QOL of HD patients in different demographic areas.

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