

A study to Assess the Knowledge and Care of Peripherally Inserted Central Catheter among the Nurses in a Cancer Hospital, Guwahati, Assam

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Abstract: Background of the study: Peripherally Inserted Central Catheter has been widely used in cancer hospitals in cancer patients who are receiving long term chemotherapy to avoid pain and irritation caused due to frequent needle prick and intravenous cannulation. However use of PICC is not free from complications just like any other intravenous access devices, if proper care and maintenance are not made following the placement of PICC. The aim of the study is to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah Cancer Institute. The primary objectives of the study are: 1. To assess the level of knowledge on Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah Cancer Institute. 2. To assess the level of care on Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah Cancer Institute. 3. To find the correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah Cancer Institute. Methodology: The study adopted a descriptive research design to accomplish the objectives. The setting was Dr. B. Borooah Cancer Institute, Guwahati, Assam. Purposive sampling technique was used to obtain the desired sample and the sample comprised of 50 nurses working in the wards and day care chemotherapy units of Dr. B. Borooah Cancer Institute, Guwahati, Assam. A self-structured questionnaire was developed to assess the knowledge of Peripherally Inserted Central Catheter and an observational checklist was developed to assess the care of Peripherally Inserted Central Catheter. Result: The study result showed that the majority of the studied nurses were in the age group of 21-30 years i.e. 68% (n=34). Majority of the nurses were female i.e. 92% (n=46). Majority of the nurses were Basic B. Sc Nursing i.e. 54% (n=27). Maximum of the nurses had 1-4 years of experience i.e. 42% (n=21). The majority of nurses i.e. 80% (n=40) did not have any previous exposure to PICC line course. Maximum of the nurses i.e. 70% (n=35) were also posted in the ward. Majority of the nurses 78% (n=39) had an adequate knowledge. The mean stress score of the nurses was 13.66 and SD=3.088. The nurses having a good level of care 40% (n=20) was slightly more than those having an average level of care 38% (n=19). The mean stress score was 12.86 and SD=4.629. There was significant good positive correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses ($r=0.622$) and ($p=0.001$) was statistically significant at p. Conclusion: After the study the researcher found that most of the nurses had adequate knowledge and good level of care regarding Peripherally Inserted Central Catheter. The result also highlighted some sections of the nurses had an inadequate knowledge and poor level of care thus helping the researcher to conclude that attention should be paid for improvement in educational program for nurses and the need for workplace training. Hence, the study can serve as a background for implementing staff developments programs and workshops to improve the nurses' knowledge and care of Peripherally Inserted Central Catheter.

Keywords: Assess, Peripherally Inserted Central Catheter, knowledge, care

1. Introduction

"Nursing is an art: and if it is to be made an art, it requires an exclusive devotion as hard a preparation as any painter's or sculptor's work: for what is the having to do with dead canvas or dead marble, compared with having to do with the living body, the temple of God's spirit?"

– FLORENCE NIGHTINGALE.

Long hospital stays and chronic diseases have been associated with long-term medication use and continuous access to the venous system. Cancer is also one such chronic disease where cases have been increasing globally as well as in India. Globally, cancer is still the second largest cause of death accounting for nearly 10 million deaths in 2020. [1] According to the Cancer Statistics, 2020 reported by National Cancer Registry Programme, India the projected amount of cancer in India is about 1,392,179 cases for the year 2020 of which 679, 421 are male and 712,758 are female.[2] According to a report by the Indian Council of Medical Research, the number of Indians suffering from cancer is projected to increase to 29.8 million in 2025 from 26.7

million in 2021. In 2021 the highest incidence was in the North (2,408 patients per 100,000) and the Northeast (2,177 per 100,000).

Chemotherapy as the treatment of cancer involves long-term infusions of chemotherapeutic drugs in multiple cycles. Frequent needle pricks for administering medicine, chemotherapy, and blood withdraw can lead to complications like irritability of the small veins, inability to get good venous access, extravasation, thrombophlebitis, pain, discomfort, and fear of needle prick to the patient.

To avoid complications nowadays, it is recommended to use a Peripherally Inserted Central Catheter if the treatment plan requires frequent needle sticks. Peripherally Inserted Central Catheter, commonly known by the acronym PICC, was initially described in the literature by the German physician Forssann in 1929.[4] A peripherally inserted central catheter (PICC) line is a thin, flexible tube that is inserted into a vein in the upper arm and guided (threaded) into a large vein above the right side of the heart.[5] It is generally used in medium and long-term therapies, preferably inserted into the basilic

vein because of its favorable anatomical features, followed by the cephalic vein.[4] It can stay in place for weeks and up to months. [6] According to the iDATA Research conducted on 2nd July 2020 over 2.7 million PICC line insertion procedures were performed in the United States.[7] In India, a study conducted by Deepak Sundriyal et al. [8] states that a total of 246 PICCs were inserted in one year period in the Dharamshila Cancer Hospital from 1st July 2012 to 30th June 2013. A study conducted by Sapkota S et al. [9] on "Analysis of Peripherally Inserted Central Catheter Line in Cancer Patients: A Single-Center Experience" reported that 500 (five hundred) PICCs were inserted over the period of 2 years to 8 months of which the most common indications for insertion was for delivering chemotherapy.

According to the Annual Report 2019-2020 of Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), TATA, Mumbai, in the year 2019, a total of 152 PICCs were inserted, and the nurse-led PICC clinics showed good clinical outcomes.[10]

Insertion of Peripherally Inserted Central Catheter constitutes one of the most common procedures in daily clinical practice for cancer patients for the purpose of administration of fluids, medications, chemotherapy, and parenteral nutrition for a prolonged period. It has become one of the most common technologies employed in the intravenous therapy as they allow safe long term intravascular access, comfort, and ease of transition to home therapy. It is the choice for administering medication especially in chemotherapy where vesicant drugs have the chance of injuring the vein and area around the vein causing extravasation.

PICC line insertion can be done by a doctor, nurse, and other trained medical providers. This serves as a developing platform for nurses to improve their knowledge and practice in this field. However, prevention of sepsis and patency is always the priority after PICC insertion as with any other central venous access device. PICC can cause bloodstream infection, local infection, bleeding, nerve injury, blood clots, and PICC line blockage and breakage, if not cared for, and not attended properly. The risks can be prevented by safe handling of the device and appropriate maintenance. It requires knowledge of the selection site, aseptic technique, consistent daily care, and dressing technique. Caring for PICC starts from the day of insertion of the PICC till the time of withdrawal. PICC care is important as it allows successful administration of medications, chemotherapy, and parenteral nutrition and prevention of complications associated with other intravenous devices. PICC dressing should be changed at least once a week or as per the hospital/institutional policy.

The relevance of this study signals the need for qualified and skillful nurses to handle the PICC and provide appropriate PICC care. In this light, the study aimed to analyze the knowledge of nurses regarding Peripherally Inserted Central Catheter, their maintenance, and practice of care.

2. Review of Literature

A review of literature is a description and analysis of the literature relevant to a particular field or topic.[14] A literature reviews provide the researcher with a practical

guide and a solid background to a particular topic of research study.[14] Therefore, it provides the researcher with an opportunity to determine how much pertinent material is available concerning the potential study; and what has been done by others regarding that particular study.[12] The task of reviewing research literature involves the identification, selection, critical analysis, and written description of existing information on a topic.[15]

To collect information on the topic under study, the investigator used online resources like websites, articles, and journals. For this particular study, the literature was reviewed under the following headings:

Section I: Reviews related to knowledge and care of Peripherally Inserted Central Catheter

Section II: Reviews related to risk factors and complications of Peripherally Inserted Central Catheter

Section III: Reviews related to Peripherally Inserted Central Catheter, Nursing interventions, and Models.

Section I: Reviews related to knowledge and care of Peripherally Inserted Central Catheter: da Silva ER et al.[16] (2022) conducted a study on "Cine-picc: satisfaction and knowledge following a video and hands-on training in peripherally inserted central catheter". A cross-sectional and prospective study was adopted for this study. Pre-test questions were answered by the participants about PICC lines, watched a video on PICC care and maintenance, attended hands-on sessions, and finally answered a post-test. The result reported that out of the 520 professionals who participated in the study, 87.4% were from the nursing staff. 211 participants answered the pre-test questions and the post-test questions were answered by 203 people. The result also reported 97% of satisfied respondents. They conclude the study by stating the importance of an active educational approach to that of a traditional training model in reaching more participants, representing an innovative pedagogical tool in the training of critical and reflexive professionals.

A study was conducted by Saltah OY et al. [17] (2022) on "The Effect of Implementing Peripherally Inserted Central Catheter Educational Program on Nurses "Knowledge, Practice, and Neonatal Outcomes". The study was conducted with the aim to evaluate the effect of implementing a peripherally inserted central catheter educational program on nurses' knowledge, practice, and neonatal outcomes. Pretest-posttest quasi-experimental design was adopted and the study comprises of a convenience sample of (45) neonatal nurses with a purposive sample of (20) neonates admitted to NICU for six months and requires PICC line insertion. The data were collected using a Peripherally inserted central catheter insertion questionnaire sheet, PICC line insertion, and care observational checklist and neonatal assessment sheet. The result showed that the majority of the nurses had poor knowledge, and more than half had competent skills about PICC before program implementation. 12 The study also showed that more than half of the nurses had average knowledge and two third had competent practices after program implementation. The study reported a decrease in the prevalence of neonatal complications. It was concluded that there was a post-positive effect of the educational program on nurses"

knowledge and skills as well as neonatal. The study recommended the need for continuing nursing education and practices about PICC line.

Section II: Reviews related to risk factors and complications of Peripherally Inserted Central Catheter: Duwadi S et al. [33] (2020) conducted a study on “Peripherally inserted central catheters in critically ill patients - complications and its prevention: A review”. The study is aimed to outline current literature on PICC procedures, potential complications, and measures for prevention. Understanding evidence-based guidelines regarding insertion technique, early detection of complications, and care bundle of PICC is significant in complication prevention. Implementation of education, training and appropriate multidisciplinary approaches on PICC care among nurses and caregivers is the key to preventing complications. Through the study it can be understood that the strict care of indwelling PICC lines, targeted and reasonable PICC-associated complication prevention, and nursing care has a major clinical significance in reducing the occurrence of potential PICC complications.

Bhargava M et al. [34] (2020) conducted a study on “Risk factors for peripherally inserted central catheter line-related deep venous thrombosis in critically ill intensive care unit patients” with the objective to find out the risk factors associated with peripherally inserted central catheter line-related deep venous thrombosis in critically ill medical-surgical intensive care unit patients in a community hospital.

The study was conducted using 21 cases with symptomatic peripherally inserted central catheter-related deep venous thrombosis and 42 control groups with peripherally inserted central catheters without deep venous thrombosis. The result of the study showed that triple lumen peripherally inserted central catheters, larger outer diameter, and open (vs valve) peripherally inserted central catheters were the associated factors for causing venous thrombosis. The study reported no association of peripherally inserted central catheter-related deep venous thrombosis with a prior history of deep venous thrombosis, use of alteplase, anti-platelet therapy, prophylactic or therapeutic anticoagulation, international normalized ratio, platelet count and the use of peripherally inserted central catheters for total parenteral nutrition.

Section III: Reviews related to Peripherally Inserted Central Catheter, Nursing interventions, and Models. Zhou J et al. [37] (2022) conducted a study on “Application of a Nursing Data Driven Model for Continuous Improvement of PICC Care Quality”. This study was done by maintaining a PICC catheter network to monitor the maintenance of catheters in placed patients throughout the process, providing homogeneous PICC catheter continuity of care for patients. Model-driven architecture (MDA) design was used in the study. According to the requirements of nursing, the data-driven model is mainly divided into the interface layer and a functional service layer. Hence, the study was conducted by adopting MDA technology which can detach the functions of the system from the platform, based on domain knowledge. On the other hand, the meta-model adopted an XSD-based data model to generate the PIM model, which is stored in the model library. The study results

showed a positive outcome of an increased in the number of nurses at maintenance from 79 to 232, an increased in the PICC placement rate for oncology patients from 35.0% to 76.0%, increased in the nurse maintenance operation pass rate from 53.9% to 88.4%, and the maintenance default rate was found to be decreased from 40.0% to 10.9%.

Xu H et al. [38] (2021) conducted a study on “Analysis of Nursing Effect and Impact of Narrative Nursing Model on Anxiety of Tumor Patients with PICC under Chemotherapy”. The study included 200 tumor patients with PICC under chemotherapy who were randomly selected and divided into the control group (routine nursing) and the experimental group (narrative nursing) by the draw method, with 100 cases each. General Anxiety Disorder-7 (GAD-7) scale was used to assess the patients and their anxiety scores were over 5 points. They assessed the adverse reaction rate (ARR) during placement in both groups, and the effectiveness of patient care was evaluated after extubation.

The result showed that as compared with the control group, the experimental group obtained significantly higher satisfaction scores and QLI scores at T0, T1, T2, and T3 and lower GAD-7 anxiety scores, SAS scores, SDS scores, and MSSNS scores at T0, T1, T2, and T3, which were statistically significant ($P < 0.05$). They found that the efficiency of care was higher among the experimental group than in the control group and a significantly lower ARR during treatment ($P < 0.05$). They concluded the study by saying that the narrative nursing model can be used to improve the nursing effect, treat anxiety, and provide a more quality nursing for tumor patients with PICC under chemotherapy.

3. Methodology

The methodology adopted for the study includes the research approach, research design, setting of the study, population of the study, sample, criteria for selection of samples, sampling technique, variables, description of tools, content validity of the tools, reliability of the tools, data collection process, ethical consideration, and plan for data analysis.

The research approach adopted for the present study is a quantitative approach. A descriptive study design was used to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses in a Cancer Hospital, Guwahati, Assam. The study was conducted at Dr. B. Borooah Cancer Institute, Guwahati, Assam. The setting was selected because of the availability of sample, feasibility of conducting the study and geographical condition. The population comprised of the nurses working in Dr. B. Borooah Cancer Institute, Guwahati, Assam. the sample comprised of the 50 nurses working in the wards and daycare chemotherapy units of Dr. B. Borooah Cancer Institute, Guwahati, Assam who fulfills the inclusion criteria. The criteria for selection of samples are as follows:

Inclusion criteria:

- Nurses who are working in the wards and day care chemotherapy units of a cancer hospital.
- Nurses who are present during data collection.
- Nurses who are willing to participate.
- Nurses who can read and write English.

Exclusion criteria:

- Nurses working in the capacity of Nursing Superintendent and Nursing Tutor.
- Non-probability purposive sampling technique was found to be appropriate for the present study and was used in selecting the sample.

The variables under the study were:

- Research variables: Knowledge and Care
- Demographic variable: Age, Gender, Educational Qualification, Years of experience, Any previous exposure to PICC line course, Area of posting.

A self-structured questionnaire and an observational checklist was proposed to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses working in different wards and daycare chemotherapy units of Dr. B. Borooah Cancer Institute, Guwahati, Assam. The reliability of the tool was tested by the Split half test method, which measures the co-efficient of internal consistency. The Spearman Brown Prophecy formula was used to find out the reliability to the full test. The result of the reliability test was found to be 0.805 and 0.799 respectively for the knowledge questionnaire and observational checklist for care. The tool was found to be reliable.

Formal written permission was obtained from the Scientific Committee, Dr. B. Borooah Cancer Institute. The researcher had undergone and passed the Good Clinical Practice (GCP) examination. Formal written permission was obtained from the Institutional Ethical Committee (IEC), Dr. B. Borooah Cancer Institute. Further written permission was obtained from the Head of the Institute before the collection of information. Participant information sheet was given to the study participants and written informed consent was obtained from the study participants.

Data collection was done for 4 weeks in the month of August, 2022. The investigator went to the wards and day care chemotherapy units of Dr. B. Borooah Cancer Institute to collect data from the sample. A purposive sampling technique was used by the investigator for the fulfillment of the targeted population (i.e. 50 samples) which was prefixed at the beginning of the study.

Accordingly ,3-5 number of samples were drawn everyday for the proposed study. Questionnaires were explained to the participants by the researcher herself. Socio-demographic information was collected before hand and subsequently self structured questionnaire to assess the knowledge was administered. An observational checklist was also

administered to assess the level of care by observing the nurses performing the care of PICC. The demographic proforma and questionnaire were filled up by the nurses by self-marking and observational checklist was filled up by the investigator by observation. The time taken by each participant for the entire data collection process was 45-50 minutes. Assurance was given to the participants about the confidentiality of their information for ethical consideration.

Plan for Data Analysis:

The data analysis and interpretation of this study were based on the data collected through a self-structured questionnaire to assess the level of knowledge on Peripherally Inserted Central Catheter among the nurses (n=50) and an observational checklist to assess the level of care on Peripherally Inserted Central Catheter among the nurses (n=50). The collected data were tabulated in the master sheet and interpreted and analyzed by using descriptive and inferential statistics based on the objectives of the study.

The plan for data analysis was as follows:

- Frequency and percentage was used to compute and describe the demographic proforma of the samples.
- Frequency, percentage, mean, median and standard deviation was used to compute the level of knowledge and the level of care of the samples.
- Pearson's correlation test was used to find the correlation between knowledge and care of Peripherally Inserted Central Catheter among the samples.

4. Results**Section I: Description of Demographic Proforma of the Nurses.**

Table 1: Frequency and Percentage distribution according to the Age groups, N=50

Age in years	Frequency	Percentage
a. 21-30 years	34	68
b. 31-40 years	10	20
c. 41-50 years	6	12
d. > 50 years	0	0

Table 1 showed the frequency and percentage distribution of age of the nurses. Out of 50 nurses from which data was collected, 34 (68%) were in the age group of 21-30 years, 10 (20%) were in the age group of 31-40 years, 6 (12%) were in the age group of 41-50 years and there were no participants in the age group > 50 years.

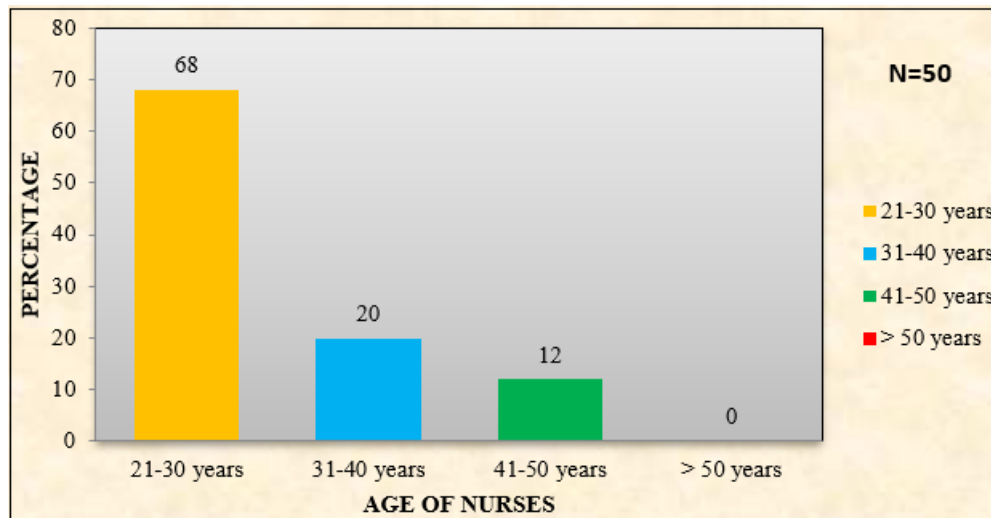


Figure 1: A clustered cylindrical diagram showing the percentage distribution of age of nurses.

Table 2: Frequency and Percentage distribution of Gender of nurses
N=50

Gender	Frequency	Percentage
a. Male	4	8
b. Female	46	92
c. Transgender	0	0

Table 2 showed that out of 50 participants, 4 (8%) were male. Maximum of the participants were female 46 (92%) and no participants fall in the transgender category.

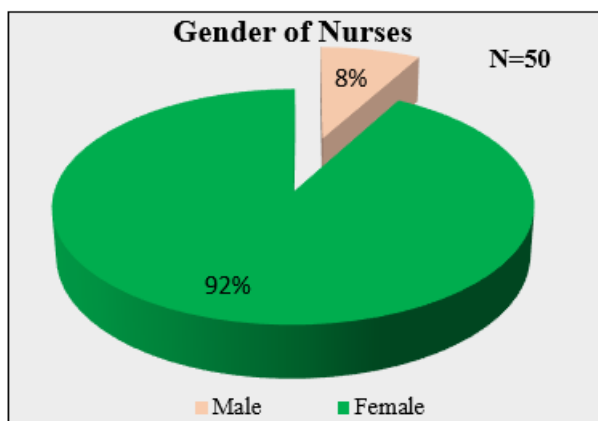


Figure 2: A 3-D exploded pie diagram showing the percentage distribution of gender of nurses

Table 3: Frequency and percentage distribution of Educational qualification of nurses, N=50

Educational qualification	Frequency	Percentage
GNM	9	18
Post Basic B. Sc Nursing	5	10
Post Basic Diploma in Oncology Nursing	8	16
Basic B. Sc Nursing	27	54
M. Sc Nursing	1	2

Table 3 showed that among the 50 nurses from which data collection was done, the majority of them i.e. 27(54%) were Basic B. Sc Nursing, 9(18%) of them were GNM, 5(10%) of them were Post Basic B. Sc Nursing. 8(16%) of them were having a Post Basic Diploma in Oncology Nursing qualification and 1(2%) was an M. Sc Nursing.

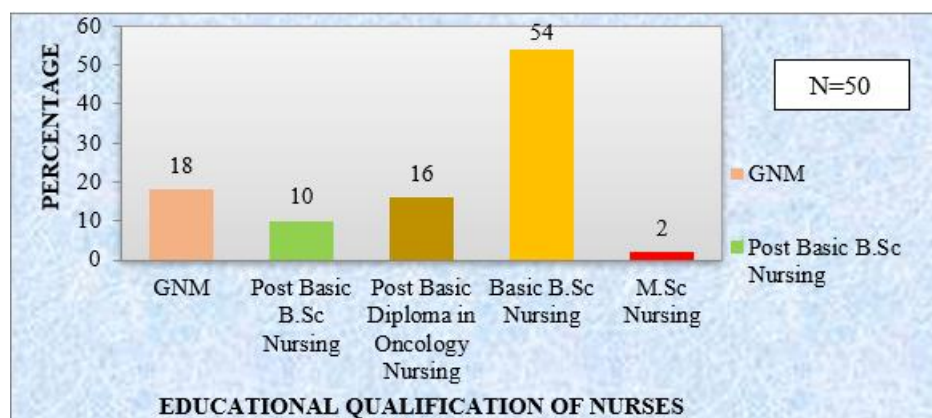
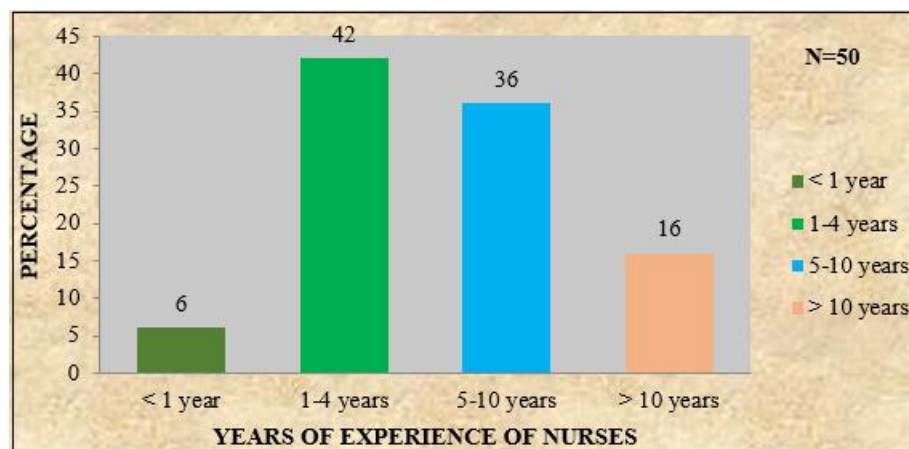


Figure 3: A clustered column diagram showing the percentage distribution of educational qualification of nurses

Table 4: Frequency and Percentage distribution of Years of experience of nurses, N=50

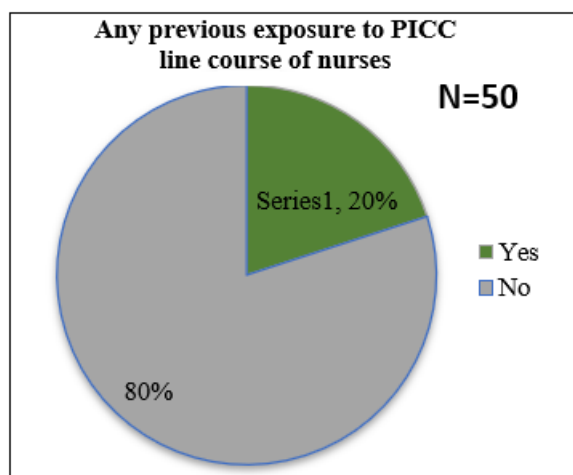
Years of experience	Frequency	Percentage
< 1 year	3	6
1-4 years	21	42
5-10 years	18	36
> 10 years	8	16

Table 4 showed that the majority of the nurses i.e. 21(42%) had 1-4 years of experience. 3(6%) of them had < 1 year of experience, 18(36%) had 5-10 years of experience and 8(16%) of them had > 10 years of experience.

**Figure 4:** A clustered cone diagram showing the percentage distribution of years of experience of nurses**Table 5:** Frequency and Percentage distribution of Any previous exposure to PICC line course of nurses, N=50

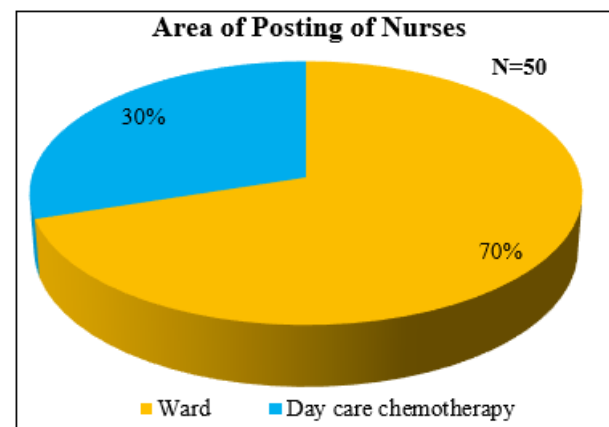
Any previous exposure to PICC line course	Frequency	Percentage
Yes	10	20
No	40	80

Table 5 showed that the majority of the nurses i.e. 40(80%) did not have any previous exposure to PICC line course. 10(20%) of them had previous exposure to PICC line course.

**Figure 5:** A pie diagram showing the percentage distribution of any previous exposure to PICC line course of nurses**Table 6:** Frequency and Percentage distribution of Area of posting of nurses, N=50

Area of posting	Frequency	Percentage
Ward	35	70
Day Care Chemotherapy	15	30

Table 6 showed that the majority of the nurses i.e. 35 (70%) were posted in the ward and 15 (30%) of them were posted in day care chemotherapy.

**Figure 6:** A 3-D pie diagram showing the percentage distribution of the area of posting of nurses

Section II: Description of knowledge score of the nurses regarding Peripherally Inserted Central Catheter.

Table 7: Frequency and percentage distribution of level of knowledge on Peripherally Inserted Central Catheter among the nurses, N=50

Level of knowledge	Frequency (f)	Percentage (%)	Median	Mean	SD
Adequate	39	78	15	13.66	3.088
Inadequate	11	22			

Table 7 depicts the frequency and percentage distribution of level of knowledge on Peripherally Inserted Central Catheter among the nurses. The table revealed that the majority 39(78%) had adequate knowledge and 11(22%) had inadequate knowledge. The median score was 15 and mean stress score was 13.66 and SD=3.088.

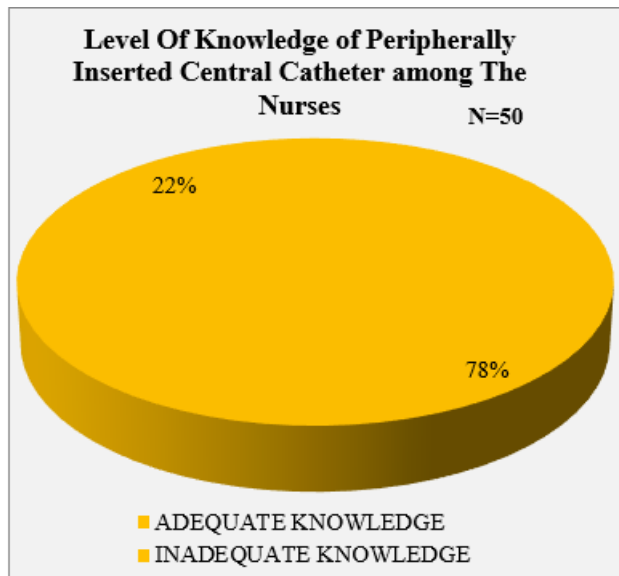


Figure 7: A 3-D pie diagram showing the distribution of level of knowledge on Peripherally Inserted Central Catheter among the nurses

Table 8: Descriptive statistics showing minimum score, maximum score, score range, mean, median mode, standard deviation, skewness, and kurtosis of knowledge of Peripherally Inserted Central Catheter among the nurses

Descriptive statistics	Values
Mean	13.66
Median	15
Mode	16
Std. Deviation	3.088
Skewness	1.049
Std. Error of Skewness	0.337
Kurtosis	0.305
Std. Error of Kurtosis	0.662
Range	13
Minimum	5
Maximum	18

Table 8 depicts the average knowledge score as 13.66 ± 3.008 . The scores varied from 5 to 18. The median and mode of the distribution were 15 and 16 respectively. The inequalities in mean, median, and mode showed that the knowledge distribution is a negatively skewed distribution (Figure 10).

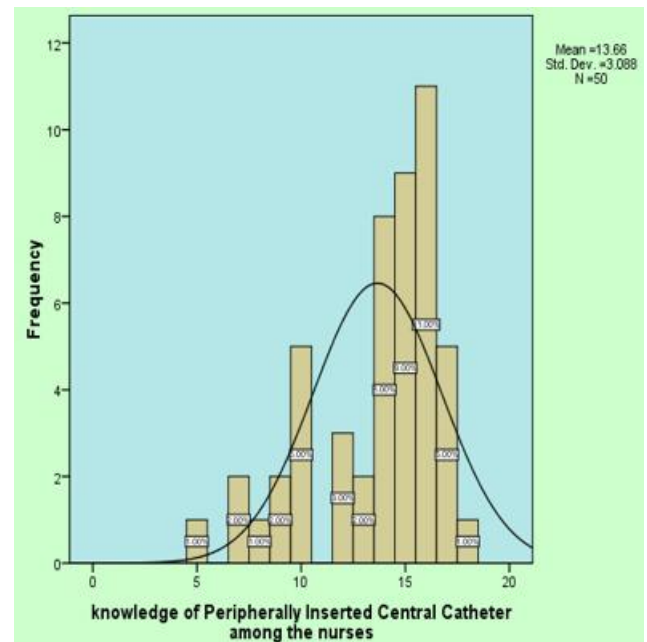


Figure 8: Histogram with normal distribution curve of knowledge of Peripherally Inserted Central Catheter among the nurses.

Section III: Description of care score of the nurses regarding Peripherally Inserted Central Catheter.

Table 9: Frequency and percentage distribution of level of care on Peripherally Inserted Central Catheter among the nurses, N=50

Level of care	Frequency (f)	Percentage (%)	Median	Mean	SD
Poor	11	22	14	12.86	4.629
Average	19	38			
Good	20	40			

Table 9 depicts the frequency and percentage distribution of level of care on Peripherally Inserted Central Catheter among the nurses. The table revealed that the majority 20 (40%) had a good level of care i.e. obtained scoring between 15-21, 19 (38%) had an average level of care i.e. scoring between 8-14, and 11 (22%) had poor level of care i.e. obtaining scores between 1-7. The median score was 14 and the mean stress score was 12.86 and SD=4.629.

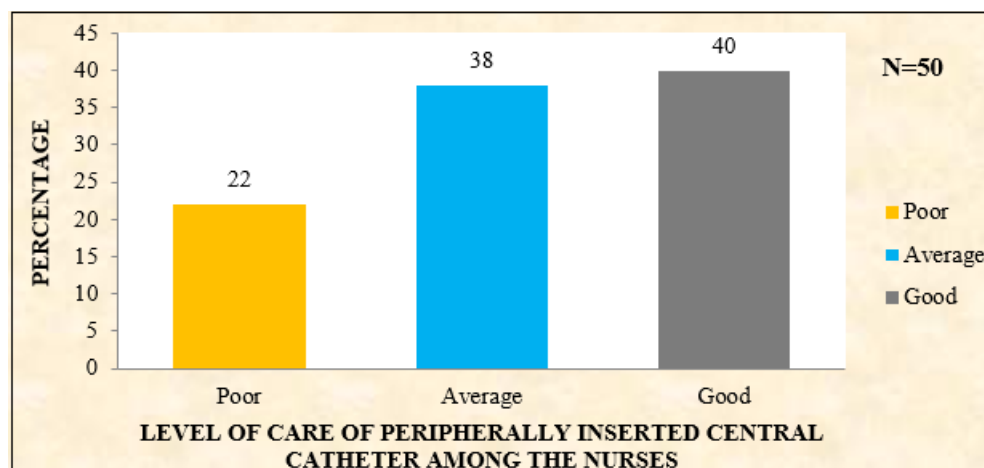


Figure 9: A clustered pyramid diagram showing the distribution of level of care on Peripherally Inserted Central Catheter among the nurses

Table 10: Descriptive statistics showing minimum score, maximum score, score range, mean, median mode, standard deviation, skewness, and kurtosis of care of Peripherally Inserted Central Catheter among the nurses

Descriptive statistics	Values
Mean	12.86
Median	14
Mode	7
Std. Deviation	4.629
Skewness	0.063
Std. Error of Skewness	0.337
Kurtosis	1.338
Std. Error of Kurtosis	0.662
Range	15
Minimum	5
Maximum	20

Table 10 depicts the average care score as 12.86 ± 4.629 . The scores varied from 5 to 20. The median and mode of the distribution were 14 and 7 respectively. The inequalities in mean, median, and mode showed that the level of care distribution is a negatively skewed distribution.

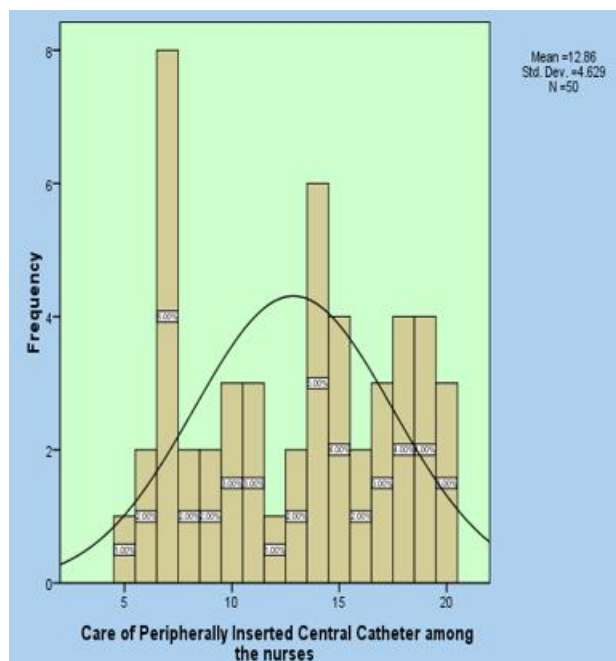


Figure 10: Histogram with normal distribution curve of care of Peripherally Inserted Central Catheter among the nurses

Section IV: Description of correlation between knowledge and care of Peripherally Inserted Central Catheter.

Table 11: Correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses, N=50

Correlation	Mean	SD	r value	p value	Significant
Knowledge	13.66	3.088	0.622	0.001*	S
Care	12.86	4.629			

* $p < 0.05$ level of significance S -Significant

Table 11 showed the correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses which was tested using Pearson coefficient correlation. Findings revealed $r = 0.622$ which indicates good positive correlation between knowledge and care of Peripherally

Inserted Central Catheter among the nurses and ($p = 0.001$) was statistically significant at $p < 0.05$ level of significance. Hence, the null hypothesis was rejected, and concluded that there was a significant correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses.

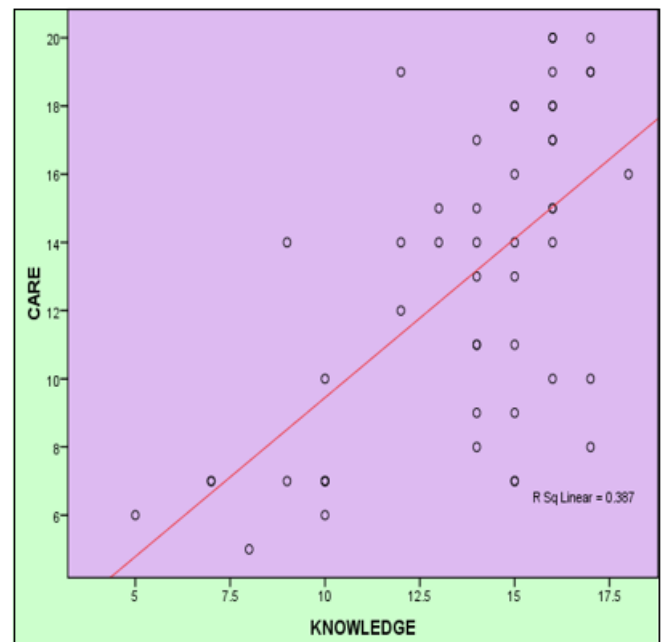


Figure 11: Correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses

5. Discussion

The present study was conducted to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses in a Cancer Hospital, Guwahati, Assam. The study was descriptive in nature, conducted over a period of four weeks in the month of August, 2022. The conceptual framework for the present study was developed from Ludwig Bertalanffy's System Theory (1968). The data was collected from 50 nurses working in the wards and day care chemotherapy units of Dr. Borooah Cancer Institute, Guwahati, Assam. A self-structured questionnaire was administered to assess the knowledge of Peripherally Inserted Central Catheter among the nurses. An observational checklist was also administered to assess the care of Peripherally Inserted Central Catheter among the nurses. Purposive sampling technique was used to select 50 nurses. The statistical data were entered in the master sheet for tabulation and statistical process.

6. Discussion of Major Findings

The findings of the study has been discussed with reference to the objectives and compared with other similar studies conducted in a different setting.

1) Percentage distribution of demographic proforma

In the age distribution of the study sample, it was seen that the majority of the sample were in the age group of 21-30 years i.e. 68% ($n = 34$), and 20% ($n = 10$) were in the age group of 31-40 years, 12% ($n = 6$) were in the age group of 41-50 years. There were no participants in the age group > 50 years.

In relation to gender, the majority of the sample were female i.e. 92% (n=46), and 8% (n=4) were male. No participants were transgender. In educational qualification wise, the majority of the sample were Basic B. Sc Nursing i.e. 54% (n=27), 18% (n=9) of them were GNM, 10% (n=5) of them were Post Basic B. Sc Nursing. 16% (n=8) of them were having an educational qualification in Post Basic Diploma in Oncology Nursing and 2% (n=1) had a qualification in M. Sc Nursing. In the study sample, it was evident that the majority of the nurses i.e. 42% (n=21) had 1-4 years of experience, 6% (n=3) had < 1 year of experience, 36% (n=18) had 5-10 years of experience and 16% (n=8) of them had > 10 years of experience. It was also evident that the majority of the nurses i.e. 80% (n=40) did not have any previous exposure to PICC line course, and 20% (n=10) had previous exposure to PICC line course. The analysis also revealed that the majority of the nurses i.e. 70% (n=35) were posted in the ward and 30% (n=15) were posted in day care chemotherapy.

2) Discussion about nurse's knowledge on Peripherally Inserted Central Catheter

In this study, the knowledge of nurses on Peripherally Inserted Central Catheter was assessed using a validated self-structured questionnaire consisting of 20 items with a total score of 20. It was found that 78% (n=39) had adequate knowledge i.e. obtaining scores between 0-10 and 22% (n=11) had inadequate knowledge i.e. scoring between 11- 20. The overall mean score was 13.66 (maximum score of 18) and the standard deviation was 3.088.

3) Discussion about nurse's level of care on Peripherally Inserted Central Catheter

In the present study, the level of care of nurses on Peripherally Inserted Central Catheter is assessed by using a validated observational checklist consisting of 21 items with a total score of 21. It was found that maximum of the nurses 40% (n=20) had a good level of care i.e. obtaining scores between 15-21, 38% (n=19) had an average level of care i.e. scoring between 8-14 and 22% (n=11) had a poor level of care i.e. obtaining scores between 0-7. The median score was 14 and the mean stress score was 12.86 and SD=4.629.

4) Discussion about the correlation of the nurses' knowledge and care of Peripherally Inserted Central Catheter

The correlation between knowledge and care scores of the nurses on Peripherally Inserted Central Catheter was assessed by using Pearson Correlation Coefficient. Table 11 showed the correlation of knowledge and care of Peripherally Inserted Central Catheter among the nurses. The result showed that „r“ value is equal to 0.622 which indicates a good positive correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses and (p=0.001) was statistically significant at p<0.05 level of significance. Hence, an increase in knowledge score would increase the level of care.

7. Major Findings of the Study

The major findings of the study are summarized as follows:

Findings related to demographic proforma:

- Majority of the participants i.e. 34 (68%) were in the age group of 21-30 years.
- Majority of the participants were female i.e. 46 (92%).
- Maximum participants i.e. 27 (54%) have an educational qualification of Basic B. Sc Nursing.
- Majority of the participants i.e. 21 (42%) had 1-4 years of experience.
- Majority of the participants i.e. 40 (80%) did not have any previous exposure to PICC line course.

Findings related to the level of knowledge on Peripherally Inserted Central Catheter:

- The mean knowledge score of the nurses was 13.66.
- Majority of the participants had adequate knowledge 39 (78%) i.e. scoring between 11-20.

Findings related to the level of care on Peripherally Inserted Central Catheter:

- The mean care score of the nurses was 12.86.
- Majority of the participants had a good level of care 20 (40%) i.e. obtaining scores between 15-21.

Findings related to the correlation between knowledge and care of Peripherally Inserted Central Catheter:

There was a good positive correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses (r=0.622) and (p=0.001) was statistically significant at p<0.05 level of significance.

8. Nursing Implications

The findings of this study have several implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

Nurses are dealing with patients having PICC line especially cancer patients who seek constant PICC maintenance and proper care. PICC line care demands expertise, clinical judgment skills and conscious, safe and efficient decision-making by the nurses. It is a specialized area and nurses who perform it should acquire theoretical knowledge of care in qualification courses and incorporate knowledge from other fields previously acquired throughout their education. This will provide nurses the basic theoretical and practical support, which enables them to safely and competently perform the care. The present study findings will indicate the existing knowledge and level of care of the nurses related to PICC. Hence, the present study will indicate the need for the acquisition of knowledge and improvement in skills related to Peripherally Inserted Central Catheter and its care among the nurses in hospitals and other settings.

Nursing Education

To provide quality nursing care and satisfactory care to the patients with PICC line, it is important that nurses acquired adequate knowledge and skills related to Peripherally Inserted Central Catheter. Therefore, this study will provide guidance and path to the nurses in the following manner:

- The study will help the nursing educator, nursing managers and educational institutions to identify areas of

improvement in the nurses and nursing students' knowledge and competency of care related to Peripherally Inserted Central Catheter.

- Staff development programs in the form of workshops, conferences, continuing nursing education (CNE) and training courses can be arranged related to Peripherally Inserted Central catheter for the nurses to improve and update their knowledge and skills to provide quality nursing care.
- Demonstration on care of Peripherally Inserted Central Catheter can also be arranged by trained nurses and nurse educators to improve the skills of fellow nursing individuals and student nurses.

Nursing Administration

- The present study findings will get the attention of the hospital administrator towards the need for continuing education programs, staff development programs, and training courses to improve the nurses' knowledge and care related to Peripherally Inserted Central Catheter.
- It will also help the administrator in planning for manpower, money, resources, and time to conduct a successful staff development program.
- The nursing administration will also make sure that each of the nursing staff acquired sufficient knowledge and skills related to the care of Peripherally Inserted Central Catheter.

Nursing Research

- Research is needed to generate new knowledge and refine the existing knowledge.
- The findings of this study can help conduct future research studies related to the topic.
- It will motivate nurse researchers to conduct more studies to improve the nurses' knowledge and care related to Peripherally Inserted Central Catheter.

9. Limitations

The study has some limitations as mentioned below:

- 1) Collection of data from heterogeneous clusters of demographic sources in just four weeks with a small sample size of 50 limits the generalizability of the study.
- 2) The samples were from the same hospitals hence generalization becomes limited only to the nurses working in the same hospital. Generalization cannot be made for nurses working in other cancer hospitals.
- 3) The study was confined to only nurses working in wards and day care chemotherapy units of a cancer hospital.

10. Conclusion

The present study was conducted with the aim to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah Cancer Institute, Guwahati, Assam. The data was collected using a self-structured questionnaire and an observational checklist. Based on the data analysis, the investigator concluded that the majority of the nurses 39 (78%) had an adequate level of knowledge and the majority of them 20 (40%) had a good level of care. The study also showed that there is a positive correlation between knowledge and care of Peripherally Inserted Central Catheter among the nurses at Dr. B. Borooah

Cancer Institute, Guwahati, Assam. It indicates that an increase in knowledge will result in an increase in the level of care. The study enabled the investigator to conclude that there is a room for improvement in the nurses' knowledge regarding Peripherally

Inserted Central Catheter as well as the need for workplace training. Therefore, it is very necessary to stress the importance of educational programs and workshops for nurses to improve their knowledge and care of PICC.

11. Recommendations

In the view of finding and limitation of the present study, the following recommendation has been suggested:

- 1) A similar study can be conducted with large samples.
- 2) A similar study can be replicated in similar and different settings to validate the findings and make a generalization.
- 3) A comparative study can be done to find out the effectiveness of structured education or simulation-based education on knowledge and care of Peripherally Inserted Central Catheter among the nurses.
- 4) A comparative study can be done to assess the knowledge and care of Peripherally Inserted Central Catheter among the nurses working in a cancer hospital and non-cancer hospital.
- 5) Maintenance of complications related to Peripherally Inserted Central Catheter can also be assessed among the study subjects.

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