



CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI) BUNDLES AMONG B.SC NURSING STUDENTS IN SELECTED NURSING COLLEGES OF GUWAHATI, ASSAM WITH THE VIEW TO DEVELOP THE INFORMATION BOOKLET: A DESCRIPTIVE STUDY

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ABSTRACT

Background: Catheter associated Urinary tract infection (CAUTI) is the most common among the device associated infections acquired from the hospital settings. Among hospital acquired UTIs, approximately 75% are associated with a urinary-catheters. Between 15-25% of hospitalized patients receive urinary catheters during their hospital stay leading to Catheter Associated Urinary Tract Infections (CAUTI) where care bundles are not practiced. Catheter-associated urinary tract infections (CAUTI) according to the center of disease control and prevention (CDC) is defined as UTI where an indwelling urinary catheter was in place for more than two calendar days on the date of event (day 1 being the day of device placement).

OBJECTIVES

1. To assess the level of knowledge regarding CAUTI bundles among B.Sc. Nursing students of selected nursing colleges in Guwahati, Assam.
2. To assess the level of attitude regarding CAUTI bundles among B.Sc. Nursing students of selected nursing colleges in Guwahati, Assam.
3. To find out correlation between knowledge and attitude regarding CAUTI bundles among B.Sc. Nursing students of selected nursing colleges in Guwahati, Assam.
4. To find out association of knowledge and attitude regarding CAUTI bundles among B.Sc. Nursing students of selected nursing colleges in Guwahati, Assam with selected demographic variables.

METHODS AND MATERIALS

A descriptive study design was used to accomplish the objective. Study was undertaken on 132 B.Sc Nursing students in selected nursing colleges of Guwahati, Assam by using non probability convenience sampling technique. Participants were selected based on inclusion and exclusion criteria. Structured knowledge questionnaire and 5 point Likert Scale were used to assess the level of knowledge and attitude.

RESULTS

The findings of the study shows that out of 132 B.Sc nursing students, majority .i.e.75.8% had moderately adequate knowledge, 18.1% had inadequate knowledge and 6.1% had adequate knowledge. Regarding attitude majority .i.e. 65.1% had desirable attitude, 34.1% had moderate attitude and 0.8% had undesirable attitude towards CAUTI bundles.

There was a positive correlation ($r=0.393$) between knowledge and attitude.

CONCLUSION

From this study, it was concluded that majority of the B.Sc Nursing students had moderately adequate knowledge and majority of the B.Sc Nursing students had desirable attitude regarding CAUTI bundles.

Therefore, the investigator concluded that proper education, hands on training regarding CAUTI Bundles are needed in order to improve the knowledge and attitude of B.Sc Nursing students regarding CAUTI bundles.

Key words

Knowledge, attitude, CAUTI Bundles

INTRODUCTION

Hospital acquired infections (HAIs) are the leading cause of morbidity and mortality in healthcare settings throughout the world, especially among the patients admitted in intensive care units (ICUs) ¹. Apart from increasing the stress, discomfort, pain, and activity restrictions among the patients, HAI also increase the economic burden in the form of prolonged hospital stay, lost work days, and laboratory and drugs costs. Catheter –associated urinary tract infection (CAUTI) is the most common HAI accounting for 40% of all HAIs and the second most common cause of nosocomial septicemia. According to the center for disease control and prevention (CDC), CAUTI increases the morbidity and mortality by 2.8-fold and length of hospitalization by 1-3 days. ²

Approximately 25% of hospitalized patients undergo urinary catheterization, whereas among critically ill ICU patients, it reaches to more than 70% resulting in >30 millions. In majority of the cases, use of catheter without proper indication, prolonged catheter days, improper procedural technique, and improper catheter care contribute to the development of CAUTI. UTIs may be caused by both Gram-negative and Gram-positive bacteria, as well as fungi. Uropathogenic *Escherichia coli* (UPEC) is the most common pathogen for both non-complicated and complicated UTI, making up 75% and 65% of infections, respectively. In complicated UTI, wherein CAUTIs make of the majority of cases, the overall most common causative organisms after UPEC include *Enterococcus* spp. (11%), *Klebsiella pneumoniae* (8%), *Candida* spp (7%), *Staphylococcus aureus* (3%), *Proteus mirabilis* (2%), *Pseudomonas aeruginosa* (2%) and group B *Streptococcus* (2%). The cornerstone for CAUTI is antibiotics. However, the abiotic surface of the catheter is subject to biofilm formation, and thus often resistant to antibiotic penetration. Further, antibiotic treatment has known collateral damage in that it selects for resistant bacterial strains and alters the vaginal and gut microbiota, which in turn may open additional niches for colonization by resistant organisms. Pili, adhesive virulence-associated factors that contribute to antibiotic evasion, may also serve to facilitate bacterial colonization of the intracellular niche. The rates of antibiotic resistance are increasing, and in 2013, the CDC declared that the human race is now in a “post-antibiotic era”, and in 2014, the World Health Organization warned that the antibiotic resistance phenomenon is becoming dire. Thus, CAUTI preventive strategies and alternative treatments to antibiotics treatment are critically needed. ³

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DESCRIPTION OF THE TOOL:

In order to meet the objectives of the study, the following tools were constructed which consists of Three sections:

SECTION I- Demographic Data**SECTION II –Knowledge questionnaire****SECTION III –Attitude scale****DATA COLLECTION**

The data collection period was scheduled between

22nd November to 20th December 2022 in five selected nursing colleges. The time schedule was 9am to 2pm. After getting ethical clearance from the INS trust ethics committee (GNRC Complex), Dispur, Guwahati, Assam, a formal written permission was obtained from the following Nursing colleges

- Purbanchal Educational Welfare Society (PEWS) Group of Institution, Guwahati
- Apollo College of Nursing, Guwahati
- Arya Nursing college, Guwahati
- Pratiksha College of Nursing, Guwahati
- Hayat Institute Of Nursing Education, Guwahati

RESULTS**SECTION I: FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF B.SC. NURSING STUDENTS****TABLE-I****FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES B.SC. NURSING STUDENTS**

n=132

| DEMOGRAPHIC VARIABLES | FREQUENCY (f) | PERCENTAGE (%) |
|---|----------------------|-----------------------|
| Age (in years) | | |
| <21 years | 45 | 34.1 |
| ≥21 years | 87 | 65.9 |
| Gender | | |
| Male | 7 | 5.3 |
| Female | 125 | 94.7 |
| Programs attended related to CAUTI bundles | | |
| YES | 30 | 22.7 |
| NO | 102 | 77.3 |
| Clinical exposure to CAUTI bundles | | |
| YES | 85 | 64.4 |

| | | |
|----|----|------|
| NO | 47 | 35.6 |
|----|----|------|

SECTION II

TABLE II: FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF KNOWLEDGE REGARDING CAUTI BUNDLES AMONG B.SC. NURSING STUDENTS

n=132

| LEVEL OF KNOWLEDGE | FREQUENCY(f) | PERCENTAGE (%) |
|--|--------------|----------------|
| Inadequate Knowledge $\leq 50\%$ (score ≤ 11) | 24 | 18.1 |
| Moderately Adequate knowledge 51-75% (score 12 – 16) | 100 | 75.8 |
| Adequate knowledge $\geq 75\%$ (score ≥ 17) | 8 | 6.1 |

The data presented in Table II shows that out of 132 B.Sc. Nursing students, majority of the B.Sc. Nursing students.i.e.,75.8% had moderately adequate knowledge, 18.1% had inadequate knowledge and 6.1% had adequate knowledge

SECTION III

TABLE III: FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF ATTITUDE REGARDING CAUTI BUNDLES AMONG B.Sc. NURSING STUDENTS

n=132

| LEVEL OF ATTITUDE | FREQUENCY(f) | PERCENTAGE (%) |
|--|--------------|----------------|
| Undesirable Attitude $\leq 50\%$ (score ≤ 30) | 1 | 0.8 |
| Moderately desirable Attitude 51-75% (score 31 – 45) | 45 | 34.1 |
| Desirable Attitude $\geq 75\%$ (score ≥ 46) | 86 | 65.1 |

The data presented in Table III shows that out of 132 B.Sc. Nursing students, majority of the B.Sc. Nursing students.i.e.65.1% had desirable attitude, 34.1% had moderately desirable attitude and 0.8% had undesirable attitude.

SECTION IV

TABLE IV: CORRELATION BETWEEN KNOWLEDGE AND ATTITUDE REGARDING CAUTI BUNDLES AMONG B.Sc. NURSING STUDENTS

The correlation was calculated by using Karl Pearson's test

n=132

| Variables | Mean | S.D | Karl Pearson's Correlation 'r' Value |
|-----------|-------|------|--|
| Knowledge | 13.73 | 2.47 | r = 0.383 p=0.0001, Significant |
| Attitude | 46.82 | 5.96 | |

Note: p<0.001, S – Significant

The data presented in Table IV shows the relationship between knowledge and attitude scores towards CAUTI Bundles among B.Sc. Nursing students. The table depicts that the mean score of knowledge was 13.73±2.47 and the mean score of attitude was 46.82±5.96. The calculated Karl Pearson's Correlation value of r=0.393 shows a positive correlation between knowledge and attitude which was found to be statistically significant at p<0.001 level. This clearly infers that when knowledge regarding CAUTI bundles among B.Sc. Nursing Students increases their attitude towards it also increases.

SECTION V

TABLE V: ASSOCIATION OF LEVEL OF KNOWLEDGE REGARDING CAUTI BUNDLES AMONG B.Sc. NURSING STUDENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLES

Fisher Exact test was used to assess the association between knowledge of CAUTI bundles among B.Sc. Nursing students with their demographic variables

n=132

| Demographic variables | Inadequate (f) | Moderately Adequate (f) | Adequate (f) | Fisher Exact test p-value | Remarks |
|---|----------------|-------------------------|--------------|---------------------------|----------|
| Age | | | | p=0.003* | S |
| <21 years | 9 | 29 | 6 | | |
| ≥21 years | 15 | 71 | 1 | | |
| Gender | | | | p=0.757 | N.S |
| Male | 2 | 5 | 0 | | |
| Female | 22 | 95 | 8 | | |
| Have you attended any workshop, seminars, presentation related to CAUTI BUNDLES? | | | | p=0.027* | S |
| Yes | 10 | 20 | 0 | | |
| No | 14 | 80 | 8 | | |

| Have you come across about CAUTI bundles protocols during your clinical posting? | | | | p=0.512 | N.S |
|--|----|----|---|---------|-----|
| Yes | 13 | 67 | 5 | | |
| No | 11 | 33 | 3 | | |

NOTE: p<0.01, *p<0.05, S – Significant, p>0.05, N.S – Not Significant

The data in table V depicts the association of level of knowledge regarding CAUTI bundles among B.Sc. Nursing students with their selected demographic variables.

INTERPRETATION:

AGE- As the p value is 0.003 which is less than at 0.05 level of significance, hence there is a significant association between the level of knowledge and age of respondents.

GENDER - As the p value is 0.757 which is more than at 0.05 level of significance, hence there is no association between the level of knowledge and gender of respondents

ATTENDED ANY WORKSHOP, SEMINARS, PRESENTATIONS RELATED TO CAUTI BUNDLES- As the p value 0.027 which is less than at 0.05 level of significant, hence there is a significant between level of knowledge and programs attended by the respondents.

CLINICAL EXPOSURE TO CAUTI BUNDLES – As the p value 0.512 which is more than at 0.05 level of significance, hence there is a no significant association between level of knowledge and programs attended by the respondents.

The analysis depicted that the demographic variables age (p=0.003) and attended any workshop, seminars, presentations related to CAUTI Bundles (p=0.027) had statistically significant association with level of knowledge

The other demographic variables gender (p=0.757) and clinical exposure to CAUTI bundles (p=0.512) did not show statistically significant association with level of knowledge regarding CAUTI bundles among B.Sc. Nursing students.

SECTION VI

TABLE VI: ASSOCIATION OF LEVEL OF ATTITUDE REGARDING CAUTI BUNDLES AMONG B.SC. NURSING STUDENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLES

Fisher exact test was used to assess the association between attitude of CAUTI bundles among B.Sc. Nursing students with their demographic variables.

n=132

| Demographic variables | Inadequate (f) | Moderately Adequate (f) | Adequate (f) | Fisher Exact test p-value | Remarks |
|---|----------------|-------------------------|--------------|---------------------------|---------|
| Age | | | | p=0.714 | N.S |
| <21 years | 0 | 17 | 21.2 | | |
| ≥21 years | 1 | 28 | 43.9 | | |
| Gender | | | | p=0.097 | N.S |
| Male | 0 | 5 | 1.5 | | |
| Female | 1 | 40 | 63.6 | | |
| Have you attended any workshop, seminars, presentation related to CAUTI BUNDLES? | | | | p=0.016* | S |
| Yes | | 15 | 10.6 | | |
| No | | 30 | 54.5 | | |
| Have you come across about CAUTI bundles protocols during your clinical posting? | | | | p=0.902 | N.S |
| Yes | | 28 | 42.4 | | |
| No | | 17 | 22.7 | | |

NOTE *p<0.05, S – Significant, p>0.05, N.S – Not Significant

The data in table IX depicts the association of attitude regarding CAUTI bundles among B.Sc. Nursing students with their selected demographic variables.

INTERPRETATION:

AGE- As the p value is 0.714 which is more than at 0.05 level of significance, hence there is no significant association between the level of attitude and age of respondents.

GENDER - As the p value is 0.097 which is more than at 0.05 level of significance, hence there is no association between the level of attitude and gender of respondents

ATTENDED ANY WORKSHOP, SEMINARS, PRESENTATIONS RELATED TO CAUTI BUNDLES- As the p value 0.016 which is less than at 0.05 level of significant, hence there is a significant between level of attitude and programs attended by the respondents.

CLINICAL EXPOSURE TO CAUTI BUNDLES – As the p value 0.902 which is more than at 0.05 level of significance, hence there is a no significant association between level of attitude and programs attended by the respondents.

The analysis depicted that the demographic variable attended any workshop, seminars, presentations related to CAUTI Bundles ($p=0.016$) had statistically significant association with level of attitude.

The other demographic variables age ($p=0.714$), gender ($p=0.097$) and clinical exposure to CAUTI bundles ($p=0.902$) did not show statistically significant association with level of attitude regarding CAUTI bundles among B.Sc. Nursing student.

CONCLUSION

The findings of the study showed that out of 132 B.Sc Nursing students, majority .i.e.75.8% had moderately adequate knowledge and 18.1% had inadequate knowledge and 6.1% had adequate knowledge. Whereas in attitude, majority.i.e.65.1% had desirable attitude, 34.1% had moderate attitude and 0.8% had undesirable attitude towards CAUTI bundles.

There was a moderate positive correlation calculated ($r=0.393$) between knowledge and attitude.

The association was statistically tested for knowledge by Fisher Exact test and analysis depicted that demographic variables age ($p=0.003$) and attended any workshop, seminars, presentations related to CAUTI Bundles ($p=0.027$) had statistically significant association with level of knowledge at $p<0.01$ and $p<0.05$ level respectively.

The association was statistically tested for attitude by Fisher Exact test and analysis depicted that demographic variable attended any workshop, seminars, presentations related to CAUTI Bundles ($p=0.016$) had statistically significant association with level of attitude at $p<0.05$ level.

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