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Araştırma/Research

Gambiya'daki Bir Üçüncü Basamak Hastanede Sağlık Bakım İlişkili Enfeksiyonların Önlenmesinde Hemşirelerin Bilgi, Uygulama ve Tutumları

Nurses' Knowledge, Practice, and Attitudes in Preventing Healthcare-associated Infections in a Tertiary Hospital in Gambia

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Öz

Amaç: Gambiya'da üçüncü basamak bir hastanede çalışan hemşirelerin, sağlık bakım ilişkili enfeksiyonları önleme ve kontrol etme konusundaki bilgi, uygulama ve tutumlarını belirlemektir.

Gereç ve Yöntem: Araştırma tanımlayıcı ve kesitsel desende yürütülmüştür. Çalışmanın evrenini, 441 hemşire oluşturmaktadır. Örneklem, evreni bilinen örnekleme yöntemini kullanarak 205 hemşire olarak hesaplanmıştır. Araştırmanın verileri, araştırmacı tarafından yapılandırılmış kişisel bilgi formu ve hemşirelerin sağlık bakım ilişkili enfeksiyonu önleme ve kontrolünde bilgi, uygulama ve tutum ölçeği ile çevrimiçi google form kullanılarak toplanmıştır. Çalışmanın verileri, Mann–Whitney U testi, post hoc testi, Kruskal-Wallis H testi ve Spear-men testi kullanılarak analiz edilmiştir.

Bulgular: Hemşirelerin çoğunluğu (%60) kadın, yaklaşık yarısı (%48.3) 18-27 yaş aralığında ve tamamına yakını (%96.1) Gambiyalı'dır. Hemşirelerin sağlık bakım ilişkili enfeksiyonu önleme ve kontrol etmede bilgi, uygulama ve tutum ölçek toplam puan ortalamasının 197.21 olduğu belirlendi. Hemşirelerin en yüksek ortalama puanı (84,57) uygulama, en düşük ortalama puanı (41,30) ise tutum alt boyutundan aldıkları belirlendi ($p<0.05$).

Sonuç: Hemşirelerin sağlık bakım ilişkili enfeksiyonunu önleme ve kontrol etme konusundaki bilgi ve uygulamaları iyi düzeydedir. En düşük puan tutum ölçeği alt boyutunda olduğu için konuya ilişkin olumlu tutum geliştirmeye yönelik hizmet içi eğitimlerin planlanması önerilmektedir.

Anahtar Kelimeler: Bilgi, enfeksiyon, hemşire, önleme, uygulama

Abstract

Aim: To determine the knowledge, practices and attitudes of nurses working in a tertiary hospital in the Gambia regarding the prevention and control of healthcare-associated infections.

Materials and Methods: The study was conducted as a descriptive and cross-sectional design. A descriptive research design was conducted in a tertiary hospital in the Gambia. The population of this study was 441 nurses. The sample was calculated as 205 nurses using the sampling method whose population is known. The study data were collected using web-based surveys that are structured personal information form and the scale for knowledge, practice and attitude of nurses in infection prevention and control by the researcher. Data from this study were analyzed using, the Mann–Whitney U test, the post hoc test, the Kruskal-Wallis H test, and the Spear-Men test.

Results: The most of the nurses (60%) are female, almost half of them (48.3%) are 18-27 years old, and almost all of them (96.1%) are Gambian. It was found that nurses' knowledge, practice, and attitude scale total score mean in preventing and controlling healthcare-associated infections was 197.21. It was determined that the highest overall mean score (84.57) from the application, followed by knowledge (71.34) and the lowest attitude (41.30) score.

Conclusion: The level of knowledge and practice of nurses about preventing healthcare associated infections is at a good level. It is recommended that in-service education be planned to develop positive attitudes since the lowest score for prevention and control of the infection is in the attitude scale sub-dimension of nurses.

Keywords: Infection, knowledge, nurse, practice, prevention

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Introduction

Healthcare-associated infections (HAIs) are infections that patients acquire while they are admitted to or staying in the healthcare setting.[1] Knowledge of infection prevention and control measures are critical element in the preventing of HAIs.[2] These infections are neither present nor incubating prior to the patient's hospitalization in a particular healthcare setting. HAIs are a widespread, dangerous health issue that raises great concerns on both the patient's and healthcare professionals' safety.[3] HAIs cause patients to stay in the hospital for long time, negatively affecting treatment and may lead to loss of life. Patients, healtcare professionals, and their relatives spend much money when they get HAIs.[2,4] HAIs are the major recurrent disadvantage in terms of patient outcomes in healthcare settings globally.[5] At any given time, the prevalence of HAIs varies between 5.7% and 19.1% in low- and middle-income countries. The mean prevalence is significantly higher in high-income countries (15.5%) than in low-income countries (8.5%).[4]

The World Health Organization (WHO) reported that, hundreds of millions of patients are exposed to or affected by HAIs globally yearly, causing severe, high mortality rates, and bankruptcy in healthcare settings, especially in Africa.[4] The Gambia is one of the smallest country in Africa. A study was found on the prevention and control of HAIs in the Gambia.[5] In the study conducted in Gambia, It was found that many healthcare professionals have inadequate hand hygiene performance as well as limited availability of hand hygiene resources from healthcare settings.[5]

The goal of infection control procedures is to lower the frequency of HAIs it includes both basic safety measures and a guide on infectious diseases.[6] Standard precautions include hand hygiene, respiratory hygiene, personal protection equipment, safe infection practices, sterile intruments and devices, sharps safety, and cleaning and disinfection.[1]

Utilizing their infection prevention and control training, nurses play a significant role in patient safety. They illustrate infection prevention and control measures to patient thereby playing a pivotal role in minimizing the spread of HAIs.[6] Studies have found that nurses have high level of knowledge on infection prevention and control in HAIs.[6-10] Furthermore, researches have shown that nurses with low knowledge and practice scores on prevention and control of HAIs may have a very high rate of negligence in preventing them.[7-11] In Khatrawi et al.'s (2023) study, in which nurses from various countries participated, the findings showed that nurses had a good understanding and positive attitude towards the prevention of HAIs.[12]

Exploring the knowledge and practice of nurses in infection prevention and control will help them to understand and to apply recommendations on how to improve infection prevention and control practices in the Gambia.[13] The findings of this research can also be used for educational reasons. Policies need to be made in the hospital to ensure that general prevention measures against

HAIs are successfully implemented among nurses and other healthcare personnel. This study aims to determine nurses' the knowledge, practices, and attitudes regarding healthcare-associated infection prevention and control at a tertiary hospital in the Gambia.

Research Questions

1. What is the level of scoring for knowledge, practice, and attitudes regarding the prevention and control of HAIs among nurses at a tertiary hospital in the Gambia?
2. Is there a relationship between these scoring levels and the sociodemographic characteristics of the nurses?

Materıals and Methods

Research Design

'The study was conducted as a descriptive and cross-sectional design.

Population and Sample

The sample size was calculated from the total population of 441 nurses working in Kanifing general hospital in the Gambia. There are four leading at a tertiary hospital in the Gambia. The hospital has a total bed capacity of 200. It is one of four tertiary public healthcare settings in the country, serving a catchment population of more than 600,000 people, approximately 30% of the Gambian population. The sample size of the study is 205 nurses. This size was calculated using the sample size method of sample size determination of the known population.

Inclusion criteria of study;

- To work at at a tertiary hospital in the Gambia and
- To be volunteer to participate in the study
- To speak, understand and read English

Exclusive criteria of the study;

- To work as nursing student in a tertiary hospital

Data Collection Tools and Procedure

Data from the study were collected using web-based surveys that are structured personal information forms and the scale for knowledge and practice of healthcare-associated infections. The researcher collected the study data between December 09, 2022, and January 30, 2023. In order to collect the data, the online survey Google form link was shared with nurses' WhatsApp groups in the hospital and the nurses' association or by email. The link to the survey form was shared until the sample size was reached. Reminders were given regularly in groups every week. The link of the research was shared with information about the sampling criteria, and those who were eligible filled in the link. Since all questions were determined as compulsory, the

participants in the research proved the questions completely. Completing of the surveys took almost 10 minutes.

Personal Information Form

This form was used to collect the participant's personal information, and it consists of 9 questions that include their age, gender, nationality, nursing educational level, nursing category, current specialty unit/department, marital status, working duration as a nurse, and employment status. The personal information form was developed by two surgical nursing experts.

The Scale for Knowledge, Practice, and Attitude of Nurses on Hospital-Acquire Infections

The scale was created to observe nurses' knowledge, practice, and attitude of nurses in infection prevention and control**.** Dr Kamunge developed the scale at the University of Seton Hall. Permission was granted to use this scale. The scale consists of seven points that assists in knowing nurses's the knowledge, practice and attitude of nurses in infection prevention and control. Likert 7 points scale format which is; 1=Strongly Disagree, 2=Slightly Disagree, 3=Disagree, 4 =Neutral, 5 = Agree, 6=Slightly Agree, 7=Strongly Agree. The scale comprises of 33 questions and total score of 7 is a higher score. The Cronbach's alpha value is 0.72. The lowest score on KPA total score is 33 and the highest is 231.There are three divisions; the first is knowledge response, which includes 11 questions ranging from 1-7 on Likert scales. The lowest score of this division is 11, and the highest is 77. The second is practice response with has 14 questions ranging from 1-7 on a Likert scale. The lowest score of the second division is 14, and the highest is 98. The last is attitude response, which has eight questions ranging from 1-7 on a Likert scale. The lowest score is eight, and the highest is 56. The higher the score, the higher the level of knowledge, attitude, and practice on HAIs.[14]

Data Analysis

Data were analyzed by using the Statistical 26.0 (SPSS) package program. The distribution of nurses according to their socio-demographic characteristics was evaluated by frequency analysis. This study used percentile, mean, and standard deviation for descriptive scale scores and age statistictics. For statistical analysis, parametric tests was used when they fit the normal distribution for continuous data, and non-parametric tests when it does not to analyses the relationship between the scoring of the scale and socio-demographic characteristics. At this moment, data of this study were analyzed using then Mann – Whitney U test, the post hoc test (Dunnett T3 test), the Kruskal-Wallis H test and the Spear-men test.

Ethical consideration

The researcher took the permission from Kanifing general hospital. Also, the researchers obtained permission from Dr. Kamunge to utilize the scale in this study. Participations were

informed about the purpose of the study, and their signed informed consent was collected via online survey. This study was approved by the Near East University (NEU) ethics committee (NEU/2022/108-1657).

Results

Table 1. Sociodemographic characteristics of the participants (n=205)

Variable	Categories	Frequency (n)	Percentage %
Gender	Female	123	60.0
	Male	82	40.0
Age Range	18 – 27	99	48.3
	28 – 37	88	42.9
	38 – 47	16	7.8
	48 and above	2	1.0
Nationality	Gambian	197	96.1
	Nigerian	5	2.4
	Others*	3	1.5
Marital Status	Single	142	69.3
	Married	63	33.2
Nurses Education Level	Bachelors	63	30.7
	Master's degree	7	3.4
	Others**	136	65.9
Nursing Category	Registered Nurse	136	66.3
	Enrolled Nurse	59	28.8
	Others***	10	4.9
Employment Status	Full time	187	91.2
	Part time	8	3.9
	Contract	6	2.9
	Others****	4	2.0
Years of Nursing Experience	1-5 years	112	54.6
	Below 1 year	12	5.9
	Above 10 year	5	2.4
Specialty Unit or Department	Medical-Surgical Ward	52	25.4
	Maternal (Labor &Delivery, Post-natal)	34	16.6
	Pediatric or Neonatal Unit	33	16.1
	Acute Care	26	12.7
	Emergency Care	26	12.7
	Critical Care or Intensive Care unit	16	7.8
	Telemetry or Recovery	10	4.9
	Psychiatric or Behavioral	8	3.9

*Other = Liberian & Sri Lankan,
** Educated, they went through The Gambia college/University, The Gambia School of Nursing or The Gambia School of CHNs/ ENs Nurses etc. They are all registered nurses who have sat The Gambia nursing state board exam and certify by Nurses and midwifes council in the county in order to execute nursing duties.
***All others types of Nurses including Senior Nurse Attendants, Nurse Attendants etc.
**** Daily hire

It was found that most of the nurses (60%) are female, almost half of them (48.3%) are 18-27 years old, almost all of them (96.1%) are Gambian and most of them (66.8%) are single.

It was determined that the majority of the nurses (66.3%) are registered nurse, most of them (30.7%) have a bachelor's degree, most of them have worked for 1-5 year (54.6%) as full time (91.6%). In this study, nurses stated that they worked in various departments, where are medical-surgical department (25.4%), maternal (16.6%) and pediatrics or neonatal department (16.1%), respectively (Table 1).

Table 2 presents the descriptive statistics of the nurse's scores on the Scale of Knowledge, Practice, and Attitude of HAIs. The total score on the Scale of Knowledge, Practice, and Attitude of HAIs has a mean of 197.21 and a standard deviation of 11.23 (min.:122.00- max.:218.00). The practice has the highest total mean score of 84.57, followed by knowledge with mean score of 71.34, the lowest mean score was the attitude which has 41.30. The total mean score of KPA of 197.21, which is 85.3% of the total score of 231, shows that, on mean, the KPA of nurses concerning HAIs is good. The Practice means a score of 84.57 is 86.1% of 98. This indicates that nurses have good practice in the prevention of HAIs. The Knowledge mean score is 71.34, which is 96.6% of 77, indicating that they are well knowledgeable about the prevention of HAIs. Lastly, is attitude, the mean score is 41.3 which is 74% of 56. This again indicates that nurses have an intermediate attitude in the prevention of HAIs.

Table 2. The descriptive statistics nurse's scores on the scale of knowledge, practice, attitude of healthcare-associated infections (n=205)

	$\bar{x}$	s	Min	Max
Total Score on Scale of Knowledge, Practice, Attitude of HAIs	197.21	11.23	122.00	218.00
Knowledge Subscale	71.34	4.82	34.00	77.00
Practice Subscale	84.57	6.39	44.00	94.00
Attitude Subscale	41.30	3.69	34.00	53.00

Min.= Minimum, Max.=Maximum, $\bar{x}$=mean, s=standard deviation

There is no statistically significant difference exists between age group, nationality, marital status, and the score scale of knowledge, practice, and attitude on HAIs among nurses. There is a statistically significant difference between level of education, category of nurses, level of employment, nursing experience, department, and the total scale score or subscale score of knowledge, practice, and attitude on HAIs in this study. Nurses with bachelor's degrees have higher scores of practice subscale on HAIs than other educational groups in this study. Registered nurses have higher scores on the score of attitude subscale – HAIs than enrolled and other nurses. However, there is no statistically significant difference in their

knowledge and practice toward infection prevention and control. Nurses who with worked full time have the highest score as compared to others' employment status of the nurses in terms of knowledge ($p< 0.05$) and practice ($p<0.001$) in infection prevention and control. Nurses who worked for one or five years have higher total scores, knowledge subscale, and attitude subscale than other nursing experience categories. In the surgical ward, maternal scores are higher on the KPA of HAIs than in other departments. However, no statistically significant difference exists in their practice and attitude toward infection prevention and control ($p>0.05$).

Discussion

The results of this study showed that nurses have a good level of practical skills (mean score=85 points out of 98 points) in preventing HAIs. It was determined that almost all of the nurses have well knowledge (mean score=71 points out of 77 points) and majority of nurses have an intermediate attitude (mean score=41 points out of 56) in the prevention of HAIs. (Table 2) Nurses may be receiving in-service training on HAIs. The success of the infection control team may also have influenced this result. It is thought that most of the nurses are recent graduates because their working hours are short and they are young. (Table 1) Therefore, knowledge scores may be higher than practical and attitude scores due to more up-to-date theoretical knowledge.

Studies have shown that most of the nurses (approximately range=73%-89%) have good knowledge and clinical practices and positive attitudes towards the prevention and control of HAIs and those results support the findings of our study.[3,9,10,12,15-21] In a study conducted in South Africa,[13] to determine nurses understanding due of the increasing number of HAIs, 90% of nurses who took part in the study washed their hands before and after performing any health procedure. 99.5% of nurses practiced routine hand cleanliness after coming into contact with patients' fluids in same study.[13] In a study conducted in Saudi Arabia, the percentage of nurses who answered individual HAIs knowledge questions correctly ranged from 40.9% to 95.5%.[6] Some studies found that nurses have moderate knowledge, practice, and attitudes towards the prevention and control of HAIs.[8,22] In Khatrawi et al.'s (2023) study, in which nurses from various countries participated, the findings showed that nurses had a good understanding and positive attitude (KAP: 74.1, 73.07, and 88.7) towards the prevention of HAIs.[12] Similar to our study, in this study[12], it is seen that the attitude scores towards infection prevention and protection are lower than practice and knowledge scores. However, it is noteworthy that the attitude score (KAP: 71.3, 41.3, 84.5) in our study was quite low (Table 2). Cultural factors in the Gambia and the hospital's policies and procedures regarding infection control may be the reason for these differences.

Some studies did not supports this study findings that nurses with low knowledge and practice scores on preventing and controlling in HAIs have a very high negligence rate in preventing them.[7,11] A systematic review study highlighted that nurses need a better performance level despite adeuate knowledge and a positive attitude about HAIs.[23] Nurses with poor and moderate levels of knowledge, practice, and attitude on HAI's, have different demographic characteristics and work in different clinics and different working conditions. These factors are seen as the reason for the differences among studies. For example, the large number of patients and long working hours can negatively affect nurses' ability to prevent and control HAIs. In underdeveloped countries, barriers to accessing healthcare resources also lead to negative attitudes and inadequate practices in HAIs protection and prevention.

There is a statistically significant difference between level of education, category of nurses, level of employment, nursing experience, department and the total scale score or subscale score of knowledge, practice, and attitude on HAIs in this study. The level of education increases, nurses' practice about HAIs decrease. This indicates that there were statistically significant differences in nurses' practices based on their level of education. The more extended nursing experience and level of employment of those with lower education levels may have affected this result. In this study, registered nurses have higher scores on the score of knowledge, practice and attitude about HAIs than enrolled nurses. Full-time working nurses have higher levels of knowledge, practice, and attitude toward HAIs. This finding suggests that the level of employment may affect the extent to which nurses are knowledgeable about and able to practice infection prevention and control. In some studies, it was found that as working experience of healtcare profesionals/nurses increases, their knowledge, practice, and attitude of towards HAIs prevention becomes more suitable.[6,12,18] The study results of Alojaimy et al (2021)[6], Bayleyegn et al (2021)[18], and Khatrawi et al. (2023)[12] support our study result.

In Getahun et al.'s, (2022) study conducted in a hospital in Tanzania Africa, showed the performance of nurses with a degree or a higher quality of nursing education was considerably more significant than that of nurses with low level of training in nursing.[24] A study conducted in a hospital in India, it was found that nurses working in the surgical ward at the time of the investigation had little understanding of infection prevention and control.[25] The findings are also with a study at a hospital in Egypt, which evaluated healtcare professionals' knowledge, attitudes, and practices of healthcare professionals about trash disposal and indicated that experience length and coaching had no significant impact on knowledge, attitude, and practice ratings.[7] In Bayleyegn et al. (2021), it was found that as educational level

of healtcare professionals increases, their attitude of towards HAIs prevention gets more suitable[18] Otherwise, similar of this study, in Kurt's Study (2021), the level of education increases, nurses' knowledge about HAI's decreases.[13] In Alojaimy et al.'s (2021) study, a high score on HAI knowledge and practices among nurses was significantly associated with high education level.[6] Overall, these results highlight the importance of considering various factors influencing nurses' knowledge, practice, and attitude toward infection prevention and control. By understanding these factors, interventions and training programs can be designed to target specific areas where improvements are needed.

In this study, the difference between the maternal and intensive care units, and maternal had higher scores than other departments. However, there is no statistically significant difference in their practice and attitude toward infection prevention and control ($p>0.05$). According to their department or expertise, nurses' behavior and attitude did not change significantly. The findings suggest that there may be variations in the training and education provided to nurses in different departments or specialties, which could impact their knowledge of infection prevention and control. Nurses working in specific departments may need more targeted training and education to ensure that they are adequately equipped to prevent and control infections. For instance, nurses working in psychiatric departments may require additional training in managing infections related to mental health conditions. Although there were no significant differences in nurses' practice and attitude, this does not necessarily mean that all nurses in all departments are equally skilled in infection prevention and control. It is possible that there are individual differences among nurses within each department or specialty, which were not captured in this analysis. In Fakery et al.'s (2018) study conducted in medical and surgical units, the majority of the nurses had a good level of awareness regarding injection safety.[26] It is reported that infection control and prevention knowledge of nurses is important especially in surgical and intensive care units, which are risky units.[27-30]

In this study, it was determined that the subscale of knowledge on HAIs increases, practice tends to increase as well, and practice increases and attitude tends to decrease. The fact that nurses increase the level of knowledge about preventing HAIs shows that this knowledge will reflect positively on practice. However, as the working experience of the nurse increases, their practice skills on preventing HAIs improve, but their attitude towards HAI' decreases.

Conclusion

It is recommended that in-service educations be planned to develop positive attitudes, since the lowest score for preventing and controlling of HAIs is in the attitude scale sub-dimension of nurses. It is recommended that hospitals and healthcare setting offer nurses continuing

programs about infection prevention and control of HAIs, for especially for groups with long nursing work experience, part-time and non-registered nurses. It is recommended that future research might examine the influence of continuous education and training programs on nurses' understanding, application, and attitudes toward HAI prevention and management as well as on patient outcomes. Further investigation is needed to understand the expertise and conduct of nurses in infection prevention and control to evaluate the effects of other variables not included in this study. Additionally, it is important to consider other factors that may influence nurses' knowledge, practice, and attitudes on HAIs, such as working hours and duration, the approximate number of patients.

Limitation

The research was limited to only one hospital in Gambia. Nurses who could access the online survey link filled out the google form. Therefore, the findings of the study cannot be generalized to other hospital in the country. There could be potential reporting bias due to self-reporting of knowledge, practice, and attitude toward infection prevention and control than observational or objective evaluation.

Conflict of interest

The authors declared no conflicts of interest.

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