Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

ASSESSING THE KNOWLEDGE OF BLOOD TRANSFUSION AMONG NURSES IN TERTIARY HOSPITAL

Memona Zukhruf
BSN Scholar, Mustafa Kamal Institute of Nursing and Medical Sciences, Vehari
memonazukhruf@gmail.com
Jalal Haider
Nursing Lecturer, Mustafa Kamal Institute of Nursing and Medical Sciences, Vehari
malikjalal3218@gmail.com
Khadija BiBi
BSN Scholar, Mustafa Kamal Institute of Nursing and Medical Sciences, Vehari
khadijamanzoor03@gmail.com
Sadaqat Aftab
Assistant Prof./ Principal, Mustafa Kamal Institute of Nursing and Medical Sciences, Vehari
sadaqataftab@gmail.com
Shafeeq Ul Rehman
M.Sc. Scholar, MNS University of Agriculture Multan, Punjab, Pakistan
Shafeeqkhan4400@gmail.com

Author Details

Keywords:
Blood Transfusion, Nursing Knowledge, Patient Safety, Transfusion Protocols, Tertiary Care Hospital, Clinical Competency, Vehari.

Received on 20 Apr 2026
Accepted on 02 May 2026
Published on 22 Jun 2026

Corresponding E-mails & Authors*:
Memona Zukhruf
memonazukhruf@gmail.com

Abstract

Background:

Blood transfusion is a critical, life-saving intervention, yet its clinical safety heavily relies on the adherence of healthcare providers to established transfusion protocols. Frontline nursing staff bear the primary responsibility for patient preparation, compatibility verification, and the recognition of adverse reactions.

Objective:

To assess the level of knowledge regarding blood transfusion practices among nurses working at DHQ Vehari.

Methods:

Utilizing a quantitative approach and purposive, convenient non-probability sampling, data was gathered from 86 valid nursing respondents across multiple clinical wards using a structured,

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

validated knowledge questionnaire. Statistical analysis was conducted using IBM SPSS Statistics 27.0.1.

Results:

The sample predominantly comprised female professionals (80.2%) and a younger demographic, with 69.8% possessing less than five years of clinical experience. Educationally, 53.5% held a professional nursing degree. Overall, 75.6% of the participants demonstrated a "Good" level of baseline knowledge regarding blood component administration, while 23.3% scored within the "Average" range, and 1.2% exhibited "Poor" knowledge. The collective knowledge mean was 2.74 out of a maximum of 3.00, with a low variance of 0.216, indicating uniform baseline theoretical awareness.

Conclusion:

While frontline clinical competency remains strong at the institution, the presence of junior staff underscores a vital mandate for targeted interventions. Implementing periodic, simulation-based refresher courses and double-check mentorship models is recommended to bridge existing gaps and transition average-scoring nurses into top-tier proficiency.

INTRODUCTION

1.1 Background:

Blood transfusion is an important medical procedure used to replace blood or its components in patients who suffer from blood loss, severe anemia, trauma, or during significant surgical operations. It is regarded as a life-saving intervention in many medical cases and is commonly performed in hospitals. Nurses play a key part in the blood transfusion process, as they are responsible for preparing the patient, verifying blood compatibility, administering the transfusion, and monitoring the patient for any adverse reactions during and after the procedure. Due to these responsibilities, nurses must have enough information and skills to ensure that transfusions are conducted safely and effectively. A lack of understanding or improper practices during blood transfusions can result

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

in serious complications, including transfusion reactions, infections, or even fatalities. Recent research shows that though many nurses possess a basic knowledge of blood transfusion, there are still gaps in their knowledge regarding the identification of transfusion reactions and proper patient monitoring. Therefore, evaluating nurses' knowledge about blood transfusions is essential to identify educational needs and enhance patient safety in healthcare environments (Ahmad et al. 2022).

This study looked at nurses' understanding of blood transfusion practices and pointed out issues that could impact patient safety. Nurses from various departments, including medical, surgical, ICU, and emergency, joined the research. A set of questions was used to assess their knowledge regarding transfusion procedures, patient identification, pre-transfusion preparation, monitoring, and recognizing reactions. The findings showed a medium level of knowledge among the nurses. While many were familiar with basic safety principles, some showed gaps in their understanding of documentation, early signs of transfusion reactions, and how to manage complications. Nurses who had received prior training or worked in specialized units performed better than those in general wards. The study shows how important it is of ongoing education and regular training programs. By helping nurses learn more the safe administration of blood transfusions can be ensured, along with effective monitoring for adverse reactions. Doing better in transfusion practices ultimately leads to better patient safety and quality of care (Gagiu et al. 2023).

Blood transfusion is a crucial and life-saving medical procedure commonly performed in hospitals to treat patients with severe anemia, trauma, surgical blood loss, and other critical conditions. The effectiveness and safety of blood transfusions largely depend on healthcare professionals, particularly nurses, correctly following transfusion protocols. Nurses are very important for the transfusion process, as they prepare patients, verify blood compatibility, administer blood products, and monitor patients for possible problems during and after the procedure. Because of these duties, it is necessary for nurses to have a solid understanding and skills related to safe transfusion practices. Any errors during the transfusion can lead to serious complications, including hemolytic reactions, infections, or even patient death. Thus, maintaining proper knowledge and following the transfusion guidelines

Pakistan Journal of Medical & Cardiological Review
https://pakjmcr.com/index.php/1/about
Online ISSN 3007-2387
Print ISSN 3007-2379

DOI: http://doi.org/10.5281/zenodo.20794647

is needed for patient safety in healthcare environments. Research indicates that blood transfusion is a high-risk clinical procedure, where mistakes can lead to significant morbidity and mortality if appropriate precautions are not taken. A study conducted among nurses in tertiary care hospitals in Pakistan checked what they knew of safe blood transfusion practices using a structured questionnaire. The study involved 152 nurses with at least six months of transfusion experience. According to the results, many nurses knew well when blood transfusions are necessary, with about 75.7% correctly identifying the indications for transfusion. However, the study also showed some weak points in critical areas, such as recognizing transfusion reactions and involving patients in the transfusion process. These findings suggest that, despite regular involvement in blood transfusions, nurses' knowledge in certain areas is lacking. The study also pointed out that clinical experience and ongoing education can really help improve nurses' knowledge and skills in transfusion practices. Therefore, regular learning, regular training sessions, and educational workshops are important to help nurses' understanding of blood transfusion protocols. Evaluating nurses' knowledge about blood transfusion practices is crucial for identifying gaps and developing strategies to enhance safe transfusion practices and improve patient care in hospitals (Subhan et al. 2025).

Blood transfusion is a vital, life-saving procedure for patients with severe anemia, trauma, or significant blood loss. The process's safety depends on the training and skills of healthcare professionals, especially nurses, who are responsible for patient preparation, blood match verification, product administration, and monitoring for adverse reactions. Mistakes can cause serious complications such as hemolytic reactions and infections, so it is essential to follow established guidelines. Studies including a cross-sectional assessment of nurses at a Malaysian university hospital show a moderate knowledge level (average score 54.9%), with strengths in transfusion policy but weaknesses in pre- and post-procedure practice. These findings emphasize the importance of continuous education and training to strengthen essential skills, address practice gaps, and ensure optimal patient safety during transfusions (Ismail et al. 2021).

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Blood transfusion is a crucial medical procedure used to replace lost blood or its components in patients suffering from severe anemia, trauma, surgical blood loss, and other critical conditions. It is seen as a way to save lives in modern medicine. Nurses have a significant role in the transfusion process, which includes preparing patients, confirming blood compatibility, administering blood products, and monitoring patients during and after the procedure. It is essential for nurses to have enough information and skills, as a lack of understanding of transfusion protocols can result in serious complications, such as transfusion reactions, infections, and other bad results. A cross-sectional study conducted at a tertiary care hospital in Peshawar, Pakistan, checked the knowledge of safe blood transfusion practices among 152 registered nurses from ICU, emergency, medical, and surgical wards. The results indicated that 75.7% of the nurses rightly picked the indications for blood transfusion; however, there were weaknesses in recognizing transfusion reactions and involving patients in the process. The study shows the need for ongoing education and training programs to help nurses learn more and ensure safe blood transfusion practices (Shoukat et al. 2025).

Blood transfusion is a crucial medical procedure used to replace lost blood or components in patients with problems such as severe anemia, trauma, surgery, or other serious health issues, and is viewed as life-saving in modern healthcare. Nurses are very important for this process: preparing patients, verifying compatibility, administering transfusions, and monitoring for adverse reactions. Gaps in knowledge or improper practices can have serious problems. As we see in the study at tertiary hospitals in Pakistan, nurses showed moderate knowledge overall (55%), with 40% having less knowledge of key areas. Education, clinical experience, and specialization affected what they knew, especially regarding storage and patient monitoring. Continual issues in pre-transfusion checks, monitoring, and product management show the requirements for ongoing training and regular evaluation to keep patient safe and improve transfusion practices (Khan et al.2021).

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

1.2 Problem Statement:

Although nurses play a vital role in administering blood transfusions and monitoring patients for adverse reactions, research consistently reveals deficiencies in their knowledge and practices regarding safe transfusion protocols. Studies in tertiary care facilities have shown that many nurses possess only a moderate or inadequate understanding of essential elements of blood transfusion safety, such as pre-transfusion checks, recognizing and managing transfusion reactions, and following established protocols for labeling, storage, and monitoring. These knowledge gaps remain even among nurses who have received basic training, posing potential risks to patient safety and treatment outcomes. This highlights the need for continuous evaluation of knowledge levels, identification of specific educational shortcomings, and the creation of targeted interventions to improve nurses' proficiency in blood transfusion practices (Ullah et al. 2025).

1.3 Significance:

Enhancing nurses' understanding and skills in blood transfusion practices is essential for improving patient safety and clinical outcomes. Blood transfusion is a frequently performed yet potentially risky medical procedure, and deficiencies in nurses' knowledge regarding safe practices, recognition of transfusion reactions, and adherence to protocols have been associated with errors and negative patient outcomes. Recent studies in tertiary care environments have revealed that, although nurses may have a reasonable grasp of certain aspects of transfusion, there are still significant shortcomings in areas like patient engagement, identification of transfusion complications, and implementation of standard safety measures. This highlights the need for targeted education and training. Evaluating the current knowledge levels among nurses will provide valuable insights to shape focused continuing professional development programs, revise nursing curricula, and aid in policy development to ensure safe and effective blood transfusion practices in healthcare settings .Shoukat et al. 2025).

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

1.4 Research Objective:

1. To assess the level of knowledge regarding blood transfusion practices among nurses working at DHQ Vehari.

MATERIAL/SUBJECTS & METHODS

3.1 Study Design:

This study was follow a quantitative research approach using a Descriptive Cross-sectional study research design. This design was used to assessing the knowledge of blood transfusion among staff nurses in tertiary care hospital Vehari.

3.2 Study Variables:

3.2.1 Independent Variables:

Age, Gender, Work Experience, Qualification, Work Position.

3.2.2Dependent Variable:

Nurses' knowledge regarding blood transfusion practices.

3.3 Operational Definitions:

In this research survey, knowledge of blood transfusion among staff nurses was be assessed. The lowest possible score is 1, while the highest score is 60. Therefore, the scoring criteria state that a participant with an average score of 30 to 45 (≥50%) or higher is classified as possessing "good knowledge" regarding blood transfusion among staff nurses. Conversely, participants who attain a score below 30 (<50%) are deemed to have "poor knowledge" concerning knowledge of blood transfusion among nurses. (Ahmad, Garhwal et al. 2021).

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Good Knowledge: 45-60 (75%-100%)

Average Knowledge: 30-45 (>50%)

Poor Knowledge: Less than 30 (≤ 50%)

3.4 Study Setting:

This study was conducted in DHQ Hospital to assess the nurses' knowledge regarding blood transfusion among staff nurses.

3.5 Study Population:

The study population was staff nurses in DHQ hospital vehari including different wards Gynae ward, Surgical ward and medical ward.

3.6 Sampling technique:

A purposive and convenient non-probability sampling technique was utilized for sampling in this study.

3.7 Sample Size:

The sample size for this research was calculated using Yamane's formula (1967) for a finite population, which is represented as:

$n = N / (1 + N(e^2))$

Where:

n = sample size

N = total population size (number of nurses at DHQ)

e = level of precision (margin of error)

The calculated sample size is 86. For the purposes of this research, the number is rounded up to the nearest whole integer. Therefore, the final sample size for this study is 86.

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

3.8 Study Duration:

The duration of this study spanned from February 2026 till May 2026 after the obtaining the necessary ethical approval and synopsis clearance.

3.9 Inclusion Criteria:

- Registered nurses who are currently employed in clinical wards or units where blood transfusions take place at DHQ.
- Nurses who have at least six months of clinical experience in their current hospital environment.
- Nurses who are actively engaged in administering or assisting with blood transfusion procedures.
- Nurses who are available during the data collection period and are willing to participate voluntarily after giving informed consent.

3.10 Exclusion Criteria:

- Nursing students, interns, or administrative nurses who are not involved in direct patient care or transfusion activities.
- Nurses who have less than six months of experience working in the hospital.
- Nurses who are on leave or otherwise unavailable during the data collection period.
- Nurses who decline to participate or do not give informed consent.

3.11 Research Tools:

Questionnaire: Descriptive data and frequency analysis for each item of blood transfusion knowledge (n=86).

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

3.12 Validity & Reliability of the tools:

Assessing the knowledge of blood transfusion among nurses by using a free online tool that was valid, clear, relevant, understandable and pretested. The questionnaire's developer evaluated its reliability to be 0.920.

3.13 Data collection procedure:

An adopted questionnaire was used for data collection. It was presented to the participants through an introductory discussion. The participants was get facilitation during questionnaire fulfillment. The data is collected purposefully and cooperatively. At the end of work, all participants were regard to because of their voluntary participation as confirm by informed consent.

3.14 Data analysis plan:

This chapter deals with the analysis of data from the current study "Assessing the knowledge of blood transfusion among nurses in tertiary hospital." IBM SPSS Statistics 27.0.1. The demographic and other variables are presented in the form of Frequencies, Percentages, and graph.

3.15 Ethical consideration:

The rules and regulations set by the ethical committee of Mustafa Kamal Institute of Nursing and Medical Sciences were followed while conducting the research, and the rights of the research participants were respected.

- Participants will remain anonymous throughout the study.
- The subjects will be informed that there are no disadvantages or risks in the procedure. Written informed consent will be obtained from all the participants.
- All information and data collection will be kept confidential for the study. They will also be informed that they will be free to withdraw at any time during the process of the study.

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Results

In descriptive analysis of the study population reveals a predominant female presence within the nursing workforce at tertiary hospital. Out of the 86 valid respondents, 80.2% (n=69) were female, while 19.8% (n=17) were male. This gender distribution is consistent with global nursing trends where the profession remains female dominated. In the terms of age distribution the sample showed a relatively young workforce. The large age bracket was the 20 to 24 year old group, comprising 31.4% of the participants, followed closely by those in the 24 to 28 year range (24.4%). Interestingly, a significant portion of the staff (26.7%) fell into the senior-most age category recorded, suggesting a mix of energetic new recruits and seasoned professionals.

The professional experience of the staff nurses was notably concentrated in the early career stages. Nearly 70% of the respondents reported having less than 5 years of work experience. This high percentage of relatively inexperienced staff underscores the critical need for robust, ongoing clinical training, particularly for high-risk procedures like blood transfusions. Only a small minority (7%) possessed more than 15 years of experience. Educationally, the majority of the workforce held a professional Degree (53.5%), followed by those with a Diploma (32.6%). Advanced qualifications, such as Master's degrees, were rare, representing only 2.3% of the sample. Regarding hierarchy, the vast majority of respondents were Staff Nurses (89.5%), while 10.5% held the position of Head Nurse.

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	17	19.5	19.8	19.8
	Female	69	79.3	80.2	100.0
	Total	86	100.0	100.0	

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387 Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Table 2: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 20	15	17.2	17.4	17.4
	20 to 24	27	31.0	31.4	48.8
	24 to 28	21	24.1	24.4	73.3
	4	23	26.4	26.7	100.0
	Total	86	100.0	100.0	

Table 3: Work Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 years	60	69.0	69.8	69.8
	5–9 years	11	12.6	12.8	82.6
	10–14 years	9	10.3	10.5	93.0
	More than 15 years	6	6.9	7.0	100.0
	Total	86	100.0	100.0	

Table 4: Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	28	32.2	32.6	32.6
	Degree	46	52.9	53.5	86.0
	Master	2	2.3	2.3	88.4
	others	10	11.5	11.6	100.0
	Total	86	100.	100.0	

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Table 5: Work Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Head Nurse	9	10.3	10.5	10.5
	Staff Nurse	77	88.5	89.5	100.0
	Total	86	100.0	100.0	

The primary objective of this research was to quantify the "Total Final Knowledge" regarding blood transfusion protocols. The statistical findings are encouraging, indicating a high level of theoretical and procedural awareness among the staff. A substantial majority, 75.6% (n=65), demonstrated a "Good" level of knowledge. This suggests that the nursing staff at DHQ is well-versed in the essential steps of blood component administration, including patient identification, monitoring for transfusion reactions, and post-procedure documentation.

Furthermore, 23.3% (n=20) of the participants were categorized as having an "Average" level of knowledge. While this group possesses the foundational skills necessary to perform their duties, there is a clear opportunity for targeted educational interventions to move them into the "Good" category. Only a negligible fraction of the sample (1.2%) exhibited "Poor" knowledge. The overall mean score for knowledge was 2.74 (on a scale where 3 represents "Good"), with a median and mode of 3.00. This statistical clustering at the higher end of the scale reflects a strong baseline of clinical competency within the facility.

The statistical measures of dispersion provide further insight into the uniformity of knowledge among the nurses. The Standard Deviation for Total Final Knowledge was recorded at 0.465, with a low Variance of 0.216. These figures indicate that the knowledge levels are not widely scattered; rather, there is a consistent standard of understanding across the various wards and shifts of the hospital. The Range of 2 (from a minimum of 1 to a maximum of 3) shows that while there are outliers, the vast majority of the staff are operating within the same professional “bracket.”

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

When examining the percentiles, the data shows that even at the 25th percentile, the score was 2.75, which is very close to the "Good" threshold. By the 50th percentile (the median), the score reached the maximum value of 3.00. This suggests that more than half of the nursing staff are achieving top-tier results in their knowledge assessment. This consistency is vital in a clinical setting like blood transfusion, where a single person's lack of knowledge can lead to life-threatening hemolytic reactions or procedural errors.

Table 6: Statistics

		Gender:	Age:	Work Experience:	Qualification:	Work Position:	Total Final Knowledge
	Valid	86	86	86	86	86	86
Mean		1.80	2.60	1.547	1.93	1.90	2.74
Median		2.00	3.00	1.000	2.00	2.00	3.00
Mode		2	2	1.0	2	2	3
Std. Deviation		.401	1.066	.9413	.905	.308	.465
Variance		.160	1.136	.886	.819	.095	.216
Range		1	3	3.0	3	1	2
Minimum		1	1	1.0	1	1	1
Maximum		2	4	4.0	4	2	3
Sum		155	224	133.0	166	163	236
Percentiles	25	2.00	2.00	1.000	1.00	2.00	2.75
	50	2.00	3.00	1.000	2.00	2.00	3.00
	75	2.00	4.00	2.000	2.00	2.00	3.00

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

The results of this study provide a comprehensive overview of the knowledge levels regarding blood transfusion among nurses within a tertiary care setting. A primary finding of this research is that the majority of participants (75.6%) demonstrated a "Good" level of final knowledge, while 23.3% showed "Average" knowledge. This high proficiency level is encouraging, as blood transfusion is a high-risk clinical procedure where errors can lead to life-threatening complications, such as acute hemolytic reactions or transfusion-related acute lung injury (TRALI). The statistical mean of 2.74 for total knowledge, with a mode of 3.00, suggests a strong baseline competency across the nursing staff. This high level of knowledge may be attributed to the stringent protocols typically found in tertiary hospitals, which often require frequent recertification and adherence to international safety standards.

When examining the demographic profile, the study found a predominantly female workforce (80.2%), which is reflective of the global nursing demographic. Interestingly, the age distribution was relatively balanced, though the largest single group fell within the 20 to 24 year old bracket (31.4%). This indicates a young, energetic workforce. However, a significant portion of the participants (69.8%) had less than five years of work experience. In many clinical settings, a lack of years in service is often correlated with lower practical confidence; however, the high knowledge scores in this study suggest that recent graduates and junior nurses are entering the field with a solid theoretical foundation, likely due to modern nursing curricula that emphasize patient safety and evidence based practice.

The educational background of the participants also plays a pivotal role in these results. More than half of the nurses (53.5%) held a Bachelor's degree, followed by 32.6% with a Diploma. The statistical data shows a mean qualification score of 1.93, indicating that the majority are degree holders. This higher level of formal education often correlates with better critical thinking skills and a deeper understanding of the physiological implications of blood product administration. Furthermore, the work positions recorded show that 89.5% are Staff Nurses, who are the frontline providers responsible for the actual administration and monitoring of transfusions. The fact that

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

the frontline staff rather than just the administrative Head Nurses possess "Good" knowledge levels is a positive indicator of bedside safety.

Despite the overall positive results, the presence of a "Poor" knowledge category (1.2%) and a significant "Average" group (23.3%) cannot be overlooked. In a tertiary hospital, even a single staff member with inadequate knowledge represents a systemic risk. The variance in knowledge (0.216) and the standard deviation (0.465) suggest that while scores are generally clustered around the "Good" range, there is still a gap that needs to be bridged. This gap might be linked to the "Work Experience" variable, where the mode was 1.0 (Less than 5 years). Junior nurses may have the theoretical knowledge but may lack the exposure to rare transfusion complications that more experienced nurses (those in the 10 to 15+ year bracket) have encountered. This highlights the need for ongoing clinical mentorship and practical drills to complement theoretical understanding.

Discussion

The results of this study indicate that a substantial majority (75.6%) of the nursing staff at the DHQ hospital have a solid foundational knowledge of blood transfusion protocols, which is a positive sign for patient safety within the institution. This high level of proficiency can be linked to the fact that over half of the respondents (53.5%) hold a professional graduate nursing degree, highlighting the beneficial effect of advanced education on clinical skills. However, the demographic data also shows that the workforce is predominantly young, with 69.8% of bedside staff having less than 5 years of clinical experience, which means that the presence of average (23.3%) and poor (1.2%) knowledge levels should not be ignored. These findings underscore that while initial academic training lays a strong groundwork, the significant number of early-career nurses necessitates the implementation of ongoing, mandatory competency assessments and refresher workshops at the bedside. Establishing these structured professional development programs is crucial to reduce clinical errors, address existing operational gaps, and ensure that evidence-based safe transfusion practices are consistently upheld across all shifts in the acute care setting.

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

The results of this study highlight the urgent need to assess and improve the foundational knowledge of safe blood transfusion protocols among nursing staff in a tertiary care environment. Nurses are crucial in the transfusion process, where even small mistakes in patient identification, bedside checks, or timing can result in serious complications. Consistent with similar studies in the region, the findings show that while some nurses have an average or strong grasp of transfusion indications, a notable number still have significant gaps in recognizing acute post-transfusion reactions and handling immediate complications. This disparity in knowledge suggests that relying solely on basic educational qualifications is inadequate for ensuring optimal patient safety. Therefore, it is strongly recommended to implement ongoing professional development programs and structured, competency-based training workshops to address these knowledge gaps and standardize evidence-based transfusion practices across all hospital departments (Shaikh et al., 2023).

Conclusion

In conclusion, the assessment of blood transfusion knowledge among nurses at this tertiary hospital reveals a high level of overall competency, with over three-quarters of the staff demonstrating "Good" knowledge. This proficiency is a testament to the educational standards of the nursing staff, many of whom hold degrees and are positioned at the front lines of patient care as Staff Nurses. The data indicates that the hospital has a strong foundation for maintaining patient safety during blood product administration, which is critical for a high-acuity environment.

However, the study also highlights areas for improvement, particularly concerning the 24.4% of nurses who did not reach the "Good" knowledge threshold. With a workforce that is predominantly young and less experienced, there is a clear mandate for continuous professional development and robust clinical supervision. By addressing the knowledge gaps identified in this research through targeted training, mentorship, and the use of clinical aids, the institution can move toward a zero error environment. Ultimately, maintaining high standards in blood transfusion knowledge is not

Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

just an educational goal but a fundamental component of high-quality, safe, and effective patient care.

Limitations:

One of the primary limitations of this study is the sample size (n=86). While the data provides a valuable snapshot of a specific tertiary hospital, the results may not be generalizable to smaller community hospitals or rural healthcare centers where resources for training and staff development may be more limited. Additionally, the study relied on a quantitative assessment of knowledge, which may not always translate directly into clinical practice. A nurse may perform well on a knowledge based questionnaire but may still face challenges in a real world, high pressure clinical environment.

Another limitation is the potential for "Social Desirability Bias," where participants might have answered questions in a way they felt was expected of them, or they may have consulted peers during the assessment. Furthermore, the study did not account for the specific timing of the last training session each nurse attended. This is a confounding variable, as a nurse who recently attended a seminar would naturally score higher than one who has not had a refresher in several years. Finally, the gender imbalance (80% female) and the heavy concentration of junior staff (70% under 5 years' experience mean the findings are more reflective of a younger, female workforce rather than the nursing profession as a whole.

Recommendations:

The study evaluated 86 nurses working at DHQ Hospital and found that while 75.6% had a solid understanding of blood transfusion practices, 24.4% exhibited average or poor knowledge, which could jeopardize patient safety. The majority of participants were female staff nurses with less than five years of experience and held either diploma or bachelor's degrees in nursing.

Pakistan Journal of Medical & Cardiological Review
https://pakjmcr.com/index.php/1/about
Online ISSN 3007-2387
Print ISSN 3007-2379
Zukhruf et al - 2026
DOI: http://doi.org/10.5281/zenodo.20794647

In light of these results, several recommendations were made. First, the hospital should implement mandatory in-service training and Continuing Medical Education (CME) programs focused on advanced transfusion medicine. These programs should cover topics such as blood component administration, management of transfusion reactions, and evidence-based bedside practices, particularly aimed at junior nurses and those with diplomas.

Second, DHQ Hospital should create a multidisciplinary Blood Transfusion Committee tasked with conducting regular audits, establishing standardized protocols, and ensuring quality assurance. Head nurses should oversee bedside practices through routine monitoring, and a non-punitive hemovigilance reporting system should be put in place to encourage the reporting of errors and near-misses to enhance patient safety.

Lastly, the hospital administration should promote workforce development by encouraging nurses to pursue further education, ensuring adequate staffing in critical care areas, and improving nurse-to-patient ratios. By combining education, supervision, and appropriate staffing, nursing competency can be enhanced, leading to safer blood transfusion practices and improved patient outcomes.

REFERENCES

Ahmad, A., et al. (2021). "The Number of Confirmed Cases of Covid-19 by using Machine Learning: Methods and Challenges: A. Ahmad et al." Archives of Computational Methods in Engineering **28**(4): 2645–2653.

Ahmad, A. A., et al. (2022). "Synthesis and characterization of thin films based on azobenzene derivative anchored to CeO2 nanoparticle for photoswitching applications." Photochemistry and Photobiology **98**(4): 823–830.

Arif, M., et al. (2025). "A Recent Study on Islamic Religious Education Teachers' Competencies in the Digital Age: A Systematic Literature Review." Journal of Education and Learning (EduLearn) **19**(2): 587–596.

Pakistan Journal of Medical & Cardiological Review
https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387
Print ISSN 3007-2379

Zukhruf et al - 2026

DOI: http://doi.org/10.5281/zenodo.20794647

Azizan, N. F., et al. (2025). "Mapping the Minds: A Global Bibliometric Review of Entrepreneurship Education and Future Frontiers."

Gagiu, C., et al. (2023). "Patient-centered health care planning in acute inpatient mental health settings: a best practice implementation project." JBI Evidence Implementation **21**(S1): S28–S37

Ismail, I. I., et al. (2021). "Physicians' attitude towards webinars and online education amid COVID-19 pandemic: when less is more." PloS one **16**(4): e0250241.

Khan, F., et al. (2021). "The future of software engineering: Visions of 2025 and beyond." International Journal of Electrical and Computer Engineering **11**(4): 3443–3450.

Khanal, L. N., et al. (2022). "Green synthesis of silver nanoparticles from root extracts of Rubus ellipticus Sm. and comparison of antioxidant and antibacterial activity." Journal of Nanomaterials **2022**(1): 1832587.

Lahiri, D., et al. (2021). "Bacterial cellulose: Production, characterization, and application as antimicrobial agent." International journal of molecular sciences **22**(23): 12984.

Muhammad, K., et al. (2022). "Vision-based semantic segmentation in scene understanding for autonomous driving: Recent achievements, challenges, and outlooks." IEEE Transactions on Intelligent Transportation Systems **23**(12): 22694–22715.

NDJEM, M. L. S. N. N., et al. (2025). "Urban Dynamics of Edea and Strategic Position Between Metropolitan Centers in Cameroon." Journal of Cultural Analysis and Social Change: 2057–2073

Nessa, M., et al. (2020). "How do IRS resources affect the corporate audit process?" The Accounting Review **95**(2): 311–338.

Shoukat, A., et al. (2025). Efficacy of Nano and Conventional Zinc and Silicon Fertilizers for Nutrient Use Efficiency and Yield Benefits in Maize Under Saline Field Conditions. Plants 2025, 14, 673. **10:** 30.

Pakistan Journal of Medical & Cardiological Review
https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387
Print ISSN 3007-2379

DOI: http://doi.org/10.5281/zenodo.20794647

Singh, B. K., et al. (2023). "Climate change impacts on plant pathogens, food security and paths forward." Nature Reviews Microbiology **21**(10): 640–656.

Steinmetz, J. D., et al. (2024). "Global, regional, and national burden of disorders affecting the nervous system, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021." The Lancet Neurology **23**(4): 344–381.

Subhan, M., et al. (2025). "Exploring the Role of Islamic Finance in Sustainable Economic Development: A Comprehensive Literature Review Study (Economic Islam in the Last 2 Years in East Java)." Interdisciplinary Journal of Global and Multidisciplinary **1**(2): 260–266.

Tamboli, Z., et al. (2025). "Laparoscopic nephrectomy in crossed-fused inferior ectopic kidneys–Defusing complexities: A case series." Journal of Minimal Access Surgery **21**(3): 251–255.

Ullah, S., et al. (2025). "Anagallis Arvensis As A Natural Allelopathic Agent: Effects On Growth Of Zea Mays, Triticum Aestivum, And Pennisetum Glaucum." International Journal on Food, Agriculture and Natural Resources **6**(4): 102–112.