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EFFECT OF DESIGNATED EVIDENCE-BASED GUIDELINES ON NURSING PERFORMANCE AMONG PATIENTS WITH AUTOIMMUNE DISEASE UNDERGOING PLASMAPHERESIS

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Background

Plasmapheresis is a medical procedure that involves the extraction, substitution, or exchange of blood plasma externally from the body. Nurses hold a crucial role within the multidisciplinary team in executing and supervising the plasmapheresis treatment. ***The aim*** of this study was to assess the impact of designated evidence-based guidelines on nursing performance among patients with autoimmune disease undergoing plasmapheresis**.** ***Design*****:** A quasi-experimental research design utilizing a pretest and a posttest will be employed to fulfill the aim of this study. ***Sitting***: This study was performed at the therapeutic plasma exchange room in the Hemodialysis unit in Ain Shams University Hospital affiliated to Ain Shams University. ***Tools***: A structured interview questionnaire for nurses comprised two sections: Section 1: Demographic Attributes of Nurses, Section 2: Nurses' knowledge of the Plasmapheresis Procedure. ***Result***: 33.3% of the studied nurses exhibited good knowledge before the intervention, which increased to 76.7% post-intervention, indicating highly statistically significant differences, also this study showed improvement in nurses' level of practice regarding plasmapheresis 53.3 % competent level of practice pre intervention become 93.3 % competent level of practice post intervention. ***Conclusion:*** The results indicated that the implementation of specific evidence-based guidelines markedly improved nurses' knowledge and practice. This study emphasizes the significance of incorporating evidence-based guidelines into clinical practice and ensuring continuous education and training for nurses. ***Recommendations:*** Evidence-based guidelines should be implemented as a standard protocol in all units where plasmapheresis is performed and the Nursing curriculum should incorporate the best evidence-based protocols for procedures such as plasmapheresis, ensuring that graduated nurses are well-prepared.

INTRODUCTION

Plasmapheresis is a therapeutic procedure that entails the extracorporeal extraction, reinfusion, or substitution of blood plasma or its constituents. The fundamental mechanism of this technique is achieved through either centrifugation or filtration utilizing semipermeable membranes. This technique produces a filtered plasma product that can be used for the treatment of several disorders. (***Sergent and Ashurst, 2023).*** An autoimmune disease is defined by the existence of self-reactive immune elements termed

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"autoantibodies" alongside clinically evident pathology. The prevalence of autoimmune illnesses is significantly rising. Therapeutic plasma exchange (TPE) is frequently employed to treat specific autoimmune neurological disorders, primarily aimed at eliminating pathogenic toxins or autoantibodies. Plasma containing toxins and autoantibodies is substituted with crystalloids, colloids, and/or normal saline. It is more efficient and economical than immunoglobulin (***Bogi et al., 2024; Abd El Hafeez et al., 2025).*** Initially, therapeutic plasma exchange employed for hyperviscosity syndrome in multiple myeloma, then, it has developed into a widely available treatment option for numerous conditions linked to deficiencies in plasma components, as well as those involving the circulation of autoantibodies, alloantibodies, toxins, and immune complexes (Warner et al., 2025). Evidence-Based Practice (EBP) in nursing is a framework for clinical decision-making based on the most pertinent research, clinical expertise, and patient preferences. This methodology integrates relevant and contemporary scientific knowledge with clinical expertise and patient preferences to provide superior service quality. The application of evidence-based practice (EBP) in clinical environments has shown to elevate quality of care and enhance patient outcomes. ***(Brunt; Morris, 2023).*** Nurses must have extensive knowledge and skills concerning patients' requirements to deliver appropriate nursing interventions that protect safety, promote health, and enhance quality of life during plasmapheresis. Nursing practitioners must pursue education and training to elevate healthcare standards and acquire new information and skills. Education standards are viewed as a mechanism to provide nurses with the theoretical and technical knowledge essential for skill acquisition and the continual advancement of nursing practice. Motivate nurses to assume accountability for their professional development as well (***Goda et al., 2023).*** Nurses play a significant part in the multidisciplinary team during the implementation of the plasmapheresis process. Acquiring the patient's medical history by nurses is essential for identifying individuals for whom therapy is contraindicated. Additionally, ensure that patients undergoing plasma exchange procedures have access to specialized care and appropriate interventions by monitoring for any problems **(Farag et al.,2025).**

Significance of the Study

It is estimated that the total incidence and prevalence of autoimmune diseases worldwide are increasing by 19.1% and 12.5% per year, respectively. In fact, autoimmune diseases affect approximately 10% of the world’s population, causing great suffering to patients, and are also a major global socio-economic problem ***(Zeng, et al, 2025***). Plasmapheresis is a versatile and effective technique that is used primarily for the treatment of several autoimmune diseases, despite the development of more selective and advanced therapies in recent years ***(Miranda, et al., 2025).*** In fact, Plasmapheresis is a somewhat unfamiliar area of nursing practice that requires specialized technical skills and particular knowledge to avoid complications. All nurses must be appropriately qualified and trained in the procedures that they regularly perform. This study is very significant as it contributes to improving the quality of nursing care provided to patients with autoimmune diseases undergoing plasmapheresis, in which evidence-based guidelines serve as a scientific context that helps nurses deliver standardized, safe, and effective interventions pre,

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during, and after the plasmapheresis procedure. Moreover, the study's findings will assist nursing administrators in identifying existing gaps in clinical practice and designing targeted training programs to strengthen nurses' competencies in such specialized procedures.

Aim of the Study

This study aimed to evaluate the effect of designated evidence-based guidelines on nurses' performance among patients with autoimmune disorders undergoing plasmapheresis.

Research Hypothesis

The application of designated evidence-based guidelines will enhance nurses' performance regarding plasmapheresis among patients with autoimmune disorders.

SUBJECT AND METHODS

Design

A quasi-experimental research design utilizing pretest and posttest was employed to fulfill the aim of this study.

Study Setting

This study performed at the therapeutic plasma exchange room in the Hemodialysis unit in Ain Shams university Hospital affiliated to Ain Shams University. Therapeutic plasma exchange room involves six Fresenius plasma exchange apparatuses including two (Hepatitis C Virus) HCV apparatuses and one SICHUAN Nigale apparatus, six chairs for patients, one oxygen tube, emergency apparatus trolley, and Cardiopulmonary Resuscitation (CPR) equipment, three pulse oximeters, three blood pressure measurement appliances, two water basins, one refrigerator for plasma, weight, and height measuring gauge, six isolated curtains, and cupboard for all tools of unit.

Sample

A convenient sample of all available nurses (n=30) who work in previously stated setting, from both gender and agree to participate in the study

Tools of Data Collection

Tool I: A structured interview questionnaire for nurses was created by the researchers after reviewing pertinent literature and interviewing experts, which included the following Parts: Part 1: Personnel Characteristics of studied Nurses: Closed-ended questions pertained to age, gender, marital status, educational level, years of experience in nursing as general, years of experience in the hemodialysis unit, and involvement attainting educational program or courses about plasmapheresis. This component was employed only once, as the nurses participating in the pre-test were the same as those in the post-test.

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Part II: Nurses' level of Knowledge about the Plasmapheresis Process. This tool was developed by researchers after reviewing extensive literature (**Abdel-Salam, et al, 2023, Goda, et al, 2023, Amin, et al., 2024**) It comprised 20 questions on the constituents of blood, the meaning of plasmapheresis, its indications, contraindications, probable complications, information about autoimmune disease, and the nursing responsibilities regarding the plasmapheresis procedure.

Scoring System

The questionnaire score was assessed according to the items in the interview questionnaire. The responses of participating nurses were evaluated using a model key answer created by the researcher, with a maximum possible knowledge score of 100%. The overall knowledge score was classified as follows: each correct response was awarded one (1) point, but incorrect answers and "don't know" responses received zero (0) points. Following statistical analysis, the ratings were later transformed into percentage scores as outlined below: Score Percentage = (observed score ÷ maximum score) × 100.

The proportion of knowledge was then classified as follows:

Insufficient level of knowledge: for those who had a score less than 60% of the maximum score.

Average level of knowledge: for those who had a score of 60%: less than 75% of the maximum score

Good level of knowledge: for those who scored more than 75% of the maximum score.

Tool II: Nurses performance checklist for plasmapheresis: It was created to evaluate nurses' performance in the care of patients receiving plasmapheresis. The researchers designed and utilized it after examining the pertinent literature to collect the requisite data for this study. This tool comprised three sections: ***section 1***: Nursing practice prior to plasmapheresis, encompassing: • Securing patient permission • Performing hand hygiene • Donning personal protective equipment as per protocol • Assessing weight and height • Monitoring vital signs and collecting blood samples.

Section 2: Nursing procedures during plasmapheresis, encompassing the protocol for connecting the patient to the apparatus.

Section 3: Nursing practice following plasmapheresis, encompassing the monitoring of related problems, hand hygiene, the disposal and sanitation of utilized equipment, and the documentation of all procedural stages.

Scoring System

A score of 1 was assigned for successful execution of the practice by the nurse, while a score of 0 was given for unsuccessful execution. The ratings were later transformed into percentage scores by statistical analysis as follows:

Score Percentage = (observed score / maximum score) x 100.

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The percentage score of practice was subsequently categorized into the following statistical classifications.

1. Unsatisfactory practice level: for people who attained a score below 70% of the highest achievable score.
2. Satisfactory practice level: for persons who attained a score of 70% or above the maximum score.

Validity and Reliability

Face and content validity for the study items were assessed by a panel of five experts in medical-surgical nursing from the nursing faculties of Helwan University and Cairo University.

The experts assessed the tools for topic coverage, clarity, language, length, structure, overall appearance, and the revisions implemented.

The reliability of the research tool was statistically validated using Cronbach's alpha to evaluate internal consistency. The Cronbach's alpha value of the Nurse's knowledge level about plasmapheresis is 0.899, and Plasmapheresis nurses' practices Observational Checklist is 0.902

Ethical Consideration

A primary approval was obtained from the Research Ethics Committee at the Faculty of Nursing, Helwan University to perform the study on January 27, 2025, session number (46). Furthermore, proper authorization from the hemodialysis unit at El Demerdash University Hospital.

The study's objective, nature, and significance were elucidated to each nurse who met the inclusion criteria.

Anonymity and confidentiality were guaranteed by coding the data. Nurses were informed that participation in this study was optional and that they possessed the right to withdraw from the study at any time without penalty.

Procedure

Preparatory Phase

The study was conducted as follows: After defining the study's objectives and ensuring the privacy, anonymity, and confidentiality of the collected data, approval was obtained from the Research Ethics Committee, at the Faculty of Nursing, Helwan University to perform the study on January 27, 2025, session number (46). and from the Head of the Hemodialysis Department at the University Hospital.

Following the clarification of the study's objective, written informed permission was obtained. The researcher created the tools following a review of pertinent literature.

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A panel of five experts in Medical Surgical Nursing and Hemodialysis assessed the study's tool to verify their completeness, clarity, and content validity, and the required modifications were made.

- The Cronbach's Alpha test was utilized to assess the reliability of the instruments and analyze their internal consistency. The researcher executed a pilot study to evaluate the tools' applicability and clarity, and to identify any potential application challenges. The selected nurses were then included in the study's sample.

Data collection: Data collected over six months starting on February 2025 to the end of July 2025.

The following four phases were used to conduct the study: **Assessment phase:** Before implementing nursing evidence-based guidelines, a preliminary assessment of nurses is conducted to collect nursing personal data, then evaluate their knowledge and performance regarding the implementation of the plasma pheresis procedure as a baseline assessment.

- The researchers developed an educational booklet for nurses in simplified Arabic, enhanced by photos. It consisted of two parts; the first part consisted of a brief base of knowledge about the plasmapheresis procedure, and the second part, which illustrated the skills of nurses pre-, during & after the plasmapheresis procedure. This illustrative booklet was used as a guide for all nurses.

Implementation Phase

In this phase, the researchers were distributing studied nurses into small groups and each group include (5 nurses) and start application of educational sessions and it was taken approximately (45-60 minute) contain (definition, purpose, indications, contraindications and possible adverse events) this was accomplished using the designed booklet.

Session two: (Practical session) included a demonstration of skills related to preparations that the nurse should perform before, during, and after plasmapheresis.

Evaluation Phase

A post-test was conducted immediately, followed by a one-month data collection period utilizing Tool II (performance checklist of plasmapheresis) to assess the impact of evidence-based guidelines on nursing practice.

Data Analysis

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Continuous data were normally distributed and were expressed in mean ±standard deviation (SD). Categorical data were expressed in number and percentage. Chi-square test (or fisher's exact test when applicable) was used for comparison of variables with categorical data. Correlation co-efficient test was used to test for correlations between two variables with continuous data. The reliability (internal consistency) test for the questionnaires used in the study was calculate. Statistical significance was set at $p<0.05$.

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RESULTS

Table 1: Distribution of the studied nurses according to their personal data

	N	%
Age (Years)		
20 > 30	10	33.3
30 > 40	10	33.3
40 > 50	2	6.7
50 and more	8	26.7
Mean ±SD	32.9 ±10.2	
Gender		
Male	14	46.7
Female	16	53.3
Marital status		
Single	8	26.7
Married	19	63.3
Divorced / Widowed	3	10.0
Educational level		
Nursing Diploma	7	23.3
Technical institute of nursing	14	46.7
Bachelor degree in nursing	9	30.0
Years of experience in nursing as a general		
Less than one	9	30.0
1 > 5	10	33.3
5 > 10	2	6.7
10 – 15	9	30.0
Mean ±SD	5.9 ±2.9	
Years of Experience in plasma pheresis		
Less than one	17	56.7
1 > 5	8	26.7
5 > 10	4	13.3
10 – 15	1	3.3
Mean ±SD	4.1 ±2.0	
Attending Educational programs or courses about plasma pheresis		
No	17	56.7
Yes	13	43.3

Table 1 indicates that 33.3% equal percentage between 20> 30 and 30> 40 age group of the studied nurses, with a mean age of 32.9 ± 10.2.

Regarding gender, 53.3% were female, and 63.3% were married.

Additionally, 46.7% possessed a technical institute of nursing.

The table further reveals that 33.3% had 1 to less than 5 years of general experience, and 56.7% had less than one years of experience in plasmapheresis and not attended an educational program about plasmapheresis.

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Table 2: Nurse's total level of knowledge about plasmapheresis pre / post intervention

	Pre – intervention		Post – intervention		Chi – square / Fisher's exact test	
	n	%	n	%	X^2	P
Total knowledge level						
Poor knowledge	4	13.3	2	6.7		
Average knowledge	16	53.3	5	16.7		
Good knowledge	10	33.3	23	76.7	11.550	0.003*
Mean ±SD	13.7 ±3.1		16.3 ±1.8		3.972	<0.001**

Table (2) demonstrate a significant enhancement in the overall level of knowledge following the intervention, compared to before the intervention. Specifically, 33.3% of the studied nurses exhibited good knowledge before the intervention, which increased to 76.7% post-intervention, with highly statistically significant differences observed. X^2 = 11.550, p = 0.003.

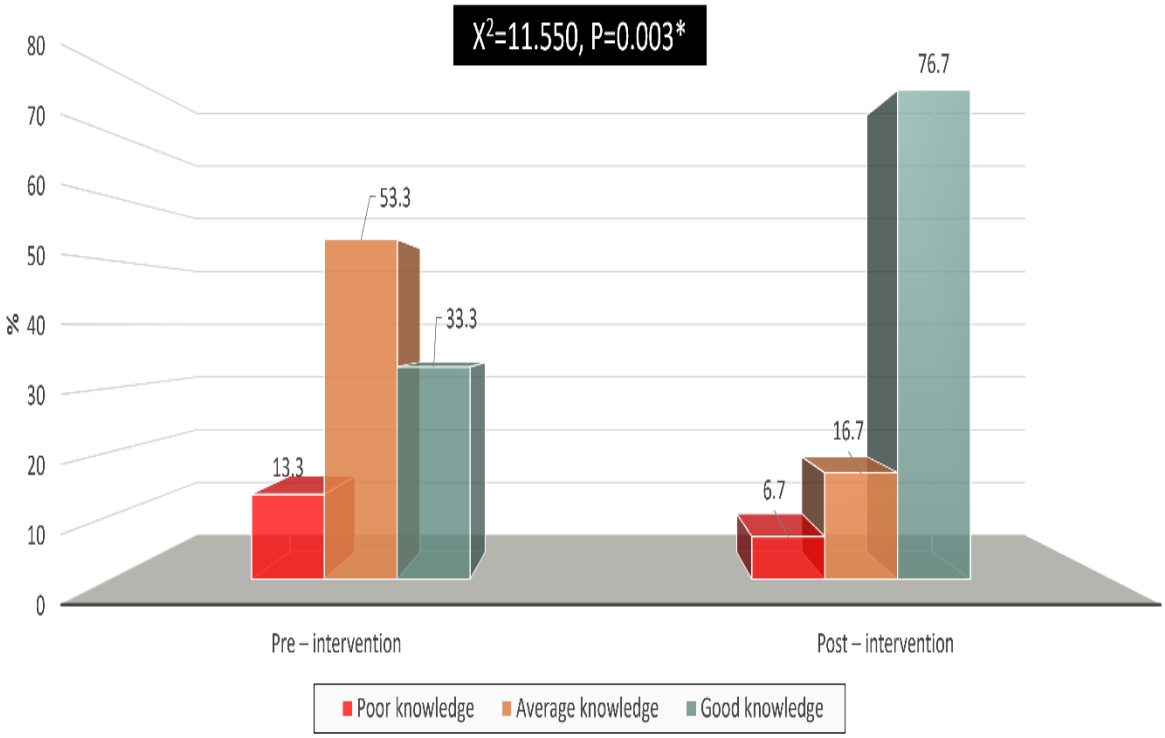

Figure1: Comparison of the Nurse's knowledge level pre and post intervention of plasmapheresis

Figure 1 demonstrates a significant enhancement in the overall level of knowledge following the intervention compared to prior to the intervention. Specifically, 33.3% of the studied nurses exhibited good knowledge before the intervention, which increased to 76.7% post-intervention, indicating highly statistically significant differences. X^2 = 11.550, p = 0.003.

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Table 3: Comparison of the Nurses' practice level pre and post intervention of plasmapheresis

	Pre – intervention				Post – intervention					
	Incompetence practice		Competence practice		Incompetence practice		Competence practice		Chi – square / Fisher's exact test	
	N	%	n	%	n	%	N	%	X^2	P
Regarding the machine										
Before Plasmapheresis	15	50.0	15	50.0	0	0.0	30	100.0	20.000	<0.001**
During Plasmapheresis	17	56.7	13	43.3	0	0.0	30	100.0	23.721	<0.001**
After Plasmapheresis	16	53.3	14	46.7	0	0.0	30	100.0	21.818	<0.001**
Regarding to the patient										
Before Plasmapheresis	13	43.3	17	56.7	1	3.3	29	96.7	13.416	<0.001**
During Plasmapheresis	11	36.7	19	63.3	5	16.7	25	83.3	4.022	0.044*
After Plasmapheresis	11	36.7	19	63.3	4	13.3	26	86.7	4.356	0.036*
Total checklist level	14	46.7	16	53.3	2	6.7	28	93.3	12.273	<0.001**
Total checklist score	25.0 ±4.8				39.3 ±4.2				12.280	<0.001**

Table 3) indicates statistically significant differences between pre- and post-intervention concerning nurses' practices related to plasmapheresis, with p = <0.001 for all phases regarding the machine and prior to plasmapheresis concerning patients. This table indicates statistically significant differences pre- and post-intervention during and after plasmapheresis, with p-values of 0.044 and 0.036, respectively, and a total practice level p-value of <0.001.

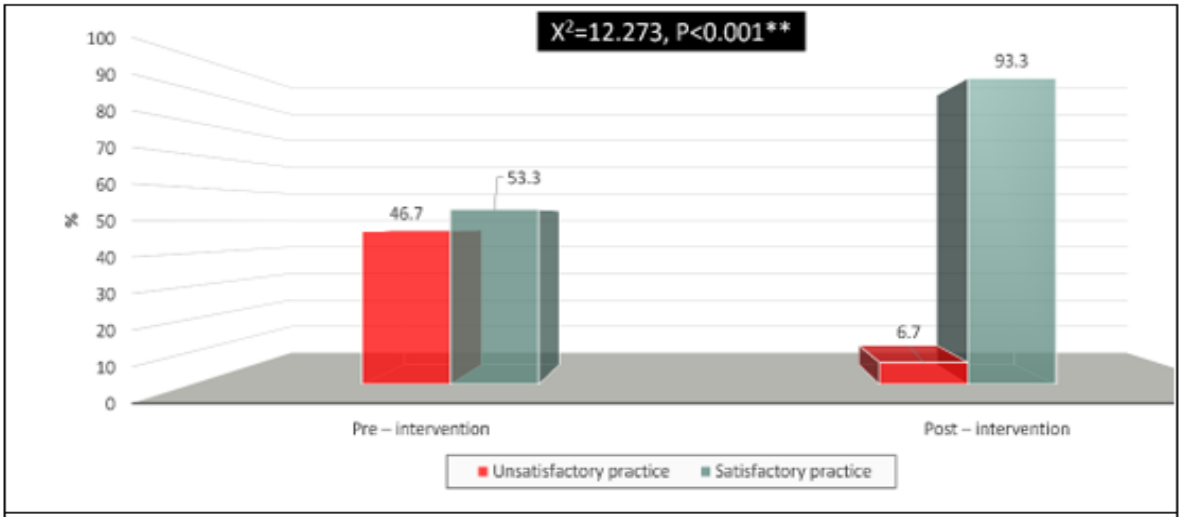

Figure 2: Comparison of the Plasmapheresis nurses' practices Observational Checklist total level

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Figure (2) Illustrated that markedly improvement in nurses' level of practice regarding plasmapheresis 53.3 % satisfactory level of practice pre intervention become 93.3 % satisfactory level of practice post intervention with X^2 12.273, p<0.001.

Table 4: Association between the personal data of studied nurses and their total level of knowledge about plasmapheresis (Post – intervention)

	Poor knowledge (n=2)		Average knowledge (n=5)		Good knowledge (n=23)		Chi – square / Fisher's exact test	
	N	%	n	%	N	%	X^2	P
Age (Years)								
20 > 30	0	0.0	1	20.0	9	39.1		
30 > 40	0	0.0	3	60.0	7	30.4		
40 > 50	0	0.0	0	0.0	2	8.7		
50 and more	2	100.0	1	20.0	5	21.7	7.891	0.246
Gender								
Male	0	0.0	3	60.0	11	47.8		
Female	2	100.0	2	40.0	12	52.2	2.120	0.347
Marital status								
Single	0	0.0	1	20.0	7	30.4		
Married	1	50.0	4	80.0	14	60.9		
Divorced / Widowed	1	50.0	0	0.0	2	8.7	4.776	0.311
Educational level								
Diploma	2	100.0	3	60.0	2	8.7		
Technician	0	0.0	2	40.0	12	52.2		
Bachelor	0	0.0	0	0.0	9	39.1	13.901	0.007*
Years of experience								
Less than one	2	100.0	4	80.0	3	13.0		
1 > 5	0	0.0	1	20.0	9	39.1		
5 > 10	0	0.0	0	0.0	2	8.7		
10 – 15	0	0.0	0	0.0	9	39.1	14.151	0.027*
Experience in plasma pheresis								
Less than one	2	100.0	5	100.0	10	43.5		
1 > 5	0	0.0	0	0.0	8	34.8		
5 > 10	0	0.0	0	0.0	4	17.4		
10 – 15	0	0.0	0	0.0	1	4.3	6.982	0.322
Educational program about plasma pheresis								
No	2	100.0	5	100.0	10	43.5		
Yes	0	0.0	0	0.0	13	56.5	6.982	0.030*

Table (4) demonstrates a statistically significant relation between the personal data of the studied nurses and their level of knowledge of educational attainment, years of experience, and participation in educational programs about plasmapheresis, with p-values of 0.007, 0.027, and 0.030, respectively.

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Table 5: Relation between the personal data of studied nurses and their level of practice about plasmapheresis (Post – intervention)

	Unsatisfactory practice (n=2)		Satisfactory practice (n=28)		Chi – square / Fisher's exact test	
	N	%	n	%	X^2	P
Age (Years)						
20 > 30	1	50.0	9	32.1		
30 > 40	1	50.0	9	32.1		
40 > 50	0	0.0	2	7.1		
50 and more	0	0.0	8	28.6	1.071	0.784
Gender						
Male	1	50.0	13	46.4		
Female	1	50.0	15	53.6	0.010	0.922
Marital status						
Single	1	50.0	7	25.0		
Married	1	50.0	18	64.3		
Divorced / Widowed	0	0.0	3	10.7	0.712	0.700
Educational level						
Diploma	2	100.0	5	17.9		
Technician	0	0.0	14	50.0		
Bachelor	0	0.0	9	32.1	7.041	0.029*
Years of experience						
Less than one	1	50.0	8	28.6		
1 > 5	1	50.0	9	32.1		
5 > 10	0	0.0	2	7.1		
10 – 15	0	0.0	9	32.1	1.250	0.741
Experience in plasma pheresis						
Less than one	1	50.0	16	57.1		
1 > 5	1	50.0	7	25.0		
5 > 10	0	0.0	4	14.3		
10 – 15	0	0.0	1	3.6	0.811	0.847
Educational program about plasma pheresis						
No	2	100.0	15	53.6		
Yes	0	0.0	13	46.4	1.639	0.200

Table (5) demonstrated a statistically significant relation between the level of practice and the personal data of the studied nurses about educational level, p = 0.029.

This table indicates no statistically significant differences for age, gender, marital status, overall years of experience, experience in plasmapheresis, and participation in educational programs about plasmapheresis, with p > 0.05.

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Table 6: Correlation between total Nurses' knowledge level and their total practice level about plasmapheresis

	Nurse's knowledge level about plasmapheresis	
	R	**p**
Plasmapheresis nurses' practices Observational Checklist		
Pre – intervention	0.125	0.511
Post – intervention	0.636	<0.001**

Table 6) demonstrates a highly statistically significant positive correlation between the studied nurses' knowledge level and their practice level about plasmapheresis following the intervention. $p < 0.001$ and $r = 0.636$

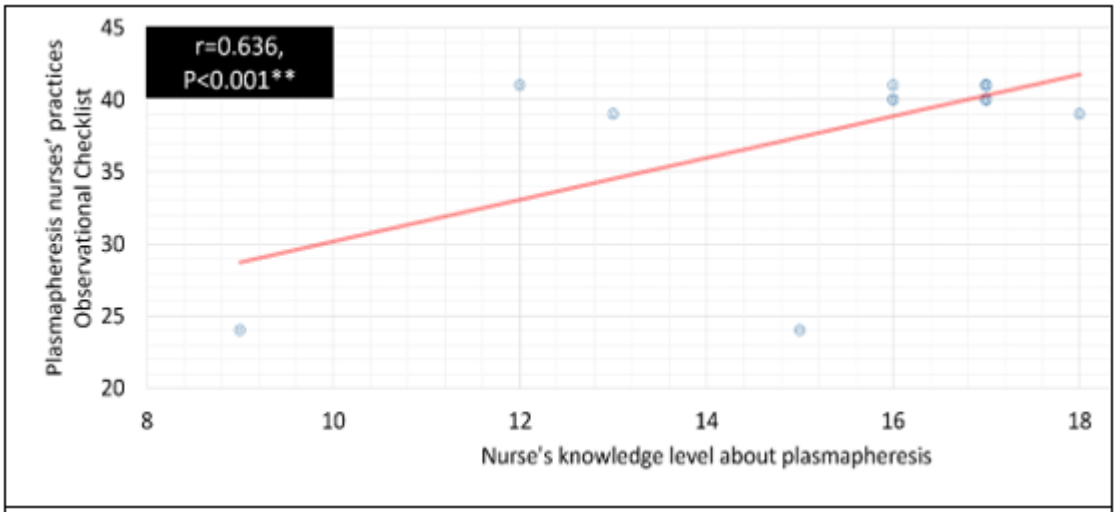

Figure 3: Correlation between total Nurses' knowledge level and their practice level about plasmapheresis (Post – intervention)

Figure (3) demonstrated a highly statistically significant positive correlation between nurses' knowledge and practice about plasmapheresis post-intervention, with r=0.636 and p=0.001

DISCUSSION

Nurses play a crucial role in plasmapheresis, a procedure involving the removal and replacement of a patient's plasma. The nurse's role is essential and complex in managing patients undergoing plasmapheresis, since the nurse must furnish information, guarantee safety, and administer suitable care within the nursing process framework. **(Elsayed, et al, 2024).**

Regarding the studied nurses' demographic data, the current study indicates that more than one-third were aged 20 to >29 years, while an additional third were aged 30 to 40 years. Regarding gender, 53.3% were female.

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This result corresponds with the research conducted by (**Farag, et al, 2025),** which indicated that one third of the surveyed nurses were aged between 30 and 40 years, with a mean age of 39.20 ± 0.96, and that the predominant demographic among the nurses was female. This finding can be clarified by the intrinsically feminine characteristics of the nursing profession.

Regarding educational level, the current study revealed that 46.7% held a certificate from a technical institute of nurses. This finding contradicts the study by (**Goda, et al, 2023),** titled "Effect of Educational Guidelines on Nurses' Performance Regarding Complications Associated with Plasmapheresis and Patients' Outcomes with Autoimmune Disorders," which revealed that 50% of the surveyed nurses had a nursing diploma, whereas 10% held a bachelor's degree in nursing. This result can be attributed to the fact that one-third of the evaluated participants were aged 30 to 39 years, with the majority of this age group holding only a technical nursing diploma.

In relation to years of experiences of studied nurses, the present study revealed that 56.7% of the studied nurses had less than one year of experience in the plasmapheresis unit, and correspondingly, 56.7% had not engaged in any educational programs or courses pertaining to plasmapheresis. The results differ from those presented by **(Abdel-Salam, et al, 2023)** in study titled “Effect of Evidence Based Guidelines on Nurses’ Performance and Attitude Regarding Care of Children Undergoing Plasmapheresis,” which indicated that 62.5% of the nurses examined possessed between 5 and 10 years of experience in the plasmapheresis unit, with a mean ± SD of 7.17 ± 3.0 years of experience.

The few years of experience and lack of training course participation may clarify the noted deficiency in knowledge and practice prior to the intervention. This highlights the importance of continuous educational opportunities and targeted training programs to improve nurses' performance and ensure safe and effective patient care in plasmapheresis.

As regard nurses level of knowledge the results of current study revealed that there is markedly improved in total level of knowledge post intervention than pre intervention, this results in consistent with study titled" Effectiveness of plasmapheresis educational and training program on nurses’ competency" which revealed that there was a statistically significant enhancement in the mean scores for knowledge related to the plasmapheresis, following the implementation of an educational and training program **(Amin, et al., 2024).** The improvement in nurses’ knowledge could be attributed to the variety of teaching strategies applied in the designated evidence-based guidelines, such as lectures and discussions, along with the researcher’s reinforcement of information at the end of each session, as well as the participants’ adherence to the provided instructions regarding plasmapheresis. Furthermore, nursing designated evidenced based guidelines has a significant impact on improving nurses' knowledge and comprehension of the complications related to plasmapheresis.

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On the same hand, the current study revealed statistically significant differences in nurses' practices related to plasmapheresis before and after the intervention, encompassing both machine operation and patient care. This signifies a substantial improvement in nurses' overall practice levels subsequent to the designated evidence-based guidelines. This outcome corresponds with the study titled "Effect of Educational Guidelines on Nurses' Performance Regarding Complications Associated with Plasmapheresis and Patients' Outcomes with Autoimmune Disorders," which found that most nurses evaluated an inadequate level of practice concerning plasmapheresis prior to the introduction of the educational guidelines.

Regarding post-implementation of educational guidelines, the present study revealed a statistically significant enhancement in satisfactory nursing practices before, during, and after the plasmapheresis procedure subsequent to the application of designated evidence-based guidelines, with a marked statistically significant difference in the overall score of nurses' practices.

This finding may be due to lack of relevant training programs in this nursing discipline. Also, this outcome may be attributed to a shortage of nursing staff, potentially impacting participation in training courses, or it may arise from a lack of motivation among nurses, who sometimes regard these training sessions as unworthy. Nurse leaders and their teams must consistently review standards, best practices, and current research, integrating them into everyday operations (American Nurses Association, 2023).

As regard the relation between nurses' personal data and their total level of knowledge, the results of current study indicated a statistically significant relationship between personal data of studied nurses and their level of knowledge. The data demonstrate that educational attainment, years of experience, and involvement in instructional programs on plasmapheresis are critically significant determinants.

Thus, nurses possessing advanced education, extensive experience, and participation in plasmapheresis training have significantly better level of knowledge about plasmapheresis These findings refuted Assad (**Flayh and Hassan, 2023),** who conducted a study titled "Relationship between Nurses' Knowledge about Apheresis Component of Blood Therapy and Nurses' Characteristics" and noted a lack of link between nurses' knowledge and their characteristics.

On the same hand, the findings of the present study revealed a statistically significant relation between the level of practice and the personal data of the studied nurses regarding educational level. This indicates that nurses possessing advanced education (e.g., bachelor's or postgraduate degrees) demonstrated enhanced practical performance in plasmapheresis relative to their less qualified counterparts. Conversely, the present investigation indicated that other characteristics (age, gender, married status, overall years of experience, specialized experience in plasmapheresis, and participation in educational programs) For all these factors, Consequently, there was no statistically significant difference in the level of practice across these characteristics. Therefore, these factors did not influence the nurses' level of practice, respectively.

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These results indicate that formal education exerts a greater influence on nurses' practice skills in plasmapheresis than general experience or other demographic factors. In addition, the current study's results indicate a highly statistically significant positive correlation between the nurses' level of knowledge and their level of practice about plasmapheresis following the intervention. The results correspond with the study "Nurses' Knowledge and Practices Regarding Care of Children Undergoing Vascular Access and Its Related Complications," which revealed a positive statistical correlation between nurses' overall knowledge level and their practices related to the care of children with vascular access devices (VAD).

Therefore, it is advisable for pediatric nurses to augment their expertise and practices by continuous training, educational initiatives, and workshops. A study entitled "Nurses' Performance Regarding Patients Undergoing Therapeutic Plasma Exchange" demonstrated a positive association between the overall knowledge score and the total practices score for the treatment of patients undergoing therapeutic plasma exchange. This outcome indicates that enhancements in knowledge were significantly correlated with greater practice performance. As the nurses' knowledge rose, their practical skills were also enhanced. This outcome validates the efficacy of the training program in reconciling theoretical comprehension with practical implementation, underscoring that knowledge is a crucial factor in the quality of nursing practice.

CONCLUSION

This study sought to evaluate the effect of designated evidence guidelines on nursing performance in patients with autoimmune diseases receiving plasmapheresis. The results indicated that the implementation of specific evidence-based guidelines markedly improved nurses' knowledge and practice. This study emphasizes the significance of incorporating evidence-based guidelines into clinical practice and ensuring continuous education and training for nurses.

Recommendations

From the study's findings, the subsequent recommendations can be derived:

For Nursing Practice:

- Further studies should be conducted on larger, diverse populations to prove the findings and enhance generalizability.
- A continuous training and education program should be provided periodically for nurses working with patients undergoing the plasmapheresis procedure.
- Evidence-based guidelines should be implemented as a standard protocol in all units where plasmapheresis is performed.

Regarding education: the Nursing curriculum should incorporate the best evidence-based protocols for procedures such as plasmapheresis, ensuring that graduated nurses are well-prepared.

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References

1) Abd El Hafeez, N.A., Gebril, H., ElRazkey, J.Y., Hafez, M.K., (2025). Effect of Nursing Guidelines on Controlling Adverse Events of plasmapheresisamong Patients with Autoimmune Diseases. Egyptian Journal of Health Care, 16 (1)

2) Abd El-Fadel,R.A., Ouda,W.E., Said,Kh. M., Abd El- Aziz, S.M. (2022). Nures' Knowledge and Practices regarding Care of Children Undergoing Vascular Access and its Related sComplications. Journal of Nursing Science Benha University 3(1). DOI: 10.21608/jnsbu.2022.215877.

3) Abdel-Salam.A.A., Sharshour, S.M., Abd-El Aziz,S.M.(2023). Effect of Evidence Based Guidelines on Nurses' Performance and attitude Regarding Care of Children Undergoing Plasmapheresis Tanta scientific nursing Journal) .31).4. 10.21608/tsnj.2023.328678

4) Amein, N.M., Elkodoos,R.F., Mostafa, H.A.A., Ismail,L.M.N. Hegazy, M.A.EL. (2024). Effectiveness of plasmapheresis educational and training program on nurses' competency" Egyptian Nursing Journal 21:(1). DOI: 10.4103/enj.enj_2_24.

5) Bogi, Krishna,M., Kumar, Mahesh, K., Vujhini, Kumar, S., Bonagiri, Shanthi(2024). Effectiveness of Therapeutic Plasma Exchange in Autoimmune Neurological Diseases in a Tertiary Care Hospital of South India. Global Journal of Transfusion Medicine AATM. 9(1): DOI: 10.4103/gjtm.gjtm_3_24.

6) Brunt, B. A., Morris, M.M., (2023). Nursing Professional Development Evidence-Based Practice. Available at. https://www.ncbi.nlm.nih.gov/books/NBK589676/

7) Elsayed,H.A., Mohamed, H.S., Ahmed, S.N.A., Iman Abdallah Mohammed Abdulmutalib,I.A.M., (2024). Nurses' Performance Regarding Patients Undergoing Therapeutic Plasma Exchange. Egyptian Journal of Health care, March, 2024 EJHC Vol.15 No. 1

8) Farag, S.A., Mahmoud, M.H., Mohamed,H.A., Mohamed,N.F.,(2025). Effect of Implementing Educational Guidelines on Nurses' Knowledge and Practice regarding Plasmapheresis Process. Journal of Nursing Science Benha University. 6(1). DOI: 10.21608/jnsbu.2025.406499..

9) Flayh,A.J. and Hassan, H.B.(2023). Relationship between Nurses' Knowledge about Apheresis Component of Blood Therapy and Nurses' Characteristics. Bahrain Medical Bulletin, 45: (3).

10) Goda, T.E., Taha, N.M., Mohamed,F.A., Mohamed,A.A. (2023). Effect of Educational Guidelines on Nurses' Performance Regarding Complications Associated plasmapheresis and Patients' Outcome with Autoimmune Disorders. International Journal of Chemical and Biochemical Sciences. IJCBS, 24(10).

11) Khalifa,M., , Omar,T., El-Gendy, F., Ahmed, H., Saad, A. (2022). Effect of Nursing Care Bundle on Central Venous Line Associated Blood Stream Infection. Menoufia Nursing Journal. 7(1). DOI: 10.21608/menj.2022.317834.

12) Miranda, D.M ,.Coelho,M., Delamain, M.T., Fabreti-Olivei, R.A. (2025). Therapeutic Plasma Exchange: Analysis of Practices and Compliance with International Guidelines. Journal of Clinical Apheresis 40(2). https://doi.org/10.1002/jca.70023

13) Sergent, S.R., Ashurst,J.V., (2023). Plasmapheresis. Available @ https://www.ncbi.nlm.nih.gov/books/NBK560566/

14) Warner,D., Duncan, H., Gudsoorkar, P., & Anand,M., (2025). BMC Nephrol (1):87. doi: 10.1186/s12882-025-03970-2.

15) Zeng,Z., Mao, H., Lei, Q., He,Y.(2025). IL-7 in autoimmune diseases: mechanisms and therapeutic potential. Frontiers in Immunology. (16). | https://doi.org/10.3389/fimmu.2025.1545760