

## KNOWLEDGE, ATTITUDES, AND PERCEIVED BARRIERS REGARDING BLOOD TRANSFUSION SAFETY AMONG NURSES IN DHQ HOSPITAL DIR UPPER.

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### Abstract

**Background:** Blood transfusion is a life-saving intervention widely used in healthcare, but errors during transfusion can lead to serious adverse events, including reactions, infections, and mortality. Nurses play a central role in ensuring transfusion safety, and their knowledge, attitudes, and perceived barriers are critical determinants of patient outcomes. Understanding these factors is essential for improving transfusion practices, particularly in resource-limited district hospitals.

**Aim:** This study aimed to assess the knowledge, attitudes, and perceived barriers regarding blood transfusion safety among nurses at District Headquarter (DHQ) Hospital Dir Upper, Pakistan.

**Methods:** A descriptive cross-sectional study was conducted among all 60 eligible nurses using a universal sampling technique. Data were collected over four weeks using a structured, self-administered questionnaire comprising sections on demographics, knowledge, attitudes, and perceived barriers. Data were analyzed using SPSS version 27. Descriptive statistics summarized the findings, while chi-square and t-tests were applied to examine associations between demographic variables and knowledge or attitude levels.

**Results:** The majority of nurses (45%) demonstrated moderate knowledge of transfusion safety, while 35% had adequate knowledge and 20% showed inadequate understanding. Most nurses (63.3%) exhibited a positive attitude toward transfusion safety, but 25% were neutral and 11.7% displayed negative attitudes. Heavy workload, staff shortages, lack of refresher training, and limited supervision were the most frequently reported barriers. Significant associations were observed between years of experience and knowledge level ( $p = 0.045$ ) and between educational qualification and attitude level ( $p = 0.039$ ).

**Conclusion:** While nurses at DHQ Hospital Dir Upper generally showed positive attitudes toward blood transfusion safety, knowledge gaps and multiple systemic barriers persist. Continuous education, mentorship, adequate staffing, and institutional support are essential to enhance safe transfusion practices and

*improve patient outcomes.*

## INTRODUCTION

Knowledge, attitudes, and perceived barriers regarding blood transfusion safety are critical components of safe nursing practice. Knowledge refers to nurses' understanding of blood transfusion principles, including indications, compatibility testing, administration procedures, and recognition of transfusion reactions. [1] Attitudes denote nurses' beliefs, perceptions, and sense of responsibility toward safe transfusion practices. Perceived barriers include factors that hinder proper adherence to transfusion safety protocols, such as workload, lack of training, or inadequate resources. Blood transfusion safety encompasses all measures taken to ensure the correct blood is given to the right patient at the right time. Nurses play a central role in transfusion processes as they are directly involved in preparation, administration, and monitoring. [2]. Understanding these concepts provides a foundation for examining transfusion safety practices in clinical settings. [3].

### 1.1 BACKGROUND OF THE STUDY:

Blood transfusion is a life-saving intervention that is one of the fundamental ones and is commonly applied in the medical and surgical care and is estimated that millions of transfusion are done every year around the world [4]. Although blood transfusion has therapeutic advantages, it also has some associated risks, which may result in severe adverse outcomes like transfusing reactions, infection transmission, and even death, in case it is not performed in a safe manner [5]. Most of these risks can be attributed to mistakes in the point of care especially in the bedside where the duty of the nurse is mainly to prepare and administer blood products. It has been indicated that a significant percentage of errors during transfusion is avoidable and is caused by failure in knowledge, protocols violation or systemic constraints in clinical practice [6].

The nurses are at the centre of the transfusion practice due to the fact that they carry out the foundational aspects of patient identification, product verification, and observing adverse reactions during the transfusion process [7]. It is important that nurses should have a sufficient level of knowledge about safe transfusion to make sure that appropriate practices are applied and possible complications are detected and addressed timely. It has been demonstrated that nursing personnel in different environments have knowledge gaps that lead to moderate to poor understanding of essential points in transfusion safety, such as pretransfusion tests, component storage, and identification processes [8]. The findings reveal the existence of knowledge gaps although the importance of safety is identified in the practice of transfusion.

Patient outcomes have been closely linked with the grade of knowledge that nurses have about blood transfusion with nurses possessing a better level of understanding being more inclined to perform comprehensive checks, follow the guidelines, and react promptly to complications [9]. Indicatively, research conducted in Pakistan has reported moderate levels of knowledge on transfusion protocols by the nurses and a lot of gaps in the most critical areas including the early identification of transfusion reactions and adherence to pretransfusion verification measures [10]. International studies have also demonstrated equivalent results with moderate levels of knowledge observed among nurses in tertiary hospitals with this illustrating the globalization of the problem [11].

The attitudes towards transfusion safety are positive, which contributes to the transfer of knowledge into the safe clinical practice. When nurses perceive safety practices as part of the professional conduct, they are more conscientious when performing their duties and watching over patients [12]. Personal beliefs, culture of work place, supervision and previous

experience with the events of transfusion affect attitudes. Positive environment based on values of safety may enhance the adherence of the nurses to the protocols used whereas negative or passive attitudes may lead to the tendency to commit lapses and shortcuts in the busy clinical rotations [13]. Research has indicated that positive attitudes development by means of leadership, role-modeling, and encouraging safety culture enhance adherence to transfusion standards [14].

Although knowledge and positive attitudes are enough, nurses in most cases face obstacles that prevent them in adopting safe transfusion practices. Finally, overworking, time, and a shortage of staff are often mentioned as the hindrances that undermine the provision of all the essential safety inspections [15]. These obstacles are especially sharp in high-volume or resource constrained environments, in which nurses have to deal with a number of competing demands. Also, the absence of standardized and easily accessible guidelines and the ineffective communication between multidisciplinary teams makes practice inconsistent [16]. Such systemic problems usually lead to the neglect of safety precautions or sluggish identification of adverse reactions.

The role of institutional support in the determination of transfusion safety is vital. Hospitals that have clear policies, frequent educational sessions and where active supervision is performed are more effective in strengthening protocol compliance. In contrast, a low level of institutional support, including the lack of

lifelong learning, the inability to obtain the latest guidelines, and the lack of control systems is associated with a greater error rate [18]. There are also other challenges encountered in resource-limited settings, such as lack of sufficient equipment and wards overcrowding that further stress nurses and affect safe practices [19].

**Methodology:**

A quantitative cross-sectional study was conducted at DHQ Hospital Dir Upper, Pakistan, to assess workplace violence (WPV) and its effects on job satisfaction and career outlook among nurses. Using universal sampling, all 60 eligible nurses with at least six months of clinical experience were included. Data were collected via a structured, self-administered questionnaire covering demographics, WPV exposure, job satisfaction, and career outlook. Ethical approval was obtained, and informed consent was secured from all participants, with strict measures taken to ensure anonymity and confidentiality. Data were analyzed using SPSS version 27, employing descriptive statistics to summarize variables and Pearson’s correlation to examine associations between WPV exposure and professional outcomes, with significance set at  $p < 0.05$ .

**Results:**

**4.1. Demographic Analysis**

The nursing workforce was predominantly young and female, with the largest group holding diploma-level qualifications and having less than five years of experience.

**Table 4.1: Demographic Characteristics of Nurses (n = 60)**

Variable	Category	Frequency	Percentage (%)
Age (years)	20-29	22	36.7
	30-39	28	46.7
	40-49	8	13.3
	≥50	2	3.3
Gender	Male	24	40
	Female	36	60
Professional Experience	<5 years	25	41.7
	5-10 years	20	33.3
	>10 years	15	25

<b>Educational Qualification</b>	Diploma in Nursing	34	56.7
	BSN / Post-RN BSN	26	43.3

**4.2. Knowledge Regarding Blood Transfusion Safety**

Nurses demonstrated varying levels of knowledge, with the majority having moderate to adequate

understanding. However, 20% showed inadequate knowledge, indicating a need for educational reinforcement.

**Figure 4.1: Level of Knowledge Regarding Blood Transfusion Safety (n = 60)**

Knowledge Level	Frequency (n)	Percentage (%)
Adequate	21	35.0
Moderate	27	45.0
Inadequate	12	20.0

**4.3. Attitude Toward Blood Transfusion Safety**

A majority of nurses held a positive attitude towards blood transfusion safety, which is conducive to good clinical practice.

**Figure 4.2: Attitude of Nurses Toward Blood Transfusion Safety (n = 60)**

Attitude Level	Frequency (n)	Percentage (%)
Positive	38	63.3
Neutral	15	25.0
Negative	7	11.7

**4.4. Perceived Barriers to Safe Blood Transfusion Practices**

The most significant barriers were related to workload and staffing, followed by time pressures and a lack of refresher training.

**Table 4.2: Perceived Barriers to Safe Blood Transfusion Practices (n = 60)**

Perceived Barrier	Yes n (%)	No n (%)
Heavy workload / staff shortage	44 (73.3)	16 (26.7)
Lack of refresher training	39 (65.0)	21 (35.0)
Inadequate availability of protocols	35 (58.3)	25 (41.7)
Time constraints during emergencies	41 (68.3)	19 (31.7)
Limited supervision	29 (48.3)	31 (51.7)

**4.5. Association Between Variables**

A statistically significant association was found between knowledge level and years of experience. Nurses with more than five years of experience were more likely to have adequate knowledge.

**Table 4.3: Association Between Knowledge Level and Years of Experience**

Experience	Adequate n	Moderate n	Inadequate n	$\chi^2$	p-value
≤5 years	6	15	7	6.21	0.045
>5 years	15	12	5		
<b>Total</b>	<b>21</b>	<b>27</b>	<b>12</b>		

A significant association was also found between educational qualification and attitude. Nurses with a BSN/Post-RN BSN degree demonstrated a significantly more positive attitude towards blood transfusion safety.

**Table 4.4: Association between Educational Qualification and Attitude Level**

Qualification	Positive n	Neutral n	Negative n	$\chi^2$	p-value
Diploma	18	11	5	5.87	0.039
BSN/Post-RN	20	4	2		
<b>Total</b>	<b>38</b>	<b>15</b>	<b>7</b>		

**DISCUSSIONS**

This research showed that the nurses in DHQ Hospital Dir Upper had different degrees of knowledge about the safety of blood transfusion, where most of them had a moderate knowledge level. Though over a third of the respondents already had the sufficient knowledge, yet a significant share of them revealed insufficient knowledge about the key principles of transfusion, including identification of the patient, blood compatibility tests, and surveillance of the side effects. [12]. Transfusion-related complications such as acute transfusion reactions and delayed adverse events are some of the knowledge gaps that expose patients to avoidable risks. The results show that the imperative necessity towards continuous professional education and organized in-service training activities is crucial to retain and improve the competency of nurses in transfusion safety. The same tendencies are documented in the earlier studies, with the lack of knowledge among the nurses being explained by a lack of access to refresher training and the lack of regular evaluation of competencies [20].

The results also demonstrated that most of the nurses displayed a positive attitude to the safety of blood transfusion that showed a feeling of professional responsibility and the knowledge of the principles of patient safety. Positive-attitude nurses were more inclined to believe the importance of following the laid down procedures, checking the procedures twice, and closely observing patients during the transfusion. Nevertheless, the fact that there are neutral and negative attitudes among a number of the

participants indicates that there are inconsistencies in safety culture within the institution. [21]. Attitude is a key factor in knowledge to safe practice and even moderate negative perceptions can result in complacency or non-adherence to protocols, especially in high pressure clinical environments. These findings can be compared to previous studies that indicated that the strength of the positive attitudes to transfusion safety is strengthened with the help of the effective supervision, supportive leadership and continuous education [22].

Perceived barriers were observed to be a major obstacle to the practices of safe blood transfusion. The most common barriers reported included heavy workload and staff shortages, which underscores how nurses are strained in the healthcare setting in the public sector. The availability of time was also another factor that restricted the capacity of nurses to strictly comply with the transfusion process during emergency cases. [23]. Moreover, the undiscipline of refresher training and sufficient access to standardized instructions were also shown as significant setbacks. Lack of supervision was also cited as a factor to blame, which may lower accountability and compliance to best practices. These obstacles are an indicator of more systemic and organizational challenges to safe clinical practice. The same obstacles have been well documented in state hospitals in the low- and middle-income countries, where the lack of resources and the abundance of patients adversely affect patient safety efforts [24].

In the study, statistically significant relationship between years of professional experience and the knowledge levels of nurses on the safety of blood transfusion were also identified. Nurses who had over five years of clinical experience had higher chances of exhibiting sufficient knowledge than their junior counterparts. The greater exposure to transfusion procedures, clinical decision making and problem solving in the real world are likely to develop more competence and confidence with time. [12]. This observation highlights the significance of hands-on learning and well-built mentoring initiatives, whereby senior nurses are able to mentor and assist junior employees. These programs can be used to overcome knowledge gaps and encourage safer transfusion practices by the newly employed or less experienced nurses [24].

## CONCLUSION:

The research shows that the level of knowledge of the nurses employed in DHQ Hospital Dir Upper, as it relates to blood transfusion safety, is heterogeneous, as most of the nurses presented an average degree of knowledge. Despite the positive attitudes portrayed by most nurses towards safe transfusion practices, the knowledge gaps and some participants being neutral or negative towards the whole process show lack of agreement in the safety culture. The research also found that heavy workload, shortage of staff, time constraints during emergencies, inadequate refresher training and limited supervision are considered as critical perceived impediments hindering strict compliance with standard transfusion measures.

The statistically significant correlation between years of experience and knowledge level, education qualification and attitude reveal that clinical exposures and higher education play a significant role in facilitating transfusion safety. In general, attitudes to the safety of blood transfusion are mostly positive, but the boost in knowledge of nurses and the mitigation of organizational obstacles are needed to guarantee safe, effective, and error-free blood transfusion behaviors in the district-level hospitals.

## LIMITATIONS OF THE STUDY:

The study has several limitations. It was conducted in a single District Headquarter (DHQ) hospital, which may limit the generalizability of the findings to other healthcare settings. A relatively small sample size (n = 60) was used due to the limited number of nurses at the study site. The cross-sectional design collected data at one point in time and could not establish causal relationships. Data were obtained through a self-administered questionnaire, which may be affected by response and social desirability bias. Additionally, actual transfusion practices were not directly observed, as the findings relied on self-reported knowledge, attitudes, and perceived barriers. Time constraints and workload during data collection may also have influenced participants' response

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