

## Physiological and Psychosocial Stressors among Patients on Hemodialysis

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### Abstract

**Background:** End stage renal disease (ESRD) which is the fifth stage of chronic kidney disease, is a chronic and life threatening illness and a worldwide public health problem. It implies that the kidneys are permanently damaged and the person can no longer survive independently without renal replacement therapy including kidney transplantation and dialysis (hemodialysis and peritoneal dialysis). Hemodialysis is the most common method - used to remove wastes, fluids and toxic substances from the body using artificial kidney (filter). **Aim:** the study aimed to assess physiological, psychological and social stressors among patients on hemodialysis. **Design:** A descriptive exploratory research design was utilized. **Setting:** This study was carried out at the kidney dialysis unit of Damanshour National Medical Institute -affiliated to the General Organization for teaching hospitals and Institutes. **Study subjects:** A systematic random sample of 70 adult patients from both genders of patients on hemodialysis. **Data tools:** I) Patient's interviewing questionnaire. II) Hemodialysis Stressor Scale (HSS) done by Baldree et al., 1982 and modified by Issa, 2015. **Results:** More than two third of the studied patients had satisfactory level of knowledge about chronic renal failure and hemodialysis. The severity of stressors all of high level stress. The social stressors were the highest stressors facing hemodialysis patients followed by psychological stressors then physiological stressors. There were highly statistically significant relations between social stressors and gender and between psychological stressors and marital status. There was highly statistically significant positive correlation between the total level of knowledge and educational level. **Conclusion:** patients on hemodialysis face various types of stressors. Social stressors had the highest severity followed by psychological stressors then physiological stressors. **Recommendations:** Self-management educational program should become an integrated part of the total management of hemodialysis patients focusing on the stressors patients facing. Also, counseling and support groups including financial and economic support are important.

**Key words:** Hemodialysis, Physiological stressors, Psychological stressors, Social stressors.

### Introduction

Hemodialysis (HD) is a medical procedure to remove fluid and waste products from the blood and correct electrolyte imbalances to achieve hemostasis through using a machine and a dialyzer which referred to as an "artificial kidney" (Stoppler., 2021). Dialysis initiated when one or more of the following are present: symptoms or signs attributable to kidney failure including neurological signs and symptoms attributable to uremia, pericarditis, anorexia, medically resistant acid-base or electrolyte abnormalities, reduced energy level, weight loss with no other potential explanation and intractable pruritus, or bleeding (Chan et al., 2019).

The incidence of end stage renal disease (ESRD) patients on chronic hemodialysis in El-Beheira Governorate, Egypt was 571 pmp (patients per million populations) (0.057%). The causes of ESRD studied in 2019 were hypertension (31.7%), diabetes mellitus (18.0%), obstructive nephropathy (10.8%), glomerulonephritis (4.5%), urinary tract infection (3.9%), autosomal dominant polycystic kidney disease (ADPKD) (2.9%), unknown (21.6%) and other causes such interstitial nephritis (1.9%) and systemic lupus erythematosus (1.5%) (Elballat et al., 2019).

Principles of hemodialysis include osmosis which is the movement of water and very small molecules of wastes across a semipermeable membrane into the dialysis fluid (Saini, 2020). Also, diffusion is the movement of molecules from an area of high concentration

to an area of low concentration. Moreover, ultrafiltration which is the movement of fluid through a semipermeable membrane. In addition, convection which is solvent drag, is the movement of molecules through a semipermeable membrane associated with the fluid being removed during ultrafiltration (*Nickson, 2020*).

End stage renal disease symptoms affect patient's quality of life, the frequency of hemodialysis and the compliance of patients with treatment regimen which affect the physiological and psychosocial health of the patient, so hemodialysis patients face various types of physiological and psychosocial stressors that cause different levels of discomfort. Identifying such stressors is a crucial step to improve the quality of health care offered to hemodialysis patients, thus using coping strategies depending on personal experience, social support system, individual beliefs and availability of resources (*Tchape et al., 2018*).

The nursing staff should help the patient to adhere to treatment regimen.as adherence is crucial in management of ESRD patients. World health organization (WHO) describes adherence as the extent to which a person's behaviour like taking medications, following a recommended diet, exercise and /or executing life style changes to corresponds with the agreed recommendations of health care provider (*Rakshitha et al., 2019*).

Broad strategies and activities for preventing psychosocial and physiological stressors must be used, e.g. psychological counseling, health education and treatment for physiological stressors. Patients and families need to express the negative feelings and must be included in the treatment process through providing accurate information: pre, during and post dialysis education which is essential in empowering patients with end stage renal failure (ESRF). An educational video introduction may be helpful. Health professionals could also refer patients to support groups and organizations to help patients cope with long-term dialysis therapy (*Chu& Lin, 2021*).

### **Significance of the study:**

Hemodialysis is a long term treatment in which patients are subjected to frequent, recurring and stressful situations, thus tolerating the usual continuous stress of chronic illness and treatment regimen is a must. There is a constant uncertainty about their life expectancy, as well as about immediate medical complications. Hemodialysis patients face significant stressors in various aspects of life that must be dealt with (*Tchape et al., 2018*).

Both physiological and psychosocial stressors are a challenge and a threat to human well-being. The nurse should understand the effects of stress and how to overcome. Identifying the level of self-efficacy and coping strategies provides valuable information for planning specific treatment and improving the performance of health care team. The nurse has to contribute to the preventive and therapeutic intervention to help patients to adapt to treatment regimen and eliminate stress which help improving quality of life (*Abo El-Ata et al., 2021*).

### **Aim of the study**

This study aimed to assess physiological, psychological and social stressors among patients on hemodialysis. It was achieved through the following:

- Assess patient's knowledge about chronic renal failure (CRF) and hemodialysis.

-Assess physiological, psychological and social stressors among patients on hemodialysis.

### **Research Question:**

• What are physiological stressors among patients on hemodialysis?

• What are psychological stressors among patients on hemodialysis?

• What are social stressors among patients on hemodialysis??

## Subjects And Methods

### (I) Technical design:

It entails the design, setting, subjects and tools for data collections

### Research Design:

A descriptive exploratory research design was utilized to meet the aim of the study.

### Research Settings:

This study was carried out at the kidney dialysis unit of Damanhour National Medical Institute –affiliated to the General Organization for teaching hospitals and Institutes. The unit contains three floors, a ground floor in the main building of the hospital and two floors in another building in the hospital. The ground floor in the main building of the hospital is for dialysis catheter insertion. It contains two operating rooms. The kidney dialysis unit in the other building contains the ground floor which contains kidney dialysis for acute kidney failure where there are 7 beds and 7 dialysis machines. While the first high floor contains 4 rooms A, B, C, D; all for negative cases of viral hepatitis C and B except room B which contains viral hepatitis C cases; room A contains 13 beds and 13 dialysis machines, room B contains 5 beds and 5 dialysis machines, room C contains 10 beds and 10 dialysis machines and room D contains 9 beds and 9 dialysis machines. Also, there is another room in the same floor for peritoneal dialysis for acute cases.

### Research Subjects:

A systematic random sample of 70 adult patients from both genders (males & females) on hemodialysis in the previously mentioned setting was selected to conduct this study.

The sample size was determined considering the total number of patients (222) who have attended within the year 2020 (from 1st of July to 30 of September) in the previous mentioned setting, based on power analysis where, the Epi-Info program was used. The program revealed sample size to be 67 patients on hemodialysis. Thus, it was decided in the present study to recruit a sample of 70 patients

on hemodialysis. Also, the sample size was calculated based on acceptable error (d) = 10 % according to sample equation for finite population:

$$n = \frac{NZ^2pq}{d^2(N-1)+Z^2pq}$$

Where:

n=sample size.

N=population size.

p=estimated proportion=, 50

q=1-p=, 50

d=acceptable error=10%

z=standard normal distribution=1, 96 or 2, 58.

### Tools for data collection:

The following tools were used to fulfill the study aim.

#### I- Patients interviewing questionnaire: (Appendix I):

It was developed by the investigator based on reviewing the current literature **Levy et al., (2016), Mandal, (2019), Nutrition Education Materials Online (NEMO) team, (2021) and Yevzlin et al., (2022)**. It was written in simple Arabic language and divided into three parts:-

#### The first part:

It was concerned with the socio-demographic characteristics of the studied patients (gender, age, educational level, marital status, occupation, income, treatment coverage, housing condition and means of transportation to the hospital. It consisted of ten main questions in addition to subtitles questions.

#### The second part:

It was used to assess the patient`s clinical data (past and present history of the patient) and the family history including: current diagnosis, disease discovery, duration of hemodialysis, number of sessions weekly, duration of hemodialysis session, other medical problems, special habits, source of health education about CRF and hemodialysis and family medical

history. It consisted of nine multiple choice questions (MCQ).

### **The third part:**

It was used to assess the patients' level of knowledge about chronic renal failure (CRF) and hemodialysis. It consisted of 31 multiple choice questions (MCQ).

### **Scoring system:**

For the 3<sup>rd</sup> part the total score of the patients' knowledge was 31 marks. Score categorized into satisfactory and unsatisfactory level where correct answer take score (1) and incorrect answer take score (0).

≥ 75 % (≥ 23.3 grades) was considered satisfactory level of knowledge according to statistical report.

< 75% (< 23.3grades) was considered unsatisfactory level of knowledge according to statistical report.

## **II- Hemodialysis Stressor Scale (HSS): (Appendix II):**

Hemodialysis stressor scale (HSS), the original one was done by **Baldree et al., 1982**. This scale was modified by **Issa, 2015**; it divided the stressors into two subscales; physiological stressors and psychosocial stressors. It was modified again by **the investigator**. This scale measures the level of stress experienced by hemodialysis patients. It consists of 30-items that describe the stressors which hemodialysis patients mostly face in their life. It contains three stressors sub-scales; physiological stressors (16 items), psychological stressors (8 items) and social stressors (6 items), these items are measured on a 4 point likert scale ranging from 1- 4 with higher scores indicating the greater severity of stress experienced. Also, items are ranked/ ordered where the lowest ranking is the highest stressor.

### **Scoring system:**

- 80% and more was considered very high.
- 60% - 79.9% was considered high.

- 40% - 59.9% was considered middle.
- 39.9% and less was considered low.

This reflected the agreement among participants regard each item according to statistical report.

### **Ranking:**

The Ranking system where items are ranked/ ordered to make it easy to compare the data values and simplifies the analysis of the data.

In the tables, the lowest ranking is the highest stressor and the highest ranking is the lowest stressor.

## **(II) Operational design:**

It includes the preparatory phase, content validity and reliability, pilot study and field work.

### **Preparatory phase:**

It included reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools of data collection.

## **Tools validity and reliability: (Appendix III):**

### **Face and content validity tool:**

The tools were revised by a panel of 7 experts from Faculty of Nursing – Ain Shams University(7 professors of medical-surgical nursing) who reviewed the content of the tools for comprehensiveness, accuracy, clarity, applicability and relevancy. Modifications of tools were done according to the panel's judgment.

### **Tools reliability:**

The reliability of tools was done using cronbach's alpha coefficient. The result values were (.751) knowledge, (.841) hemodialysis stressor scale which denoted acceptable and good reliability of the used tools.

**Pilot study:**

A pilot study was applied on 10% of patients on hemodialysis patients (7 patients), in order to ensure the clarity of questions, applicability of the tools, estimate the time needed to complete them and perform the required modifications that were done according to the available resources. Subjects who shared in the pilot study were excluded from the main study sample.

**Field of work:**

The purpose of the study was simply explained to the studied patients who agreed to participate in the study prior to any data collection. The actual work of this study started and completed within three months from the first of July 2020 and was completed by the end of September 2020. Data was collected from the kidney dialysis unit of Damanhour National Medical Institute –affiliated to the General Organization for teaching hospitals and Institutes during the patient attendance to the unit for hemodialysis sessions. It was collected by the investigator during patient’s interview four days per week (Sunday, Monday, Wednesday and Thursday), in the morning shift from 9.00am to 2.00pm.

The questionnaire was read, explained, and choices were recorded by the educated patients and by the investigator for non-educated patients. The time needed for completing the tools was about 25-35 minutes for every patient

**(III)Administrative design:**

An official letters including the title and the purpose of the study were sent from the Dean of Faculty of Nursing– Ain Shams University to the director of the Damanhour National Medical Institute –affiliated to the General Organization for teaching hospitals and Institutes to get their approval for data collection, and to obtain the statistical data of the patients on hemodialysis.

**Ethical consideration:**

Ethical Approval was obtained from the scientific, ethical committee of the Faculty of Nursing– Ain Shams University. The purpose of the study was explained to the patients before conducting the study and oral consents were obtained from them to participate in the study

The studied patients were given an opportunity to withdraw from the study at any time without giving any reason and they were assured that anonymity and confidentiality of information were protected. Ethics, values, cultures and beliefs were respected.

**(IV) Statistical design:**

The collected data were organized, tabulated, graphically and statistically analyzed using the statistical package for the social sciences (SPSS) software package version 20. Descriptive statistics including frequency, distribution, mean, median and standard deviation.

The statistical analysis included:

•**Percentages (%), mean and standard deviation (SD):** were used for quantitative continuous variables.

• **Coefficient of correlation (r) (pearson correlation):** a test was used to measure the strength of the association between two variables.

**Significance of results was considered as follows:**

Not Significant (NS)  $p \geq 0.05$

Significant (S)  $p < 0.05^*$

Highly Significant (HS)  $p < 0.01^{**}$

**Results**

**Table (1):** Shows that, 61.4% of the studied patients were males and 37.2% of them, their age ranged from 30 to less than 50 years with mean of age of  $44.24 \pm 16.404$ . Also, 32.9% of them were secondary and university educated respectively. In addition, 70% of the patients

were married and 95.2% of the single patients were single because of hemodialysis. Also, 91.8% of them had children and 55.5% had 1-2 children. Moreover, 81.4% of the studied patients were not working, 36.8% of them not found a work and 18.6% of them were working and 76.9% of their work required muscle and mental effort. Moreover, 58.6% of them had regular monthly income. 92.9% of them had not enough income and 78.6% of them had treatment coverage through the governmental expense. In addition, 64.3% of the studied patients lived in rural areas.

**Table (2):** Shows that 37.1% of the studied patients discovered end stage renal failure and received hemodialysis from 5 to less than 10 years and 98.6% of them received hemodialysis three times per week and 100% of them had their session from 3-4 hours. Also, 81.4% of the studied patients had hypertension, 64.3% of them used to drink caffeine, 97.1% of the studied patients received their health education about chronic renal failure and hemodialysis from physicians and nurses and 65.7% of their families had hypertension.

**Table (3):** Shows that 70%, 34.3% 28.6% of the studied patients had unsatisfactory knowledge about graft nature, instructions followed during hemodialysis sessions and signs of fluid excess respectively, while 80% of them had satisfactory level of knowledge regarding advantages of hemodialysis, investigations done for hemodialysis patients.

**Figure (1):** Shows that, 70% of the studied patients had satisfactory total level of knowledge about CRF and hemodialysis, while, 30% of them had unsatisfactory total level of knowledge about CRF and hemodialysis.

**Table (4):** Shows severity of physiological stressors in which the very high stressors were feeling tired, limitation of fluid and decrease in sexual derive and their percentages were 88.9%, 83.2% and 80.8% respectively in where the means were  $3.56\pm.629$ ,  $3.33\pm.737$  and  $3.25\pm.926$  respectively. In contrast, there were the lowest physiological stressors of middle level which were nausea and vomiting, dependency on nurses and dependency on physicians and their percentages were 43.9%,

40.4% and 40% respectively in where the means were  $1.76\pm.999$ ,  $1.61\pm.728$  and  $1.60\pm.710$  respectively.

**Table (5):** Shows severity of psychological stressors in which high stressors were changes in body appearance, limited in style of clothing and length of treatment and their percentages were 77.9%, 76.4% and 75.7% respectively in where the means were  $3.11\pm 1.071$ ,  $3.06\pm 1.141$  and  $3.03\pm.916$  respectively, , while the lowest stressors of middle level were uncertainty about the future, dialysis machine and/ or equipment and fear of being alone and their percentages were 53.9%, 49.6% and 46.4% respectively in where the means were  $2.16\pm 1.187$ ,  $1.99\pm.807$  and  $1.86\pm 1.053$  respectively.

**Table (6):** Shows severity of social stressors in which very high stressors represented in transportation to and from the unit and cost of treatment / transportation to and from treatment / or other cost factors in which their percentages were 81.4% and 80.7% respectively, in where the means were  $3.26\pm.928$  and  $3.23\pm 1.024$  respectively, while the lowest social stressors of high and middle levels were limits on time and place for vacation and changes in family responsibilities in which their percentages were 60.7% and 59.3% respectively in where the means were  $2.43\pm 1.057$  and  $2.39\pm 1.127$  respectively.

**Figure (2):** Shows the severity of total stressors. All of them were high stressors represented in social stressors followed by psychological stressors then physiological stressors in which their percentages were 64.3%, 64.1% and 62.6% respectively. While the severity of total stressors was high and its percentage was 63.3%.

**Table (7):** Shows that, there was highly statistically significant positive correlation between the total level of knowledge and educational level at P value ( $p < 0.01$ ). Also, there was highly statistically significant negative correlation between total level of knowledge and age at P value ( $p < 0.01$ ). Moreover, there was statistically significant positive correlation between total level of knowledge and marital status at P value ( $p < 0.05$ ).

**Table (1):** Number and percentage distribution of the studied patients regarding their socio-demographic characteristics (n=70).

Items	No	%
<b>Age</b>		
Less than 30 years	19	27.1
30 to less than 50 years	26	37.2
50 and more years	25	35.7
<b>Mean <math>\pm</math> SD</b>	<b>44.24<math>\pm</math>16.404</b>	
<b>Gender</b>		
Male	43	61.4
Female	27	38.6
<b>Educational level</b>		
Doesn't read or write	11	15.7
Read and write	13	18.5
Secondary school	23	32.9
University education	23	32.9
<b>Marital status</b>		
Married	49	70.0
Single	21	30.0
<b>Single because of hemodialysis (n=21)</b>		
Yes	20	95.2
<b>Having children (n=49)</b>		
Yes	45	91.8
<b>Number of children (n=45)</b>		
1-2	25	55.5
3-4	17	37.8
More than 4	3	6.7
<b>Job</b>		
Working	13	18.6
Not working	57	81.4
<b>Work nature</b>		
Mental effort	3	23.1
Muscle and mental effort	10	76.9
<b>Causes of not work (n=57)</b>		
Retired	18	31.6
Housewife	10	17.6
Not found a work	21	36.8
Lost job due to disease	8	14
<b>Regular monthly income</b>		
Yes	41	58.6
<b>Income</b>		
Not enough	65	92.9
<b>Ways of treatment coverage</b>		
Insurance	13	18.6
The governmental expense	55	78.6
Other (Contracted parties)	2	2.8
<b>Residence</b>		
Urban	25	35.7
Rural	45	64.3

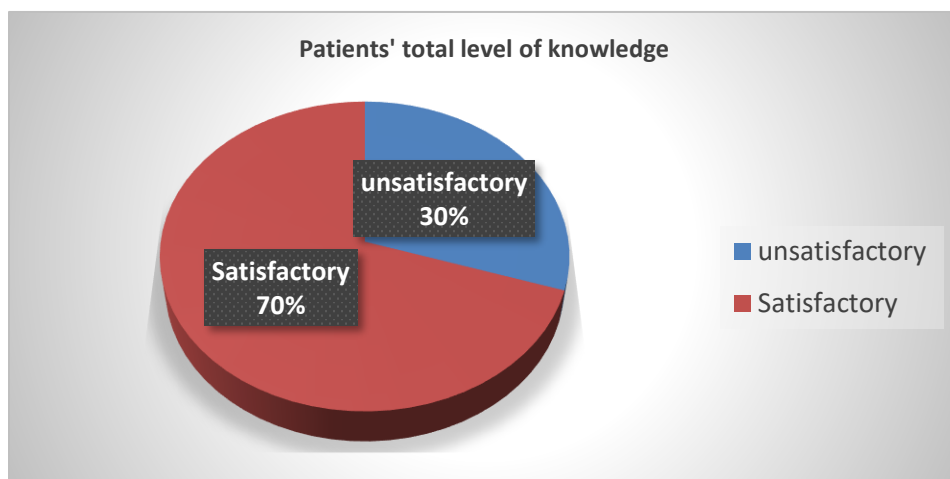
**Table (2):** Number and percentage distribution of the studied patients regarding their clinical data and family history (n=70).

Items	No	%
<b>Disease discovery</b>		
Less than a year	1	1.4
From 1 to less than 5 years	23	32.9
From 5 to less than 10 years	26	37.1
10 years and more	20	28.6
<b>Number of years of hemodialysis</b>		
Less than a year	1	1.4
From 1to less than 5 years	23	32.9
From 5 to less than 10 years	26	37.1
10 years and more	20	28.6
<b>Times of hemodialysis weekly</b>		
Twice	1	1.4
Three times	69	98.6
<b>duration of the session</b>		
3-4 hours	70	100.0
<b>Comorbidity*</b>		
Heart diseases	1	1.4
Hypertension	57	81.4
Diabetes	10	14.3
Other (systemic lupus erythematosus and convulsion)	3	4.3
<b>Unhealthy habits (58)</b>		
Smoking	13	18.6
Caffeine intake	45	64.3
<b>Patients' source of health education about chronic renal failure and hemodialysis*</b>		
Physicians and nurses	68	97.1
Media	20	28.6
Relatives	20	28.6
<b>Family history *</b>		
Heart diseases	7	10.0
Hypertension	46	65.7
Renal failure	13	18.6
Diabetes	26	37.1

**Table (3):** Number and percentage distribution of the studied patients' level of knowledge regarding CRF and hemodialysis (n=70).

Items of knowledge	Correct		Incorrect	
	No	%	No	%
Kidney function	55	78.6	15	21.4
Causes of chronic renal failure	51	72.9	19	27.1
Definition of hemodialysis	54	77.1	16	22.9
Indications of hemodialysis	54	77.1	16	22.9
Signs of fluid excess	50	71.4	20	28.6
Advantages of hemodialysis	56	80.0	14	20.0
Types of dialysis machine access	54	77.1	16	22.9
Fistula nature	51	72.9	19	27.1
Graft nature	21	30.0	49	70
Complications of fistula and graft	51	72.9	19	27.1
Complications of the catheter	51	72.9	19	27.1
Complications of hemodialysis	55	78.6	15	21.4
Investigations done for hemodialysis patients	56	80.0	14	20.0
Care of fistula and graft	55	78.6	15	21.4
Care of catheter	53	75.7	17	24.3
Maintaining the therapeutic regimen	53	75.7	17	24.3
Maintain the efficiency of hemodialysis session	55	78.6	15	21.4
Instructions followed during hemodialysis sessions	46	65.7	24	34.3





**Figure (1):** Percentage distribution of the studied patients regarding their total level of knowledge about CRF and hemodialysis (n=70).

**Table (4):** Number and percentage distribution of the studied patients regarding to physiological stressors (n=70).

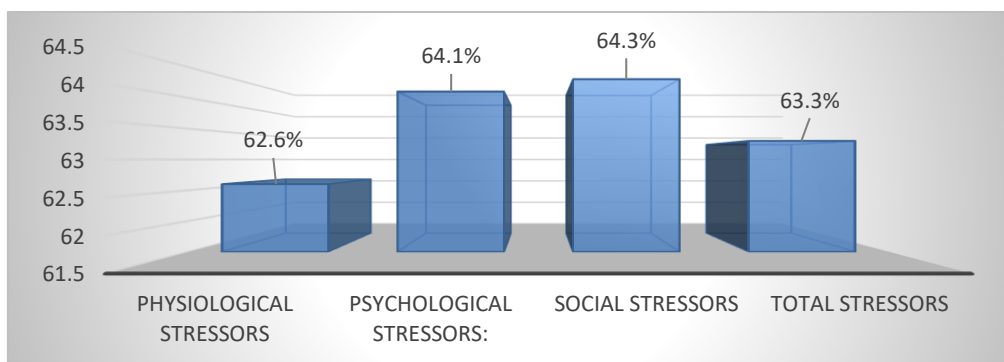
Stressors	Ranking of severity	% of severity	$\bar{x} \pm SD$
Arterial & venous stick.	6	66.4	2.66±.849
Nausea and vomiting.	14	43.9	1.76±.999
Muscle cramps/soreness.	10	62.5	2.50±.974
Itching.	12	54.6	2.19±1.054
Stiffening of joints.	8	65.0	2.60±1.095
Feeling tired	1	88.9	3.56±.629
Loss of body function.	5	76.8	3.07±.709
Limitation of food.	11	60.4	2.41±.970
Limitation of fluid.	2	83.2	3.33±.737
Decrease in sexual derive. N= 49	3	80.8	3.25±.926
Limitation of physical activity.	4	78.6	3.14±.708
Sleep disturbances.	9	62.9	2.51±.928
Decreased ability to have children. N= 49	13	45.0	2.06±1.183
Feelings related to treatments example: feeling cold.	7	66.1	2.64±.993
Dependency on nurses.	15	40.4	1.61±.728
Dependency on physicians.	16	40.0	1.60±.710

**Table (5):** Number and percentage distribution of the studied patients regarding to psychological stressors (n=70).

Stressors	Ranking of severity	% of severity	$\bar{x} \pm SD$
Length of treatment.	3	75.7	3.03±.916
Uncertainty about the future.	6	53.9	2.16±1.187
Changes in body appearance.	1	77.9	3.11±1.071
Limited in style of clothing.	2	76.4	3.06±1.141
Frequent hospital admission.	4	71.1	2.84±1.044
Dialysis machine and/ or equipment.	7	49.6	1.99±.807
Fear of being alone.	8	46.4	1.86±1.053
Boredom.	5	61.8	2.47±1.176

**Table (6):** Number and percentage distribution of the studied patients regarding to social stressors (n=70).

Stressors	Ranking of severity	% of severity	$\bar{x}$ and SD
Decrease in social life.	3	71.1	2.84±1.016
Interference with job. N= 13	4	66.2	2.57±1.9
Changes in family responsibilities.	6	59.3	2.39±1.127
Cost of treatment / transportation to and from treatment/ or other cost factors.	2	80.7	3.23±1.024
Transportation to and from the unit.	1	81.4	3.26±.928
Limits on time and place for vacation.	5	60.7	2.43±1.057



**Figure (2):** Number and percentage distribution of the studied patients regarding total stressors (n=70).

**Table (7):** Correlation between the patients’ level of knowledge about CRF and hemodialysis and their socio-demographic characteristics (n=70).

Socio-demographic characteristics	Total level of knowledge	
	R	P value
Gender	.072	.551
Age	-.487**	<.001
Educational level	.880**	<.001
Marital status	.260*	.030
Have children	-.006	.968
Job	.157	.197
Income	-.172	.154
Way of treatment coverage	.034	.780
Residence	-.205	.088

**Discussion**

Quality of life for hemodialysis patients is affected by different types of stressors and dimensions including physiological, psychological and social stressors, so it is necessary to develop a stress intervention program suitable for hemodialysis patients to overcome these stressors to promote health and wellbeing (Kim et al., 2021).

This study aimed to assess physiological, psychological and social stressors among patients on hemodialysis (HD). It was achieved through the following:

- Assess patient's knowledge about chronic renal failure (CRF) and hemodialysis.
- Assess physiological, psychological and social stressors among patients on hemodialysis.

Regarding age of the studied patients, it was observed that the highest percentage of them reaching more than one third; their age ranged between 30<50 years. From the investigator’ point of view the interpretation of the previous findings may be because the middle age feel the freedom to do whatever they want like smoking, junky food and other

unhealthy habits which affects body systems badly and may cause renal failure. This finding is contrary to (*Abo El-Ata, et al., 2021*) that performed study entitled "Relation between stressors, coping strategies, self-efficacy among patients undergoing hemodialysis", this study was carried out in hemodialysis unit at El-Salam Hospital in Port-Said city, Egypt and reported that the highest percentage of the studied patients occurred in adults more than 50 years.

Concerning gender of the studied patients, the present study revealed that more than half of the studied patients were males. High percentage of males in this study, from the investigator's point of view, the interpretation of the previous findings may be because unhealthy habits of men compared to women as customs and tradition controlled females unlike some males who followed unhealthy habits because of misconceptions or faulty concepts. This study finding is in harmony with (*Rady & Ahmed, 2019*) that performed a study entitled "Stressors, Self Efficacy and Level of Hope for Patients with Chronic Renal Failure Undergoing Hemodialysis" this study was conducted at King Fahd unit for hemodialysis at, ELManial hospital, Cairo University and showed that nearly two thirds of the studied patients were males.

Regarding level of education of the studied patients, it was observed that the highest percentage of them, their level of education was secondary school and university education as equal due to increased awareness of importance of education in the society nowadays. Also this explains why more than two third of the patients had satisfactory level of knowledge about their disease and hemodialysis. This finding is in disagreement with (*Bilgiç & Cebeci, 2022*) that performed a study entitled "Relationship Between Stressors and Comfort Level in Hemodialysis Patients", this study was carried out in the outpatient hemodialysis units of 2 state hospitals, Turkey and reported that the highest percentage of the patients' level of education was primary school and the percentage was three quarters of the studied patients.

Regarding occupation of the studied patients, it was observed that more than four

fifths of the studied patients were unemployed. This findings is in agreement with (*Kılıç & Alpar, 2016*) who conducted a study entitled "The effect of group training implemented on hemodialysis patients for their stress management, psychosocial adjustment and self-care strength" this study was carried out on patients who received therapy in the hemodialysis units at two state hospitals in Turkish Republic of Northern Cyprus (TRNC) that found that more than four fifths of the studied patients were unemployed.

Regarding disease discovery and duration of hemodialysis of the studied patients, it was observed that the highest percentage of the studied patients (more than one third), their discovery of ESRF and their duration of hemodialysis ranged between 5 to less than 10 years as more cases were in the middle age and started hemodialysis between 5 to less than 10 years. This finding is in disagreement with (*Nguyen, 2020*) who conducted a study about "Stressors and Coping Styles Among Chronic Hemodialysis Patients in Vietnam " this study was conducted at Cho Ray hospital in Ho Chi Minh City, Vietnam, that found that the highest percentage; more than one third of the studied patients, their duration of hemodialysis was less than five years.

Regarding comorbidity of the studied patients, it was observed that more than four fifths of the studied patients had hypertension and more than half of them had a family history of hypertension as hypertension with end-stage renal disease (ESRD) receiving hemodialysis, is common and poorly controlled in general due to volume overload, sodium retention, increased arterial stiffness, activation of renin-angiotensin-aldosterone system, activation of sympathetic nervous system, and use of recombinant erythropoietin may be also involved. This finding is in disagreement with (*El-Habashi et al., 2020*), that conducted a study about "Quality of Life and its Determinants among Hemodialysis Patients: A Single-Center Study" this study was carried out in among HD patients at one big center, Bahrain Defense Force Hospital, Manama, Kingdom of Bahrain and showed that diabetic mellitus was the common cause of ESRD (85%).

Concerning level of knowledge, more than two thirds of the studied patients had satisfactory level of knowledge about chronic renal failure and hemodialysis, this may be due to increased awareness and knowledge given to the patients about their condition due to presence of experienced and caring medical and nursing staff who focused on health teaching for hemodialysis patients.

Regarding physiological stressors of the studied patients, it was observed that the highest stressor was feeling tired as feeling tired is a subjective symptom illustrated by weakness and lack of energy and caused by anemia, malnutrition, inflammation, creatinine and albumin levels, and sleep disorders. This study outcome likes finding of study performed by (*Qaddumi et al., 2020*) who conducted a study about " Physiological and psychosocial stressors among Palestinian hemodialysis patients: A cross-sectional study " this study was conducted in three governmental hospitals and one private hospital in the North of the West Bank, Palestine that found that feeling tired was the highest stressor. In contrast, this finding is in disagreement with (*Nguyen, 2020*), that showed that the highest physiological stressor was arterial and venous stick.

Regarding physiological stressors of the studied patients, it was observed that the lowest stressor was dependency on physicians, this may be because doctors were qualified, professional and helpful. Also because of the trusting relationship created between the physician and the patients due to length of treatment. This finding is contrary to (*Tchape et al., 2018*), who conducted study about "Physiological and psychosocial stressors among hemodialysis patients in the Buea Regional Hospital, Cameroon " this study was carried out in the Buea Health District at the South West Region dialysis Centre found at the Buea Regional hospital that found that itching was the lowest physiological stressor.

Regarding psychological stressors of the studied patients, it was observed that the most frequent psychological stressors included changes in body appearance, limited in style of clothing, length of treatment and frequent hospital admission respectively, all are high

level stressors. This finding is in disagreement with (*Elgamal & Saleh, 2019*), who conducted a study entitled "assessing the physiological, psychological stressors and coping strategies among hemodialysis patients in the kingdom of Saudi Arabia " revealed that the most frequent psychosocial stressors included boredom, length of treatment, frequent hospital admission and changes in body appearance.

Regarding psychological stressors of the studied patients, it was observed that fear of being alone was the lowest stressful psychological stressor facing the patients represent middle level stressor. This finding is in agreement with (*Amin et al., 2015*) who conducted a study entitled "Hemodialysis; psychosocial stressors in patients undergoing", this study was conducted in the Renal Dialysis Unit of Nishtar Hospital, Multan, that found that fear of being alone was the lowest stressful psychological stressor facing the patients. While this finding is contrary to (*Jirdi et al., 2017*) who conducted study about "Patients' perception of physical and psychosocial stressors and coping strategies in hemodialysis units" this study was conducted in the hemodialysis unit of a Tishreen University Hospital in Latakia and showed that depression was the lowest psychological stressor.

Regarding social stressors of the studied patients, it was observed that the highest social stressor was transportation to and from the unit, this may be because majority of cases lived in rural areas away from the hospital and needed means of transportation to reach it besides putting extra fatigue from transportation and more exhaustion. This finding is in agreement with (*Tchape et al., 2018*) that found that transportation to and from the unit was the highest social stressor.

In contrast, it was found that changes in family responsibilities was the lowest social stressor representing middle level stress, this may be due to presence of patients' families who supported them and carried the heavy weight on their shoulder to see them in a well state. This study is in agreement with (*Neupane et al., 2019*) who conducted a study entitled "Stressors and Coping Strategies among the Patients undergoing Maintenance

Haemodialysis at B.P. Koirala Institute of Health Sciences", this study was conducted in haemodialysis unit of B.P. Koirala Institute of Health Sciences (BPKIHS) and showed that changes in family responsibilities was the lowest stressor.

Regarding severity of all stressors, this study revealed that all stressors of high level stress, this may be because patients had to adapt to a restrictive lifestyle and the quality of life is affected negatively. This finding is in disagreement with (*Bilgiç & Cebeci, 2022*) that found that the patients' perception of stress was moderate.

Regarding severity of all stressors, this study revealed that social stressors were the highest stressful stressors followed by psychological stressors then physiological stressors. This study similar to results of (*Abu El- Ata et al., 2021*), that found that social stressors were the highest stressful stressors followed by psychological stressors then physiological stressors. In contrast, this study is contrary to the study of (*Mafi et al., 2019*) who conducted study about "Relationship Between Stressors and Coping Strategies in Iranian Patients Undergoing Hemodialysis" this study was conducted from a large referral hemodialysis center affiliated to Qazvin University of Medical Sciences, Iran, revealed that physiological stressors were the highest stressful stressors followed by psychosocial stressors.

Regarding correlation between the patients' level of knowledge about CRF and hemodialysis and their socio-demographic characteristics, it was observed that there was highly statistically significant positive correlation between the total level of knowledge and educational level at P value ( $p < 0.01$ ) as high educational level are more aware of everything about their condition and know how to search for updates.

Also, there was highly statistically significant negative correlation between total level of knowledge and age at P value ( $p < 0.01$ ), this may be because young age patients were more educated and attentive to information's given. Moreover, there was

statistically significant positive correlation between total level of knowledge and marital status at P value ( $p < 0.05$ ), this may be because married patients had to care for their families and this was a motive to them to face the challenges of the disease and increase knowledge needed.

## Conclusion

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More than two third of the studied sample had satisfactory level of knowledge regarding chronic renal failure, hemodialysis & its management. Also, the studied patients face physiological, psychological and social stressors, all of high level stress and the social stressors were the highest stressful stressors followed by psychological stressors then physiological stressors. There were highly statistically significant relations between social stressors and gender and between psychological stressors and age of the studied patients.

Additionally, there was highly statistically significant positive correlation between the total level of knowledge and educational level. Also, there was highly statistically significant negative correlation between total level of knowledge and age. Moreover, there was statistically significant positive correlation between total level of knowledge and marital status.

## Recommendations

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### In services:

- Establish a center for the patient education provided with teaching aids and facilities to teach patients and their families' ways to live with ESRF and hemodialysis.
- Continuous designing and implementing educational programs should be held for patients about proper coping methods; problem solving strategies and stress management techniques to alleviate stressors associated with chronic hemodialysis treatment and maintain compliance to treatment regimen emphasizing on the importance of holistic care and viewing patients as a whole bio-psychosocial being to empower their self-efficacy by health professionals.
- Providing comprehensive updated educational media including: booklet, handouts, videos,

posters, and CDs should be available for all hemodialysis patients about their illness to improve their awareness and self-efficacy.

- Develop rehabilitation programs taking into consideration the studied physiological, psychological and social stressors among patients on hemodialysis and follow up care to improve the patient condition and increase quality of life.
- A written policy on self-care instructions is recommended to be established.

#### In research:

- Replication of the study is recommended on a wider probability sample selected from different settings and different geographical areas in Egypt to obtain more generalizable data.
- Future studies are needed to assess the effectiveness of the educational programs for patients undergoing hemodialysis on patients' stress and self-efficacy.

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