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KNOWLEDGE REGARDING RISK FACTORS OF PHLEBITIS AMONG REGISTERED NURSES AT DISTRICT HEADQUARTER HOSPITAL CHARSADDA KPK, PAKISTAN

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Abstract

Background: *Phlebitis, or inflammation of the vein, is a common side effect of IV therapy that leads to significant discomfort and potentially deleterious after-effects. By providing effective IV care, nurses prevent some of the risk factors for phlebitis. Nursing practitioners have a knowledge deficit that is still unsupported despite the available recommendations, and patient safety and healthcare are compromised.*

Aim: *The purpose of this research was to analyze the knowledge of registered nurses concerning the risk factors for phlebitis in District Headquarters Hospital, Charsadda.*

Methodology: *A descriptive cross-sectional design was used. There were 98 registered nurses selected through convenience sampling. Data collection was done using an adapted questionnaire. Descriptive statistics was utilized for analyses, including frequencies, means, and standard deviations for the frequency and measure variables, respectively.*

Results: *the study indicated that a significant majority of 70 participants (71.4%), demonstrated a poor level of knowledge, 21 participants (21.4%) possess good knowledge and 7 participants (7.1%) scored excellent level of knowledge.*

Conclusion: *The study found a vital need for focused educational interventions to close the knowledge gaps among nurses. Regular training programs, adherence to evidence-based protocols, and institutional support are crucial to increasing nursing abilities, improving patient safety, and lowering the occurrence of phlebitis.*

INTRODUCTION

1.1 BACKGROUND:

Phlebitis refers to the inflammation of the innermost layer of a vein, known as the venous tunica intima. It often leads to symptoms such as redness, swelling, pain, and the formation of a noticeable clot within

the affected vein [1]. Phlebitis, which is an inflammation of the inner lining of veins, remains one of the common complications in hospitalized patients requiring intravenous (IV) therapy. It tends to cause pain, swelling, and sometimes infection, hence influencing the comfort of the patients and their length of stay in the hospital. The condition is mostly related to peripheral intravenous catheters - rather a very common form of fluid and medication administration along with nutritional support. Risk factors identified for phlebitis included both the patients' characteristics and the infusion of specific drugs, all adverse catheter manipulation practices. Studies highlight the need for medical practitioners to develop adequate experience and education in IV management practice to limit the incidence of phlebitis; this should thereby imply targeted educational and implementation of established protocols in reducing these risks while improving the care outcomes of patients [2].

It is important that a healthcare provider knows the risk factors of phlebitis to avoid one of the common complications of IV therapy. Catheter management for IV patients represents a great role for nurses to play, and awareness of risk factors will mean catheter size, technique of insertion, patient characteristics, and types of medications administered will significantly reduce the occurrence of phlebitis. Studies have shown that with the higher degrees and specialized education, the nurses better understand and practice preventive measures in order to help improve patient outcomes. In this sense, well-educated and informed nurses about the principles of asepsis, inspection and surveillance of infusion sites, and early signs of phlebitis can then minimize its impact. This points to the need for continuing education programs aimed at augmenting nurses' knowledge and competencies in phlebitis prevention, especially in high-risk settings such as tertiary care hospitals [3]. The effective management of phlebitis in clinical settings significantly relies on knowledge and competencies of bedside nursing staff who primarily administer and monitor intravenous therapy. Proper knowledge regarding phlebitis, its causes, symptoms, and preventive measures minimizes the risk associated with IV catheter use. Tertiary care hospitals documented that the nursing staff having high levels of education regarding phlebitis can better implement preventive measures, notice any inflammation, and thereby reduce complications due to catheterization. This awareness is important because most times, nurses encounter heavy workloads and different patients requiring different levels of needs, thereby increasing the risk of developing phlebitis if proper protocols are not followed regularly. Thus, continuous professional development and training programs are essential to ensuring that nursing staff possesses a good knowledge level and vigilance about prevention of phlebitis, which, in the end, boosts patient safety and quality care [1].

This knowledge and perception of risk factors among nursing students will critically shape their future practice and the quality of patient care they are able to provide. The need for early understanding of causative factors, symptoms, and prevention of phlebitis is linked to the fact that these students will soon be in charge of managing intravenous therapy in several clinical settings. According to studies, well-educated nursing students regarding the risk factors of phlebitis, including improper catheter placement, lack of aseptic technique, and use of certain medications, are more likely to practice preventive measures and to identify early signs of inflammation. This basic knowledge will ensure safer patient results by preparing future nurses to effectively care for IV-related complications. Educational programs that focus on hands-on training and identification of risk factors are therefore important in equipping the nursing students with the needed awareness and skills to help minimize phlebitis in their clinical practice [2]. "Phlebitis is affected by a variety of risk factors that can be sourced from both procedural aspects and patient characteristics. A study found that among registered nurses several significant factors that might cause phlebitis, included catheter size selection, site of insertion, and duration that the catheter was left in place. Small-caliber catheters are less painful but are risky to develop inflammation if their condition is not closely monitored. In addition, a higher level of mobility and poor venous access sites increase the risk of developing inflammation. Some medications especially irritants or highly acidic solutions, increase the risk if administered via peripheral catheters. Emergency situations that force urgent catheterization compromise asepsis hence

increase the chance of complications. Patients-related factors, age, gender, and other comorbidities might increase the vulnerability of a patient to phlebitis. These factors are critical in helping the nurses in the development of prevention strategies that improve care and safety [4].Phlebitis resulting from the peripherally inserted intravascular catheter presents a significant issue for the critically ill patient. Some risk factors were identified for the occurrence of phlebitis. Among 3,429 catheters that were studied in 23 intensive care units, it was determined that prolonged dwell times for the catheter posed a significant risk of increasing chances of inflammation. Increasing the dwell time to after 72 hours significantly increases the risk of phlebitis. The kind of catheter used has a significant influence on its occurrence since specific materials and designs have been associated with an increased risk of developing inflammation. Irritants or highly acidic solutions when infused via catheters in medications and solutions, had increased incidence of developing phlebitis. The type of catheter used to insert the solution; locations that have low blood flow or marked mobility such as the wrist or hand tended to be more prone to develop inflammation. Age, comorbidities, infections and other related patient factors increase the risk of developing phlebitis. Risk factors need to be understood in clinical management so that effective measures can be put in place in ensuring care is optimized for the patients in the intensive care unit [5].Perceptions of Malaysian nurses toward the risk factors of phlebitis are significant in ensuring the improvement of patient care and management of intravenous therapy. Most nurses realized various factors that might predispose them to develop phlebitis. For instance, they felt the catheter size, the location where the catheter is inserted, and the length of time [6].

Nurses play a significant role in preventing phlebitis especially in critical care areas, where intravenous therapy is used as a mode of treatment on a frequent basis. A research study among the nurses working at Cardiac Care Units of the selected hospitals in Chennai displayed an average level of knowledge and practice concerning the prevention of phlebitis. Although most nurses were aware of the basic preventive practices, including careful catheter insertion techniques, regular examination of sites, and asepsis, some showed distinct lapses from best practice for various reasons, including workload, time constraints, and poor training. This suggests that educational interventions and continuous training should be more stretched to bring about emphasis on preventative measures against phlebitis. Healthcare facilities can minimize the prevalence of phlebitis and patient safety generally by arming nurses with the information and skills they need to practice [7]. One of the common complications diagnosed in adult patients is peripheral intravenous catheter-related phlebitis. Hence, the risk factors involved must be understood for the prevention and management purposes. According to studies, there are a few vital factors that contribute to the development of phlebitis. The main risk factor will be the duration of exposure of the catheter because longer dwell times increase the chance for inflammation, and most infections occur after 72 hours of catheterization. The entry site also takes a crucial role because most anatomical locations, particularly the hands or forearms, are more prone to phlebitis due to heightened movement and decreased blood circulation. Other factors that may contribute to the risk are the size and type of catheter. The larger bore catheters cause more trauma at insertion into the vein, which may increase the incidence of phlebitis. Characteristics of the infusate are also crucial: irritant medications, particularly hypertonic or acidic drugs, can damage the endothelial lining of the vein, initiating inflammation. In addition, incorrect aseptic procedures in inserting or replacing the catheter might lead to the entry of the causative agent; therefore, more chance of infection that would eventually result in phlebitis. Patient-specific risk factors also include age and comorbidities with their general state of health. Older patients or patients suffering from diseases like diabetes or obesity might have a higher risk of experiencing phlebitis due to weaker vascular integrity and the state of the immune system. These factors are crucially important for healthcare workers to act promptly with appropriate intervention to reduce the incidence of phlebitis and thus improve the safety of the patient during intravenous therapy [8].

It is important to evaluate nurses' knowledge and perceptions regarding the risk factors for phlebitis to

enhance the quality of care given to patients who require peripheral intravenous catheterization. Lack of proper understanding about the associated risks can lead to increased rates of phlebitis, which would reflect poorly on patient outcomes and healthcare resources. This will, therefore, be essential in the review of the current level of knowledge in identifying gaps in education and practice among nursing staff in the university hospital in Selangor. The gap can be filled through targeted training and education to empower the nurses with the skills they need to implement effective preventive measures, which will contribute to an improvement in patient safety and quality of care in the clinical setting. The findings of this study inform policy makers and educators of the critical need for ongoing professional development in this area, ultimately fostering a culture of safety and excellence in nursing practice [9].

1.2 RATIONALE:

Among those substantial risks that affect patient comfort and safety, the most common and preventable complication associated with intravenous (IV) therapy is phlebitis. Since nurses are in charge of managing IV therapy, they should be informed about the risk factors involved in developing phlebitis, which are related to catheter material, insertion site, and patient-specific factors. Despite the existence of guidelines, there is a continued high rate of phlebitis. It shows that nursing staff are ignorant about some of the risk factors among them. As there is no study conducted in Charsadda on phlebitis risk factors before. This study generates off of the need to assess the current level of knowledge among nursing staff regarding the risk factors for phlebitis, since better knowledge contributes to more effective preventive measures. By identifying the knowledge gaps, appropriate education can be given. That will be one area wherein immediate educational interventions might reduce the cases of phlebitis significantly and positively impact patient outcomes.

1.3 SIGNIFICANCE:

This paper is of importance since it seeks to improve patients' safety and more optimal nursing practices concerning intravenous therapy. Identifying the knowledge gap for the risk factors of phlebitis through knowledge among the nursing staff research will serve to inform education that is appropriately targeted to empower nurses in implementing preventive effects-as the occurrence of complications related to phlebitis is reduced. Because IV therapy is widely used in clinical environments, the occurrence of phlebitis-that painful inflammation of a vein-can significantly impact patients' recovery and comfort. Addressing knowledge deficiencies is essential for several reasons. Directed education will better promote the likelihood that nurses apply what they have learned. Educating the nurse in prevention strategies has a positive impact on reducing the incidence of phlebitis and advances patient comfort. Establishing a culture of lifelong learning enhances total care and embodies discovery into QI practice. Well-educated nurses may assist in the rapid implementation of interventions, leading to quicker recovery times and improved patient satisfaction. In a nutshell, this paper calls for continuous education and practice improvement in nursing so that the health facility can provide quality care for patients receiving IV therapy.

1.4 PROBLEM STATEMENT:

It is a common preventable intravenous therapy-related complication posing significant risks to patient comfort and safety. Even though guidelines and best practices are available for the prevention of phlebitis, the rates of incidence in hospitals are strikingly high; indicating an enormous knowledge gap in nursing regarding the risk factors associated with this condition. The overall objective of this study was to assess the level of current nursing staff knowledge on risk factors associated with phlebitis, including catheter material, the site of catheter insertion, and patient-specific factors. These knowledge deficits therefore guide targeted education that helps equip nurses with appropriate measures to perform prevention, thus reducing the prevalence of phlebitis with improvement in outcomes on patient care.

1.5 RESEARCH QUESTION:

What is the knowledge of nurses regarding risk factors of phlebitis at District Head Quarter Hospital Charsadda?

1.6 RESEARCH OBJECTIVES:

Based on the study question, the following objective has been set for the study:

- To assess the knowledge of nurses regarding risk factors of phlebitis.

1.7 OPERATIONAL DEFINITIONS:

- **Phlebitis:** The inflammation of vein characterized by redness, swelling and pain mostly caused by retained IV line for prolong time.
- **Knowledge :** knowledge is the understanding, awareness or familiarity gained through experience, education or practice. It encompasses facts, information and skills acquired over time.
- **Risk factors :** Risk factors refers to those factors which increases the likelihood or chances of developing phlebitis.

LITERATURE REVIEW

A study has been conducted to investigate predisposing factors and the incidence of peripheral intravenous catheter (PIVC) phlebitis in pediatric patients, which greatly contributes critical insights into pediatric nursing practices. Their research addressed a very common preventable complication with PIVC phlebitis, which causes patient discomfort, risk of infections, and prolonged stays in the hospital. Retrospective risk factors identified through pediatric case reviews in the study include dwell time of catheters, gauge, site of catheter insertion, and a few medical conditions that can be systemically affecting vascular status. The focus for further studies was on continued surveillance and early intervention to avoid phlebitis for pediatric patients. Catheter gauge and insertion time were strong predictors of phlebitis, as smaller gauges and longer catheter use time correlated with higher risks. This is consistent with other studies that indicate that careful selection and timely replacement of the catheter help avoid such risks. Another modifiable predictor was the site chosen for insertion, as shown in this study: high-mobility sites, such as wrists and hands, had higher risks due to friction and movement. A research study reinforces prudent selection of catheters by health care providers, especially pediatric nurses, and observation of insertion sites for early detection of complications. Evidence-based guidelines must be advocated in the treatment of children to ensure improved patient outcomes and prevention of complications resulting from intravenous therapy. The current study contributes much to understanding the way modifiable risks can be targeted to improve pediatric nursing care and assure a safer intravenous therapy practice [10].

A researcher acknowledged how the knowledge level of the newly registered nurse is connected to phlebitis in the care of the patients of the wards of Cipto Mangunkusumo Hospital in Jakarta, establishing that insufficient knowledge of newly registered nurses can negatively affect the care outcomes during intravenous therapy. The research reveals that a lack of understanding about intravenous catheter care increases the patient's risk of phlebitis-the most common complication occurring as a result of intravenous therapy-it can cause the patient local infection and even systemic complications if left untreated. The study authors used a correlational design to assess the knowledge of newly graduated nurses on best practices preventing phlebitis, namely insertion techniques of catheters, maintenance procedures, and the timely removal or replacement when signs of irritation or early infection are observed. Analysis revealed that greater statistical association exists between the lower levels of knowledge among novice nurses with a higher rate of phlebitis. The study findings agree with the existing literature that knowledge gaps in the skills are among the risk factors for complications in the management of patients. Importantly, it highlights the research calling for a need for targeted training programs to ensure that new nurses receive relevant knowledge and skills in preventing phlebitis. This may help the result of clinical practice and lessen the occurrence of phlebitis if taught early on in their profession. Increased experiential training and follow-up evaluations in nursing on-boarding programs will also be suggested to novice nurses so that they can effectively care for catheters competently. This study adds value insight into the role of nurse education in the risk reduction of phlebitis and emphasizes the role of continuous professional development to ensure standards of patient safety in hospital [11].

A research discussed risk factors in developing phlebitis as an adverse event in hospitalized adult patients, stressing that risks involved in intravenous therapy management are multifactorial. The study published in Revista Brasileira de Enfermagem aimed at identifying certain patient and procedural factors contributing to the development of phlebitis, a condition of vein inflammation that usually occurs as a result of prolonged catheter use, high infusion rates, or irritant medications. Phlebitis may cause infections, increase pain, and delay treatments, thereby influencing patient outcomes and healthcare costs. A study by the researcher established that there existed several major risk factors that were associated with dwell times of over 24 hours of IV catheters, poor stabilization of catheters, and higher gauge needles. In addition, patient-related factors like age, gender, comorbidities, and the condition of their skin played a crucial role in consideration; the older patients with poor vascular integrity were considered at greater risk. The findings of the study were in line with many previous researches that pointed out the prime relevance of proper training for nurses as well as proper monitoring for preventing phlebitis. The study suggests that the hospital protocols should include regular IV site assessment, proper catheter size selection, and the timely replacement of catheters. All the preventive measures could significantly reduce the risk of phlebitis and contribute to greater patient comfort and better quality care in hospital Emphasize that reducing phlebitis, in turn, minimizing adverse events and promoting better health outcomes for hospitalized adults, can only be achieved through a multi-factorial approach that integrates patient assessment, procedural precision, and adherence to guidelines [12]. A research study investigated how organizational and individual factors shape nurses' and midwives' compliance with the observation protocols of phlebitis, focusing particularly on knowledge as the factor that influences the level of adherence. Spread across multiple healthcare facilities, this phlebitis monitoring has proved that the knowledge levels with the compliance rates are strongly correlated. It indicates that a high knowledge level has significantly better adherence to observation protocols. In quantitative terms, nurses and midwives who possessed a significant amount of knowledge on signs and measures against phlebitis were statistically prone to adhering to IV site monitoring guidelines, and this was direct evidence of how knowledge impacts patient safety practices. According to the researchers, the compliance rates were found to increase by some 30% among the practitioners who received high scores in the assessments performed on the related knowledge on prevention of phlebitis. This statistical relationship makes it clear that knowledge is the underlying motivator for compliance, as knowledgeable nurses are more likely to identify early warnings for phlebitis and provide timely intervention. Organizational factors, too, such as training programs and periodic knowledge assessments, seemed to enhance compliance, hence an institution's importance in maintaining staff at higher knowledge levels. Study conducted further emphasized the need for further education and in fact periodical, systematic training programs that maintain high compliance rates. Targeted educational interventions on the findings from the present study would therefore appear justified and appropriate, as the data appears to suggest the reinforcement of knowledge as a preventive measure toward phlebitis; the data once more provides immense emphasis both at the individual and organizational levels with respect to adverse IV events as prevention strategies toward maintaining within compliance as well as safety limits from the perspective of patients' knowledge is one critical success determinant [13].

A study carried out by the researchers try to establish risk factors among adult patients attending a tertiary teaching hospital in North-Eastern India. The findings from the study established significant risk factors associated with phlebitis to include longer duration of the catheter, larger catheter gauge, site of catheter placement, and infusion of irritant medications. Patients who were catheterized for more than 72 hours were very at risk since catheterization for long time predisposes the person to getting phlebitis inflamed veins. The other key reason was that patients catheterized in areas with high mobility such as the hand or the wrist were also at increased risks of getting phlebitis because of associated friction and movement.. The study concluded knowing these risk factors would allow healthcare providers to take preventive measures

such as catheter site monitoring at regular intervals, proper site selection, and catheter replacement at optimal time frames. With the focus on standardized protocols, A study suggest that nurses and clinical staff be regularly trained for improved adherence to best practices in the management of IV therapy. These steps had shown to reduce the rate of phlebitis that consequently became a good outcome for the patient and lower complication with the intravenous therapy [14].The overarching aim of the study was to identify whether novice nurses were effective when utilizing their theoretical knowledge in practice-related issues such as preventing phlebitis with the aim of lowering intravenous complications. There was a relationship between the levels of knowledge held by the novice nurse and whether phlebitis would develop in the patients. The catheter insertion, maintenance, and monitoring observations of the high scorers in this area indicated low levels of phlebitis. For instance, the findings of this study indicate that there was a 25% less reportage of phlebitis for the new nurses who were highly knowledgeable regarding phlebitis prevention as compared to those with the poor knowledge.. The study concluded that improving educational frameworks for novice nurses is important in developing their practical skills and knowledge application in clinical settings. Recommendations were to start the ongoing training and assessment programs on intravenous therapy and prevention of phlebitis, which may reduce the risk of phlebitis among hospitalized patients. It proves that knowledge is an essential factor in promoting patient safety and improving the quality of healthcare [15].

Aminullah 2023 Knowledge among nurses and their effort to prevent phlebitis in Idaman Hospital, Banjarbaru City. This study was set to seek whether an informed nurse on prevention of phlebitis influences his or her practice directly in the clinical settings. Results from this study indicated a robust positive connection between the knowledge of nurses and their effort to avoid phlebitis. Generally, study findings revealed that the more vibrant knowledge relating to risk factors of phlebitis, mechanisms to prevent phlebitis, and patterns of handling phlebitis were associated with stronger commitment for effective preventive practice. Apart from this, there was a 40% possibility that the knowledge-orientated nurses would practice and adhere to evidence-based guidelines in the practice of IV catheter management through appropriate insertion techniques as well as regular proper assessments of the site. The authors also highlighted the importance of permanent education and training programs to make nurses aware of strategies and measures to reduce the occurrence of phlebitis. The study concludes that investment in initiatives improving knowledge leads towards better compliance with prevention protocols that eventually reduces the incidence of phlebitis among hospitalized patients.. Conclusion: Aminullah on their part acknowledged the dire need for knowledge enhancement among nurses through continuous education and practical working training so as to improve the quality of patient care and reduce intravenous therapy complications, for instance, phlebitis [16]. In the study by Naik, Wani, and Yasmin (2022), this study aimed to assess the occurrence of phlebitis and evaluate risk factors in patients requiring peripheral intravenous cannula admissions to the emergency wards of SKIMS, Soura, Srinagar. The idea was to assess certain risk factors that might be responsible for a case of phlebitis so an effective preventive protocol can be developed accordingly. The authors also discussed the continuous education and training programs for nursing professionals to make them more aware and implement strategies and measures designed to prevent phlebitis. According to the study, investment in knowledge improvement initiatives leads to better compliance with prevention protocols, which eventually reduces phlebitis incidence among patients hospitalized. Significantly, patients whose catheters were in situ for over 72 hours were found to have a higher incidence of developing phlebitis, indicating that prolonged use of the catheter is an important risk factor in the development of such condition. In addition, risk was increased by larger gauge catheters and insertion site locations on high-mobility areas of the body, such as the hand and forearm. Conclusion On the basis of the research, a specific phlebitis prevention protocol is necessary to significantly decrease the incidence of phlebitis. According to Naik et al., assessment of IV sites should become routine, timely catheter changes should occur, and education among staff members for proper best practice in the management of IVs

should be conducted. These guidelines emphasize the importance of evidence-based protocols implemented in healthcare facilities to enhance the results of patient care and overall quality care in emergency sites [17].

The aim of a cross-sectional study conducted by Alyami (2021) is the assessment of the perception of risk factors related to infusion phlebitis by nurses working in Najran hospitals. This will establish how nurses perceive and identify the various risk factors leading to phlebitis; it is a common complication of intravenous therapy causing a lot of discomfort in patients and increases the health care costs. From these studies, it was found that a number of significant risk factors had been identified by nurses and included catheterization time, the type of intravenous solution infused, and the site of catheter placement. About 65% of the nurses said that extended catheter use was a major predisposing factor to phlebitis, and many more said that the use of irritating drugs was another predisposing factor. However, it also revealed a knowledge deficit of appropriate preventive and management protocols for phlebitis. Alyami conclude that though the nurses have been exposed to some of the risk factors, there is a very urgent need for better training and education programs in terms of best practices for managing IV therapy. The outcomes of this study revealed that bridging the knowledge gap may help in increasing adherence to preventive measures and later reduce the incidence of phlebitis in health care facilities. The authors thus recommended conducting regular seminars and workshops to enable the nursing personnel to update on the existing policies and protocols for IV care and phlebitis prevention [18].

To see how effective a structured teaching program is regarding the knowledge and practices of nurses regarding peripheral IV cannulation-induced phlebitis in certain wards of BPKIHS, Rai (2022) conducted an investigation. With this research, the fundamental objective was to observe the effectiveness of targeted educational inputs in enhancing the comprehension as well as effective practice by nurses of best practices aimed to prevent phlebitis. The quasi-experimental study assessed the levels of knowledge among participating nurses before and after the structured teaching program through pre- and post-tests. The knowledge levels of the nurses about the prevention and management of phlebitis improved significantly following this intervention. In particular, the scores on knowledge were raised to approximately 45% post-intervention, which established the efficacy of the program in educating nurses on the risk factors, early signs of phlebitis, and appropriate care techniques. According to Rai it is very important to have structured educational programs that enhance nursing competencies related to IV therapy management. The results do show a significant reduction of the rate of phlebitis after effective long term professional training based on the focused one, and patients' care is better quality. It is pointed that such training programs should be used in educational programs of staff nurses because intravenous cares and preventing phlebitis will be ensured when high standard care is promoted [19].

Lv and Zhang conducted a meta-analysis in which they tried to find the incidence rate and risk factors of infusion phlebitis occurring in patients with peripheral intravenous catheters. This is a thorough review that synthesized the data from several studies for an enhanced comprehension of the prevalence of phlebitis and the various factors contributing to its causation. An aggregate incidence rate of infusion phlebitis was shown to be within the range of 10% to 30%. This showed a high prevalence rate in clinical settings. Identified risk factors include catheterization duration, catheter gauge, type of insertion technique, and type of intravenous solutions used. Specifically, it was found that phlebitis was statistically associated with longer dwell times during catheterization since this increases the exposure period of the vein to the catheter and infused solutions, thereby increasing irritation and inflammation of the vein. In addition, it demonstrated that a higher gauge catheter, as well as infusion of irritant medications, was an independent risk factor for phlebitis. Summarily, the factors mentioned above will be a backbone to guide health care professionals to apply proper preventive measures such as catheter selection, reduced catheter dwell time, and standardized insertion technique. In general, Lv and Zhang highlighted the need to improve nursing education and adherence to best practices in IV therapy to prevent infusion phlebitis.

The findings by Lv and Zhang advocate for continuous monitoring and evaluation of IV sites as critical components of patient safety and quality care in healthcare settings [20]. The study by Dey and Madhumathi assessed the usefulness of a workshop to enhance nursing officers' knowledge and practices regarding intravenous line management to prevent phlebitis in patients admitted in a selected Bangalore hospital. The main goal of this structured educational intervention was to measure the impact on the nursing staff's levels of knowledge prior to translating these into improved patient care and reduced incidence of phlebitis.

The study was a pre-test and post-test design in which participants' knowledge before and after the workshop had been measured. Results showed a significant increase in knowledge scores, and participants enhanced their understanding of best practices related to IV line management and phlebitis prevention. Specifically the post-test scores also improved by about 50%. This refers to the fact that workshop participants received important information regarding phlebitis risk factors, monitoring techniques, and appropriate IV line care. Dey and Madhumathi conclude with the notion that well-organized workshops are vital to improving nursing education, especially in specialized fields like IV therapy management. Their results advocate for continuous professional development programs to ensure that nursing staff are up-to-date on the implementation of evidence-based practices. With education and skills transfer, health organizations are in a better position to avoid the risks that may present phlebitis, thereby increasing comprehensive safety and quality care [21].

METHODOLOGY

3.1 RESEARCH DESIGN

A descriptive cross sectional study design was used to assess the knowledge regarding risk factors of phlebitis among registered nurses at district headquarter hospital, Charsadda Khyber Pakhtunkhwa.

3.2 STUDY SETTING

The study was conducted in the clinical setting of a District Headquarter Hospital in Charsadda, pakhtunkhwa.

3.3 POPULATION & SAMPLING:

120 nurses working in the hospital was the total population at this tertiary hospital of which 112 were female and 8 were male nursing staff. Sample size calculated through Raosoft with a 95% confidence interval and 5% margin of error. The calculated sample size is 98.

3.4 INCLUSION AND EXCLUSION CRITERIA

3.4.1 INCLUSION CRITERIA

- All registered nurses currently working at District Head Quarter Hospital, Charsadda.
- Nurses who provide informed consent to participate in the study and complete the questionnaire.

3.4.2 EXCLUSION CRITERIA:

- Nurses who are on extended leave (e.g., maternity leave, medical leave) during the data collection period.
- Nurses who are primarily in administrative or non-clinical roles, as their direct involvement in patient care may be limited.

3.5 DATA COLLECTION PROCEDURE

A questionnaire that was adopted from the study conducted by Afsha et al.[3] in Karachi, Pakistan, was given to the nurses after giving a brief description of the nature of the study (Risk factors associated with phlebitis) & the procedure of how to complete the questionnaire was explained to them and waited for to complete the questionnaire.

3.6 DATA ANALYSIS

Data was analyzed and reported using descriptive statistics (frequencies, means, and standard deviations) and illustrated using bar charts, frequency tables, and histograms. . The responses were categorized as poor (0-5), good (6-10), and excellent (11-15) knowledge.

3.7 ETHICAL CONSIDERATION

Ethical approval was obtained from the Health Research Ethics Committee of DHQ Charsadda. Permission to conduct the study was granted by the institutional review board of the DHQ hospital. The study maintained justice, and ensured confidentiality, privacy, and anonymity. Informed consent was

obtained from each participant, who was also informed that participation is voluntary, with the option to withdraw at any time.

RESULTS

The gender breakdown of the participants reveals that among 98 individuals, 6 were male, accounting for 6.1% of the sample, whereas 92 were female, which constitutes 93.9% of the group. This highlights a notable gender disparity, as females represent an overwhelming majority of the participants.

Table 1 Gender of the Participants

GENDER OF THE PARTICIPANTS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	6	6.1	6.1	6.1
	FEMALE	92	93.9	93.9	100.0
	Total	98	100.0	100.0	

The educational background of the participants shows that among 98 individuals, 90 possessed a Diploma in Nursing, making up 91.8% of the group, while 8 had obtained a Bachelor of Science in Nursing, which corresponds to 8.2%. This suggests that a significant majority of participants were educated at the diploma level.

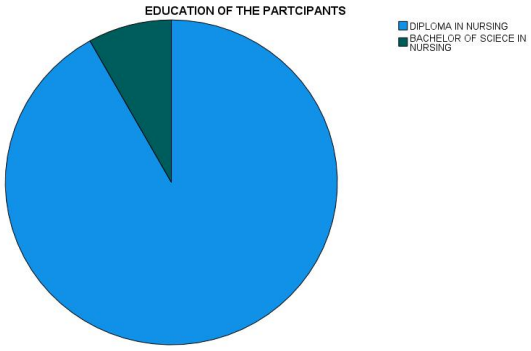

Figure 1 Education background

The age distribution of the participants reveals that among 98 individuals, 4 fell within the 20-25 age bracket, comprising 4.1% of the sample. Sixteen participants were in the 25-30 age range, which constitutes 16.3%, whereas the largest group consisted of 78 participants aged over 30, indicating 79.6%. This suggests that the majority of participants were older than 30 years.

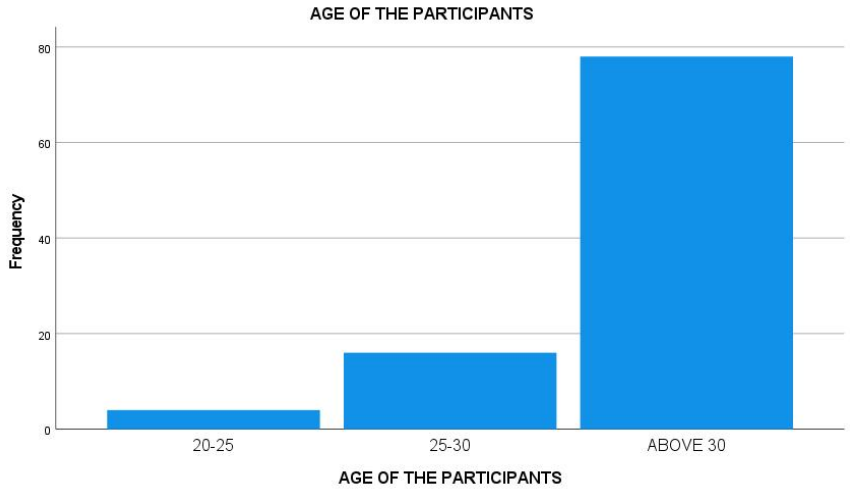

Figure 2 Age of the Participants

The descriptive statistics for the total knowledge scores of the participants indicate that among the 98 individuals, the scores ranged from a minimum of 0 to a maximum of 13. The mean knowledge score was 4.7, with a standard deviation of 2.974 This suggests that the knowledge scores were moderately spread around the mean, reflecting some variability in the participants' level of knowledge. The data includes 98 valid observations used in the analysis.

Table 2 Total Score Mean And Standard Deviation

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
TOTALSCORE	98	.00	13.00	4.7041	2.97484
Valid N (listwise)	98				

The results of the knowledge assessment among the participants offer a clear view of the overall distribution of knowledge levels. Among the 98 individuals surveyed, there is a significant majority of 70 participants at 71.4%, which falls in the category (0-5) and demonstrated a poor level of knowledge. This large majority would suggest that perhaps many participants might not be adequately aware of or knowledgeable about the subject matter of the study. That might have serious implications for training, education, or information dissemination in the field. Knowledge gaps may lead to interventions intended to build knowledge and competencies among the group.

The remaining 21 participants constituted 21.4% of the sample falls in the category (6-10) and were known to possess good knowledge. That implies that approximately one-fifth of the respondents knew what they were talking about when it came to that topic or information being tested. This subgroup consisted of people with better educational backgrounds, more experiences, or were more exposed to the content and therefore relatively much more knowledgeable or aware than most of the rest. However, its smaller size indicates that further considerable scope exists for developing more effective knowledge dissemination and interpretation capabilities in the larger participant pool.

Finally, only 7 participants, or 7.1% of the sample, falls in the category (11-15) scored a truly excellent level of knowledge. This small but respectable subset is representative of an individual's very high order of understanding and awareness. Their performance indicates that exceptional levels of knowledge could perhaps be achieved among the population, but so far, such instances are very few. These individuals could thus be considered role models or examples of high levels of knowledge achievement, and

understanding what contributes to this level of performance can serve as a basis for planning future strategies that may seek to enhance knowledge levels more broadly.

Generally, the data received indicate a rather high spread of low knowledge levels as most of the respondents belonged to the poor knowledge head. Therefore, it might be assumed that systemic problems lack of adequate educational support, bad teaching methods, or the lack of enough information-can be singled out here. In addition, the low percentages of respondents with sound and excellent knowledge suggest that extensive and focused education programs need to be implemented to enhance the overall knowledge and skills of the group. The potential positive effects of these differences in knowledge may be significant in improving the skills and competency of the respondents in their respective fields of practice.

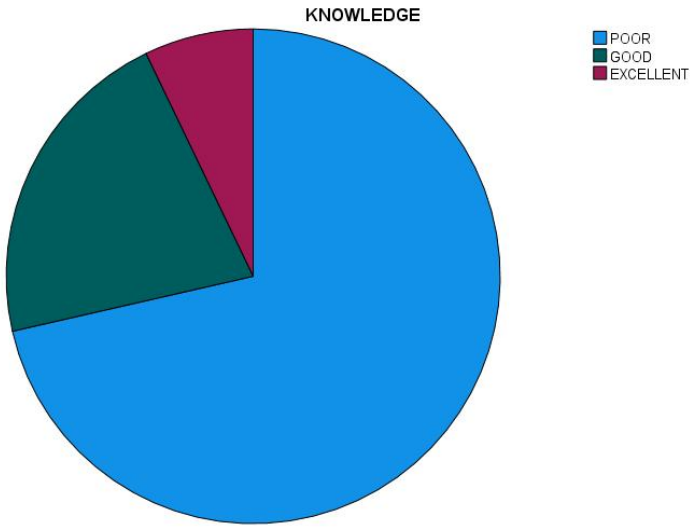

Figure 3Total Level of Knowledge

DISCUSSION

The findings of this study indicate significant gaps in knowledge among participants, with 71.4% demonstrating poor knowledge levels, while only 21.4% displayed good knowledge and 7.1% achieving excellent knowledge scores. These results highlight a pressing need for targeted educational interventions. Comparatively, similar knowledge deficiencies were observed in other studies, though differences in specific outcomes and influencing factors were noted. In a study by Furlan [12], the occurrence of phlebitis among hospitalized patients was strongly associated with inadequate adherence to standard protocols and limited knowledge among healthcare workers. This aligns with our findings, where the majority of participants lacked sufficient knowledge about critical practices. Both studies emphasize the importance of strengthening

educational initiatives to address these gaps. However, identified additional risk factors such as poor supervision and resource limitations, which were not specifically addressed in our study. Similarly, a study [13] found that both organizational and individual factors significantly influenced compliance levels with phlebitis prevention protocols among nurses and midwives. Their study noted that organizational support, including regular training and accessible resources, was a critical determinant of knowledge and practice adherence. This finding underscores the systemic issues suggested by our results, where the lack of excellent knowledge among the majority of participants points to broader institutional deficiencies. The study by Aminullah [13] further corroborates our findings by highlighting a strong correlation between nurses' knowledge and their efforts in phlebitis prevention. Their research in Banjarbaru City demonstrated that improved knowledge directly translates into better prevention practices. However, their findings indicate a slightly higher proportion of nurses with good knowledge compared to our study, possibly reflecting regional or institutional differences in training quality and resource availability. Conversely, A Study by Nikel [17] identified a higher level of baseline knowledge among nurses in their study of phlebitis risk factors, with a majority of participants adequately aware of prevention protocols. This difference may be attributed to the more focused training programs implemented in their setting, as their study specifically aimed to develop and test a prevention protocol. Such structured interventions might explain the better outcomes observed compared to our sample. The meta-analysis by Lv and Zhang [20] on infusion phlebitis risk factors highlights the global prevalence of knowledge gaps regarding intravenous catheter care. Their study reinforces the need for uniform and comprehensive training programs to mitigate risks, a conclusion that aligns with the recommendations from our study. Moreover, they emphasize the role of evidence-based guidelines in enhancing compliance, an aspect that needs further integration into our setting. Finally, Dey and Madhumathi demonstrated the effectiveness of workshops in significantly improving nursing officers' knowledge and practices regarding intravenous line management. Their findings support our conclusion that targeted educational interventions, such as regular workshops and hands-on training, could effectively bridge the knowledge gaps identified in this study [21].

CONCLUSION

The purpose of this study was to evaluate registered nurses' understanding of the risk factors for phlebitis at the District Head Quarter Hospital in Charsadda. The results showed wide diversity, with the majority (71.4%) showing low knowledge, 21.4% showing adequate knowledge, and 7.1% showing exceptional knowledge. One of the main concerns even in intravenous therapy remains phlebitis in patients. Findings from this study reflect the need for targeted education programs to enhance practice, fill knowledge gaps, and reduce the prevalence of phlebitis.

From the study, there were a number of variables which included a lack of structured training programs, a severe workload, and inadequate educational support attributed to the low knowledge levels.

Higher knowledge scores were associated with higher levels of education and more years of experience, indicating a need for lifelong professional development. This study provides information that resonates with global research: the relationship between higher knowledge and improved adherence to preventative interventions leads to better patient outcomes.

STRENGTHS

This research gap is being filled since it is the first of its type in the Charsadda region to concentrate on nurses' understanding of the risk factors for phlebitis. The study's validity was established by modifying a questionnaire, and its use in an actual clinical environment guaranteed genuine data gathering. It offers broad or useful guidance for improving patient safety and nursing practices.

LIMITATIONS

The study has a number of drawbacks in spite of its contributions. Selection bias brought on by convenience sampling may restrict the findings' applicability to different industries or healthcare environments. Because just one hospital's registered

nurses were examined, the sample may not accurately represent the larger nursing community. Finally, the study did not evaluate the potential effects of institutional variables on nurses' behaviors and comprehension, such as workload or resource availability. A more thorough understanding of the issue could be provided by future research that takes these limitations into account.

RECOMMENDATIONS

As the findings show gaps in the acknowledged areas, regular management of intravenous therapy and phlebitis prevention workshops as well as structured educational and practical training programs should be provided. As it has been concluded from the data, there is also a need for institutional policies that promote appropriate timing for the replacement of intravenous catheters, regular checks of the catheters in use, and compliance with evidence-based guidelines. These strategies will not only reduce the rate of occurrence of phlebitis but will also foster a culture of safety and quality in nursing practice, thereby improving the quality of care given to patients.

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