

Needs Assessment for Patients Undergoing Plasmapheresis: Suggested Guidelines

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Abstract

Background: Plasmapheresis is a procedure carried out for various life-threatening and debilitating diseases as a principal mode of treatment or as an adjunct with other therapies. It is a process involving extracorporeal removal of plasma from other components of blood, discarding and replacing plasma with physiological fluids. **Aim:** The present study was conducted to assess needs for the patients undergoing plasmapheresis and develop suggested guidelines. **Research design:** A descriptive exploratory design. **Setting:** The study was conducted in hemodialysis unit at urology and nephrology center and hemodialysis unit affiliated to Mansoura university hospitals. **Methods:** A purposive sample of 108 patients undergoing plasmapheresis that met the following selective criteria, from both genders, adult focal segmental glomerulosclerosis patients prepare for renal transplantation, adult patients after renal transplantation rejection, patients suffer from immunological disorder (systemic lupus) and patients undergoing plasmapheresis and agree to participate in the study. **Results:** Majority of studied patients had unsatisfactory level of overall knowledge needs of patients undergoing plasmapheresis. More than one third of patients were partially physically dependent and about one third of them were minimally physically dependent. Regarding psychological needs, Most of the patients under the study had anxiety level while the majority of the studied patients suffer from borderline depression. Regarding social needs the current study revealed that about more than one third of studied patients were very socially dependent. **Conclusion:** The highest dependence needs were anxiety followed by knowledge needs, depression, total physically dependent lastly totally socially dependent. Also, there wasn't a statistically significant relationship between knowledge needs and their educational level and occupation among the studied patients. There was a statistically significant relationship between physical needs and age. **Recommendations:** Providing of simple booklet written in Arabic language for all plasmapheresis units to improve patients' knowledge level & Psychosocial counseling should be provided by specialist for them to facilitate dealing with anxiety and depression and improve their mental health and social dependence.

Keywords: Patients Needs Assessment - Plasmapheresis- Suggested Guidelines.

Introduction

Plasmapheresis is a procedure carried out for various life-threatening and debilitating diseases as a principal mode of treatment or as an adjunct with other therapies. It is a process involving extracorporeal removal of plasma from other components of blood, discarding and replacing plasma with physiological fluids (Walsh et al., 2020).

Hospitalized patients needs physical, social support as well psychological and educational needs. The "patients' need" is a dynamic complex concept that changes with time and disease progression, while it is also dependent on the spiritual cultivation and cultural traditions of the patients (Litterini & Wilson 2022).

Through listening to patients, nurses and other health care professionals, it could also appreciate the challenges faced by plasmapheresis patients. Patients undergoing plasma exchange require ongoing review, providing the opportunity to assess patients psychosocial as well as physical needs and a secure environment in which patients feel comfortable to share their stories and concerns (*Stavroula & Gerogianni 2015*).

Nurse has a very important role in psychological support for patients undergoing plasmapheresis. That is because the specialist nurse participates to their psychological - emotional support through interpersonal communication, individualized care, development of mutual trust, reliable information and counseling (*Kong, 2019*).

Thus, the role of the clinical nurse is to provide personalized, humanistic and comprehensive nursing care to patients undergoing plasmapheresis. In clinical practice, nurse responsible about plasmapheresis to be an effective practitioner able to establish and maintain high quality evidence-based nursing services and to work with the multi-disciplinary team to ensure that patients receiving plasma exchange have access to specialist care, knowledge able and expertise (*Sargent & Ashurst 2021*).

Nurses responsible about continuous evaluation plasmapheresis patients parameter that includes physical examination, analysis and interpretation of the results of laboratory tests, evaluation before the first plasmapheresis session and assessment of each session (before, after and during it) (*Huang et al., 2018*).

Also, the nurse helps the patient to be adapted to plasmapheresis, to adjust plasmapheresis treatment in his features and to gain motivation and quality of life. However, the most important for the health practitioner is to distinguish individuals at high risk for psychosocial needs, as these individuals should

early join in vocational counseling and psychotherapy (*Nemec 2017*).

Guidelines are foundational to health care improvement efforts. Where the criteria for their development lack rigor, this may undermine their recommendations' credibility and be more harmful than beneficial in clinical practice (*Wang et al., 2020*).

Significance of the Study:

Plasmapheresis is often used as a rescue therapy for individuals who are in state of crisis or severe exacerbation. The National Institution of Health (NIH) estimates up to 23, 5 million American suffer from autoimmune disease and that the prevalence is rising. (*Hamza, Mohamed & Hassanein, 2019*).

According to Statistical Record at Urology and Nephrology Center at Mansoura University (2019), the number of adult renal patients undergoing plasmapheresis were estimated to 28 patients, While According to Statistical Record at Mansoura University Hospitals (2019) the number of patients undergoing plasmapheresis for hematological, neurological, immunological and renal diseases were estimated to 278 patients. But the total number of patients undergoing plasmapheresis for renal diseases only at Mansoura university hospitals were estimated to 122 patients. The nurse plays avital role in educating patient to overcome the negative aspect of their treatment and decrease psychological stress among patients, provide appropriate care, prevention and early detection of complications, which lead to better adjustment (*Padmanabhan et al., 2019*).

Aim of the Study:

The present study was conducted to assess needs of patients undergoing plasmapheresis and develop suggested guidelines. This aim was achieved through the following:

1. Assess needs for the patients undergoing plasmapheresis.
2. Develop suggested guidelines for patients undergoing plasmapheresis.

Research questions:

The study was conducted to answer the following research questions:

1. What are the needs of patients undergoing plasmapheresis?
2. What are the suggested guidelines to care for such groups of patients?

Subjects and Methods:

Subjects and methods for this study were portrayed under four main designs

I. Technical design

The technical design included research design, setting, subjects and tools for data collection.

• Research Design:

Descriptive exploratory design was utilized in this study to achieve the aim; this design was used to assess needs for the patient's undergoing plasmapheresis.

Setting:

The study was conducted in two units:

- Hemodialysis Unit of Urology and Nephrology Center at Mansoura University
- Hemodialysis unit affiliated to Mansoura University Hospitals.

• Subjects:

Purposive Sample of the patients undergoing plasmapheresis that met the following selective criteria:

Inclusion criteria

- From Both genders.
- Adult focal segmental glomerulosclerosis patients prepare for renal transplantation or adult patient after renal transplantation rejection or patients suffer from immunological disorder (systemic lupus).
- Patients undergoing plasmapheresis and agree to participate in the study.

Exclusion criteria:

- Patient with psychological and emotional problems.

- Patient refuse to participate in the study.

Sample size:

Total number of the adult renal patients undergoing plasmapheresis were 150 patients. According to statistical table the **sample size** was 108 patients.

Confidence=95%			Confidence=99%		
Accuracy/Margin of error			Degree of accuracy/Margin of error		
0.035	0.025	0.01	0.05	0.035	0.025
10	10	10	10	10	10
20	20	20	19	20	20
29	29	30	29	29	30
47	48	50	47	48	49
69	72	74	67	71	73
89	94	99	87	93	96
126	137	148	122	135	142
160	177	196	154	174	186

• Tools for data collection:

Four tools were utilized to collect data for this study, all tools will be in Arabic language,

Tool I: Patient Interviewing Questionnaire, it was developed by the researcher after reviewing the related literature (*Schwartz, J., Padmanabhan. A., Aqwi, N., Balogun, R., Connelly-Smith L., (2016)*). This tool composed of three parts:

Part 1: Patient Demographic Data:

This part was assessing demographic data of the studied patients including age, gender, marital status, educational level and occupation.

Part 2: Patient Health History: This part was assessing present, past medical and surgical history of the patients and it was including diagnosis, duration of disease, other associated disease, family history, surgical history and medications used.

Part 3: Patient Knowledge about Plasmapheresis: This part was used to assess patients' knowledge regarding plasmapheresis therapy. It was adapted from (*Hamza, 2019*). It consisted of 35 MCQ questions in the form of multiple choices questions (MCQ), true/false questions which were divided into three sections as following:

• **Section 1: Plasmapheresis concept**, this part concerned with general information about plasmapheresis process. It consisted of seven MCQ questions.

• **Section 2: Plasmapheresis guidelines**, this part concerned with guidelines of plasmapheresis. It consisted of five MCQ questions.

• **Section 3: Plasmapheresis complications**, this part concerned with occurrence of plasmapheresis complications. It consisted of 23 questions (True or False).

❖ Scoring system:

Regarding Patients Knowledge questionnaire, the response for each question was either by choosing the correct answer and true or false. Each correct answer was given one grade and the incorrect answer was given zero. The total scores were summed up (35 grades). The percentage of the total scores was calculated then categorized as following

- $\geq 60\%$ = satisfactory level of knowledge which equal ≥ 21 grades.
- $< 60\%$ = unsatisfactory level of knowledge which equal < 21 grades.

Tool II: Barthel Index of Activities of Daily Living: This tool adopted from (Collin, Wade & Davies 1988), it was used to assess patients' physical needs regarding plasmapheresis therapy. It consisted of 10 items including feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers, mobility, and stairs use

❖ Scoring system:

The total scores for whole physical needs assessment were summed up (100 grades then were categorized as following:

- From 80 to 100 patients were live independently.
- From 60 to 79 patients were minimally dependent.

- From 40 to 59 patients were partially dependent.
- From 20 to 39 patients were very dependent.
- < 20 patients were totally dependent.

Tool III: Hospital Anxiety and Depression Scale (HADS): This tool was adopted from *Zigmond et al., (1983)*. It was used to assessing psychological needs for patients undergoing plasmapheresis. It composed of two subscales anxiety and depression with 7 questions for each and each question contained 4 choices.

Scoring system:

The total scores for each subscale were summed up 21 grades then were categorized as following:

- From 0 to 7 patients were normal anxiety or depression level.
- From 8 to 10 patients were borderline abnormal anxiety or depression level.
- From 10 to 14 patients were abnormal anxiety or depression level.

Tool IV: The Medical Outcomes Study (MOS) Social Support Survey: This tool was adopted from (*Sherbourne and Stewart 1991*). It was used to assess social needs for patients undergoing plasmapheresis and included 20 questions. Question (1) was not included in data analysis and it was used to assess number of close friends/relatives of patients undergoing plasmapheresis. Questions (2 to 20) was used to assess social support with 5 responses in which the patient was select one of these responses using a five-point including All of the time, most of the time, some of the time, a little of the time and none of the time.

❖ Scoring system:

The total score for every patient was summed up then categorized as following:

- From 80 to 100 patients were live independently.

- From 60 to 79 patients were minimally dependent.
- From 40 to 59 patients were partially dependent.
- From 20 to 39 patients were very dependent.
- <20 patients were totally dependent.

Validity and reliability:

Testing validity revised by a jury of seven experts (two professors, three assistant expertise professors and two lecturers from medical surgical nursing department, faculty of nursing, Ain Shams University) and one physician from urology and nephrology center Mansoura university.

The reliability of tool was done statistically by Cronbach Alpha test to examine internal consistency of proposed tools. A knowledge questionnaire was reliable at 0.875 and Barthel Index of Activities of Daily Living was reliable at 0.907 Its maximal value was 1.0 which indicated highest reliability.

II. Operational design:

The operational design included the preparatory phase, content validity of the developed tool, pilot study and field work

Preparatory phase:

A review of the current and past available literature and theoretical knowledge covering the various aspects of the study using books, articles, magazines, internet and periodicals to develop tools for data collection.

Pilot study:

A Pilot study was carried out in 2 dialysis units at urology and nephrology center and Mansoura university hospitals on 10% of the subjects under study to test the applicability, clarity and to estimate the proper time required to fulfill the tools. Patients who were included in the pilot study were included into the study sample because no modifications were done after conducting pilot study.

Field Work:

Data collection took about nine months started from the beginning of May 2020 to the end of January 2021.

The investigator collected data for patients undergoing plasmapheresis on two shifts in the morning and afternoon regarding availability of patients on plasmapheresis sessions.

The investigator started data collection with interviewer questionnaire, it was filled by investigator for uneducated patients with each patient individually in about 30 minutes.

The Barthel Index of Activities of Daily Living was filled by investigator for uneducated patients in about 10 minutes.

The Hospital Anxiety and Depression Scale (HADS) was filled by investigator for uneducated patients in about 10 minutes.

The Medical Outcomes Study (MOS) Social Support survey was filled by investigator for uneducated patients in about 10 minutes.

III. Administrative design:

An official letter was issued from the Faculty of Nursing Ain shams university explaining the aim of the study to obtain permission for the collection of data. The necessary approval was obtained from the Director of Mansoura University Hospital and urology and nephrology center Mansoura University.

A brief explanation of the study aim was given to the participants that the information obtained will be treated confidentially, used only for the purpose of the study, will not cause any harm to the participants and informed that their participation was voluntary. The participants were informed that they were allowed to choose whether to participate or withdraw from the study at any time.

Ethical considerations:

The ethical research considerations in this study included the following:

- The research approval was obtained from the scientific ethical committee in faculty of nursing, Ain Shams University before starting the study.
- The researcher clarified the objective and aim of the study to the patients included in the study before starting the study.
- The researcher assured maintaining anonymity and confidentiality of the subjects' data that were included in the study.
- Written consent was obtained from patients to participate in the study.

Based on data collected the guidelines were prepared based on patients identified needs. The guidelines developed by investigator in Arabic language, guided with images after review the related literature (*Ranganathan & John 2019*), (*Padmanabhan, et al 2019*) and (*Hamza, Mohamed & Hassanein 2019*). It consisted of four parts: (1) plasmapheresis concept which included plasmapheresis introduction, plasma definition, types of plasmapheresis and therapeutic plasmapheresis definition, (2) information of plasmapheresis which included goals, method, uses and contraindications of plasmapheresis. (3) plasmapheresis complications which included most common complications (4) plasmapheresis guidelines which included guideline before plasmapheresis, during plasmapheresis and guidelines after plasmapheresis.

IV. Statistical design

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 20. The quantitative data was presented as mean, standard deviations. Also, qualitative variables were presented as number and percentages.

Cronbach's Alpha test was used to assess the internal reliability and consistency of the studied questionnaire. The relations were done by using Chi-square test and correlation between two variables was done with coefficient test. The confidence interval was set to 95% and the margin of error accepted was set to

5%. So, the p-value was considered significant as follow: $P > 0.05$: Non significant (NS) and $P < 0.05$: Significant (S).

Results:

Table (1): Illustrates that 40.7% of patient's age ranged between 30- 40 years old with mean age of 33.4 ± 9.4 , while 57.4% of the studied patients were females, 61.1% of the studied patients were married, 76.9% of the studied patients were educated and 64.8% of the studied patients were not working.

Table (2): Displays medical history of the studied patients. The table shows that Systemic lupus erythematosus represented 60.2% of the studied patients, while Renal rejection represented 14.8% on the other hand focal segmental glomerulosclerosis 25%. Also, 48.1% of patients had <1 year duration of disease. Hypertension and DM were the associated diseases for about 37.0% and 23.1% respectively, while heart disease represented 12.0%. Also, about 28.7% of the studied patients were positive family history. 51.9% of them had history of surgical operation. Regarding medication all patients were received renal medications. In addition to antihypertensive, antidiabetic and cardiac medications were used about 37.0%, 23.1%, 12.0% respectively.

Table (3): Demonstrates that 80.6% of studied patients had unsatisfactory level of total knowledge about plasmapheresis guidelines. Also, the table shows that 38.9 % of the studied patients had satisfactory level of knowledge about plasmapheresis complications.

Figure (1): Illustrates that 38.9% of studied patients were partially physical depended, while about 30.6% of studied patients were minimally physically depended. While, about 20.4%, 10.1% of studied patients were very physically depended and totally dependence.

Figure (2): Shows that 91.7% of patients under the study had anxiety while 4.6% of patients had border line anxiety level.

Figure (3): Illustrates that 85.2% of patients under the study had borderline depression level of the patients undergoing plasmapheresis, while 14.8% of patients had depression.

Figure (4): Illustrates that 33.3% of patients under the study were partially socially depended. Also, 33.3% of them were very socially depended while about 17.6 % of studied patients were minimally socially depended. On the other hand, 9.3%, 6.5% of them were totally socially dependent and socially independent respectively.

Part1: Demographic characteristics of studied patients.

Table (1): Socio-demographic characteristics of the patients undergoing plasmapheresis (n=108).

Demographic characteristics		N	%
Age	18-30	37	34.3
	30 to 40	44	40.7
	>40	27	25.0
	Mean \pm SD	33.4 \pm 9.4	
Gender	Male	46	42.6
	Female	62	57.4
Marital status	Married	66	61.1
	Unmarried	42	38.9
Educational level	Educated	83	76.9
	Uneducated	25	23.1
Occupation	Working	38	35.2
	Not working	70	64.8

Table (2): Medical history of the patients undergoing plasmapheresis (n=108).

Characters	Items	N	%
Diagnosis	Focal segmental glomerulosclerosis	27	25
	Renal rejection	16	14.8
	Systemic lupus Erythematous	65	60.2
Duration of disease (Years)	<1	52	48.1
	2 – <5	38	35.2
	> 5	18	16.7
Associated disease	Hypertension	40	37.0
	Diabetes	25	23.1
	Heart disease	13	12.0
Medications	+ve Family history	31	28.7
	Surgery	56	51.9
	Anti-Hypertensives	40	37.0
	Antidiabetic medications	25	23.1
	cardiac medications	13	12.0
	Renal medications	108	100.0

Table (3): Number and percentage distribution of the total knowledge domain and cores scores (n=108).

Items of Knowledge	Unsatisfactory		Satisfactory		Mean ± SD
	N	%	n	%	
Plasmapheresis concept	72	66.7	36	33.3	2.5 ± 0.9
Plasmapheresis guidelines	87	80.6	21	19.4	2.1 ± 0.5
Plasmapheresis complications	66	61.1	42	38.9	9.3 ± 4.6
Total Knowledge	94	87.0	14	13.0	13.9 ± 6.2

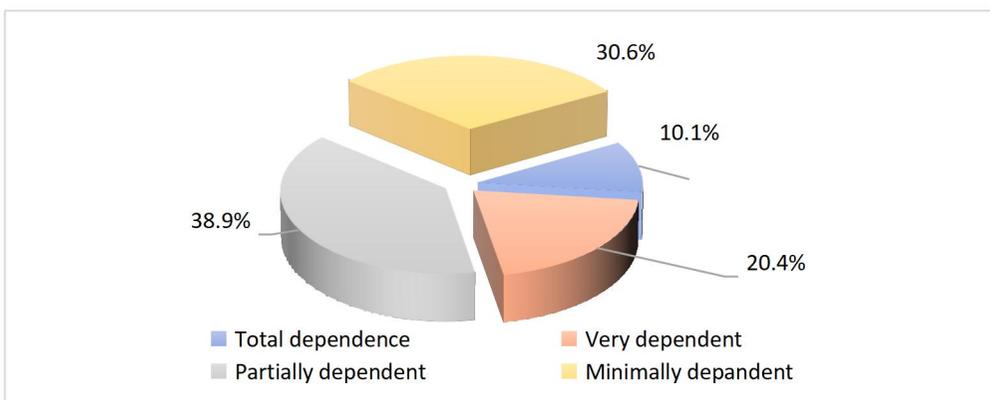


Figure (1): Number and percentage distribution of level of physical dependance of the patients undergoing plasmapheresis(n=108).

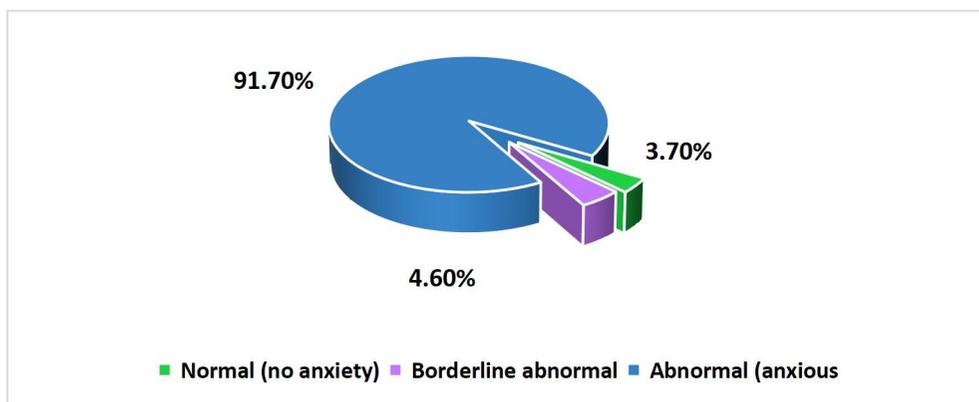


Figure (2): Number and percentage distribution of the total level of anxiety of the patients undergoing plasmapheresis (n=108).

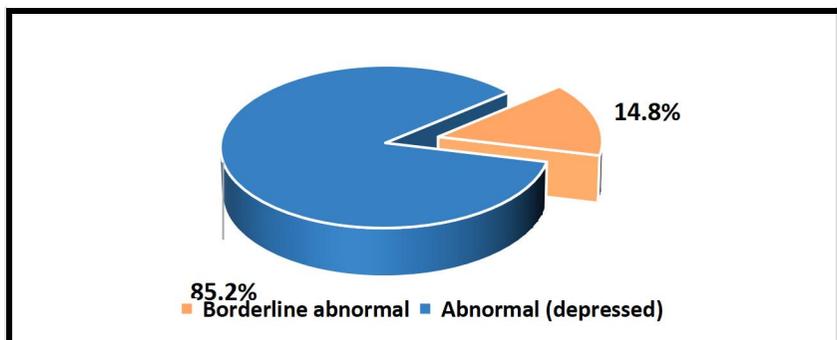


Figure (3): Number and percentage distribution of the total level of depression of the patients undergoing plasmapheresis(n=108).

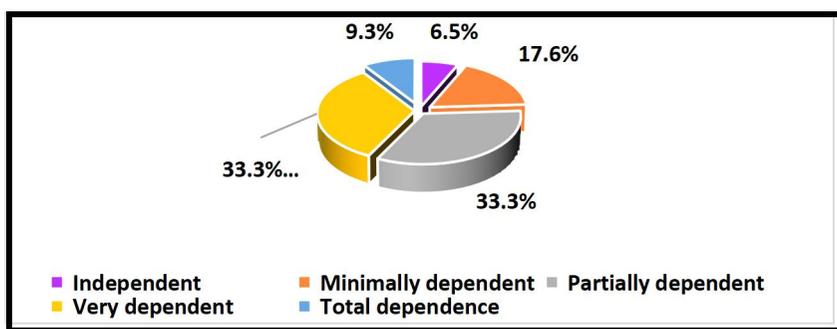


Figure (4): Number and percentage distribution of total level of social needs of the patients undergoing plasmapheresis (n=108).

Table (4): Relation between total patient knowledge and their socio-demographic data (n=108).

	Total Knowledge				Chi-Square Test	
	Unsatisfactory (n=71)		Satisfactory (n=37)		X ²	P
	N	%	n	%		
Age (years)					1.014	0.602
<30	31	33.0	6	42.8		
30 to 40	40	42.6	4	28.6		
>40	23	24.4	4	28.6		
Gender					0.000	0.983
Male	40	42.6	6	42.9		
Female	54	57.4	8	57.1		
Marital Status					7.166	0.007**
Married	62	66.0	4	28.6		
Unmarried	32	34.0	10	71.4		
Educational Level					2.316	0.128
Educated	70	74.5	13	92.9		
Uneducated	24	25.5	1	7.1		
Occupational Status					1.335	0.248
Working	35	37.2	3	21.4		
Not working	59	62.8	11	78.6		

P-value >0.05: Non significant (); P-value <0.05: Significant (*); P value <0.01: highly significant (**).

Table (5): Relations between total patient physical needs and their socio- demographic data (n=108).

	Total Physical Needs								Chi-square test	
	Total dependence (n=11)		Very dependent (n=22)		Partially dependent (n=42)		Minimally dependent (n=33)			
	N	%	N	%	n	%	N	%	X ²	P
Age (years)										
<30	0	0.0	8	36.4	17	40.5	12	36.4	30.184	<0.001**
30 to 40	1	9.1	8	36.4	19	45.2	16	48.5		
>40	10	90.9	6	27.2	6	14.3	5	15.1		
Gender										
Male	3	27.3	6	27.3	20	47.6	17	51.5	4.676	0.197
Female	8	72.7	16	72.7	22	52.4	16	48.5		
Marital Status										
Married	7	63.6	12	54.5	24	57.1	23	69.7	1.730	0.630
Unmarried	4	36.4	10	45.5	18	42.9	10	30.3		
Educational Level										
Educated	7	63.6	19	86.4	36	85.7	21	63.6	7.293	0.063
Uneducated	4	36.4	3	13.6	6	14.3	12	36.4		
Occupational Status										
Working	2	18.2	7	31.8	14	33.3	15	45.5	3.093	0.377
Not working	9	81.8	15	68.2	28	66.7	18	54.5		

P-value >0.05: Non significant (); P-value <0.05: Significant (*); P value < 0.01: highly significant (**).

Discussion

Plasmapheresis is an extracorporeal therapy used in the treatment and management of various diseases and is achieved through the removal and discarding of selected blood constituents or through the collection of targeted blood elements and return to the patient (Solanki et al., 2021).

Regarding age of the studied patients, the current study revealed that more than one third of the studied patients were age group between 30 to 40 years old. This finding is in accordance with (Joglekar et al., 2017) who conducted a study about "Therapeutic plasmapheresis for hypertriglyceridemia-associated acute pancreatitis: case series and review of the literature cytoplasmic antibody-associated systemic vasculitis" Who revealed that, the mean age of the patients was 35 years old, with range of 31–38. This finding was inconsistent with (Faria et al., 2021) who conducted a study about "Therapeutic plasmapheresis: seven year experience of an intensive care unit in portugal

" Who revealed that median age of the studied patients were of age 53 years old.

This result in the current study may be due to the fact that the disease affects all age groups and difference between current study and other findings may be due to difference sample characteristic in each study.

Related to gender, the present study showed that, more than half of the study patients were females. This finding was in the same line with (Gómez-Figueroa et al., 2016) who conducted a study about "Clinical experience of plasmapheresis for neuromyelitis optical patients in Mexico "who found that more than three quarters of the studied patients are female.

Also, this result was contraindicated with (Tombak et al., 2017) who conducted a study about "Therapeutic plasma exchange in patients with neurologic disorders: Review of 63 Cases" who indicated that the nearly two thirds of study patients were males. This result may be due to

both genders are at risk for the diseases that treated with plasmapheresis and the difference may be due to change in diagnosis in the current study and other studies.

Concerning marital status, the present study showed that two thirds of the studied patients were married. This finding was consistent with the study carried by (*Sayadi et al., 2021*) who conducted a study about "The Relationship of lifestyle with disease activity among patients with systemic lupus erythematosus "and indicated that the majority of the studied patients were married.

This result in the present study may be due to the nature of diseases more common occurring in third decade which is the age of marriage.

Concerning educational level, the present study showed that more than three quarters of the studied patients were educated. This finding was in agreement with the finding of (*Hamza, Mohamed & Hassanein 2019*) who conducted a study about "Developing guideline for patients undergoing plasmapheresis" who reported that, the most of the studied subjects were secondary school and highly educated. In contrast with study of (*Sayadi et al., 2021*) who conducted a study titled " The Relationship of lifestyle with disease activity among patients with systemic lupus erythematosus " and reported that, the majority of the studied patients were primary educated only.

Regarding occupation, the current study showed that about more than two thirds of the studied patients weren't working. This finding was in the same line with (*Torres et al., 2021*) who conducted a study titled " Exploring the challenges and needs of home caregivers of hemodialysis patients in the Philippines " and reported that nearly three quarters of patients were unworked. This might be due to the effect of disease process.

Regarding medical history, the present study revealed that systemic lupus was diagnosed in two thirds of the studied patients followed by focal segmental glomerulosclerosis. While one fifth of studied subjects were diagnosed with renal rejection. This finding was in agreement with (*Jouve et al., 2021*) who conducted a study about " Fibrinogen Reconstitution after Therapeutic apheresis: comparison of double-filtration plasmapheresis, plasma exchange, and immunoabsorption" and reported that one quarter of studied patients were diagnosed with renal rejection.

This finding was disagreement with (*Solanki et al., 2021*) who conducted a study about "Therapeutic plasma exchange an emerging treatment modality: a 3-year retrospective analysis of patients admitted in a multispecialty hospital of north India" and reported that nearly half of the studied patients had neurological causes.

This can be explaining that plasmapheresis treatment is choose in various diseases especially in neurological, kidney, immunological and in covid 19.

Additionally, associated diseases were hypertension and diabetic mellitus; who received antihypertensives and antidiabetics medications represented high percentage of studied sample than other common associated disease. This result was in disagreement with (*Chauvel et al., 2020*) who conducted a study about "Use of double filtration plasmapheresis for the treatment of acquired thrombocytopenic thrombotic purpura" who reported that hypertension and cardiopathy represented high percentage of the studied patients than diabetic mellites and chronic renal diseases.

The present study revealed that about majority of studied patients had unsatisfactory knowledge about plasmapheresis. This finding was in agreement with (*Hamza, Hamza, Mohamed & Hassanein 2019*) who conducted a study about "Developing guideline for patients procedure undergoing plasmapheresis"

and reported that, about two thirds of studied patients had poor knowledge. This might be due to plasmapheresis procedure new trend in medical treatment.

Regarding physical needs of studied subjects more than one third of patients were partially physically dependent and about one third of them were minimally physically dependent. This result was supported by (Ng et al., 2020) who conducted a study about "Stability and impact of symptom clusters in patients with end-stage renal disease undergoing dialysis" and reported that Physical function gradually declined with occasional acute episodes.

This could be explained that the underlining disease may had affect on performance of activity of daily living (ADLs), health status and physical ability of patients.

Regarding psychological needs, among the of studied patients the most of them had anxiety. This finding was in agreement with (Kasturi et al., 2021) who conducted a study about "Impact of the first wave of the COVID-19 pandemic on systemic lupus erythematosus patients: results from a multi-center perspective cohort" and reported that nearly half of the studied patients suffered from anxiety.

From investigator's point of view, new procedure, hospitalization and underlining diseases could lead to increase patients' worry and fear about every situation which lead to increase anxiety.

Regarding depression level the majority of studied patients had borderline depression. This result disagree with (Semaan et al., 2018) who conducted a study about Prevalence of depression and anxiety in end-stage renal disease: A survey of patients undergoing hemodialysis." and reported that one quarter of studied patients had borderline depression.

This might be due to the first underlying disease was systemic lupus that affected the

kidneys and led to end stage renal disease treated with hemodialysis, the second underlying disease was focal segmental glomerulosclerosis that thought cause recurrence renal failure after a kidney transplant and third disease renal transplantation rejection. These underlying diseases are serious diseases that affect patients' life and increase their physical and social dependence which lead to increase emotional distress and psychological problems.

Regarding social needs of the studied patients revealed that about more than one third of them had partially socially dependent and also one third had very socially dependent. That needed to someone to care for them and to get medical advice, also to have good time and understands their problem. This was consistent with (Hoang, Green & Bonner 2021) and conducted study about "Examining social support, psychological status and health-related quality of life in people receiving hemodialysis peritoneal dialysis patients" and reported that patients under the study had moderate levels of social support.

Regarding relation between demographic characteristic and patients needed knowledge the current study illustrated that, there wasn't statistically significant relationship between patients' educational level and total patient knowledge regarding plasmapheresis procedure, necessary guideline, and its complication. This finding contrasted with (Barth, Szöllösi & Nemes 2021) who conducted a study about "Measuring patients' level of knowledge regarding kidney transplantation in eastern Hungary. " and reported that there was a significant relationship between knowledge scores and patients educational levels.

This could be explained that plasmapheresis procedure is a new procedure and not very well known to most people regardless their educational levels and the patients' needs to improve their knowledge about plasmapheresis process. Personalized education is essential, especially among patients

undergoing plasmapheresis and have not previously known any information about it.

Also, there wasn't statistically significant relationship between knowledge needs and occupational status of the studied patients. This finding agreed with (Alsaqri *et al.*, 2020) who conducted study about " Saudi myocardial infarction patients' learning needs: implications for cardiac education program" and reported that there was not a statistically significant relation between total learning needs and occupation status.

Regarding relation between demographic characteristic and physical needs there was a statistically significant relationship between physical needs and age. This result was in the same line with (Biggar, Hidd & Ketteler 2019) who conducted a study titled "Needs around dialysis treatment from different perspectives results of the exploratory German multicenter survey " and reported that there was a relation between health and age. This can be explained that diseases affect physical needs regardless age.

Thus, effective needs assessment and suggested guideline is expected to bring greater awareness for patients undergoing plasmapheresis and greater knowledge to researcher about needs for such group of patients.

Conclusion

Based on findings of the current study, it could be concluded that:

The highest dependence needs among the studied patients were anxiety then followed by knowledge needs, depression, total physically dependent lastly totally socially dependent. Also, there wasn't a statistically significant relations between knowledge needs and studied patient's educational level and occupation. While, there was statistically significant relation between physical needs and their age.

Recommendations:

1. Providing of simple booklet written in Arabic language for all plasmapheresis units to improve patients' level of knowledge and be familiar with the developmental aspect of the procedure and how to comply it without complications.
2. Increase the patient's awareness and motivation to read and learn about plasmapheresis procedure, complications and guidelines for early detection of complications and how to avoid it.
3. Psychosocial counseling should be provided by specialist for them to facilitate dealing with anxiety and depression, improve their mental health and social dependence.

Reference:

- Alsaqri, S. H., Alkuwaisi, M. J., Shafie, Z. M., Aldalaykeh, M. K., & Alboliteh, M. (2020). Saudi myocardial infarction patients' learning needs: Implications for cardiac education program. *Clinical Epidemiology and Global Health*, 8(4), 1208-1212.
- Barth A, Szöllösi GJ, Nemes B. (2021). Measuring Patients' Level of Knowledge Regarding Kidney Transplantation in Eastern Hungary. *Transplant Proc*, 53(5):1409-1413. doi: 10.1016/j.transproceed.2021.01.040. Epub 2021 Feb 24. PMID: 33637324.
- Biggar, P., Hidd, D., Ketteler, M. (2019). Needs Around Dialysis Treatment from Different Perspectives (NADIP): Results of the Exploratory German Multicenter Survey. 44 (5), Page1233-1246.
- Chauvel F, Reboul P, Cariou S, Aglae C, Renaud S, Trusson R, Garo F, Ahmadpoor P, Prelipcean C, Pambrun E, Moranne O. (2020). Use of double filtration plasmapheresis for the treatment of acquired thrombocytopenic thrombotic purpura. *Ther Apher Dial*, 24(6):709-717. doi: 10.1111/1744-9987.13477.
- Collin, C., Wade, D. T., Davies, S., & Horne, V. (1988). The Barthel ADL Index: a reliability study. *International disability studies*, 10(2), 61-63.

- Faria, R., Bucur, A., Gordinho, A., Falcão, L., Carrão, A., Fernandes, S., ... & Messias, A. (2021).** Therapeutic Plasmapheresis: Seven Year Experience of an Intensive Care Unit in Portugal. *Acta Médica Portuguesa*, 34(13).
- Gómez-Figueroa, E., Alvarado-Bolaños, A., García-Estrada, C., Zabala-Ángeles, I., Sánchez-Rosales, N., Bribiesca-Contreras, E., ... & Flores-Rivera, J. (2021).** Clinical experience of plasmapheresis for neuromyelitis optica patients in Mexico. *Multiple Sclerosis and Related Disorders*, 52, 103022.
- Hamza, G., Mohamed, H.A., and Hassanein, A.A. (2019).** Effect of Applying Guideline for Patients Undergoing Plasmapheresis Outcomes at Mansoura University Hospital. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*; 8(3 – II): 80-88.
- Hoang, V. L., Green, T., & Bonner, A. (2021).** Examining social support, psychological status and health-related quality of life in people receiving haemodialysis. *Journal of Renal Care*.
- Huang, S. P., Toh, D. E., Sue, Y. M., Chen, T. H., Cheng, S. W., & Cheng, C. Y. (2018).** Double filtration plasmapheresis in treatment of acute pancreatitis associated with severe hypertriglyceridemia: three case reports. *Medicine*, 97(44).
- Joglekar, K., Brannick, B., Kadaria, D., et al. (2017).** Therapeutic plasmapheresis for hypertriglyceridemia-associated acute pancreatitis: case series and review of the literature 8 (4), page59-65 Available at <https://08113xi3o-1105-y-https-doi-org.mplbci.ekb.org/10.1177/2042018817695449>
- Jouve, T., Marlu, R., Naciri Bennani, H., Noble, J., Chevallier, E., Motte, L., ... & Rostaing, L. (2021).** Fibrinogen reconstitution after therapeutic apheresis: Comparison of double-filtration plasmapheresis, plasma exchange, and immunoabsorption. *Journal of Clinical Apheresis*.
- Kasturi, S., Price, L. L., Paushkin, V., Salmon, J. E., McAlindon, T. E., & Mandl, L. A. (2021).** Impact of the first wave of the COVID-19 pandemic on systemic lupus erythematosus patients: Results from a multi-center prospective cohort. *Lupus*, 09612033211033981.
- Kasturi, S., Price, L. L., Paushkin, V., Salmon, J. E., McAlindon, T. E., & Mandl, L. A. (2021).** Impact of the first wave of the COVID-19 pandemic on systemic lupus erythematosus patients: Results from a multi-center prospective cohort. *Lupus*, 09612033211033981.
- Kong, I., Law, M. C., & Ng, G. S. (2019).** Clinical practice guidelines for the provision of renal service in Hong Kong: Renal Nursing Practice. *Nephrology*, 24, 77-97.
- Litterini, A. J., & Wilson, C. M. (2022).** Physical Activity and Rehabilitation in Life-threatening Illness. Routledge.
- Nemec, R. (2017).** Apheresis education: One center curriculum design experience. *Transfusion and Apheresis Science*, 56(2), 263-267.
- Ng, M. S. N., So, W. K. W., Wong, C. L., Hui, Y. H., Ho, E. H. S., Choi, K. C., ... & Miaskowski, C. (2020).** Stability and impact of symptom clusters in patients with end-stage renal disease undergoing dialysis. *Journal of pain and symptom management*, 59(1), 67-76.
- Padmanabhan, A., Connelly-Smith, L., Aqui, N., Balogun, R. A., Klingel, R., Meyer, E., ... & Schwartz, G. E. J. (2019).** Guidelines on the use of therapeutic apheresis in clinical practice—evidence-based approach from the Writing Committee of the American Society for Apheresis: the eighth special issue. *Journal of clinical apheresis*, 34(3), 171-354.
- Ranganathan, D., & John, G. T. (2019).** Therapeutic plasma exchange in renal disorders. *Indian journal of nephrology*, 29(3), 151.

- Sayadi, L., Faezi, S. T., Hasanpour, M., & Alahmadi, S. J. (2021).** The Relationship of Lifestyle with Disease Activity among Patients with Systemic Lupus Erythematosus: A Descriptive-Correlational Study. *Mediterranean Journal of Rheumatology*, 32(2), 124.
- Schwartz, J., Padmanabhan, A., Aqai, N., Balogun, R. A., Connelly-Smith, L., Delaney, M., ... & Shaz, B. H. (2016).** Guidelines on the use of therapeutic apheresis in clinical practice—evidence-based approach from the Writing Committee of the American Society for Apheresis: the seventh special issue. *Journal of clinical apheresis*, 31(3), 149-338.
- Semaan, V., Noureddine, S., & Farhood, L. (2018).** Prevalence of depression and anxiety in end-stage renal disease: A survey of patients undergoing hemodialysis. *Applied Nursing Research*, 43, 80-85.
- Sergent, S. R., & Ashurst, J. V. (2021).** Plasmapheresis. *StatPearls* [Internet]. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK560566/>
- Sherbourne, C. D., & Stewart, A. L. (1991).** The MOS social support survey. *Social science & medicine*, 32(6), 705-714.
- Solanki, A., Singh, A., Chauhan, A., Agarwal, D., Himanshu, D., & Chandra, T. (2021).** Therapeutic plasma exchanges an emerging treatment modality: A 3-year retrospective analysis of patients admitted in a multispecialty hospital of North India. *Asian Journal of Transfusion Science*, 15(1), 46.
- Stavroula, K., Gerogianni. (2015).** The Role of Nurses in Therapeutic Plasma Exchange Procedure. *International Journal of Caring Sciences*. 8 (1) Page 194.
- Tombak, A., Uçar, M. A., Akdeniz, A., Yilmaz, A., Kalegasi, H., Sungur, M. A., & Tiftik, E. N. (2017).** Therapeutic plasma exchange in patients with neurologic disorders: review of 63 cases. *Indian Journal of Hematology and Blood Transfusion*, 33(1), 97-105.
- Torres, G. C. S., Sumile, E. F. R., Rebueno, M. C. D., Parial, L. L. B., Malong-Consolacion, C. P., Estrada, M. G., ... & Hendrix, C. C. (2021, June).** Exploring the challenges and needs of home caregivers of hemodialysis patients in the philippines: A mixed methods study. In *Nursing forum*.
- Walsh, M., Merkel, P. A., Peh, C. A., Szpirt, W. M., Puéchal, X., Fujimoto, S., ... & Jayne, D. R. (2020).** Plasma exchange and glucocorticoids in severe ANCA-associated vasculitis. *New England Journal of Medicine*, 382(7), 622-631.
- Wang, Y. Y., Liang, D. D., Lu, C., Shi, Y. X., Zhang, J., Cao, Y., ... & Jin, Y. H. (2020).** An exploration of how developers use qualitative evidence: content analysis and critical appraisal of guidelines. *BMC medical research methodology*, 20(1), 1-28.
- Zigmond, A. S., & Snaith, R. P. (1983).** The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, 67(6), 361-370.