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Nursing Students' Knowledge and Understanding of Acute Cystitis

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By

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Abstract

Acute cystitis (AC) is characterized by a sudden inflammation of the bladder caused by bacteria. The severity of AC ranges from mild to severe and may be recurrent, especially in at-risk populations. Bacteria in the bladder may travel further into the urinary system, causes urinary tract infections (UTI's) resulting in urosepsis. Hygienic procedures play a large role in decreasing the bacteria that causes AC, so it is important for nursing students to understand and correctly apply the knowledge learned throughout the curriculum. This study focused on the knowledge and understanding nursing students have about AC. To determine this information, a short questionnaire was emailed to nursing students using the Checkbox software. A letter to potential participants included information about the study and consent was obtained when the participant chose to complete the survey. The survey consisted of seven questions on demographic data, AC, sterile versus medical asepsis, and hand hygiene. Frequency tables were used to determine differences in knowledge and understanding of the questions. The results of this study showed that nursing students need to review material on acute cystitis, hand hygiene, and medical versus surgical asepsis. These findings are consistent with literature that has suggested nursing students may need to review information about AC and its related concepts.

Nursing Students' Knowledge and Understanding of Patient-Centered Care Concerning Acute Cystitis

The purpose of this research study was to determine the amount of knowledge and understanding nursing students have about acute cystitis (AC). A seven-question online survey asked the participants questions about their knowledge and understanding of medical and surgical asepsis, hand hygiene (HH), and AC. The survey was used to gather data, which was analyzed to determine the students' knowledge and understanding of AC. Numerous studies have been conducted on nursing student's knowledge on hygienic procedures, many of which have reported a less than satisfactory amount of correctly answered survey questions. Faculty members use multiple learning and teaching techniques to provide students with knowledge on AC to assist them to understand the material.

Background

AC is an inflammation of the bladder caused by bacteria entering the body through the urethra. The bacterium present in AC can cause inflammation and a urinary tract infection (UTI), which can produce varying degrees of discomfort. Uncomplicated AC is a localized inflammation in the bladder, while complicated AC extends into the ureters and kidneys that increase the possibility of the patient developing urosepsis (Li & Leslie, 2020). Medical asepsis, surgical asepsis, and HH techniques need to be reviewed and understood by nursing students to provide knowledge and understanding of how to prevent AC. Medical asepsis disinfects a surface to keep microorganisms from multiplying, while surgical asepsis eradicates microorganisms (Hassan, 2019). Surgical asepsis involves "sterilization," which uses heat, steam, or chemicals to maintain sterility of an area (Hassan, 2019); this information is taught throughout the curriculum.

Medical and sterile asepsis, HH, and acute cystitis are introduced at the beginning of the curriculum in didactic and lab. As students' progress through the curriculum, procedures that involve medical and surgical asepsis, such as urinary catheter insertion, are taught to further students' knowledge and understanding of the information taught in didactic and lab. Urinary catheter insertion is taught in the second semester didactic and lab, as well as aseptic techniques and urinary catheter care. Students are also taught how AC, UTI's, and sterility relate to children, pregnant women, and the elderly population. In addition to lab and didactic education, there is a Skills Fair at the beginning of each semester, starting with second semester, that provides additional one-on-one learning opportunities where students may manipulate the equipment, ask questions for clarification, and repeat skills previously learned. Faculty teach the information in several ways, from different learning styles, didactic courses, labs and assignments, through the Assessment Technologies Institute (ATI) tutorials and exams, and virtual clinicals. These teaching and learning techniques are used throughout the program to educate students about AC, UTI's, and hygienic procedures.

Literature Review

There is an abundance of information published on nursing students' knowledge and understanding of hygienic procedures and AC. Brosio et al. (2017) completed a research study regarding knowledge of hygienic procedures and standard precautions that nursing students learn in a nursing program. They provided copies of the same questionnaire to 339 nursing students from years 1-3. The anonymous questionnaire was used to determine the knowledge retained and understood about HH, standard precautions, and healthcare associated infections (HAI's). The first portion of the questionnaire consisted of demographics, while the second half contained six true or false questions (Brosio et al., 2017). Microsoft Excel 2007 was used to enter the collected

data, which was then analyzed by the Statview 5.0.1 software. ANOVA showed a variation in the average score of the three risk factors that were researched. A chi-square was then used to identify differences in the students' knowledge on the presented topics, with $p < 0.05$ being statistically significant. Brosio et al.'s study revealed that nursing students had less than sufficient knowledge on hygienic procedures and AC (Brosio et al., 2017).

It is possible that nursing students may possess less than satisfactory knowledge on HH, as Brosio et al. (2017) revealed that nursing students had less knowledge about when to use gloves while initiating patient contact and when to use alcohol-based solutions instead of traditional handwashing. Knowledge of when one can substitute traditional handwashing with alcohol-based solutions increased as the students continued through the curriculum. The students also lacked adequate knowledge on HH, which indicates a decrease in that knowledge as students progressed through the curriculum (Brosio, 2017). Knowledge of HH may be deficient in many students, but this, along with AC and other hygienic procedures, is being taught in multiple ways in nursing curriculums.

Carter et al. (2017) performed a national study looking at nursing students' education on hygienic measures that showed that 47% were taught in simulation labs, 33% in lecture, and 20% in the clinical setting; the study revealed that HH was taught for one to three hours during the curriculum. Carter et al. (2017) identified that 63% of the participants reported being taught aseptic technique in simulation labs, while 34% of participants stated that the time spent educating students on this topic ranged from four to eight hours. Most students indicated that they understood where, when, and how to use infection prevention and why the methods were important, however 40% of the remaining students indicated that further education was needed in their curriculum (Carter et al., 2017). One source from the Carter et al. (2017) study stated that

students might consider studying additional resources along with provided coursework to improve their knowledge and understanding.

The Centers for Disease Control and Prevention (CDC) provides information supporting the stance that students need additional studying to increase retention of their knowledge and understanding of AC, HH, and aseptic techniques. Section IV.A of the infection control segment provides knowledge regarding appropriate hygiene practices (CDC, 2019). Since students were found to lack sufficient knowledge on certain hygienic procedures, this material presented by the CDC would be helpful in reviewing and understanding information about hygienic procedures and AC.

Milo et al. (2016) performed a study that identified that nursing students possessing a satisfactory amount of knowledge on hygienic procedures could still benefit from additional reviews of the material to increase retention. This study included a 12-question survey that was administered to 186 undergraduate nursing students to assess their knowledge base regarding HH. Instead of semesters, this nursing program has periods 5-9; the students in each period were given the questionnaire. There were two parts of this questionnaire with 12 questions total, and the maximum number of correct answers for each section was six since there were six questions in each of the two sections. Milo et al.'s (2016) study found that the average student knowledge of HH was 8.6% out of each of the five periods of students; this was a high average and indicated a satisfactory level of knowledge that the nursing students had on HH. Milo et al.'s (2016) study concluded that, although there was a high and even distribution of knowledge among the students in each period, the material still needed to be reviewed. The study supports using resources, such as the CDC's Section IV.A, as additional learning and teaching methods within the curriculum.

Research Question

The research question used in this study is: What is the knowledge and understanding of AC for nursing students in semesters 3-5 at East Tennessee State University (ETSU)? This research question was used to evaluate students' knowledge and understanding on AC. A survey, with informed consent, was emailed to the cohort class presidents who then distributed the email to each cohort, after which the data was compiled and examined. The results of this study provided a glimpse of the knowledge and understanding of AC and hygienic procedures that participants had.

Significance and Consequences

AC and hygienic procedures have been researched extensively, looking at hospitals, private practices, public knowledge, and education. Data gathered through this study assisted in understanding nursing students' knowledge and understanding of AC. Various research studies have been completed on AC that included age, gender, physical symptoms, medical treatments, and prevention measures. This study targeted nursing students to assess their knowledge and understanding since they are the ones learning this information. It is important that nursing students are aware of all aspects of AC, hygienic procedures, and medical and surgical asepsis. If they are not, then they will not have the knowledge and understanding to make appropriate decisions regarding patient care.

Methods

After gaining approval from the International Review Board (IRB) to do this research study, quantitative data was collected via a seven-question online survey that was sent to the class presidents who then distributed it to their cohorts. Informed consent was obtained by participants when they chose to complete the survey. After obtaining informed consent and beginning the

survey, participants answered seven questions separated into two sections. The first section of the survey gathered demographics information that included the participant's race, gender, age, and current semester of nursing school. The second section was comprised of a forced Likert scale with three questions on sterile and medical asepsis and AC. The first question was, "I understand the differences between medical and surgical asepsis better than the previous semester." The second question was, "I understand the importance of knowing and understanding AC." The third question was, "I have knowledge of and understand the signs and symptoms of AC." The following is the forced Likert scale used in the online survey for the three questions centered around AC (see Appendix A).

Once the data was collected, frequency tables were created to see how much knowledge and understanding students have about AC. After the data was compiled by a statistician within ETSU's College of Nursing, the author interpreted and presented the findings. The information from the survey was stored on a secure ETSU drive.

Results

Seven questions were asked in an online survey, four about demographics and three about AC and medical versus surgical asepsis in a forced Likert scale. The results showed the frequency of all the questions. There were two Hispanic participants and one who chose "other" when answering the demographic question about race. This means that most participants were Caucasian. The predominant age group was 18-24, with only four participants being in the 25-32 age group. There were no participants above the 25-32 age group. The following tables show the frequency of the demographic questions in first section of the survey.

Most of the participants were female, with only five male and one "prefer not to answer" participant. The percentage of female participants was 85.4%, the percentage of male

participants was 12.2%, and the percentage of those who preferred not to answer was 2.4% (Table 1).

Table 1

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	35	85.4	85.4	85.4
	Male	5	12.2	12.2	97.6
	Prefer not to answer	1	2.4	2.4	100.0
	Total	41	100.0	100.0	

The majority of participants were Caucasian (92.7%), with only a couple identifying as Hispanic or Latino (4.9%) and one participant choosing ‘other’ (2.4%) (Table 2).

Table 2

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasian	38	92.7	92.7	92.7
	Hispanic or Latino	2	4.9	4.9	97.6
	Other	1	2.4	2.4	100.0
	Total	41	100.0	100.0	

The age range of participants was mostly 18-24 (90.2%) and then age 25-32 (9.8%) (Table 3).

Table 3

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	37	90.2	90.2	90.2
	25-32	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Most participants reported being in fourth semester (43.9%) then third semester (31.7%) and finally fifth semester (24.4%) (Table 4).

Table 4

Semester in Nursing School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fifth semester	10	24.4	24.4	24.4
	Fourth semester	18	43.9	43.9	68.3
	Third semester	13	31.7	31.7	100.0
	Total	41	100.0	100.0	

The frequencies of the three questions were gathered by using a Forced Likert scale. Question one determined how many students agreed or disagreed with the statement of “I

understand the differences between medical and surgical asepsis better than the previous semester."

Question one showed that 17.1% of participants disagreed with the statement about understanding the differences between medical and surgical asepsis. There were 41.5% of participants who chose 'agree' and strongly agree.'

Table 5

Question one: I understand the differences between medical and surgical asepsis better than the previous semester.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 – Disagree	7	17.1	17.1	17.1
	3 – Agree	17	41.5	41.5	58.5
	4 – Strongly Agree	17	41.5	41.5	100.0
	Total	41	100.0	100.0	

Question two looked at how many students agreed or disagreed with the statement, "I understand the importance of knowing and understanding acute cystitis." It showed that 2.4% of participants chose 'strongly disagree,' 22% chose 'disagree, 43.9% chose 'agree,' and 31.7% chose 'strongly agree.'

Table 6

Question two: I understand the importance of knowing and understanding acute cystitis.

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	1 - Strongly Disagree	1	2.4	2.4	2.4
	2 - Disagree	9	22.0	22.0	24.4
	3 - Agree	18	43.9	43.9	68.3
	4 - Strongly Agree	13	31.7	31.7	100.0
	Total	41	100.0	100.0	

Question three, which was about knowing and understanding signs and symptoms of AC, showed that 39% of participants chose ‘disagree’ and ‘agree,’ and 22% chose ‘strongly agree’ (Table 7).

Table 7

Question three: I have knowledge of and understand the signs and symptoms of acute cystitis.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 - Disagree	16	39.0	39.0	39.0
	3 - Agree	16	39.0	39.0	78.0
	4 - Strongly Agree	9	22.0	22.0	100.0
	Total	41	100.0	100.0	

Discussion

The participant pool for this research study was n=41. The results showed that more than half of the participants either agreed, or strongly agreed to having a good knowledge base and understanding regarding the differences between medical and surgical asepsis and AC; however, there were several participants that indicated they did not have a good working knowledge of

medical and surgical asepsis and AC. Those participants may have a harder time applying that information when dealing with both knowledge and understanding of AC instead of only knowledge of AC. The results of question one showed that 34 participants, or 83%, either agreed or strongly agreed with the statement about understanding AC. The results of question two showed that 31 participants, or 76%, either agreed or strongly agreed with the statement, but there was one 'strongly disagree' selected. Question three is where 16 students, or 39%, chose 'disagree' and only 25 students, or 61%, chose 'agree' and 'strongly agree.' Choosing 'strongly disagree' or 'disagree' may indicate need for further study and review on the material from that question.

Question one asked if the participant understood medical versus surgical asepsis better than the previous semester. The results indicated that while 17.1% of participants chose 'disagree,' the majority agreed with this statement. All remaining participants were evenly split at 42% for 'agree' and 'strongly agree.'

Question two, which was about understanding the importance of knowing and understanding AC, did have one strongly disagree, which was 2.4% of participants. There were 18 participants, or 44%, who agreed with the statement. There were 18 participants, or 44%, who chose 'agree' and only 13 participants, or 32%, who chose 'strongly agree.' There were 31 participants, or 76%, who chose 'agree' and 'strongly agree,' which was a less than desirable percentage of participants who stated that they understood the importance of having the knowledge and understanding of AC.

Question 3 asked about knowing and understanding of signs and symptoms instead of solely asking whether they understood the importance of knowledge and understanding of hygienic measures or AC. There were 16 participants, or 39%, who chose 'disagree' and 'agree,' and only

22%, or nine participants, who chose ‘strongly agree.’ This question was about being able to recognize signs and symptoms of AC and not simply knowing about the importance of AC, so it was more application-based.

The results indicated that some students may need further teaching and review of AC. Question one showed that 17.1% of participants disagreed with the statement about understanding the differences between medical and surgical asepsis and 41.5% of participants agreed or strongly agreed. The results of question two showed that 2.4% of participants chose ‘strongly disagree,’ 22% chose ‘disagree, 43.9% chose ‘agree,’ and 31.7% chose ‘strongly agree.' Question three, which was more application-based, showed that 39% of participants chose ‘disagree’ and ‘agree,’ and 22% chose ‘strongly agree.’ Since question three was more application-based, the 39% of participants who disagreed may have trouble applying their knowledge of AC in the clinical setting. The students who chose ‘disagree’ and ‘agree’ may need further teaching and study time to help them succeed in caring for future patients in the clinical setting.

Implications

The study revealed that 41.5% of students either agreed or strongly agreed with having working knowledge of medical versus surgical asepsis and AC. Question two, which was about having knowledge of AC, showed that 2.4% of participants chose ‘strongly disagree’ and 22% chose ‘disagree.’ Question three, which asked about knowing and understanding signs and symptoms of AC, showed that 39% of participants chose ‘disagree.’ For these participants that either disagreed or strongly disagreed, this now provides them with an opportunity to study and review information on AC. Reviewing possible areas of weakness as students continue through the nursing program can help find those who may need further assistance in understanding

material on AC. This study can be used to help provide student accountability and give them the opportunity to study and review information regarding AC. At-home simulation kits were also provided to give students additional learning opportunities outside of the classroom. After studying the material, if the students feel like they need to increase their knowledge and understanding, they can go to tutoring through ETSU's Office of Student Services (OSS). These options should be kept in mind, since without enough knowledge and understanding of the material students will have a harder time applying the information in the clinical setting; this can be detrimental to the care of future patients.

Limitations

A limitation of this study is that AC has been researched in the past, but more detailed questions on the knowledge and understanding of the students were asked in this research study. This study was confined to one program in one college at one university in northeast Tennessee, and only included participants in semesters 3-5. Participants were asked three objective questions to collect quantitative data, meaning they will be unable to explain their answers in detail or leave comments or suggestions. The demographics revealed that the participants were predominantly female, from ages 18-25, and Caucasian. Future research may include a different university and additional questions to gather qualitative and quantitative data.

Conclusion

This study demonstrated that 74.7% of participants self-reported having knowledge and understanding of information on hygienic procedures and AC, but 25.3% of participants did not; those who lacked knowledge and understanding of AC need to review that material. This information is important since knowledge leads to better decision making and outcomes to allow for safer and more efficient care of patients. Students who do not have a firm foundation of this

knowledge may require reinforcement of previously learned information on AC and HH. Application of knowledge in supplementary simulations would incorporate further hands-on experiences in a controlled setting. Learning and teaching methods differ with each person, so allowing time for hands-on training along with didactic, labs, assignments, exams, and clinicals addresses a broader range of students.

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Appendix A

Forced Likert Scale for Survey on AC

	Strongly Disagree	Disagree	Agree	Strongly Agree
I understand the differences between medical and surgical asepsis better than the previous semester.	1	2	3	4
I understand the importance of knowing and understanding AC.	1	2	3	4
I have knowledge of and understand the signs and symptoms of AC.	1	2	3	4