

EFFICACY OF NUTRITIONAL SUPPORT PROGRAM ON ANTHROPOMETRIC MEASUREMENT AND SUBJECTIVE GLOBAL ASSESSMENT SCORE AMONG HEMODIALYSIS PATIENTS

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Abstract:

Background: Malnutrition is mostly common worldwide among hemodialysis patients which increased risk of morbidity and mortality. **Aim of the study:** To evaluate efficacy of nutritional support educational program on anthropometric measurement and subjective global assessment score among hemodialysis patients. **Methods:** With in this study Quasi-experimental research design was utilized. A purposive sample of 100 adult patients of both sexes diagnosed with chronic renal failure and on maintenance hemodialysis (MHD), the tool used for data, collection included nutritional assessment sheet, and nutritional formula. **Results:** the study sample consists of certain hundred hemodialysis patients who met the inclusion criteria and agreed to take part into the study; Their main age was between 30 to ≥ 60 years old .The sample consisted of 49) male and 51) female. In regards renal failure causes identified by the participants, the majority had hypertension (83%), 36% of patients had diabetes and 55 % of the sample had virus C infections. Almost all the participants (92.5%) had a three times frequency of hemodialysis per week 48%on dialysis more than 5years . 39 % of study sample were considered mildly to moderately malnourished according to subjective global assessment score . Nutrition support educational program resulted in improvements in subjective global assessment score , anthropometric measurements and nutritional knowledge of the patients. **Conclusion:** Planned dietary education or counseling for hemodialysis patients performs a main function within the preservation concerning scientific outcome and the universal health regarding affected person . **Recommendation:** Continuous education and training are required for all hemodialysis patients about nutrition.

Keywords: Hemodialysis, Malnutrition, Nutritional support

Introduction:

Chronic kidney disease (CKD) is a global public health problem diagnosed as an everlasting and progressive decrease of kidney function, which lead to end-stage renal disease (ESRD). ESRD is a devastating medical, conventional, economic trouble for of the patients, their families, and the country as a whole (Olugbenga et al., 2010). In the

United States, there is a rising in incidence and prevalence of kidney disease with poor outcomes and high cost (Arora , 2014) and it is considered the eighth leading cause of adult deaths. The number of patients being treated for ESRD globally was estimated to be 2,786,000, of them approximately 2,164,000 were undergoing dialysis treatment

(hemodialysis (HD) or peritoneal dialysis (PD) and around 622,000 people were living with kidney transplants .

In Egypt, renal failure is one of the main health problems and hemodialysis represents the basic mode of its treatment (**Ahmed et al., 2010**). A national registry for ESRD in Egypt has not yet been developed. Therefore, the incidence and prevalence of ESRD are not known accurately.

The remaining version on the Egyptian Renal Registry in 2008- on hand at the website regarding Egyptian Society of Nephrology & Transplantation - suggests that the incidence about ESRD rose beside 225 pmp at 1996 to 483 pmp at 2004) yet the quantity recorded of ESRD on dialysis is 40000 (**Afifi et al., 2008**).

The consequence of cross-sectional studies in the world point that maintenance hemodialysis patients (HDP) are at high chance for malnutrition (**Laville & Fouquaxdde , 2006**) due to uremic anorexia, dietary limitations, inactivity, chronic inflammation, comorbidities, and metabolic derangements (**Ikizler et al., 2013**). So ,we found that malnutrition is highly established among maintenance hemodialysis patients and it had its bad clinical outcomes on these patients, like prolonged hospitalization, increase morbidity and mortality (**Ikizler et al.,2013**). As a result, hemodialysis patients dietary status should be continues monitored by using one or combination of these techniques such as subjective global assessment (SGA), anthropometric measurement , malnutrition inflammation score (MIS), predialysis serum creatinine, albumin (**Segall et al., 2014; As'habi et al., 2014**), and interdialytic weight gain (IDWG).

Therefore, nutritional support education programs for hemodialysis patients are very important that help to improve patients knowledge about

suitable diet that could be helpful in improving nutrition and decreasing mortality among those patients (**Hernandez Morante et al., 2014**). So, it is important that all health group members should help in evaluating the efficacy of healthy diet for hemodialysis patients and refer the patient to the dietician when necessary. Nurses also play important role in assessment of nutritional status, monitoring dietary intake, nutritional planning, patient nutritional education and support, screening and information reinforcement (**Fouque & Guebre-Egziabher , 2009**). Finally, a lot of international research have suggested a strong relation between nutrition support and clinical outcome in haemodialysis patients (**Afshar et al., 2007**). So that, the present study is attempt to evaluate efficacy of nutritional support educational program on anthropometric measurement and subjective global assessment score among hemodialysis Patients.

Aim of the study

Evaluate efficacy of nutritional support on anthropometric measurement and subjective global assessment score among hemodialysis patients.

Research Hypothesis

Hemodialysis patients who exposed to nutritional support will exhibit an improvement in anthropometric measurement and subjective globule assessment (SGA) score than those groups who are not exposed to the nutritional support.

Method

Research Design: In this study quasi- experimental research was utilized.

Setting of study: This study was conducted in dialysis unit of general medicine department at Mansoura University Hospital. This dialysis unit has 34 beds, which receive about 300 patients per month and offer 600 free monthly sessions at the present time which is free service.

Sample:

A purposive sample of 100 adult patients of both sexes calculated according to the formula explained later diagnosed with chronic renal failure and on maintenance hemodialysis (MHD) admitted at previously mentioned above setting were selected and divided randomly and alternatively in two equal groups each of 50 patients:

Study group: Received their nutritional support as calculated by the researcher and prescribed by the physician.

Control group: Received their nutritional support as routine home diet.

Inclusion criteria:

1. Adult patients of both sexes, aged \geq 20 - 60 years.
2. Maintenance hemodialysis (MHD) patients who attended regular hemodialysis sessions at the unit. i.e. 3 times per week every deflect day.
3. Patients who are able to communicate and willing to participate in the study.

Exclusion criteria

Patients who are unable to pursue the educational program due to physical or psychological ailments.

Sample size calculation

The calculated sample size of the study will be 45 for each group, using the following equation (Daniel, 1999)

$$n = \frac{Z^2 * P * (1-P)}{d^2}$$

Where

Z = 1.96 for 95% confidence level. p = expected prevalence of malnutrition (0.97) (I.S. Hegazy, et al, 2013).

d = precision (Margin of error) = 0.05

The sample size will be increased to 50 participants for each group (Study and control group) to compensate for dropouts or protocol failures with incomplete data .

Subjects drops out-:

The overall study period was nine months from 1/4/2015 to 31/12/2015 with no subjects drop out .

Tool of the study: Two tools were used in this study by researcher in an English form for collection of necessary data and achieving the aim of the study as follow:-

Tool I: Nutritional assessment questionnaire. It was developed by the researcher based on relevant literature review .

Tool II: Nutritional formula.

Validity and reliability

All tools were tested for validity by 10 experts (jury) in the field of the study including nursing specialist from faculty of nursing Mansoura University and medical specialists in Mansoura university hospital .The necessary modification were done accordingly. All tools were tested for reliability using test retest method on 10% of the participants (10 patients) on hemodialysis for testing reality of the tools.

Pilot study

To test the clarity, feasibility, and applicability a pilot study was done. Ten patient were included randomly in pilot study. The needed correction and modification were done then they were excluded from the study sample.

Human rights and ethical consideration

- The study was submitted for approval from the Research Ethics Committee at Faculty of Nursing, Mansoura University.
- Official written permission y was obtained by the researcher from responsible authorities of the selected setting after rationalized the reason of the study.
- Prior to the study, formal consent of participants was taken after explanation of the nature and the aim of the study.

- Once the necessary approvals granted to start the study, patients who meet inclusion criteria and were agree to be in the study were interviewed by the researcher after clarification the reason of study.
- Each patient was interviewed individually in order to collect the necessary data using the study tools.
- The investigator will be emphasized that participation is absolutely voluntary and confidential.
- Anonymity, privacy, safety and confidentiality will be absolutely assured throughout the whole study.
- Each participant has the right to withdraw from the study at any time without giving any explanation.

Procedure of Data Collection

Data collection extended over a period of nine months from 1/4/2015 to 31/12/2015

The framework of the study will be carried out according to three phase:

Phase 1: Assessment phase

- This phase was begun in 1/4/2015 and extended for one month. In this phase the assessment was done for 100 hemodialysis patient using all parts of the study tool (Nutritional assessment questionnaire).
- It included meeting with hemodialysis patient in dialysis unit in two different shifts during dialysis session to collect required data.
- **Tool I part 1:** was used for collection of personal and clinical data. This data such as age, sex, level of education, occupation, marital status, date of admission, diagnosis, duration of dialysis, previous hospitalization, and past and present medical health history
- **Tool I part 2:** was used for assessment anthropometric measurement.
- **Tool I part 3:** SGA was used to place patient into one of three grades:

normal nutrition, mild to moderate malnutrition and severe malnutrition.

- After data collection a randomized controlled trial were done and patients were divided in two equal groups each of 50 patients:

Study group: Who will receive their nutritional support as calculated by the researcher and prescribed by the physician.

Control group: Who will receive their nutritional support as routine home diet.

Phase2: Implementation phase :

- It was begun after one month from the assessment phase from 30/4/2015 to 31/5/2015.
- It was begun with the implementation of nutritional formula for the study groups (Harris-Benedict formula for adult males/female).
- And according to Harris-Benedict formula for adult males/female daily caloric requirements for each patient in study group was calculated using the variable of weight, age and gender of each patient. And accordingly, each patient was giving their nutritional support as calculated by the researcher and prescribed by the physician. The researcher then interviewed each patient in study group individually for explaining the nutritional diet that prescribed for him/her and nutritional health education program was also conducted for the study group.
- The patients were divided into tiny groups; each group consists of 5 patients.
- Three sessions were planned by researcher to provide patients with general guidelines about the nutritional support.

1- First session this session was included:

- orientation on educational program content.

2- Second session was included:

- Orientation on kidney and its function.

- Hemodialysis definition, types, causes and symptoms.

3- Third session was included:

- Importance of following nutritional program.

- Permitted and prohibited food for hemodialysis patient.

- Example for weekly diet commensurate with the calories for each patient.

- covered the most common nutritional problems associated with renal failure, with emphasis in anemia definition, causes, prevention and control.

- Each session was lasted for 20 –30 minutes. In each session the researcher reinforce the patient to be adhering for prescribed diet.

- Eating habits that needed to be change were discussed such as the importance of fluid and salt restriction .

- Laptop computer was used during session included slides showing the importance of fluid restriction and dietary messages.

- Colored booklet was developed about the allowed and prohibited food and weekly diet with protein requirement according to every patient need and distributed for every patient.

- While the control group patients were lefted to receive their nutrition as

routine home diet. Ethically at the end of the research control group received nutritional support provided as needed.

Phase 3: The evaluation phase

- It was conducted in 1/12/2015 to 31/12/2015.

- The patients in the study group were keep for six months to give enough time to implement the taught messages.

- A reassessment of both study and control patients using tool I part 1,3, (anthropometric measurement ,SGA, were carried out .

- After that comparing between the results of both groups were carried out to Evaluate efficacy of nutritional support educational program on anthropometric measurement and subjective global assessment score among hemodialysis patients.

- Results

- **Table (1): Percentage of hemodialysis patients of both groups (study and control) according to sociodemographics characteristics:**

- This table illustrates that (60%) of patients aged between 45 to 60 years old and (51%) of them were female while, 49% were males, of them (65%) were married. And in relation to level of education, (67%) of the patients had basic education while 33% were illiterate. As regard to occupation, (76-84%) of patients respectively were not working and (90-84%) had low income.

Table (1): Distribution of sociodemographic characteristics of hemodialysis patients of both groups (study and control). N=100

Sociodemographic data	Study group N=50		Control group N=50		Test of significance	
	N	%	N	%	χ^2	p
Age						
<30yrs	5	10%	4	8%	1.6	P >0.05
30-44yrs	17	34%		12		
45-60yrs	27	54%		24%		
60yrs	1	2%		33		
			1	2%		
Sex						
Male	28	56%	21	42%	1.9	P >0.05
Female	22	44%	29	58%		
					OR=1.8 (0.8-3.8)	
Marital status						
Married	31	62%	34	68%	0.9	P >0.05
Divorced	1	2%	2	4%		
Single	8	16%	6	12%		
Widow	10	20%	8	16%		
Occupation						
Work	12	24%	8	16%	$\chi^2 =1$	P >0.05
Not work	38	76%	42	84%		
					OR=1.7 (0.6-4.5)	
Education						
Educated	30	60%	37	74%	2.2	P >0.05
Not educated	20	40%	13	26%		
					OR=0.5 (0.2-1.2)	
Monthly income						
Enough	5	10%	8	16%	$\chi^2 =0.8$	P >0.05
Not enough	45	90%	42	84%		
					OR=0.6 (0.2-1.9)	

Statistically not significant at p >0.05 Statistically significant at p ≤ 0.05*

FE test: Fisher's exact test OR: odds ratio χ^2 : Chi- square test

As regarding, weight change during assessment phase it was observed that there was no significantly difference between studied group weight with a mean 72.2± 15.1and 68.8 ± 13.3 while , there was a significance difference after 6 months with mean 72.2± 15.1and 72.7± 13.4..Also, height of both groups was not significantly difference with a mean 171 ± 10.1 and 169.2 ± 6.9. In studied group mid arm circumference mean was 22.1 ± 5.6 compared with 20.9 ± 3.9 in controls. It was noticed that, mid-arm muscle circumference (MAMC) was significantly

differ between study and control group with mean 16.7 ± 4.1and 14.9 ± 3 and it was increase after following diet regimen in study group than in control group with mean 16.7 ± 4.1and 17.9 ± 3.5.. In studied group mean BMI was 24.3 ± 3.6 compared with that of control group mean 24.3 ± 3.4 which was statistically not significant. Moreover, it was slightly increase in study group after following diet regimen with no significance difference. As regard TSF (triceps skin fold thickness) and after following diet regimen , it was increase in

study group and decreased in control group .

Table (2):Mean and stander deviation for both study and control groups in relation to anthropometric measurement at base line visit and after six months . N=100

Anthropometric measurement	Study group N=50	Control group N=50	Test of significance	
Weight (mean ± SD)	72.2± 15.1	68.8 ± 13.3	1.2	P >0.05
Height (mean ± SD)	171 ± 10.1	169.2 ± 6.9	1.01	P >0.05
MAC (mean ± SD)	22.1 ± 5.6	20.9 ± 3.9	1.2	P >0.05
TSF median (Min- Max)	17 (8-33)	17 (9-32)	Z=0.7	P >0.05
MAMC (mean ± SD)	16.7 ± 4.1	14.9 ± 3	2.5	p≤0.01* *
BMI (mean ± SD)	24.3 ± 3.6	24.3 ± 3.4	0.1	P >0.05

- After six months

Weight (mean ± SD)	72.7 ± 13.4	67.4 ± 14.4	t=1.9	P≤0.05*
Height (mean ± SD)	171 ± 10.1	169.2 ± 6.9	t=1.01	p >0.05
MAC (mean ± SD)	24.3 ± 4.9	19.5 ± 4.1	t=5.3	P≤0.001* *
TSF median (Min- Max)	19.5 (10-35)	15.5 (10-31)	Z=1.7	p > 0.05
MAMC (mean ± SD)	17.9 ± 3.5	14.2 ± 3.1	t=5.8	P≤ 0.001**
BMI (mean ± SD)	24.5 ± 3.1	23.9 ± 3.4	t=0.9	p > 0.05

statistically not significant at p >0.05 statistically significant at p ≤ 0.05*

statistically highly significant at p≤0.001** χ² Chi- square test

MAC: mid arm circumference

TSF: Triceps skin fold thickness

MAMC: Mid arm muscle circumference

From this table it was observed that, subjective global assessment mean score during assessment phase was 23.4 ± 6.2 in study group comparing with 20.3 ± 4.8 in control group with statistically significant difference. It was found that in study group 2% of patients were normally nutrient ,32% were mildly to moderately mal nutrient and 66% were suffer severe malnutrition comparing with 6% in control group who were normally nutrient, 46% were mildly to moderately malnutrient and 48% were suffer from severely malnutrition with non-statically significant difference.

After six months and after following diet regimen subjective global assessment

mean score was 18.7 ± 5.3 in study group comparing with 21.6 ± 4.5. It was found that in study group 10% of patients were normally nutrient, 70% were mildly to moderately mal nutrient and 20% were suffer severe malnutrition. Comparing with 0% in control group who were normally nutrient, 34% were mildly to moderately mal nutrient and 66% were suffer from severely malnutrition with non-statically significant difference . According to SGA there was significant improve in nutrition status of study group than control group after following nutritional support program. As the there were only 20% in study group have severe malnutrition during evaluation phase comparing with 66% in assessment phase .while in control group the percent of severe malnutrition was 48% in

assessment phase and increased to 66% in evaluation phase.
 Table (3): Mean and standard deviation for both study and control groups in relation to subjective global assessment at base line visit and after six months .N=100

SGA	Study group N=50		Control group N=50		Test of significance	
SGA score						
Normal nutrition	1	2%	3	6%	$\chi^2 = 3.7$	P > 0.05
Mild to moderate malnutrition	16	32%	23	46%		
Severe malnutrition	33	66%	24	48%		
After six months						
SGA score						
Normal nutrition	5	10%	0	0%	$\chi^2 = 23.5$	p ≤ 0.001
Mild to moderate malnutrition	35	70%	17	34%		**
Severe malnutrition	10	20%	33	66%		

- statistically not significant at p > 0.05
- statistically significant at p ≤ 0.05*
- statistically highly significant at p ≤ 0.001**
- SGA : Subjective global assessment
- χ^2 : Chi- square test
- Using subjective global assessment scoring to place patients in one of three grades, normal nutrition (score of 7-10), mild to moderate malnutrition (score of 11-20) and severe malnutrition (score of 21-35).

Malnutrition is common in hemodialysis patients. As various studies have shown that 97% of hemodialysis patients are mildly malnourished and approximately 4.6% - 19%, are severely malnourished (Hegazy et al., 2013). This malnutrition resulted in making them more susceptible for fatigue, anemia, infection, poor rehabilitation, increases risk for hospitalization, and eventually increase morbidity and mortality (Steiber et al., 2007). The causes of malnutrition in hemodialysis patients is complicated and related to many factors such as poor food intake due to GIT disturbance, hormonal changes, acidosis and quality of dialysis therapy (Alpers et al., 2006).

So that, nutrition support plays a necessary role in treatment of hemodialysis patients and to achieve this aim the current study was conducted in the hemodialysis unit at Mansoura University hospital on one hundred maintenance hemodialysis patients, from both gender aged 19 to ≥ 60 years on

regular hemodialysis for at least six months.

The discussion of this study will be discussed in this section as the follow:

- Sociodemographic characteristics
- Medical history
- Nutrition assessment
- Effect of nutrition support on anthropometric measurement
- Effect of nutrition support on subjective global assessment

I - Sociodemographic characteristics

As regards to age, the study finding found that near half of patients were between 45-60 years old. This result is in agreement with the United States Renal Data System [USRDS], (2012) that reported that most of hemodialysis patients were between age of 45 and 60 years old and also Badheeb (2006) supported this result who stated that hemodialysis is more common in persons whose age range from 45 to 60 years old.

As regards to sex, the majority of patients were female while the minority were males. This may be attributed to

female high prevalence of hypertension, obesity, diabetes which make whom at high risk for kidney disease. This result in same line with, **El-Sayed (2007)**. Also, this finding is in disaccordance with **El-Minshawy (2011)** who emphasized that men are risk for renal disease than women. In relation to the study subject's educational level, the study finding found that, about half of patients had basic education. This is consistent with **Lutf (2007)** findings.

With respect to occupation more than three quarters of patients were not work due to physical inability. In agreement with this result, **El-Sayed (2007)** who emphasized that the majority of hemodialysis patients were not work. **Lutf (2007)** disagreed with this finding whose study showed that above one third of studied patients were work. Also, the collected data relieved that most of patient's income didn't meet their basic needs. This finding was in agreement with **Youssef (2008)**.

II-Medical history

In relation to medical history, more than half of patients had hypertension; this coincided with **Affi (2008)** whose study also revealed that more than half of patients had hypertension. Also, the study result found that less than half of patients had diabetes mellitus. This is in congruent with **Soliman et al., (2012)** who stated that the majority of hemodialysis patients were diabetic. The study revealed also, that about one quarter of studied patients had heart disease this is in coincided with **Tonelli et al (2006)**.

According to **Braatvedt et al., (2006)** cigarette smoking is the most leading cause of hemodialysis because it increases bloods pressure that has direct effect on kidneys. In this study, the result clarifies that one third of studied patients are smoker.

III- Nutrition assessment

Nutrition assessment in hemodialysis patients is more difficult. **Elliot and Robb (2009)**. In this study a comprehensive nutritional assessment was done which include (dietary history of patients, anthropometric measurement, subjective globule assessment). As regard, dietary history, about two third of studied patients experience decrease weight during past six months. This in harmony with **Borrego et al.,(2010)** whose study also revealed that about three fourth of patients suffered from weight loss.

During nutritional assessment also, it was observed that the majority of studied patients weren't follow any diet regimen this in same line with **Ali (2006)** who mentioned that slightly more than half of their sample did not receive any dietary instructions. Moreover the finding of the present study reveals that, majority of patients have moderate appetite. As regard gastrointestinal symptoms (constipation, diarrhea, nausea, vomiting and change in taste and mastication) it was found that, the majority of patient suffer from this symptoms. This in same line with **Salamon et al.,(2013)** whose results revealed that gastrointestinal symptoms are common among hemodialysis patients.

Regarding to daily physical activity less than half of patients daily activity performed without effort, about two third need more effort and about one third not tolerable. This finding is supported by **Kosmadakis (2010)** who stated that physical inactivity in hemodialysis may be related to different abnormalities, such as anemia, uremia, bone and mineral changes and, cardiovascular diseases.

IV- Effect of nutrition support on anthropometric measurement

The anthropometric measurement included (body weight, height, MAC, MAMC and BMI). Body dry weight was taken after each dialysis session. BMI was calculated by the formula (kg/m²) from

the dry weight. Midarm circumference (MAC) was measured with measuring tape from non-access (fistula free) arm and triceps skinfold thickness (TSF) measuring by using skinfold calipers. The (MAMC) was calculated by using the following equation:

$$\text{MAMC} = (\text{MAC} - 31.4 \times \text{TSF})$$

/12.56. The present study results revealed that ,during assessment phase there was statistical non-significant difference of body weight ,BMI ,MAC ,height and TSF between study and control group but after following diet regimen and nutrition support program it is found that there is a significance difference in body weight and MAC and no significant difference in body mass index between pre and post measurements. Concerning the other measures ,the present study found that there is no improvement in other anthropometric measurements this may be due to many reasons like low socioeconomic status ,absence of general guidelines for healthy eating according to caloric requirements ,presence of gastrointestinal symptoms ,presence of associated diseases and use of medications that have effect on patients appetite and adversely effect on different body measurement In accordance with this, a study in Italy demonstrated that hemodialysis patients had deficient about dietary knowledge, particularly regarding phosphorus **Cupisti et al, (2012)**.

Diet and fluid non-adherence may be related to low educational level of the patients. Also ,may be due to that these patients were lived with other family members which make them unable to cook separate food. These in line with other studies that depend on using patients' self-reports to determine prevalence of non-adherence (NA) **Kara (2007)**.While these findings were in disaccordance with **Beto et al.,(2014)** who stated that highest adherence can be obtained when diet and educational efforts

are delivered to each patient separately which can help over time to change lifestyle .

V- Effect of nutritional support on subjective global assessment (SGA)

Subjective Global Assessment (SGA) is used to assess nutritional status in hemodialysis patients as it is quick, easy, and cheap **Muster, (2009)**.In this study patients showed a moderate nutritional level represented by mean of total SGA score .In same line , a results of study by **Yang et al., (2007)** was represented that 26 patients were well-nourished, whereas 24 patients were malnourished. In Addition a study by **Espahbodi et al., (2014)** found that among one hundred and five patients, ninety eight patients consisted of fifty six males and forty two females had malnutrition ranging from mild to moderate and three women had severe malnutrition.

The combined prevalence of malnutrition in the present study (moderately malnourished and severely malnourished), consisted approximately about more than half in both groups of study participants, that indicates that urgent need for a strict nutritional and dietary counseling program are required that help to advise patients on the most basic ways to improve their nutritional status . For this reason we conducted our study.

Limitation of the study

1. lack of recent reports or statistical data from the Ministry of Health about the accurate prevalence of hemodialysis patient in Egypt .
2. The high cost of biochemical tests and other materials that are used in the study.
3. The limited number of patients and as this study only describes hemodialysis patients of Mansoura university which cannot be generalized to other centers in

Egypt .

Conclusions

- Malnutrition is common among hemodialysis patients at Mansoura university hospital, and closely related to morbidity and mortality.
- Gastrointestinal symptoms lead to inadequate food intake and may interfere significantly with the patient's nutritional status
- The majority (90%) of hemodialysis patients didn't have any diet regimen and about (51%) of patients deviated from their fluid restrictions.

Nutritional support plays a key role in management of nutritional status of hemodialysis patients that it was effective in improving anthropometric measurements and subjective globule assessment score in study group comparing with control group.

Recommendations

A-For patients

Patients nutritional status needs more interest and regular assessment through monitoring body weight and body mass index that help to maintain normal body weight especially in the first year of hemodialysis.

Every patient needs nutritional counseling depending on a care plan developed before or at the time of hemodialysis therapy as dietary counseling help to maintain adequate energy & protein intake, and to increase diet & fluid compliance .

B-For nurses:

Nurses should have more knowledge about nutritional assessment and support for hemodialysis patients So ,there should be:

Planning for in-service training program about nutrition assessment and support for nurses working in dialysis unit.

Conferences and workshops should be carried out for nurses to increase their level of knowledge.

C - For administration:

To the policy maker, activate the role of clinical nutritionists in the clinical setting as soon as possible.

Manual guidelines about update in nutritional support should be available to nurses caring for hemodialysis patients.

Further clinical researches are needed for application of nutritional support on large probability of hemodialysis patients in different geographical area.

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