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Nurse's Knowledge, Attitude And Practice Regarding Catheter Associated Urinary Tract Infections Prevention

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Abstract

Background: Catheter-associated urinary tract infections (CAUTIs) represent a significant healthcare challenge globally, particularly in intensive care units, contributing to patient discomfort, increased healthcare costs and potential life-threatening complications. Nurses play a critical role in CAUTI prevention through meticulous catheter care. However, there remains a gap between their knowledge and practical application. This study aimed to assess nurses' knowledge, attitudes, ad practices concerning CAUTI prevention at Arif Memorial Teaching Hospital, Lahore, Pakistan.

Methodology: A descriptive cross-sectional design, employing a structured research tool to collect data from nurses working in a tertiary care hospital. A convenience random sampling method was employed to select 122 staff nurses. Statistical Package for the Social Sciences (SPSS) Version 27 facilitated data analysis, incorporating descriptive and inferential statistics.

Results: The study revealed several key correlations related to catheter-associated urinary tract infection (CAUTI) prevention among nurses. While there was a weak, non-significant negative correlation between Knowledge Score and Attitude Score ($r = -0.108$, $p = 0.235$), a strong positive correlation was found between Attitude Score and Practice Score ($r = 0.906$, $p < 0.01$), indicating that positive attitudes corresponded with better implementation of

preventive measures. Knowledge Score and Practice Score showed a weak, non-significant negative correlation ($r = -0.077$, $p = 0.400$), suggesting knowledge alone does not guarantee effective practice. Additionally, age correlated moderately positively with job experience ($r = 0.555$, $p<0.01$) and weakly positively with qualification ($r = 0.293$, $p < 0.01$), while qualification and job experience were moderately correlated ($r = 0.334$, $p < 0.01$). These findings highlight the complex dynamics influencing CAUTI prevention practices among nurses.

Conclusion: The study emphasizes the urgency of addressing the knowledge-practice gap in CAUTI prevention among nurses to improve patient safety and healthcare quality. Multifaceted interventions are essential, including ongoing education, standardized protocol implementation, regular feedback mechanisms strong nursing leadership, and interdisciplinary collaboration. Closing this gap is crucial for reducing the burden of CAUTIs on healthcare systems and enhancing patient outcomes.

Introduction

BACKGROUND

Urine is transferred from the bladder to a urine collection bag using a catheter, a closed drainage device with antimicrobial components (Mohammad et al., 2022). Urinary catheterization, which carries a high risk of a urinary tract infection, is one of the most frequently performed medical procedures, particularly in intensive care units. Using a catheter contributes to more than 70% of recurrent urinary tract infections. The installation and maintenance of urinary catheters is often the job of the nursing staff. Ethiopia has little knowledge on the abilities, procedures, and other aspects that determine nurses' ability to avoid catheter-associated urinary tract infections (Teshager et al., 2022).

Catheter-related Urinary Tract infections are estimated to be the most common global infections. Nurses, who are largely in-charge of caring for urinary catheters, can prevent catheter-associated UTI by proper training and care. Nurses' attitudes and knowledge are thought to have a big impact on their profession (Mong et al., 2022).

The number of deaths annually related to Health Care Associated Infection is 99,000, according to Statistics provided from 2013, which is much more than the sum of the mortality tolls from AIDS, breast cancer, and traffic accidents. Most catheter-associated Urinary Tract Infections are preventable. It is possible to avoid CAUTI by promptly removing the indwelling catheter and maintaining appropriate surveillance of it. This can be achieved by adhering to the necessary guidelines and adopting the necessary safety measures, like properly cleaning your hands with the appropriate surveillance of it. This can be achieved by adhering to the necessary guidelines and adopting the necessary safety measures, like properly cleaning your hands with the appropriate techniques Avoid using a catheter for an excessive amount of time or when it is not necessary. Use of evidence-based strategies is required to improve patient care. Given this situation, researchers wanted to know how ell nurses were following the catheter care bundle to reduce the risk of catheter-associated urinary tract infections in hospital patients getting healthcare. Additionally, it will allow for the revision of the hospital's infection control strategy in order to analyse whether or not the preventive guidance is being followed (Kaur et al., 2022).

According to statistics, the most common illness related to healthcare is catheter-associated urinary tract infection. It is also the responsibility of nurses to learn the proper techniques for caring for catheters so as to avoid urinary tract infections. Expertise is among the most important elements of a nurse's work (Haza'a et al., 2021).

CAUTI account 80% or more of infections in the healthcare industry. The use of a "care bundle" is the cornerstone of advised preventive measures for catheter-associated urinary tract infections. Nurses are responsible for catheter care, however there haven't been enough research to determine how well they understand Catheter-

Associated UTI and the treatment package in impoverished countries. This study evaluated the nurse's knowledge and behaviors about the prevention of catheter associated urinary tract infection (Tobin et al., 2021).
A urinary tract infection brought on by a catheter is a pathogen-related infection that affects people who have urinary catheters and their urinary tract. The most typical nosocomial infection is urinary tract infection associated with catheters. For improving the effectiveness and quality of therapy, as well as catheter-related urinary tract infection preventive practices, it is crucial to identify nurse's knowledge, practice, and factors connected to these infections (Nure et al., 2022).

AIM OF THE STUDY

The aim of this study is to assess nurse's knowledge attitude and practices towards prevention of Catheter-Associated Urinary tract Infection at Arif Memorial Teaching Hospital, Lahore.

PROBLEM STATEMENT

A report by the American Association for Professionals in Infection Control and Epidemiology states that the incidence of catheter-associated urinary tract infections (CAUTI), which make up 25.6% of all health-acquired infections, is underestimated in developing countries because of a lack of surveillance systems. Urinary tract infections linked with catheters, or CAUTIs, can make patients more uncomfortable and increase their hospital stays and expenses.

SIGNIFICANE

The significance of this study rested in its capacity to provide researchers with a fundamental understanding of nurses' practices and understanding of the prevention of urinary tract infections linked with catheter use. Healthcare professionals had all the knowledge and skills required to reduce catheterization-related UTIs in hospitalized patients and to adequately educate patients about preventing CAUTIs. As a result, the goal of this study is to assess nurses' awareness of catheter-associated urinary tract infection prevention at a specific hospital (Haza'a et al., 2021).

RESEARCH QUESTION

What is the level of nurse's knowledge, attitude and practice regarding catheter associated urinary tract infections prevention working at Arif Memorial Teaching Hospital?

OBJECTIVES

To assess the level of nurses' knowledge about catheter-associated urinary tract infection (CAUTI) prevention at Arif Memorial Teaching Hospital
To evaluate nurses' attitudes toward CAUTI prevention and its importance in patient safety at Arif Memorial Teaching Hospital
To examine the relationship between knowledge, attitudes, and practices regarding CAUTI prevention among nurses at the hospital.

MATERIAL AND METHODS

This study employed a descriptive cross-sectional design. A cross-sectional study involves collecting data from a population at a specific point in time. The research focuses on knowledge, attitude, and practices regarding the prevention of catheter-associated urinary tract infections (CAUTI) among nurses at Arif Memorial Teaching Hospital, Lahore.
The study population comprises staff nurses employed at Arif Memorial Teaching Hospital, Lahore. Convenient sampling was used owing to its time and cost-efficiency. This approach enabled access to participants who were readily available and willing

to participate, which is advantageous when time and resources are limited. A total of 122 participants were recruited from Arif Memorial Teaching Hospital (AMTH). The sample size was calculated to reflect a 95% confidence level. Data collection occurred over approximately six months, from November 2023 to April 2024, at the selected hospital.

INCLUSION CRITERIA

Register nurses would be included in this study.
Nurses who had General Nursing Diploma would be included in this study.
Nurses who had BSN degree would be included in this study.

EXCLUSION CRITERIA

Head nurses
Paramedical staff
Nurses who were not willing to participate in the study.
Midwives were excluded in this study.

RESEARCH INSTRUMENT

The study employed the following tools:
Questionnaire: The survey comprised four components. Demographic data included age, gender, educational qualification, and work experience. Knowledge was assessed with 13 dichotomous (yes/no) items. Correct answers received a score of 1; incorrect answers received a score of 0. The total knowledge score ranged from 0 to 13 and was categorized as inadequate, somewhat adequate, or adequate based on whether the score was below, equal to, or above the mean.
Attitude was evaluated with eight statements on a three-point Likert scale (Agree, Neutral, Disagree). Positive statements were scored 1–3, while negatively worded items were reverse-coded (3, 2, 1). The total attitude score ranged from 8 to 24, with categories defined as below mean (negative attitude) or above mean (positive attitude).
Practice was measured using ten statements on a three-point rating system (Agree, Neutral, Disagree). Positively worded items received scores of 3–1, with negatively worded items reverse-coded. The total practice score ranged from 10 to 30, categorized as inadequate, somewhat adequate, or adequate based on the mean.

VALIDITY AND RELIABILITY

A practice questionnaire and a validated structured questionnaire assessing knowledge and attitude on a modified Likert scale were used. The instrument was developed in accordance with national and international CDC recommendations and a comprehensive literature review. Face validity was established, and a pilot study involving participants from tertiary care hospitals was conducted to assess validity and reliability. Subjects in the pilot trial were not included in the main study.

DATA COLLECTION PROCEDURE

Ethical approval was obtained from the Institutional Review Board (IRB) or equivalent ethics committee prior to data collection. Eligible nurses at Arif Memorial Teaching Hospital were approached and provided with information about the study's purpose, procedures, and potential benefits. Informed consent was obtained from all participants, who were informed of their right to withdraw at any time and of the confidentiality of their responses. Demographic data were collected, and standardized instruments were employed to assess knowledge, attitude, and practice related to infection control. Data on potential control variables related to knowledge, attitude, and practice in infection control were also collected.

DATA ANALYSIS PLAN

Data were entered into the Statistical Package for the Social Sciences (SPSS) Version 27. Descriptive and inferential statistics were planned to interpret the results. Statistical significance was assessed at a p-value threshold of 0.05.

ETHICAL CONSIDERATIONS

Permission was obtained from the hospital director and department heads. Participants were informed about the study's purpose and importance through written informed consent prior to data collection. Participants could withdraw without any consequence at any stage. All data were kept confidential, and participant anonymity would be preserved in any publications arising from the study. Participation was voluntary, with no penalties for non-participation or withdrawal.

RESULTS

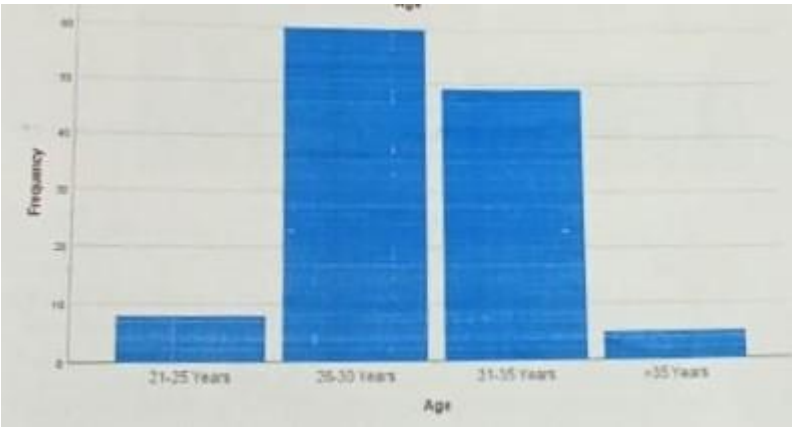
DEMOGRAPHIC CHARACTERISTICS

The demographic characteristics of the 122 participants in this study shed light on the composition of the nursing workforce engaged in catheter-associated urinary tract infection (CAUTI) prevention within the selected healthcare facilities. The gender distribution mirrors the gender demographics prevalent in the nursing profession within the study's healthcare facilities. Additionally, age diversity, years of clinical experience, educational backgrounds, and affiliations with various healthcare facilities provide a comprehensive backdrop against which the assessment of nurses' knowledge and practices related to CAUTI prevention is conducted. These demographic insights will be instrumental in understanding potential variations in CAUTI prevention approaches and adherence to best practices among nurses in different demographic groups and healthcare settings.

Age:

Almost 90% of the sample, or nurses, were between the ages of 26 and 35, according to our study's participant age analysis. Particularly, the age range of 26- 30 years old makes up the greatest percentage (49.2%), and the age range of 31-35 years old (40.2%) comes in second. On the other hand, only 4.1% of respondents are over 35, and nurses between the ages of 21 and 25 make up a lower percentage of 6.6% of the total. This demographic distribution points to a notable underrepresentation of younger nurses in our sample, especially in the late 20s to mid-30s age bracket.

Age					
		Frequency	Percent	Valid percent	Cumulative Percent
Valid	21-25 Years	8	6.6	6.6	6.6
	26-30 Years	60	49.2	49.2	55.7
	31-35 Years	49	40.2	40.2	95.9
	>35 Years	5	4.1	4.1	100.0
	Total	122	100.0	100.0	

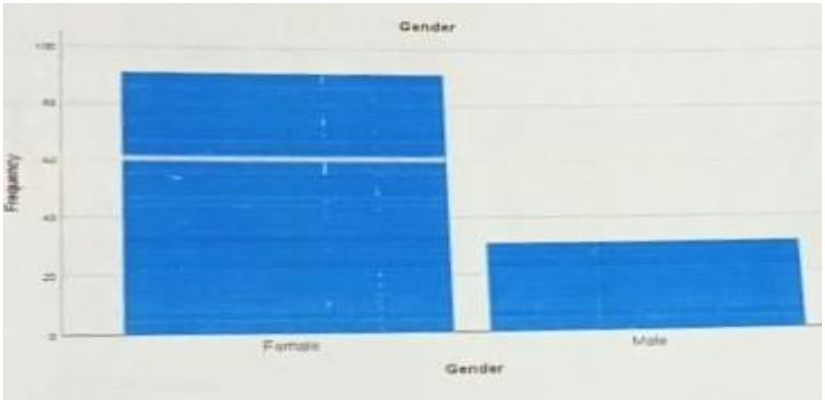


Gender

When we look at the gender demographics of our participants, we find that 74.6% of them were female, which is a significant majority of individuals. In contrast, 25.4% of the respondents who participated in the poll were men. With women predominately represented in our research on Catheter-associated urinary tract infections (CAUTI) prevention strategies, this distribution emphasizes a notable gender disparity in the nursing profession.

Gender

		Frequency	Percent	Valid percent	Cumulative Percent
Valid	Female	91	74.6	74.6	74.6
	Male	31	25.4	25.4	100.0
	Total	122	100.0	100.0	

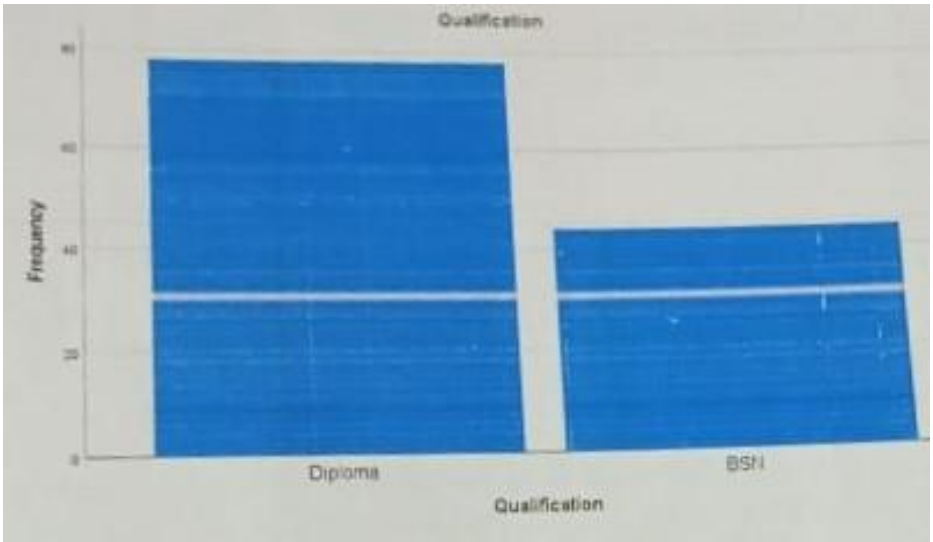


Qualification

In our study on Nurses' Knowledge, Attitude, and Practice about Catheter-Associated Urinary Tract Infections (CAUTI) Prevention, the majority of participants (63.9% of the sample) had diplomas, according to the analysis of their qualifications. The group polled is comprised of 36.1% of respondents who hold a Bachelor of Science in Nursing (BSN). This distribution highlights the considerable proportion of BSN holders in our research, as well as the noteworthy frequency of diploma-holding nurses.

Qualification

		Frequency	Percent	Valid percent	Cumulative Percent
Valid	Diploma	78	63.9	63.9	63.9
	BSN	44	36.1	36.1	100.0
	Total	122	100.0	100.0	

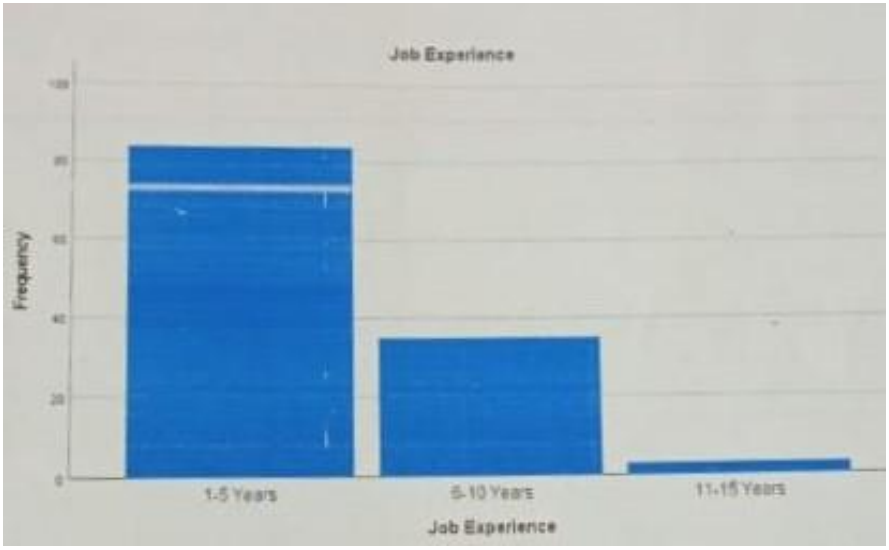


Job Experience

68.9% of the sample, or the majority of nurses, had one to five years of work experience, according to an analysis of the research participants' work experience. Furthermore, 28.7% of the sample population are respondents with 6-10 years of experience, suggesting a sizable presence of nurses with moderate experience. Additionally, 2.5% of individuals are less likely to have worked for 11-15 years. With the bulk of nurses surveyed being in the early phases of their professions and a considerable representation of mid-career professionals in between, this distribution shows a variegated terrain of professional tenure among the nurses surveyed. Such diverse experience levels offer a comprehensive perspective on CAUTI prevention practices, reflecting the amalgamation of novice insights and seasoned expertise within the nursing domain.

Job Experience

		Frequency	Percent	Valid percent	Cumulative Percent
Valid	1-5 Years	84	68.9	68.9	68.9
	6-10 Years	35	28.7	28.7	97.5
	11-15 Years	3	2.5	2.5	100.0
	Total	122	100.0	100.0	



Knowledge

The data in the below table presents responses to various statements regarding Catheter- Associated Urinary Tract Infections (CAUTI) prevention practices.

Among the surveyed nurses, the majority acknowledged CAUTI as the most common hospital- acquired infection (92.6%), while only a small percentage disagreed (7.4%).

Regarding risk factors, a significant portion (67.2%) recognized that the duration of catheterization is not directly related to CAUTI, contrasting with those who believed otherwise (32.8%).

On the other hand, a smaller percentage (11.5%) disagreed with the large majority (88.5%) who recognized female gender and elderly patients as high-risk groups for CAUTI. Additionally, the majority recognized various preventive measures, such as adhering to strict aseptic precautions for urinary catheterization (91.8%) and securing indwelling urinary catheters properly (87.7%). Opinions on the importance of some practices, such as frequently using lubricants with antiseptics, varied, with 34.4% agreeing and 65.6% opposing. The questioned nurses' varied degrees of awareness and commitment to CAUTI preventive protocols are shown in this thorough analysis, indicating areas that require focused education and intervention.

Question	**No**		**Yes**	
	F	**N%**	**F**	**N%**
Most common Hospital acquired infection is CAUTI	9	7.4%	113	92.6%
Risk factor of CAUTI is not directly related to the duration of catheterization	40	32.8%	82	67.2%
High risk groups for CAUTI include female gender and elderly patients	14	11.5%	108	88.5%
Acute urinary retention ad bladder obstruction is the indication catheterization	17	13.9%	105	86.1%
Strict Aseptic precautions to be followed for urinary catheterization	10	8.2%	112	91.8%
Catheter must be removed as soon as possible or within 24 hours for catheterized post-operative patients	24	19.7%	98	80.3%
Cleaning the peri-urethral region with antiseptic is mandatory to prevent CAUTI	19	15.6%	103	84.4%

Level of Knowledge

The statistical analysis conducted on the participants' knowledge level offers significant insights into their comprehension of the prevention of catheter-associated urinary tract infections (CAUTIS). With a mean Knowledge Score of 8.81 and a standard deviation of 1.38, participants classified as having Inadequate Knowledge represented 35.2% of the sample, suggesting a somewhat substantial variability in results within this category. On the other hand, individuals who scored as Moderately Adequate Knowledge represented 18.0% of the sample and had a mean Knowledge Score of 11.00; no standard deviation was found, indicating that the scores in this group were consistent. Individuals categorized as possessing Adequate Knowledge demonstrated the greatest average Knowledge Score of 13.49, accounting for 46.7% of the sample. The standard deviation of 0.83 suggests that there was minimal variation in scores within this cohort. These conclusions:

Level of Knowledge	**Mean**	**N%**	**SD**
Inadequate Knowledge	8.81	35.2%	1.38
Adequate Knowledge	11.00	18.0%	.00
Adequate Knowledge	13.49	46.7%	83

Attitude

Attitude statements about preventing catheter-associated urinary tract infections (CAUTIS) are contained in the data set. It reveals a prevailing consensus (97.5%) among respondents regarding the effectiveness of renewal reminders for catheter maintenance in preventing CAUTI, while a significant majority (84.4%) disagree that CAUTI development cannot be avoided among catheterized patients.

Additionally, the overwhelming agreement (92.6%) that CAUTI is a serious illness underscores the recognition of its clinical significance.

Nurses widely acknowledge (86.1%) the role of education in basic catheter care for CAUTI prevention, yet there is significant disagreement (77.0%) with the notion that healthcare workers can remove catheters at their convenience. While the majority (99.2%) refutes the belief that CAUTI prevention is unattainable, there is notable disparity (66.4%) regarding the necessity of aseptic precautions during Foley catheter removal.

The majority of responders (86.9%) also concur with the CDC's advice that catheterized patients undergo routine screening for asymptomatic bacteriuria, underscoring the significance of evidence-based approaches in infection control.

Question	**No**		**Yes**		**Agree**	
	F	**N%**	**F**	**N%**	**F**	**N%**
Renewal reminders for catheter prevents CAUTI	2	1.6%	1	0.8	119	97.5
Development of CAUTI cannot be avoided among catheterized patients.	9	7.4%	10	8.2%	103	84.4
CAUTI is not a very serious illness	0	0.0%	9	7.4%	113	92.6
Education regarding basic catheter care helps to prevents CAUTI	7	5.7%	10	8.2%	105	86.1
Health care workers can remove the catheter whenever they are convenient	94	77.0%	8	6.6%	20	16.4
Prevention of CAUTI is a frequent problem and impossible to attain it	0	0.0%	1	0.8%	121	99.2
Aseptic precautions may not be needed for removing the Foley's catheter	81	66.4%	10	8.2%	31	25.4
Routine screening for asymptomatic bacteriuria (ASB) is recommended in catheterized patients, which has now not advised by the CDC prior to catheter insertion.	8	6.6%	8	6.6%	106	86.9

Attitude

The statistical analysis based on participants' attitudes toward Catheter-Associated Urinary Tract Infections (CAUTI) prevention reveals distinct trends. Participants categorized with a Bad Attitude exhibited a mean Attitude Score of 19.47, representing 70.5% of the sample, with a standard deviation of 0.92, indicating relatively low variability in scores within this group. In contrast, individuals who met the criteria for a good attitude had a mean attitude score that was higher-22.08 and made up 29.5% of the sample. Their standard deviation was also slightly higher-0.97. This indicates that there may be a wider variety of attitudes among those in the group classified as having a good attitude. These results highlight the importance of attitudes in CAUTI prevention efforts, as there is a strong correlation between positive attitudes and higher attitude scores. Those with more positive attitudes may also be more engaged with and committed to preventive activities.

Attitude	Mean	N%	SD
Bad Attitude	19.47	70.5%	.92
Good Attitude	22.08	29.5%	.97

Practice

The dataset measures nurses' degrees of disagreement, neutrality, and agreement with particular statements to provide insights into their practice on various CAUTI (catheter-associated urinary tract infection) preventive strategies.

The majority of nurses (95.1%) concur that cleaning hands with antiseptics is a good idea both before and after treating catheter sites, which emphasizes the importance of following infection control procedures.

On the significance of utilizing the right catheter size to reduce urethral damage, there is also broad consensus (97.5%). The majority of nurses (95.1%) concur that cleaning hands with antiseptics is a good idea both before and after treating catheter sites, which emphasizes the importance of following infection control procedures.

On the significance of utilizing the right catheter size to reduce urethral damage, there is also broad consensus (97.5%). However, opinions diverge on certain practices, such as the necessity of regular urine collection bag emptying, with a significant proportion (77.0%) disagreeing. The majority of nurses (99.2%) concur that urine collection bags should be positioned lower than the bladder level in order to facilitate efficient drainage. Furthermore, 86.9% of respondents agree that keeping a tight drainage system in place is important for preventing CAUTIS, underscoring the acceptance of best practices in catheter care. The aforementioned results highlight the diverse viewpoints held by nurses with respect to CAUTI prevention tactics, highlighting points of agreement as well as prospects for additional learning and development.

Question	No		Yes		Agree	
	F	N%	F	N%	F	N%
Before and after handling the catheter site, hands must be washed with antiseptics	3	2.5%	3	2.5%	116	95.1%
Appropriate catheter size should be used to minimize urethral trauma	2	1.6%	1	0.8%	119	97.5%
Urinary catheterization must be done whenever there is an appropriate indication	9	7.4%	10	8.2%	103	84.4%
Twisting and kinking of the catheter must be prevented for an unobstructed flow of urine	0	0.0%	9	7.4%	113	92.6%
At least once daily, the bladder must irrigate with antimicrobial solutions/iodine solution	7	5.7%	10	8.2%	105	86.1%
Urine collection bag should be emptied regularly	94	77.0%	8	6.6%	20	16.4%
Urine collection bag must be positioned and fixed below the level of the bladder	0	0.0%	1	0.8%	121	99.2%
Isolation must be done for a patient with UTI, from other non-infected patients	81	66.4%	10	8.2%	31	25.4%
Maintaining close drainage system prevents CAUTI	8	6.6%	8	6.6%	106	86.9%
Regular educational training to be given on basic urinary catheter care	3	2.5%	3	2.5%	116	95.1%

Level of Practice

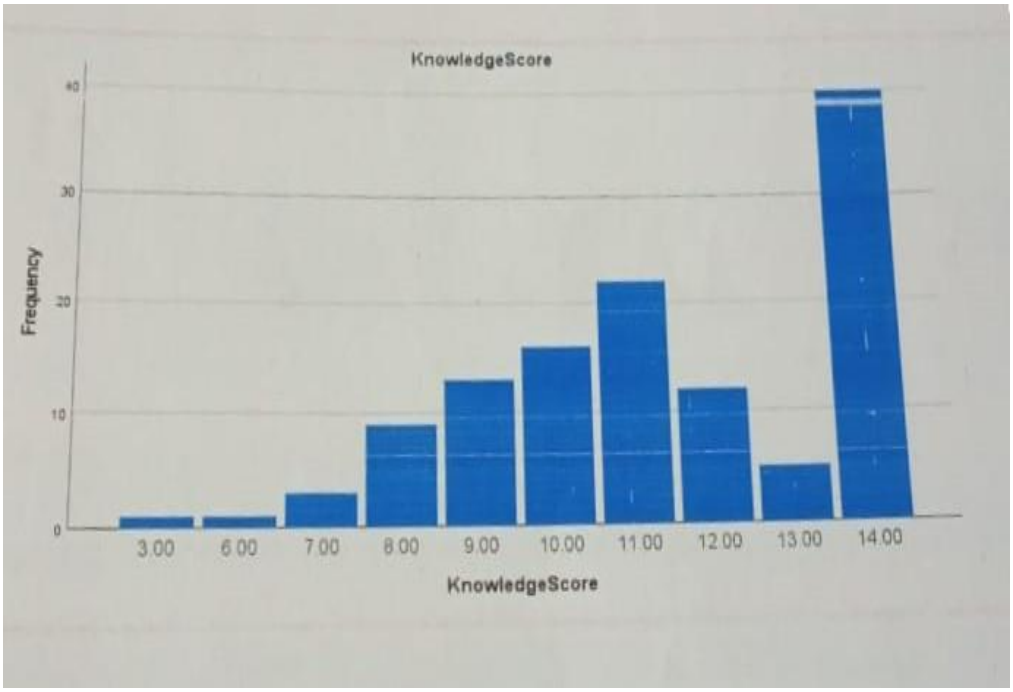
Regarding the participants' application of CAUTI (catheter-associated urinary tract infection) prevention strategies, the statistical analysis based on their degree of practice yields informative results. The average Practice Score for participants classified as having Inadequate Practice was 24.18, accounting for 27.0% of the

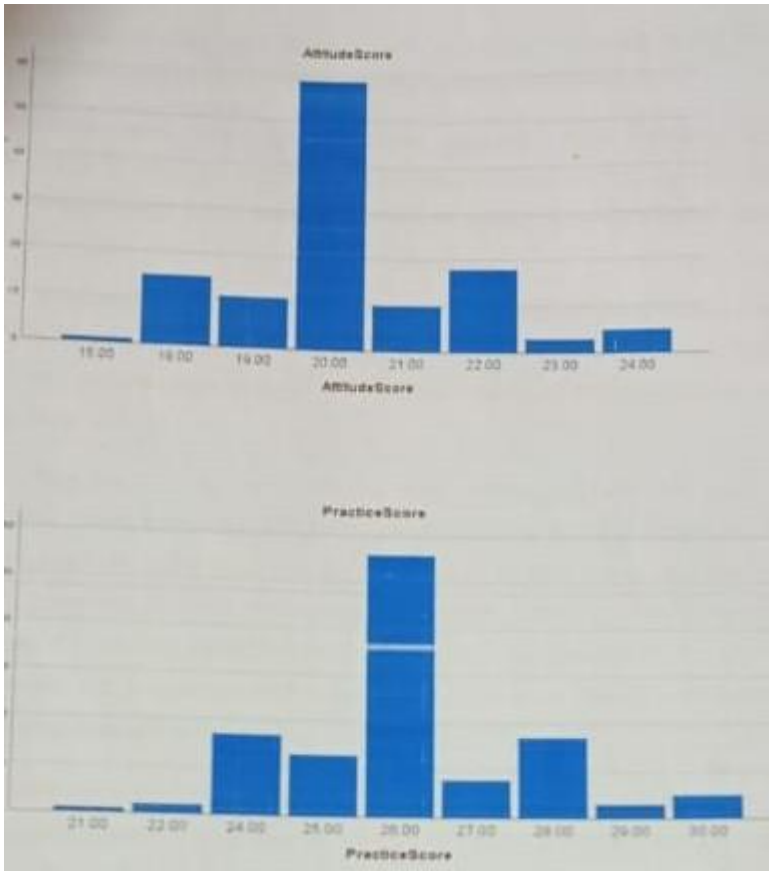
sample. The standard deviation for this group's scores was 0.95, suggesting a significant degree of variability. In contrast, participants who scored as Moderately Adequate (45.9%) had a mean Practice Score of 26.00; no standard deviation was found, indicating that this subset's scores were consistent. With a mean Practice Score of 28.15, which represents 27.0% of the sample, and a standard deviation of 0.97, participants who were classed as having Adequate Practice demonstrated relatively little variability in their results

Level of Practice	Mean	Column N %	Standard Deviation
Inadequate Practice	24.18	27.0%	.95
Moderately Adequate Practice	26.00	45.9%	.00
Adequate Practice	28.15	27.0%	.97

Statistical analysis of Knowledge Score, Attitude Score, and Practice Score:
Insightful conclusions are drawn from the statistical analysis of the participants' Knowledge Score, Attitude Score, and Practice Score. In terms of preventing catheter-associated urinary tract infections (CAUTIs), the mean scores show a moderate degree of knowledge (Mean = 11.3934), a positive attitude (Mean 20.2377), and good adherence to advised practices (Mean 26.0902). The median scores support these patterns as well, indicating that individuals' responses were consistent. Individual scores do, however, vary, as the standard deviation shows; the Knowledge Score has the most variability (Std. Deviation 2.33393). In spite of this, the majority of participants show a sufficient degree of knowledge, attitude, and practice for CAUTI prevention, falling within the range indicated by the minimum and maximum scores.

	Knowledge Score	Attitude Score	Practice Score
Mean	11.3934	20.2377	26.0902
Median	11.0000	20.0000	26.0000
Std. Deviation	2.33393	1.51605	1.62625
Minimum	3.00	15.00	21.00
Maximum	14.00	24.00	30.00





Knowledge Score across Different Demographic Variables

A good insight into participants' comprehension of CAUTI (catheter-associated urinary tract infection) prevention is provided by the statistical breakdown of Knowledge Score across several demographic characteristics. Among different age groups, participants aged 21-25 years exhibited a mean Knowledge Score of 11.88, representing 6.6% of the sample, with a standard deviation of 1.46. Those aged 26-30 years displayed a mean Knowledge Score of 11.00, constituting 49.2% of participants, with a higher standard deviation of 2.46. Participants aged 31- 35 years demonstrated a mean Knowledge Score of 11.80, representing 40.2% of the sample, with a standard deviation of 2.13, while those aged over 35 years had a mean Knowledge Score of 11.40, comprising 4.1% of participants, with a standard deviation of 3.58.

Furthermore, among genders, females displayed a mean Knowledge Score of 11.33, representing 74.6% of the sample, with a standard deviation of 1.92, whereas males had a mean Knowledge Score of 11.58, comprising 25.4% of participants, with a higher standard deviation of 3.29. Regarding qualification, participants with a Diploma exhibited a mean Knowledge Score of 11.26, constituting 63.9% of the sample, with a standard deviation of 2.30, while those with a BSN had a mean Knowledge Score of 11.64, representing 36.1% of participants, with a standard deviation of 2.39.

Moreover, among job experience levels, participants with 1-5 years of experience displayed a mean Knowledge Score of 11.18, representing 68.9% of the sample, with a standard deviation of 2.31, while those with 6-10 years of experience had a mean Knowledge Score of 12.00, comprising 28.7% of participants, with a standard deviation of 2.24. Participants with 11- 15 years of experience exhibited a lower mean Knowledge Score of 10.33, representing 2.5% of the sample, with a higher standard deviation of 3.51However, data for p. articipants with over 15 years of experience is not available.

The aforementioned results emphasize the variations in Knowledge Scores among several demographic segments, underscoring possible domains for focused education

and intervention aimed at enhancing knowledge and comprehension of CAUTI prevention.

Knowledge Score across different demographic variables:		**Score**	**%age**	**SD**
Age	21-25 Years	11.88	6.6%	1.46
	26-30 Years	11.00	49.2%	2.46
	31-35 Years	11.80	40.2%	2.13
	>35	11.40	4.1%	3.58
Gender	Female	11.33	74.6%	1.92
	Male	11.58	25.4%	3.29
Qualification	Diploma	11.26	63.9%	2.30
	BSN	11.64	36.1%	2.39
Job Experience	1-5 Years	11.18	68.9%	2.31
	6-10 Years	12.00	28.7%	2.24
	11-15 Years	10.33	2.5%	3.51
	>15 Years	.	0.0%	.

Practice Score across Different Demographic Variables

A good insight into how participants are implementing CAUTI (catheter-associated urinary tract infections) prevention strategies is provided by the statistical analysis of Practice Score across various demographic characteristics. The study sample comprised individuals aged 21 to 25 years, with a mean Practice Score of 27.13, accounting for 6.6% of the sample and a standard deviation of 1.55. With a standard deviation of 1.89, participants between the ages of 26 and 30 had a mean Practice Score of 25.95, accounting for 49.2% of the sample. Individuals between the ages of 31 and 35 had a mean Practice Score of 26.04, or 40.2% of the sample, with a lower standard deviation of 1.24. Conversely, individuals beyond 35 had a slightly higher mean Practice Score of 26.60, or 4.1% of the sample, with a standard deviation of 1.34.

Furthermore, among genders, females displayed a mean Practice Score of 26.15, representing 74.6% of the sample, with a standard deviation of 1.71, whereas males had a slightly lower mean Practice Score of 25.90, comprising 25.4% of participants, with a lower standard deviation of 1.37. Regarding qualification, participants with a Diploma exhibited a mean Practice Score of 25.90, constituting 63.9% of the sample, with a standard deviation of 1.65, while those with a BSN had a slightly higher mean Practice Score of 26.43, representing 36.1% of participants, with a standard deviation of 1.55.

Moreover, among job experience levels, participants with 1-5 years of experience displayed a mean Practice Score of 25.98, representing 68.9% of the sample, with a standard deviation of 1.73, while those with 6-10 years of experience had a slightly higher mean Practice Score of 26.40, comprising 28.7% of participants, with a standard deviation of 1.40. Participants with 11-15 years of experience exhibited a lower mean Practice Score of 25.67, representing 2.5% of the sample, with a lower standard deviation of 0.58. However, data for participants with over 15 years of experience is not available.

These findings underscore the variability in Practice Scores across different demographic groups, suggesting potential areas for targeted interventions and training to improve the implementation of CAUTI prevention practices among healthcare professionals.

Practice Score across different demographic variables:		**Score**	**%age**	**SD**
Age	21-25 Years	27.13	6.6%	1.55
	26-30 Years	25.95	49.2%	1.89
	31-35 Years	26.04	40.2%	1.24
	>35	26.60	4.1%	1.34
Gender	Female	26.15	74.6%	1.71
	Male	25.90	25.4%	1.37
Qualification	Diploma	25.90	63.9%	1.65
	BSN	26.43	36.1%	1.55
Job Experience	1-5 Years	25.98	68.9%	1.73
	6-10 Years	26.40	28.7%	1.40
	11-15 Years	25.67	2.5%	.58
	>15 Years	.	0.0%	.

CORRELATION

The correlation analysis shows a number of significant relationships between several factors pertaining to the prevention of catheter-associated urinary tract infections (CAUTIs). Firstly, there is a weak negative correlation between Knowledge Score and Attitude Score ($r = -0.108$, p 0.235), indicating that individuals with higher knowledge scores may have slightly lower attitude scores toward CAUTI prevention.

On the other hand, there is a significant positive connection ($r = 0.906$, $p < 0.01$) between the Attitude Score and the Practice Score, indicating that those who have more positive attitudes regarding CAUTI prevention tend to implement preventative behaviors more effectively.

Furthermore, a weak negative correlation ($r = -0.077$, $p = 0.400$) has been seen between the Knowledge Score and Practice Score, suggesting that superior knowledge scores do not always translate into superior preventative practice implementation.

It may be inferred that older participants likely to have more job experience and higher qualifications as age also demonstrates a moderate positive association with job experience ($r = 0.555$, $p <0.01$) and a weak positive correlation with qualification ($r=0.293$, $p<0.01$).

Moreover, there is a moderately significant correlation between Qualification and Job Experience ($r=0.334$, $p < 0.01$), suggesting that those with more qualifications typically have more work experience.

These results suggest possible areas for focused interventions and training programs and offer insightful information about the relationships between age, qualification, work experience, knowledge, attitude, and practice in the context of CAUTI prevention.

Correlations							
		Knowledge	Attitude	Practice	Age	Qualification	Job Experience
Knowledge	Pearson Correlation	1	-.108	-.077	.083	.078	.100
	Sig. (2-tailed)		.235	.400	.362	.390	.271
	N	122	122	122	122	122	122
Attitude	Pearson Correlation	-.108	1	.906**	-.073	.164	.065
	Sig. (2-tailed)	.235		.000	.422	.070	.476
	N	122	122	122	122	122	122
Practice	Pearson Correlation	-.077	.906**	1	-.042	.158	.081

	Sig. (2-tailed)	.400	.000		.646	.081	.378
	N	122	122	122	122	122	122
Age	Pearson Correlation	.83	-.073	-.042	1	.293**	.555**
	Sig. (2-tailed)	.362	.422	.646		.001	.000
	N	122	122	122	122	122	122
Qualification	Pearson Correlation	.078	.164	.158	.293**	1	.334**
	Sig. (2-tailed)	.390	.070	.081	.001		.0000
	N	122	122	122	122	122	122
Job Experience	Pearson Correlation	.100	.065	.081	.555**	.334**	1
	Sig. (2-tailed)	.271	.476	.0378	.000	.000	
	N	122	122	122	122	122	122
**. Correlation is significant at the 0.01 level (2-tailed).							

DISCUSSION

Urinary tract infections associated with catheter use (CAUTIs) are a major global health concern that can cause discomfort to patients, escalate healthcare expenses, and result in potentially fatal outcomes. Because they are frequently in charge of catheter placement, maintenance, and removal, nurses are essential to the prevention of CAUTI. The study on nurses' knowledge and practices on CAUTI prevention in public tertiary care hospitals in Pakistan will be critically examined in this debate. It will also look at the larger background of CAUTI prevention in healthcare settings, possible treatments to close the knowledge-practice gap, and the consequences of these findings.

The results of the study show that although most staff nurses were adequately knowledgeable about preventing CAUTIS, there was non-compliance with the tasks involved in inserting, collecting, and maintaining urinary catheters. This gap between practice and understanding specific to CAUTI prevention; it is a problem that exists in many healthcare settings. There could be a number of reasons behind this knowledge-practice gap. Despite possessing theoretical knowledge, nurses encounter practical difficulties when putting guidelines into practice in a hectic clinical setting. Adherence to best practices may be hampered by competing priorities, time restrictions, and heavy patient loads. (Gould et al., 2019).

Secondly, the results of the study are consistent with earlier studies that suggested nurses might exaggerate how closely they adhere to best practices (Gill et al., 2019). This overconfidence may cause one to deviate from advised practices. In order to match nurses' opinions of their practices with their real behaviors, it emphasizes the significance of frequent audits, feedback systems, and continuing education.

The difficulties nurses encounter in putting knowledge into practice as a result of demanding workloads, time restraints, and conflicting objectives could be one reason for this discrepancy (Meddings et. al., 2017). Furthermore, organizational culture and resource accessibility can have a big impact on how well nurses follow best practices (Saint et al., 2016). Interventions should therefore address structural issues within healthcare facilities in addition to improving individual expertise.

The study also looked at how nurses' practices are impacted by demographic characteristics. Notably, the greatest average practice score was seen among nurses with 11-15 years of experience. As more seasoned nurses may have improved their clinical judgment and infection control skills over time, this study highlights the importance of experience in the healthcare industry (Fakih et al., 2019). However, it is important to use care when extrapolating this result due to the limited sample size in this area.

When comparing nurses with a Bachelor of Science in Nursing (BSN) degree to those with a diploma, the association between qualification and practices showed that the former had a marginally higher average practice score. The slight variation implies that educational level may have some bearing on CAUTI prevention strategies, even though it was not statistically significant. To fully examine this association, more study including a bigger and more varied sample size is necessary.

There was no discernible linear correlation between age and practice ratings, since nurses across all age groups demonstrated varying levels of practice. The aforementioned discovery underscores the intricacy of variables impacting the practices of nurses and underscores the necessity of customized interventions that take into account individual traits and professional phases.

Implications of the Knowledge-Practice Gap

The study's findings regarding the knowledge-practice gap have significant ramifications for patient safety and the standard of treatment. One of the most prevalent illnesses linked to healthcare settings is CAUTI, and preventing them is essential to infection control initiatives. Patients are more likely to get CAUTIS when nurses do not regularly adhere to evidence-based standards. This can result in lengthier hospital stays, higher healthcare expenses, and even death (Chuang et al., 2018).

Moreover, it is important to recognize the financial cost associated with CAUTIS. The treatment of CAUTIS carries significant expenditures for healthcare facilities, including longer hospital stays, more diagnostic testing, and antibiotic prescriptions (Fakih et al., 2019). Budgets for healthcare are strained by these expenses, which also take money away from other areas where patients potentially need care. Not only is it vital for patient safety to close the knowledge-practice gap in CAUTI prevention, but it is also economically necessary.

Future Research and Limitations

Although this study offers insightful information about nurses' awareness of and actions related to CAUTI prevention, there are a number of limitations that need to be noted. Initially, a cross- sectional design was used in the study, which gathers data at a certain moment in time. A more dynamic understanding of knowledge and practice patterns throughout time would be provided by a longitudinal approach.

Second, only nurses employed by public hospitals were included in the study's sample. Given that local circumstances and resources may differ, extra caution should be used when extrapolating the findings to other areas or healthcare systems.

Subsequent investigations ought to examine the effects of focused interventions on enhancing nurses' practices about the prevention of CAUTIS. Studies with a longitudinal design can evaluate how long-lasting practice advancements are. Furthermore, from the perspective of nurses, qualitative research can offer greater insights into the obstacles to and enablers of CAUTI preventive strategies.

The study's conclusions highlight the necessity of all-encompassing treatments to close the knowledge-practice gap in nurses' CAUTI prevention. Individual variables, corporate culture, nursing leadership, and interdisciplinary teamwork should all be taken into account in these interventions. Improving patient safety and the general standard of care in healthcare facilities requires establishing a culture of safety and continual progress in CAUTI prevention.

CONCLUSION

This study has shed light on the present knowledge and practices of nurses with reference to preventing catheter-associated urinary tract infections (CAUTIs). The results show a large discrepancy in nurses' actual CAUTI prevention strategies and their awareness of the condition. The majority of nurses showed sufficient knowledge,

although there were variations in how consistently they followed the recommended practices for inserting, maintaining, and removing catheters.

This knowledge-practice divide has significant ramifications. Because they can result in potentially fatal consequences, increased healthcare expenditures, and patient pain, CAUTIs are a major healthcare problem. In addition to being necessary for patient safety, closing the knowledge and practice gap in CAUTI prevention is also financially critical because these infections put a pressure on healthcare spending.

Interventions with multiple facets are required to close this gap. The creation of standardized protocols and checklists, regular feedback mechanisms, clinical decision support system installation, continuous education and training, proficient nursing leadership, and the promotion of a safety culture within healthcare institutions are a few of these. A comprehensive strategy for CAUTI prevention also requires interdisciplinary cooperation among medical experts.

This study highlights the need for focused efforts to improve the caliber of nursing care and contributes to the growing body of knowledge on the prevention of CAUTIS. Furthermore, it emphasizes how crucial it is for healthcare facilities to foster an atmosphere that encourages and permits nurses to give infection prevention first priority.

In conclusion, improving patient safety and the general standard of care in healthcare facilities requires bridging the knowledge-practice gap in CAUTI prevention among nurses. It is a shared responsibility of healthcare organizations, nursing leadership, and individual nurses to work collaboratively toward this goal.

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