

To What Extend does Reported Practice from Nurses in Management of Indwelling Urinary Catheters Reflect National Evidence-based Guidelines?

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Abstract

In recent years, Catheter-Associated Urinary Tract Infection (CAUTI) has progressively developed into a major hospital complication accounting for 60% of hospital-acquired infections; it is costly and morbid. Nurses account for more than half of the catheterisation conducted within hospitals. Due to this reason, it was important to identify whether nursing practice on the management of indwelling urinary catheter was in the reflection of the current national guidelines. The survey is conducted on 32 participants who reveal the strengths and limitation within the areas. Nurses account for more than half of the catheterisation conducted within the hospital. In order to prevent CAUTI complication, the research suggested training and education as the main solution since nurses significantly exhibited poor performance in terms of knowledge and skills in the area of catheterisation, especially in the induction process. Moreover, the study reveals that the use of bladder scan and system intervention which has been identified to reduce the number of catheter insertions contributes to the reduction of urinary bacterial infection.

Introduction

The study is aimed at discovering whether nursing practice on the management of indwelling urinary catheter was in the reflection of the current national guidelines. In addition, this study brings into effect the significance of CAUTI complicated issues as a result of the nursing practice. Research was conducted through an online platform where a survey form was availed, and professional nurses were invited to participate. The data was then gathered and analysed through SPSS where nursing practice in relation to catheter maintenance and catheterisation was explored. The outcome of the result was then used to identify some of the key strategies that could be employed in order to solve the problems relating to poor nursing practice within the area of catheterisation. Through the entire process, small data was identified as the main limitation of the study. Nevertheless, the result indicated that several nurses lack appropriate knowledge and skills that would enable them to exhibit the best professional practice in order to reduce the risks associated with CAUTI problems. As a solution to the CAUTI complication, system intervention and the use of bladder scan has been identified as the main preventive measures.

Methodology Study Setting

The investigation process incorporated nurses who possess the following characteristics; Those nurses who work in the UK, those operating under acute settings and hospitals where there exists higher risk of infection as compared to other environmental settings, nurses who have a dire experience and encounter with both female and male catheterisation process and nurses who have operated in

the National Health Service across the UK [1]. The recruitment of these nurses to participate in the survey followed an elaborate online process through the use of Twitter, LinkedIn, Research Gate and Facebook between May 25th, 2016 and July 31st the same year. An online web link that was formed was then distributed to the mentioned sites inviting nurses and allowing them to participate in the survey process. The use of the online process for participant invitation was mainly to obtain a quick response within the few stipulated hours. In addition, the target population was expected to be big, therefore, to deal with a larger number of participants, the online process especially the use of web link was highly recommended [2]. Furthermore, the survey questionnaire forms were availed to the nurses who responded and agreed to participate in the process after the inclusion rationale factors earlier identified had been considered.

Survey Techniques

A survey questionnaire that contains 53 questions was developed as a data collection tool based on the epic recommendation which was seeking to obtain answers on; the need for catheterisation, the selection type of the Catheter, knowledge of Catheter insertion, the maintenance procedure for catheter, competent training to the relatives, patients and other healthcare workers on the use of catheter and system application in the reduction of risks associated with the use of the catheter [3]. In addition, the survey contained both open and closed question concerning the nursing practice, for instance, the demographics, nursing experience, the availability of good training and specialisation, and the general nursing views on the entire process.

The survey was structured initially in December 2015 by healthcare professionals from universities and hospitals where it was aimed at obtaining information concerning the nursing general practice and the use of catheter, insertion, and maintenance. The experimental test was equally important for the National Institute of Health even to provide a better understanding and to assess whether the survey questions were relevant to the study topic. At this point, it was found to be necessary that additional open and closed questions be included to even enable obtain more comprehensive data on completion of the forms. Subsequently, another preliminary test was conducted in April 2016 where one student with other four nurses in practice was involved in order to assess the completion time.

Sampling Methods

After the recruitment through social media, the participants were then engaged through the online website where they could click on the link that directed them to the survey form. The sampling process was more effective on Twitter due to the large following a particular nurse had that facilitated quick circulation and response. The principal investigator applied a special setting on the Qualtrics that hosted the survey form hence enabling participants to only fill the sheet once. The response was continuously monitored and the participants could fill the forms they choose to continue later. Moreover, the participants had a free will to either continue with the process up to the completion or they could choose otherwise. At the end of the sampling, 33 survey forms were uncompleted.

Statistical Procedure

The G*Power was used in the calculation of the sample size where an adjustment of 90% was made on its power level effective of 0.3 in size and 0.5 alpha level. The calculation was expected to be conducted on 119 sample size however, participants who completed their survey forms at the particular time frame of 25th May to 31st July 2016 was 35.

Analytical Procedures

Statistical Package for Social Science (SPSS) version 22.0 was used to carry out a quantitative data analysis after they had been imported from the Qualtrics. The primary data analysis which was descriptive in nature was assessed and evaluated to confirm whether the data had been distributed evenly. The procedure employed to assess the normality was through the use of kurtosis, Shapiro, and Skewness in a probability-probability plot. In this type of test, $P > 0.05$ was a demonstration that the distribution fell under the required categories. On the other hand, secondary data analysis planned was the use of ANOVA which is mainly suggested for normally distributed data as demonstrated in the kurtosis and skewed graphs [4]. Similarly, correlational tests are equally important to assess the correlation between the dependent variables. Continuous and ordinal data were assessed through the use of Spearman Rho to obtain their correlation. Content analysis was important to analyse open-ended texts and unique words highlighted and coded. After this, the available data were assigned codes then expressed in terms of percentage and frequencies.

Results

The Recruitment

A total of 68 participants involved in the process where 33 did not complete the sheet hence only 35 completed the entire process. The rationale factors for choosing participants further excluded three hence the final number was 32. Out of this number, five were

males accounting for 16% while 27 were females accounting for 84%. Five (13%) participants were between the age of 18 to 24, 20 (62%) between 25 and 44, 8 (25%) between 45 to 64. The result obtained is summarized in the tables below.

Gender Responses

Figure 1.0

Gender	Number of Response	Percentage
Male	5	16%
Female	27	84%

Response According to Age

Figure 2.0

Age	Responses	Percentage
18-24	4	12
25-44	19	59
45-64	9	28

Response Based on Educational Level

Figure 3.0

Educational Grading	Responses	Percentage
Diploma	8	25%
BSc	15	47%
MSc	3	9%
PhD	1	3%
Others	5	16%

Response According to Nursing Experience

Figure 4.0

Years of Nursing Experience	Response	Percentage
Below 1 year	1	3%
1-9	15	47%
10-25	8	25%
Above 25 years	8	25%

Response Based on Specialty

Figure 5.0

Ward Specialty	Responses	Percentage
A and E	1	3%
Care of the Elderly	6	19%
Critical Care	5	16%
HASU	2	6%
Oncology	3	9%
Urology	4	13%
Others	11	34%

Male and Female Catheterisation

The result was then analysed through SPSS to identify the knowledge on the use and maintenance of the catheter on various genders. The process also assessed the type of training the participants underwent and the following responses were obtained. 59% of the participants had female catheterisation training while 41% had none. In their respective working places, 25% of them had gone through the training while 75% were not exposed to such female catheterisation

training. 63% of the participant had training on male catheterisation while 37% had none, 16% of the participants had an induction on their current workplace on male catheterisation training while 84% had none.

Type of training for female catheterisation at induction proved that 63% had classroom teachings while 80% for male catheterisation, 88% had practical teaching on female training while 100% for male, 53% had training on simulation female while 80% on male educational training and 25% on workbook theory for female catheterisation while 80% for males.

Knowledge of Epic3 Guidelines

Bladder Scan Training as Measure to Reduce CAUTI Risks

The result established that only 47% had bladder scan training while 53% had none. Out of the total respondents, only two indicated that bladder scan was necessary to reduce risks associated with the CAUTI. Out of the 26% of the respondents who were undecided whether the bladder scan was unnecessary, 50% (n=13) of them do not use bladder scan and 17% had limited access to the scan, other 17% revealed that retention can be identified without the scan and therefore unnecessary. Similarly, another 17% were not knowledgeable about the use of the scan.

Insertion of Catheter

The insertion is done according to Epic3 guidelines where the lubricant is used prior, to minimize infections, trauma, and urethral discomfort. 91% confirmed that they use this lubricant, 72% use urethral cleaning solution which was identified as sodium chloride, 66% use catheter securement while 66% noted that catheter removal was necessary on insertion according to the epic3 guidelines.

Catheter Maintenance

Catheter bags are suggested to be emptied at the three-quarters level, only 44% follow this recommendation. 88% of the participant stated that they don't add solution to the catheter bags which was theoretically correct, all the respondents attributed that the position of the catheter bag was very important where 41% stated that a good position promote better drainage, 16% recommended that it was necessary to prevent reflux while another 16% pointed out patient comfort. Still on the same, 13% stated that it was necessary to reduce infection while the rest gave no comment on the position.

System Intervention to Minimise Infection

Figure 6.0

Factor to considering	Correct responses (%)
Catheter care bundle availability	85%
Care bundle Documentation	67%
Auditing availability	54%
Audit Frequency	26%

Discussion

The study was aimed at discovering whether nursing practice on the management of indwelling urinary catheter was in the reflection of current national guidelines. The result revealed that there are specific key areas where nurses were less informed. Most importantly, the evidence established that there is good awareness in relation to epic3 guidelines pertaining to catheter removal, documentation and care bundle. Nurses were exposed to different training backgrounds for instance through the classroom, through practice, through simulation,

and through workbook theories.

Catheterisation Training for Males and Females

The result indicated that the majority of the nurses had proper training for both male and female catheterisation. One area that posed a challenge was induction training since most of the nurses had no training in their current workplaces. According to the audit conducted by Hampshire that identified methicillin-resistant *Staphylococcus aureus* (MRSA) as the main cause of bacterial infection to the urinary catheter, recommended that staffs needed to undergo more formal training in order to eliminate the problem [5]. Furthermore, nurses needed to continuously undergo education in these areas so that they may register improvements in some of the delicate areas of catheter induction which is closely linked to CAUTI risks. In more elaborate research conducted by Schneider (2012) in a patient with hip fracture revealed that nurses lacked knowledge on the importance of using catheter protocol, its documentation, insertion, and even removal [6]. The research, however, noted an improvement of nurse knowledge on the use of catheter whenever they were trained however it didn't determine whether there was a reduction on the CAUTI meaning there is no association between education and CAUTI rates. Nevertheless, the educational sessions are very important in improving nursing knowledge and to maintain their competency. In another research conducted by Bell et al (2016) on the educational session of nurses managing intensive and emergency care units where the learning was coupled with daily tracking and electronic reminders, minimized the number of catheter days which ultimately reduced the risk of CAUTI [7].

The study, however, did not establish any substantial differences between female and male catheterisation training. However certain compromising factors existed that drew the differences between them. For instance, insertion procedures and infection risks differed. According to Olmert (2008), infection risks were much greater in women than men due to their shortened urethra which exposes it more to bacterial infestation [8]. The use of incorrect catheter size is known to cause male catheterisation due to trauma. The study noted that the majority of nurses qualified for training for both female and male catheterisation. A quarter of the nurses had training for female catheterisation while a fifth had training for male catheterisation.

Under this category, it's important to note that training of the nurses using both theoretical models, classwork and practical sessions are very important in the reduction of risks associated to induction procedure, insertion, and maintenance which eventually minimizes the risks associated with CAUTI.

Awareness of Epic3 Guidelines

Generally, the study conducted revealed that nurses had a good knowledge of the Epic3 guidelines where they were assessed on the questions within the guidelines. The highest score was insertion procedure of the catheter, where the majority emphasized upon the use of the lubricant, the appropriate solution for cleansing the metal, catheter securement and prompt planning on how to conduct catheter removal on insertion. In addition, they were much informed on the policy required to change the catheter bag and the need for not adding a solution to the bag. Catheter care bundle documentation process was found to be necessary as it keeps nurses with the appropriate national guidelines. The audit which was conducted on 53% of the nurses was very important since it provided an assessment on the nursing practice where it measures performance, identifies an

existing problem, and make a recommendation for the areas which require improvement. Selection of catheter type, size and system still remained a misery among the nurses. The epic3 guidelines recommended catheter with the smallest gauge which permits free flow of urine [3]. The use of 12 to 14 Charrieres is recommended for females while males can use 12 to 16 [9].

The study also revealed that there is a lack of appropriate knowledge when it comes to catheter maintenance. The position of the catheter bag had no problem except for the patient's comfort which was mentioned by a few participants however, the frequency of emptying the bag posed a challenge. Considerably, more than half of the participants were not aware of the appropriate moment to empty the bag. Emptying the catheter bag frequently induces serious challenges since it increases the risk of CAUTI because, during the insertion process, there exist higher risks of bacterial infection [10].

Bladder Scan Training

Oman et al (2012) established that it was necessary to use bladder scan in order to reduce CAUTI risks [11]. Similarly, the responses provided by the nurses coincided with this argument where they emphasised on the need to use bladder scan due to its usefulness in gaging retention and to prevent unwanted catheterisation. Furthermore, it was found to be less invasive when compared to catheterisation. The relationship between the bladder scan and CAUTI was established due to the fact that when the use of bladder scan is increased, inserted catheters reduces in number hence a reduction in the risk of CAUTI. As a confirmation experiment to support this logic, Cutright (2011) conducted a research to establish the impact the use of bladder scan has on the number of inserted catheters, the study revealed that bladder scan use prevented re-catheterisation process by 80% and catheterisation procedure by 87% [12].

In the UK where short term use of catheter has posed serious challenges, the use of bladder scan is known to have saved almost £20,000 per month due to the fact that the process prevents CAUTI associated risks as explained by Trueland (2015) [13]. The only challenge that the study revealed is that still a significant number of nurses nationally do not have training on the bladder scan. Only 47% had the training skills on the use of bladder scan. Therefore, it's important to incorporate both the theoretical education in the classroom and the practical work that would enable nurses to learn the use of bladder scan so that CAUTI complication may be reduced.

Improvement Strategies for the use and Maintenance of Catheter

Evidently, from the data which has been obtained from this study, several challenges need to be made nationally in order to equip nurses in the UK with the best practices which coincide with the current national guidelines which would reduce the risks of CAUTI by gaining much knowledge on the preventive measures which has been identified as the use of bladder scanning. Moreover, catheterisation and catheter maintenance should be the main point of focus within the nursing class. Intervention is needed in managing catheter insertion which by far has progressively increased urethral infection during the induction process. Since it was identified that CAUTI has a big impact on the healthcare financial system, strategic policies relating to education and training should be adopted by clinical educators and managers in order to address the problem. In order to progress in addressing CAUTI complications, compulsory educational system for all nurses for the catheter maintenance and

use should be initiated.

Strengths and Limitation of the Study

Despite the fact that CAUTI has been a national problem, the area is still marked with underdeveloped resources characterised with few works of literature especially on matters relating to its prevention. In this research, the study, therefore, identifies the strategic mechanism of preventive measures that can be used to solve the problem of CAUTI within the UK and even abroad. The study put more emphasis on the nursing practice where training that coincides with the epic3 guidelines are necessary for the acquisition of skills for catheter maintenance and catheterisation through bladder scan and system intervention.

One of the major limitations of this study was the availability of a small sample size. The assumption can be made that result will not reflect the actual population which didn't participate in the process. In addition, the self-relied responses of the participants can comprise the outcome of the result hence affecting the validity of the analysis.

Conclusion

The study was aimed at discovering whether nursing practice on the management of indwelling urinary catheter was in the reflection of current national guidelines. The study further demonstrated the use of epic3 guidelines in the nursing practice for catheter maintenance and catheterisation where the nursing practice put more emphasis on the induction procedure and insertion of the catheter. Furthermore, the research identifies CAUTI as a national problem that requires preventive measures through the use of system intervention and bladder scan. The preventive measures are only achieved through the adoption of the appropriate educational and training system that reflect epic3 guidelines [14-20].

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