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ASSESSMENT OF NURSES' KNOWLEDGE REGARDING SAFE BLOOD TRANSFUSION PROTOCOLS IN DIVERSE TERTIARY HEALTHCARE SETTINGS

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Abstract

Blood transfusion it is one of the important medical services that need full and extensive understanding and mastery among the nursing profession to avoid the adverse effects on the patients who undergo transfusion. The lack of information nursing deepens the gap among nurses and impairs the improvement of the nursing environment as well as a negative impact on the outcomes of patients. To assess the effectiveness of educational interventions regarding aspects of blood transfusion among nurses working in two major tertiary care hospitals in Karachi and to identify directions for the optimization of educational interventions aimed at improving transfusion safety. Following Study Permission from Head of Department to collect study data, this exploratory quantitative research design in the form of cross-sectional survey was employed among 180 registered nurses working at Farooq hospital Lahore, Akhter Saeed Trust Hospital Lahore and Civil Hospital, Hyderabad. Information was obtained from a self-administered blood transfusion knowledge questionnaire comprising demographic information and transfusion related questions from existing scale validated for use. Descriptive analysis using SPSS version 25 was used to determine means, percent and frequencies of samples. The respondents were 67.20% females and 45.55% fell in the age group of 31–40 years. The percentage of correct knowledge shown by majority of them: 89.3% knew correct usage of the blood transport box, 90.77% knew that the first step is to verify the bag labels and request forms for blood collection. Nevertheless, there was knowledge at moderate level overall and still much need in the areas of training and education. Few knowledge gaps in regards transfusion were observed within the nurses at the tertiary care hospital but education disparity was relatively significant.

Keywords: *Blood transfusion, Nursing practices, Patient safety, Transfusion practices, Nursing education*

INTRODUCTION

Blood transfusion is one of the basic profound techniques of modern medicine, which is widely practiced in the treatment of severe anemia and many other severe states (1). It stands among the top utilized therapeutic approaches in the whole world (2). However, as much as blood transfusion is common today several complications are associated with it especially amongst the pediatric and the youthful population (3). These have a variety of risk factors that ranges from the initiation of adverse reactions, infections as well as complications that make it important to be used cautiously and sparingly (4). To tackle these challenges, Patient Blood Management (PBM) programs have become popular globally (5). PBM is focused on patient and evidence based and aims at delivering the best possible clinical results by creating efficiency, using the patient's own blood, avoiding unnecessary blood transfusions or complications (6). Safety of blood supplies and associated cost of transfusion therapy have provided the rationale to reconsider blood transfusion policy (7). This ranges from reconsideration of transfusion triggers aimed at achieving optimal risks and benefits of transfusion (8). For instance, a group of researchers realize clinically important adverse effects associated with transfusions including worsening respiratory status, hydrostatic pulmonary oedema, prolonged duration of mechanical ventilation, multi-organ dysfunction and increased mortality rates (9). This paper underscores the importance of EBPs and targeted interventions; especially in the process of reducing

associated risks with transfusion (10). In some patient populations, such as thalassemia patients who require lifelong transfusions the burden remains high, especially in high incidence areas such as South Asia, Africa and the Mediterranean (11). Transfusion practices in the present day may be intricate processes that involve several steps of collection, inherent infection exposure screening, processing, storage and distribution and as such require the involvement of several individuals (12). Transfusion safety and its effectiveness greatly depend on the position of nurses (13). The PBM is thus envisaged as assuming greater intricacy and jeopardy within blood transfusions subsequently demanding enhanced PBM practices, interdisciplinary coordination, and prioritized teaching geared towards augmenting transfusion security and enhancing respectable patient result (14).

The objective of this study was to assess the effectiveness of educational interventions regarding aspects of blood transfusion among nurses working in diverse tertiary care settings to identify directions for the optimization of educational interventions aimed at improving transfusion safety.

METHODOLOGY

Following Study Permission from Head of Department to collect study data, this exploratory quantitative research design in the form of cross-sectional survey was employed among 180 registered nurses working at Farooq hospital Lahore, Akhter Saeed Trust Hospital Lahore and Civil Hospital, Hyderabad. Specifically, convenience sampling which is a non-probability sampling technique convenience sampling was used to select all the 180 participants from the total population of 440 nurses sampled from Farooq Hospital Lahore and Civil Hospital, Hyderabad after study data collection permissions. The sample size was determined by Raosoft software with test of sample proportion required margin of error of 5%, confidence interval of 95% and an assumed response distribution of 50%. Sampling criteria aimed to enroll only practicing nurses from different wards interested in participating. Nurse exclusion criteria included any nurse with less than one year's experience, nursing students, administrative nurses, and any nurse with no blood transfusion training or who attended no blood transfusion workshops. Data analysis was carried out with the help of SPSS version 25 to correspond to updated analytical requirements, the data was described as means and standard deviations (for continuous variables) and frequencies and percentages (for categorical variables). Ethical considerations were brooked to the highest level. The participants were as follows the study's participants provided written informed consent during the study and participant anonymity was upheld throughout the study as recommended in the Declaration of Helsinki. There was no identification of person at any time hence agreed clearly with what counts most –autonomy, beneficence, non-maleficence, and justice. The structure of questionnaire was utilized after positive evaluation from two local reviewers to collect assessment over general practices among Nursing.

RESULTS

The rigorous approach of this research was geared towards providing a systematic coverage of the study question and, at the same time, provides an ethical and methodologically sound investigation of the targeted domain of the nurses' blood transfusion knowledge. Demographic characteristics of selected population are mentioned in Table I while Table II shows general Assessment of Study Population.

Table I. Demographic characteristics

Demographic characteristics	Category	Frequency	Percentage
Gender	Female	121	67.20%
	Male	59	32.80%
Age	21 to 30 Years	42	23.33%
	31 to 40 Years	82	45.55%
	41 to 50 Years	50	27.77%
	51 to 60 Years	06	3.35%
Higher Qualification	MS Nursing	20	11.1%
	BS Nursing / Post RN	100	55.6%
	Specialized Nursing (e.g., ICU, Peads)	40	22.2%
	Diploma Nursing	20	11.1%

Experience	1 to 5 Years	50	27.7%
	6 to 10 Years	74	41.1%
	11 to 15 Years	34	19.2%
	16 to 20 Years	16	8.8%
	21 Years and Above	06	3.2%

Table II. General Assessment of Study Population

Questions	Options	Frequency	Percentage (%)
Preferred Method of Transporting Blood Bags from the Blood Bank to the Ward	Plastic Bag	18	10%
	Blood Transport Box	134	74.45%
	Kidney Tray	28	15.55%
Initial Step in Collecting a Blood Bag from the Blood Bank	Check Details on Bag Label and Blood Request Form	157	87.22%
	Informed Consent	15	8.34%
	Monitoring Vital Signs	8	4.44%
Key Steps to Follow Before Initiating a Blood Transfusion	Patient Information	1	0.55%
	Patient Identification	5	2.78%
	Vital Sign Recording	1	0.55%
	All of the Above	173	96.12%
Information to Provide to Patients Prior to a Blood Transfusion	Reason for Transfusion	0	0%
	Risks of Transfusion	2	1.12%
	Reaction Symptoms	7	3.88%
	All of the above	171	95%
Procedure for Verifying Patient Identity Before Transfusion	Ask Patient to State Name, Date of Birth	2	1.11%
	Match Patient ID Details with Blood Bag	5	2.78%
	ID Band, Blood Request Form and Chart	9	5%
	All of the Above	164	91.11%
Nursing Responsibilities After Starting a Blood Transfusion	Setting Up the Flow Rate	120	66.66%
	Observe for Transfusion Reaction	60	33.34%
	Vital Sign Recording	-	-
	Documentation of Relevant Information	-	-
Maximum Allowable Time for a Blood Bag to Remain Out of the Refrigerator	10 Minutes	14	7.78%
	20 Minutes	18	10%
	30 Minutes	140	77.77%
	1 Hour	8	4.45%
Time frame for Completing a Blood Transfusion	Within 4 Hours	169	93.88%
	After 4 Hours	2	1.12%
	None of the Above	9	5%
Common Signs of an Acute Hemolytic Transfusion Reaction	Tachycardia	18	10%
	Nausea/Vomiting	8	4.45%
	Hypotension	1	0.55%
	All of the Above	153	85%
Conditions That Cannot Be Transmitted Through Blood Transfusion	Hepatitis B&C, HIV/AIDS, Malaria	70	38.88%
	Hemophilia	110	61.12%
Health Issues That Are Not Complications of Blood Transfusion	Hemolytic Reaction,Allergic Reaction, Non-Hemolytic Febrile Reaction	117	65%
	Leukemia	63	35%

DISCUSSION

The objective of this study was to evaluate nurses' knowledge about blood transfusion protocol using a structured questionnaire in Farooq hospital Lahore and Civil Hospital, Hyderabad. Demographic analysis indicated that the most of the respondents were female nurses (67.20%), which reflects a worldwide phenomenon. This matches previous work by a researcher which observed a 58.3% female representation (15,16). The comparatively lower male participation (32.80%) reflects a growing trend of men entering the nursing workforce (17). Most participants (45.55%) were aged between 31 and 40 years. Additionally, 41.1%

of the nurses has 6 to 10 years of experience, which is similar to findings by a researcher, highlighting comparable professional maturity among nursing staff globally (18).

According to the data, 74.45% of nurses correctly identified the usage of blood transport boxes, indicating a high level of understanding of the correct procedures for receiving blood bags from the blood bank. This finding is consistent with results reported by a group of researchers (18). Similarly, nurses demonstrated exceptionally high knowledge of patient education about transfusion, including its reasons, risks and possible reactions (92.7%), which was equivalent to the 90.5% reported in a similar study (19). Additionally, 84.4% of nurses responded correctly responded to questions regarding patient verification procedures prior to transfusion (20).

However, 85% of nurses in this study recognized acute hemolytic transfusion reactions, which was more than 76% reported in another study, indicating that participants were more familiar with transfusion related problems (21). Further, 77.77% of nurses correctly identified that the maximum time a blood unit can remain unrefrigerated is 30 minutes (22). This figure is notably higher than the 60% reported in 2019, likely due to differences in the education and training of nursing staff. Comparisons with studies, it has been showed that, the nurses polled had a moderate level of expertise on the topic (23,24).

These findings indicate a moderate level of knowledge among nurses regarding blood transfusion protocols with a lack of training opportunities on transfusion practices accounted for significant knowledge gaps (25). Fostering educational programs to improve transfusion safety and effectiveness depends heavily on administrative support (26). While the generalizability of the study is limited due to its focus on only two major hospitals in karachi and a purposive sampling approach, the comprehensive response rate and lack of funding conflicts underscore the study's value in understanding transfusion practices for overall evaluation of regional practices which needs to be extended further.

The results of this study highlight the need for hospital administrations to proactively address to and close educational gaps regarding blood transfusion among nurses (27). To minimize transfusion related complications, nursing education curricula must extensively incorporate transfusion medicine to equip nurses with the required skills and knowledge to practice (28). Furthermore, policies must be developed and transfusion guidelines continuously disseminated to hospitals units, in order to maintain best practices (29, 30). Future research should include larger, more diverse samples across various healthcare settings to validate and expand upon these findings.

CONCLUSION

Nurses at these two tertiary care hospitals in Karachi were found to have moderate knowledge concerning blood transfusion practices, emphasizing the need for enhanced education in transfusion medicine and the development of further training programs. These findings underscore the need for healthcare administrations to take responsibility for creating comprehensive training programs and policies to enhance nurses' competencies in transfusion services. Conveniently, these educational gaps allow the healthcare sector with an opportunity to improve patient safety by addressing the risk of transfusion related adverse events and enhancing the overall quality of care for patients. This emphasizes the broader implication for healthcare: the continual need for professional education and development in critical patient care to maintain the highest standards of care and safety in clinical practice.

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