



HEALTH RELATED NEEDS OF PATIENTS UNDERGOING PLASMAPHERESIS AT AIN SHAMS UNIVERSITY HOSPITALS

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Abstract

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. This study aimed to assess health related needs of patients undergoing plasmapheresis at Ain Shams University Hospitals. A descriptive exploratory research design was used to conduct this study. Settings: This study was conducted at dialysis unit at Ain- Shams University Hospitals. Sample: A purposive sample of 70 adult patients received plasmapheresis at mention setting. Three tools were used for data collection tool I: Patients interview questionnaire consists of two parts: (1) demographic characteristics of the patients, (2) patients' medical history. Plasmapheresis patient's knowledge Assessment Tool: Patients needs questionnaire. Results: The study showed that 57% of the studied patients were female from urban area, and 50% were married with mean age 37.05 ± 9.11 years. Also, total level of physical needs had a significant statistical positive correlation with total level of physical problems and psychological problems. The study concluded that approximately three-fifth of the studied patient had unsatisfactory knowledge level with physical and psychological needs as well more than half of patients had physical and psychological problems. Psychosocial counseling to facilitate dealing with anxiety and depression, improve patient's mental health and social dependence.

Keywords: Plasmapheresis; Health Related Needs; Ain Shams University Hospitals

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1. 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 ^[1]. Plasmapheresis health related needs physical, psychological, social support 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 ^[2].

Plasmapheresis is a term used to refer to a broad range of procedures in which extracorporeal separation of blood components results in a filtered plasma product. The filtering of plasma from whole blood can be accomplished via centrifugation or the use of semipermeable membranes. Centrifugation takes advantage of the different specific gravities inherent to various blood products, such as red blood cells (RBCs), white blood cells (WBCs), platelets, and plasma. Membrane plasma separation uses differences in particle size to filter plasma from the cellular components of blood ^[3]. The indications for TPE have been refined over time. TPE is an invasive procedure with often emergent indications, demanding its execution as soon as possible. Thus, a rapid response by experienced staff, with specific equipment, close monitoring, and multidisciplinary management is essential. The Apheresis Applications Committee of the American Society for Apheresis (ASFA) periodically evaluates potential indications for apheresis and categorizes them from I to IV in the basis of the available medical literature ^[4].

Category I indications is disorders for which apheresis is accepted as first-line therapy, either as a primary standalone treatment or in conjunction with other modes of treatment ^[5]. Category II indications is disorders for which apheresis is accepted as second-line therapy, either as a standalone treatment or in conjunction with other modes of treatment ^[6]. Category III indications is disorders for which the optimal role of apheresis therapy is not established; decision-making should be individualized ^[7]. Category IV indications is disorders in which published evidence demonstrates or suggests apheresis to be ineffective or harmful; institutional review board approval is desirable if apheresis treatment is undertaken in these circumstances ^[8].

The complications can be of immunologic (e.g., hemolytic or anaphylactic transfusion reactions

and reaction to ethylene oxide) or non-immunologic (hematomas, bleeding complications, and vasovagal reactions) origins. Side effects can also be categorized as systemic and/or local and acute or delayed as some side effects may occur many days after the therapeutic apheresis procedure. The severity of adverse events is typically categorized as mild, moderate, or severe. Mild and moderate reactions are much more common than severe reactions ^[9].

The nursing role in the process of plasmapheresis is multiple including (assessment, diagnosis, implementation, planning and evaluation) in the form distinguished in clinical, educational, inquiring and advisory needs. The nursing role is the patient's care be including tutor, the primary care provider, the consultant, the educator, the researcher, the administrator, the instructor, the lawyer, the mentor and the ombudsman ^[10].

Assessment is the systematic collection, organization, validation, and documentation of patient data and medication assessment. Assessment is both initial and ongoing assessment which involves collecting objective and subjective data about plasmapheresis needs that is analyzed to identify problems and can be alleviated or resolved by nursing actions and provide a basis for decisions about continuing or revising nursing care ^[11].

Nursing diagnoses related to health related needs patients undergoing plasmapheresis will most likely develop out of data, such as deficient knowledge, physical mobility, activity intolerance, fluid and electrolyte imbalance, impaired bowel elimination and psychological disorders, Risk for infection and risk for fall ^[12].

The planning phase plans the steps for carrying out nursing activities that are specific and will meet the expected outcomes. Planning anticipates the implementation phase or the carrying out of nursing actions that are specific for the health related needs for patient's undergoing plasmapheresis. In this instance, the planning phase occurs immediately before implementation phase and is necessary to carry out the technique of supervision and organization correctly ^[13]. Implementation is the carrying out of the plan of action and is a natural outgrowth of the nursing process. It's related to health related needs patients undergoing plasmapheresis implementation. Before managing patients' needs, the nurse reviews the subjective and objective data obtained on assessments and consider any additional data ^[14]. The nurse is educating inform patients undergoing plasmapheresis and the families on the management of the condition and coping psychosocial issues strategies ^[15].

The present study aimed to assess health related needs of patients undergoing plasmapheresis at Ain-Shams University Hospitals through assess knowledge level of patients undergoing plasmapheresis. Also, assess health related physical, psychological and social needs for patients undergoing plasmapheresis.

2. Subjects and Methods

This study was conducted at Dialysis unit in Ain Shams University Hospitals. A purposive sample composed of (70) adult patients from both sexes undergoing plasmapheresis at Ain Shams university hospitals has been recruited in this study ($n = 2 (Z\alpha + Z [1-\beta]) \times SD / d$).

Inclusion criteria:

Adult patients of both gender from age 20 to 60 years. Patients' who have confirmed diagnosis with autoimmune disorders. Patients undergoing plasmapheresis and agree to participate to this research.

Exclusion criteria:

Patients with psychotic disorders.

Ethical approval:

Approval to conduct the study was obtained from the ethical committee in the faculty of nursing, Helwan University. The investigator explained and clarified the study aim and conducting way to the subjects before taking the consent of participation. The investigator assured maintaining anonymity and confidentiality of data of subjects. The participants were informed about their right to withdraw from the study at any time without giving any reason.

Tools of data collection:

Data was collected using the following tools: -

Tool I: Patient's interview questionnaire (appendix I) was developed by the Investigator into Arabic language after reviewing of relevant related literatures^[16] and it included two parts:

(1) Patient's demographic characteristics included age, gender, marital status, level of education, occupation, place of residence, smoking.

(2): Patient's medical history: It included patient's past medical history and present health history.

Tool II: plasmapheresis patient's knowledge questionnaire (appendix II) this adapted from Cheong et al.^[16] to assess information needs of patients regarding patient's plasmapheresis. It consisted of 10 true & false questions.

Scoring system

The scores for the responses of each statement were scored as follows: Yes = 1 and No = 0. The total scores of knowledge were summed up and converted into a percentage score. It ranged from 0-100 degrees which equal 100% and categorized as satisfactory knowledge if total score $\geq 60\%$, and unsatisfactory knowledge if total score from $< 60\%$.

Tool III: Patient's health related needs questionnaire (appendix III) was adapted from Cheong et al.^[19] and modified by the investigator to assess the needs and problems of patient undergoing plasmapheresis therapy. It consisted of two sections in one sheet as it asked about health related needs patients for nurse's assistant care at the same domains. It consisted of 3 dimensions as the follow:

Dimension I: Physical problems and needs (32 items) consists of problems of mobility (5 items); activities of daily living (5 items); discomforts-bowel-bladder functions (18 items) and role/personal activities (4 items).

Dimension II: Psychological problems and needs (28 items): It assesses the psychological sub-items as feeling of depression (2 items), feeling of anxiety (5 items), attitude toward disease (8 items), autonomy (9 items) and spiritual issues (4 items).

Dimension III: Social problems and needs (12 items): It assesses the patient's relations with others and the ability to talk about the disease with them and how they react with this condition and also their support to the patient.

Scoring system for patients' problem

The scores for the responses of each statement were scored as follows: Yes = 2, to a certain extent=1 and No = 0. The total scores of problem assessment were summed up, converted into a percentage score and categorized as Mild problems if total score $< 60\%$, moderate problems if total score from $60\% - 75\%$, and severe problems if total score from $> 75\%$.

Scoring system for patients' needs

The scores for the responses of each statement were scored as follows: Yes = 1 and No = 0. The total scores of needs were summed up, converted into a percentage score and categorized as Dependent if total score $\leq 60\%$, and Independent problems if total score from $> 60\%$.

Operational design:

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

A- The preparatory phase:

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

B-Tool's Validity and Reliability:

- Content of validity: The face and content validity was done through a panel of five experts from Medical Surgical Nursing Department, Faculty of Nursing, Helwan University (one professor and two assistant professors and two lecturers). Their opinions were regarding comprehensiveness, accuracy, clarity, relevance and appropriateness of the study tools. Minor modifications were done based on expert's judgment and the final form was developed.
- Content of reliability: Testing reliability of the proposed tools was done statistically by using Cronbach's alpha coefficient test for (0-1) knowledge questionnaire=0.86, physical problems=0.79, psychological problems=0.83, social problems=0.87, physical needs=0.82, psychological needs=0.85 and social needs=0.91.

C-Pilot study:

A pilot study was done on (10%) of the sample (12 patients) to test applicability, feasibility and clarity of questions and time needed to complete the study tools. Subjects were included and chosen randomly from the previously mentioned setting then later included to the sample. According to results of pilot study, on modification were done for the used tools. So patients shared in the pilot study were involved in the sample.

D-Field work

An oral informed consent was obtained from each participant prior to the data collection after explaining the aim of the study. Data collection started and completed within six months from the beginning of June (2022) until the end of November (2022).

Statistical analysis:

The collected data were statistically analyzed using the statistical package for social science (SPSS) version 20 and Microsoft Excel version 2010. Quantitative data were presented as mean and standard deviation (SD) while qualitative data were expressed as frequency and percentage. Chi-square test (χ^2) was used as a test of significance to test relations between categorical variables. The observed differences and associations were considered as $P > 0.05$ was considered non-

significant (NS). $P \leq 0.05$ was considered Significant (S).

Results:

The present study 40.0% of the studied patients were in age group 30 - < 45 years old with mean age 37.05 ± 9.11 years, 57.1% of them were females and 50.0% of them were married. Also, 41.4% of them had secondary education and 35.7% of them were unemployed. Additionally, 57.1% of them were from urban residence and only 30.0% of them were smokers (Table 1).

Diabetes mellitus and neurological disease were the most common chronic diseases among 42.8% of the studied patients. Also, Vitamin D and calcium were the most common current medications among 75.7% and 71.4% of them respectively (Table 2). 64.3% of the studied patients were dependent while 35.7% of them were independent regarding their physical needs with most common current medications among 75.7% and 71.4% of them, respectively (Figure 1). 58.5% of the studied patients were dependent while 41.5% of them were independent regarding their psychological needs (Figure 2). 55.7% of the studied patients were independent while 44.3% of them were dependent regarding their social needs (Figure 3).

There was a significant statistical relationship between total level of knowledge of the studied nurses and their educational level and residence at P -value= 0.057 and 0.036 respectively (Table 3). Total level of physical needs had a significant statistical positive correlation with total level of physical problems and psychological problems at P -value=0.000 and 0.004 respectively while had a no significant statistical correlation with total level of social problems at P -value= 0.085 (Table 4). Also, total level of psychological problems had a significant statistical positive correlation with total level of physical problems, psychological problems and social problems at P -value= 0.014, 0.000 and 0.029 respectively. Additionally, total level of social problems had a significant statistical positive correlation with total level of physical problems, psychological problems and social problems at P -value= 0.037, 0.018 and 0.000 respectively (Table 4).

Discussion

Evaluation is the part of the nursing process that includes a decision making process, evaluating the patient needs to stated goals and expected outcome criteria related to the nursing diagnoses are met. When related to the patients undergoing plasmapheresis needs implementation, this phase of the nursing process is used to evaluate the

patients' response to implementation. Some outcomes can be evaluated require much longer periods of time of evaluation and recurrent observation by the nurse [15,17].

Nurse's main duties are maintaining and improving standards of nursing care, effective use of resources and improvement in quality both in the life of the individuals undergoing plasmapheresis and the delivery of health services. The clinical responsibilities of nurse include prevention of infections in plasmapheresis unit with careful antisepsis in the entry point of the needle or the catheter, early identification of risk factors and adherence to quality assurance criteria with the goal of providing high quality healthcare services [18].

Plasmapheresis was needed in acute inflammatory polyneuropathy (Guillain-Barre syndrome), myasthenia gravis, good pasture's syndrome and hyperviscosity syndromes, for over 30% patients undergoing plasmapheresis category I was indicated, while incomplete hematopoietic stem cell transplantation, incomplete solid organ transplantation, over 30% patients were reported to need plasmapheresis category II. Also, it was reported that 10% to 30% patients needed plasmapheresis for treatment of cryoglobulinemia. In over 30% patients with acute liver failure, plasmapheresis category III was indicated. In case of acute disseminated encephalomyelitis, in less than 10% patient's plasmapheresis was indicated, category III [19].

There are no clear data results connected to plasmapheresis in Egypt, but at Ain Shams University Hospital which treats a variety of immunological and non-immunological diseases, that accounting outcome of 210 patients who underwent plasmapheresis from 2019 to 2020 is being studied and about 4768 patients undergoing plasmapheresis through last 3 years from the study [1,6].

As regards to demographic characteristics of the studied patients, the finding of the present study demonstrated that two fifth of the studied patients' age group were 30 - < 45 with mean age 37.05 ± 9.11 years. From the investigator point of view, that implies high rate risk regarding age undergoing plasmapheresis and increase life stressors even among people in this age group. These results were in the same line with the study conducted by Ahmed et al. [20] entitled needs assessment for patients undergoing plasmapheresis suggested guidelines in hemodialysis unit at urology and nephrology center and hemodialysis unit affiliated to Mansoura university hospitals, Egypt (n=108) and reported that, two fifth of patient's age ranged

between 30- 40 years old with mean age of 33.4 ± 9.4years old.

Concerning gender, the findings of the present study showed that more than half of the studied patients were females. From the investigator point of view, female's unable to coping with stressful events. This result was agreed with Boss et al. [21] who conducted a study about "Severe and long-lasting alteration of albumin redox state by plasmapheresis" in University Hospital Essen, Germany (n=43) who found that more than half of patients were females. Also, this result was consistent with Al-Ahmer & Elshony [22] in a study entitled "Determinants of quality-of-life changes with plasmapheresis in patients with myasthenia gravis" in, Menoufia University, Shebin Elkom, Egypt (n=98) who found that more than half of patients were females.

Regarding marital status, the findings of the present study showed that half of the studied patients were married. From the investigator point of view, the nature of diseases more common occurring in the third decade which is the age of marriage and during child bearing period. This result was congruent with Hassan et al. [23] entitled "Nurses knowledge and practices toward patients undergoing plasmapheresis" (n=35) and found that about more than half of patients were married.

As related to the educational level, the findings of the present study revealed that two fifths of the studied patients had secondary education. From the investigator point of view, this result from free basic education in Egypt. This result was agreed with Hoang et al. [24] in a study entitled "Examining social support, psychological status, and health-related quality of life in people receiving hemodialysis (n=388) "who found less than two-fifth of patients had secondary education.

With regard to occupation, the current study showed that more than one third of the studied patients werent working. From the investigators point of view, this result could be due to the studies group age with the course of disease & attributed to the effect of the disease process. This result was agreed with Hoang et al. [24] who reported that more than one third of patients were unemployed.

As regard to residence, the findings of the present study revealed that more than half of the studied patients were from urban residence. This result was inconsistent with Hamza et al. [25] who found that more than half of patients were from rural residence.

Regarding smoking, the findings of the present study revealed that one third of the studied

patients were smokers. This result was consistent with Bilgic et al. [26] in a study entitled "Therapeutic effects of plasmapheresis on acute exacerbations of chronic hepatitis B infection" in, Inonu University, Malatya, turkey (n=48) indicated that nearly two-fifth the studied patients were smokers. Also, this result was inconsistent with Sayadi et al. [27] who found that most of patients were non-smokers.

Concerning chronic disease, the findings of the present study revealed that diabetes mellitus and neurological disease were the most common among more than two fifths of the studied patients. This result was agreed with Ahmed and Elderiny [14] who found that myasthenia gravis was the most common disease among about half of patients.

Regarding current medications, the findings of the present study show that vitamin D and calcium were the most common current medications among more than two thirds and about three quarters of the studied patients respectively. From the investigator point of view, these results could be related to the nature of diseases that required recurrent treatments with a close time interval to get rid of the body from a reduction of some electrolytes. This result was consistent with Ahmed and Elderiny [14] found that more than two-thirds of patients were on calcium due to hypocalcemia.

Regarding medical history, the present study revealed that multiple sclerosis and chronic inflammatory demyelinating polyneuropathy (CIPD) were the most common diagnosis respectively among less than on quarter and less than one-third of the studied patients. From the investigator point of view, these diseases are mostly treated by plasmapheresis due to presence of almost antibodies. this finding agree with Ahmed and Elderiny [14] who reported that one quarter of the studied patients were diagnosed with chronic inflammatory demyelinating polyneuropathy.

Concerning to total level of physical needs, the findings of the present study revealed that about two-third of the studied patients were dependent while more than one-third of them were independent regarding the physical needs. This could be underlining disease may be effecting on patients performance and activity of daily living (ADLs), which reflected on patient health status and physical ability. This result was consistent with Ahmed et al. [20] who found that more than two-thirds of patients were physically dependent.

By evaluating the total level of psychological problems, the findings of the present study revealed that about two-thirds of the studied

patients had severe levels of psychological problems related to depression and autonomy. Also, about two-thirds of them had severe levels of psychological problems related to anxiety. From an investigators point of view, new procedures, hospitalization and underlining diseases could lead to increase patients anxiety and expression of the hidden psychological feeling. This result was consistent with Hamza et al. [25] who found about two-thirds of patients had psychological problems and low self-esteem respectively.

In the same context distribution of the studied patients according to the patients total level of social problems, the findings of the present study revealed that more than half of the studied patients were independent while more than one third of them were dependent. This result was consistent with Ahmed et al. [20] who found that two thirds of patients were socially dependent.

By evaluating relation between demographic characteristics of the studied patients and their total level of knowledge, the findings of the present study revealed that there was there was a significant statistical relationship between total level of knowledge of the studied patients and their educational level and residence at $P = 0.057$ and 0.036 respectively. While there was no significant statistical relationship between total level of knowledge of the studied patients and their age, gender, marital status, occupation, and smoking at $P=0.150$, 0.434 , 0.647 and 0.683 respectively. This result was match with Keesey [28] in a study entitled Clinical evaluation and management of myasthenia gravis in California, USA who found that there was not a statistically significant relationship between total knowledge of the studied patients and their educational level. While there was no significant statistical relationship between total levels of knowledge of the studied patients.

Relating to Correlation between total level of physical, psychological and social needs and problems among the studied patients. total level of physical needs had a significant statistical positive correlation with total level of physical problems and psychological problems at $P = 0.000$ and 0.004 respectively while had a no significant statistical correlation with total level of social problems at $P = 0.085$.

Also, total level of psychological problems had a significant statistical positive correlation with total level of physical problems, psychological problems and social problems at $P=0.014$, 0.000 and 0.029 respectively. Additionally, total level of social problems had a significant statistical positive correlation with total level of physical

problems, psychological problems and social problems at P-value= 0.037, 0.018 and 0.000 respectively. This result was gone in line with Ahmed et al. [20] who found that had a significant statistical positive correlation between total level of physical, psychological and social needs and problems among the studied patients. total level of physical needs had a significant statistical positive correlation with total level of physical problems and psychological problems at P =0.000 and 0.004 respectively while had a no significant statistical correlation with total level of social problems at P = 0.085. Also, total level of psychological problems had a significant statistical positive correlation with total level of physical problems, psychological problems and social problems at P = 0.014, 0.000

and 0.029 respectively. Additionally, total level of social problems had a significant statistical positive correlation with total level of physical problems, psychological problems and social problems at P-value= 0.037, 0.018 and 0.000 respectively. This result was gone in line with Ahmed et al. [20] who found that had a significant statistical positive correlation between total level of physical needs and total level of physical problems, also had a significant statistical positive correlation between total level of physical needs and psychological problems. onn between total level of physical needs and total level of physical problems, also had a significant statistical positive correlation between total level of physical needs and psychological problems.

Table 1. Frequency and percentage distribution of the studied patients according to their demographic characteristics (n=70).

Demographic Characteristics	Items	N	%
Age (in years)	20 - < 30	23	32.9
	30 - < 45	28	40.0
	45 – 60	19	27.1
	Mean ± SD	37.05 ± 9.11	
Gender	Male	30	42.9
	Female	40	57.1
Marital status	Single	15	21.4
	Married	35	50.0
	Divorced	14	20.0
	Widowed	6	8.6
Educational qualification	Read and write	12	17.1
	Don't read and write	14	20
	Secondary /Diploma	29	41.4
	University education	11	15.7
	Post graduate studies	4	5.7
Occupation	Employee	15	21.4
	Professional	17	24.3
	Unemployed	25	35.7
	Retired	13	18.6
Place of residence	Rural	30	42.9
	Urban	40	57.1
Smoking	Yes	21	30.0
	No	49	70.0

Table 2. Frequency and percentage distribution of the studied patients according to their medical history (n=70).

Characteristics	Items	N	%
Past medical history			
Chronic illness	High blood pressure	15	24.2
	Diabetes mellitus	30	42.8
	Heart diseases	13	18.5

	Kidney diseases	3	4.2
	Neurological disease	30	42.8
	Blood disease	6	8.5
	Tumors	6	8.5
Present medical history			
Current Medication	Calcium	50	71.4
	Vitamin D	53	75.7
	Blood pressure medication	15	21.4
	Heart medication	13	18.5
	Diabetic medication	30	42.8
	Depression medication	47	67.1
	Erythropoietin Stimulating Medication	26	37.1
	Neurological medication	30	42.8

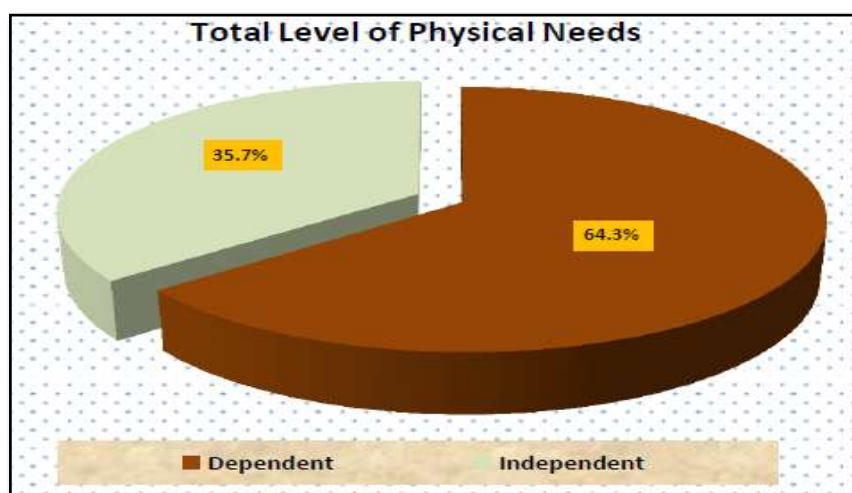


Figure 1. Percentage distribution of the studied patients according to their total level of reported physical needs (n=70).

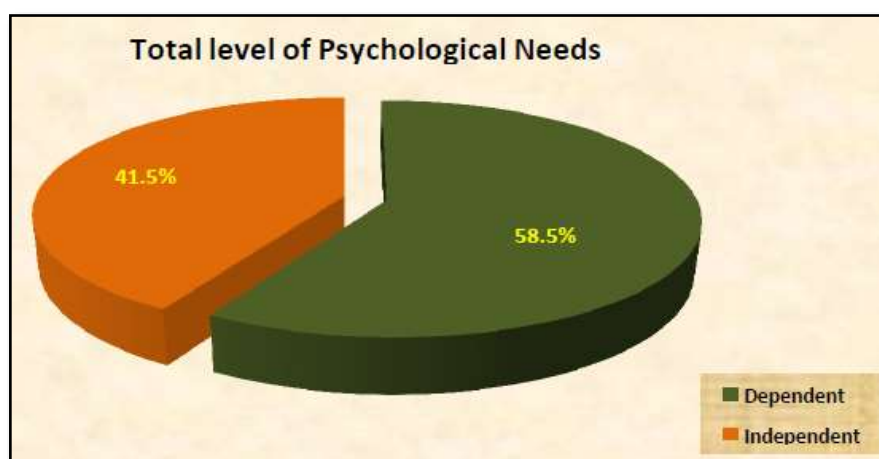


Figure 2. Percentage distribution of the studied patients according to their total level of psychological needs (n=70).

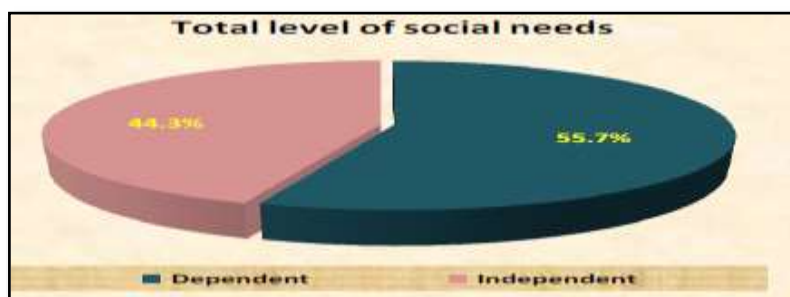


Figure 3. Percentage distribution of the studied patients according to their total level of social needs (n=70).

Table 3. Relationship between demographic characteristics of the studied patients and their total level of knowledge (n=70).

Demographic characteristics		Total level of knowledge				X ²	P-value
		Satisfactory		Unsatisfactory			
		N	%	N	%		
Age (in years)	20 - ≥ 30	9	12.8	14	20.0	1.174	0.150(NS)
	30 - ≥ 45	13	18.5	15	21.4		
	45 - ≥ 60	7	10.0	12	17.1		
Gender	Male	15	21.4	15	21.4	0.791	0.434 (NS)
	Female	14	20.0	26	37.1		
Marital status	Single	6	8.5	9	12.8	1.273	0.647(NS)
	Married	16	22.8	19	27.1		
	Divorced	5	7.1	9	12.8		
	Widowed	2	2.8	4	5.7		
Educational qualification	Read & write	5	7.1	7	10.0	0.981	0.057*(S)
	Don't read & write	4	5.7	10	14.2		
	Secondary/ Diploma	10	14.2	19	27.1		
	University	8	11.4	3	4.2		
	Post graduate studies	2	2.8	2	2.8		
Occupation	Employee	7	10.0	8	11.4	0.911	0.683(NS)
	Professional	12	17.1	5	7.1		
	Unemployed	6	8.5	19	27.1		
	Retired	4	5.7	9	12.8		
Residence	Rural	11	15.7	19	27.1	1.571	0.036*(S)
	Urban	18	25.7	22	31.4		

Table 4. Correlation between total level of physical, psychological and social needs and problems among the studied patients.

Variables	Physical needs		Psychological Needs		Social needs	
	R	P-value	R	P-value	r	P-value
Physical problems	0.694	0.000*	0.457	0.014*	0.538	0.037*
Psychological Problems	0.482	0.004*	0.515	0.000*	0.273	0.018*
Social problems	0.761	0.085	0.714	0.029*	0.472	0.000*

Conclusions

The results of this study supported the research questions, as it can be concluded that: More than half of the studied patients had unsatisfactory level of knowledge. Less than two-third of them had physical needs with less than half of them had severe physical problem. More than two third of

the studies patients had psychological needs with less than half of them had psychological problem. More than half of the studies patient had social needs with about one-third of them had sever social problem.

Additionally, there were a significant statistical relationship between the studies patient total level

of knowledge and their educational level and residence, while there was a significant statistical relationship between total level of physical problem of the studied patients and their age and gender. As well, the total level of physical needs had a significant statistical positive correlation with total level of psychological needs. While, had a no significant statistical correlation with total level of social needs.

Recommendations

In the light of the findings of the current study the following recommendations are suggested:

- 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 regarding plasmapheresis guidelines for early detection of complications and how to avoid it.
- 3- Psychosocial counseling to facilitate dealing with anxiety and depression, improve patients' mental health and social dependence.
- 4- Further studies; design training program to improve nurses' knowledge and practice regarding the process of plasmapheresis.
- 5- Create Instructions Module to improve nurses' awareness regarding plasmapheresis patients' health related needs.

- **Availability of data and materials:** All data are available on request.
- **Competing interests:** The authors declare that they have no competing interests.
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