

Research Paper



Knowledge and practice of hand hygiene among healthcare workers in a selected hospital

Sulaiman Umar^{1*}, Zakari Usman², Yahuza Garba³, Samaila Abba⁴, Babangida Abubakar⁵

^{1,3}Department of Nursing Science, College of Health Sciences, Federal University Birnin Kebbi, Kebbi State, Nigeria.

²Department of Nursing Science, Faculty of Allied Health Sciences, College of Health Sciences, Usmanu Danfodiyo University Sokoto, Sokoto State, Nigeria.

⁴Department of Nursing Science, College of Health Sciences, Abdullahi Fodiyo University of Science and Technology Aliero, Kebbi State, Nigeria.

⁵Department of Nursing Services, Kebbi State University Teaching Hospital, Birnin Kebbi, Kebbi State, Nigeria.

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ABSTRACT

Introduction: Hand hygiene (HH) denotes to washing hands with soap and water, or other cleansers containing an antiseptic agent to reduce or prevent the growth of microorganisms.

Aims: The aim of the study was to assess the knowledge and practice of hand hygiene among healthcare workers in Sir Yahaya Memorial Hospital Birnin-Kebbi.

Materials and methods: The research design used for the study was descriptive survey design. Purposive sampling technique was used to select 60 healthcare workers. Data was collected using structured questionnaire. The collected data were tabulated in Excel and transported to IBM SPSS version 20.0.

Results: The study result showed that, 16.7% of respondents are categorized as having "Poor Knowledge" with scores of 40% or less. 26.7% fall into the "Average Knowledge" category, which includes scores ranging from 50% to 60%. The majority of respondents, accounting for 56.7%, demonstrate "Good Knowledge" with scores in the range of 70% to 100%. This data provides insights into the distribution of knowledge levels within the surveyed group, with most respondents exhibiting good knowledge, while a smaller proportion falls into the average and poor knowledge categories. Therefore, the H0:1 Hypothesis was rejected, while H1:1 Hypothesis was accepted. The result revealed that 3.3% of respondents' exhibit "Negative Practice," falling within the score range of 0-3. The majority, accounting for 96.7% of respondents, demonstrate "Positive Practice," with scores ranging from 4-7. This data classifies respondents into two practice levels, with most displaying positive practice and only a small proportion showing negative practice. It offers insights into the distribution of practice levels within the surveyed group. Hence the H1:2 Hypothesis was accepted, while H0:2 Hypothesis is rejected.

Conclusion: There was statistically significant association between their level of knowledge regarding hand hygiene with

their selected socio-demographic variables (profession, educational qualification, and years of experience).

Corresponding Author:

Sulaiman Umar

Department of Nursing Science, College of Health Sciences, Federal University Birnin Kebbi, Kebbi State, Nigeria.

Email: rnumarsulaiman91@gmail.com

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1. INTRODUCTION

1.1. Background of the Study

Hand hygiene (HH) denotes to washing hands with soap and water, or other cleansers containing an antiseptic agent to reduce or prevent the growth of microorganisms. The World Health Organization (WHO) regards HH as the most active way of decreasing the spread of pathogens that cause health care-associated infections (HCAIs) and stimulates HH in the Clean Care is Safer Care programme [1], Failure to adhere to hand hygiene can lead Hospital acquired infections to medical or surgical patients [2], World Health Organization terms HH practices as those “that help to sustain health and prevent the transmission of diseases”. These practices include behaviors to disinfect one’s body and surrounding environment [3]. However, hand hygiene is the best effective and low-cost method to prevent Health Care Acquired Infections (HCAIs), although the significance of HH is well understood, adherence rates continue to be sub-optimal [4], the United State Center for Disease Control and Prevention recognizes that around 1.7 million of hospitalized individuals yearly get some sort of HCAIs and that more than nine hundred thousand (98,000) of these individuals (one out of 17) pass away as a result of HCAIs. On the other hand, the European Center for Disease Prevention and Control approximates that annually 4,131,000 patients are acted by a HCAI and that on regular, 37,000 patients pass away from it. HCAIs occurrence cannot be allowed and hand hygiene is one of the necessary preventive procedures [5], nearly 5% - 15% of hospitalized individuals globally get HAIs and the growing usage of antibiotics has led towards antimicrobial resistance. HAIs are one of the highest reasons of death in majority nations. With the frequency rising at frightening rate contamination rates in emerging economies are three to 20 times developed than in high-income nations. Even though, HH is one of the important actions for inhibiting HAIs, adherence remains a serious problem in various hospitals across the globe [6].

Moreover, HAI have severe consequences for patients and health care organisms, resulting to longer hospitalization, rising in mortality and morbidity, and economic burden in Europe, nearly eighty thousand (80,000) hospital patients suffer at least one HAI every day. Yielding an overall incidence of 5.7%. HAI also affect many patients globally every year. HAI causal organisms can be conveyed to patients through healthcare workers’ hands contaminated by touching the patient environment or patient contact. Effective HH is precarious to prevent HAI [7], it is very difficult to adhere to hand hygiene guidelines in low and middle income nations as result of overpopulation, access to water-sources, lack of awareness, and proper training [8].

In addition, hand hygiene competency is one of the serious consequences in nursing, ensuring healthcare providers adhere to hand hygiene will reduce the rate of healthcare associated infections [9], pathogenic microorganism could be transferred in Hospitals through patients hands but little is known regarding barriers of hand hygiene among hospitalized patients and the facilitators [10], when optimally performed, it play a significant role in the prevention of healthcare associated infections and contributes to the improvement of patients outcome [11]. While a large population of multidrug resistant infections in nursing homes may be prevented through hand hygiene behavior of nurses [12], improving patients hand

hygiene has important clinical outcomes in reducing nosocomial infection [13], [14], [15], some rural communities have poor perception of about the important of hand hygiene [16], effectiveness of hand hygiene play a vital role during COVID-19 in addressing risk prevention [17]. Therefore, the researcher felt the desire to conduct a study to assess the knowledge, and practice of hand hygiene among healthcare workers {HCWs} in Sir Yahaya Memorial Hospital Birnin Kebbi, Kebbi State, Nigeria.

2. RELATED WORK

A descriptive study was conducted on impact of HH and the HH compliance among healthcare students at Martin of Comenius University, Bratislava. The findings revealed that, only few (32.9%) of the participants did not performed hand hygiene properly [18], nurses and doctors demonstrated good knowledge in infection prevention and hand hygiene and there was a noticeable gap in their knowledge of infection prevention [19], 45.80% of the participants had average knowledge of hand wash, this study identify gap related to hand hygiene. It is important to provide training programme on infection preventive measures [20].

Cross-sectional study was conducted on Hand hygiene among pharmacist and other healthcare professionals in different settings of Jordan. The results depict that there was a significant difference in total knowledge mean score 59.22 vs 61.45, $p = 0.02$ between pharmacist and other healthcare professionals. According to sex the mean score was 597.22 vs 61.79; $p = 0.030$ in favour of males [21], 61.30% of the respondents practice of infection prevention [22].

Another study was conducted on assessment of knowledge, attitude, and practices of HH among medical and nursing students. Seven pre-medical students, 22 nursing students, 18 clinical students, and 26 MD students (73 total participants) are enrolled for this study. Data was collected online and analyzed using SPSS version 21.0. Only 28.6% pre-medical students had no knowledge of hand hygiene, majority (90.9%) of nursing students had sufficient knowledge of hand hygiene, and 72.2% clinical students had sufficient knowledge. There was statistically significant association between the students' level of knowledge regarding hand hygiene and their selected socio-demographic characteristics with $p < 0.025$ [23], in another study finding in Southern Nigeria 70.0% perceived HH as a major for prevention of hospital acquired infections and there is association between the respondents age and their level of perception with $p = 0.012$ [24]. Knowledge of hand hygiene was compare between those in Hajj and Umrah 68.00% and 63.00% respectively with the difference mean total 4.1 vs. 3.7, $p < 0.001$ [25].

2.1. Statement of the Problem

The goal of the study was to assess the knowledge, and practice of hand hygiene among healthcare workers in Sir Yahaya Memorial Hospital Birnin Kebbi, Kebbi State, Nigeria.

Precisely, it seeks to response the following questions

1. What is the sociodemographic data of the participants in terms of age, sex, profession, years of experience, area of practice and educational qualification?
2. What is the level of knowledge of HH among healthcare-workers?
3. What is the level of practice of HH among healthcare-workers?
4. Is there statistically significant association between their level of knowledge of hand hygiene and designated socio-demographic characteristics?

2.2. Research Hypothesis

1. $H_{1:1}$ There was a significance knowledge of hand hygiene among healthcare-workers.
2. $H_{1:2}$ There was a positive practice towards hand hygiene among healthcare-workers.
3. $H_{1:3}$ There was statistically significant relationship between their levels of knowledge of hand hygiene and designated socio-demographic characteristics.

2.3. Conceptual Framework

The framework used for this study was modified HEALTH BELIEF MODEL which was developed by Hochbaum Rosenstock and others in 1950's. This model addresses the relationship between an individual and behavior. It delivers a way of understanding and predicting how a person will behave in relation to their health, and how will obey with healthcare measures. A framework that described an individual health behavior as an appearance of health belief. The model was design to predict an individual's health behavior, including the use of healthcare services and to rationalize intervention to modify maladaptive health behavior. Components of the health model includes the individual's own awareness of susceptibility to a condition or disease, the perceived likelihood of contracting that condition or disease, the perceived benefits of care, and barriers to preventive behavior and the external or internal stimuli that results in proper. The main concept of health belief model

1. Perceived susceptibility
2. Perceived severity
3. Perceived benefit.
4. Perceived barriers
5. Lines of action.
6. Likelihood of behavioral change.

Individual Perceptions Component: In this study individual perception refers to healthcare workers' perception regarding hand hygiene practice.

Perceived Susceptibility: Predisposing factors like years of experience, and area of practice. So, inadequate knowledge, and practice of HH among healthcare-workers can increase their risk of getting infection.

Perceived Severity: Area of practice, if the healthcare workers are not practicing hand wash. Healthcare workers that are working in theatre or ward without practice hand hygiene. Therefore, failure to practice hand hygiene can predispose healthcare workers to higher risk of infection.

Perceived Benefits of Action: Participation in research regarding knowledge and practice of hand hygiene.

Component 2: Modifying factors in present study, the modifying factors are gender, age profession, years of experience, area of practice, educational qualifications, and religion.

Perceived Threats: In present study perceived threats of not practicing hand hygiene due to area of practice.

Lines of Action: refers to influence of educational qualification, area of practice, profession, mass media, television, chart, pamphlets, news-paper, health camps, health care personnel, and school.

Component 3: Likelihood of action in present study perceived benefits through assessing knowledge and practice of hand hygiene. The barriers may be unwillingness, non-availability and lack of time during data collection.

Likelihood of Change: Healthcare workers at Sir Yahaya Memorial Hospital Birnin Kebbi, may search for information regarding knowledge and practice of hand hygiene for their future use.



Figure 1. Conceptual Frame Work Based on Becker's Health Belief Model [26]

3. METHODOLOGY

3.1. Research Design

quantitative evaluative cross-sectional study was used to conduct this study among HCWs in Sir Yahaya Memorial Hospital Birnin Kebbi, Kebbi State, Nigeria. Self-structured questionnaire was used to gather the data from the respondent through online.

3.2. Population and Study Setting

There were 69 healthcare workers (including Nurses, Medical doctors, laboratory technicians, Dieticians, Pharmacists, Medical Imagery Scientist) in from Sir Yahaya Memorial Hospital (SYMh). SYMH is a government healthcare institution located in Birnin Kebbi, Kebbi State, Nigeria. The Hospital was built in 1952 with native authority, later it was commissioned in December 1952 as a General Hospital with a maternity and three wards (two female ward and one male ward).

After creation of Kebbi state from Sokoto state, the General Hospital was promoted to Specialist Hospital Birnin Kebbi. In 1997 Specialist Hospital was name again Sir Yahaya Memorial Hospital Birnin Kebbi to memorialize the 17th Emir of Gwandu who had a vision to build a hospital at that time on his farmland without soliciting for compensation. Later the hospital is only managing paediatric and maternity cases. Overall, Sir Yahaya Memorial Hospital shows a significant role in providing healthcare services to the individuals of Kebbi State, contributing to the upgrading of public health in the region (Sir Yahaya Memorial Hospital 2023).

3.3. Instrument for Data Collection

The instrument for data collection was a self-prepared closed-ended questionnaire to meet the needs of the research objectives. The questionnaire consists of three sections, section A, B and C; section A socio-demographic variable, section B consist of 30 questions on knowledge of hand hygiene, while section C consist of 20 questions on practice of hand hygiene.

3.4. Method of Data Collection

Data was collected from the participants using structured Questionnaire to assess their knowledge, and practice of hand hygiene.

Section A: It contains the demographic data of the research participants.

Section B: It contains questions on knowledge of hand hygiene

Section C: It contains questions on practice of hand hygiene

Formal permission was taken from the management of Sir Yahaya Memorial Hospital, Birnin Kebbi, Kebbi State. The data for the main study was collected among 60 HCWs, which comprised of healthcare workers, both male and female. They were all selected using consensus sampling. The investigator gave a formal self-introduction and explained the main purpose for the study. In an average it took 45 – 60 minutes to collect the response from the respondents. The subject was assured for confidentiality of their responses.

3.5. Method of Data Analysis

Data was analyzed using descriptive, and inferential statistics with the aid of IBM SPSS Statistics for version 20.0.

3.5.1. Descriptive Statistics

Sample criteria were analyzed by using frequency and percentage distribution tables.

3.5.2. Inferential Statistics

Chi-square test was used to find out the relationship between their levels of knowledge of hand hygiene and their designated socio-demographic variables.

3.6. Ethical Considerations

The study was conducted after the approval of the Ethical Committee of Sir Yahaya memorial Hospital, Birnin Kebbi. And written consent was also obtained from the study participants.

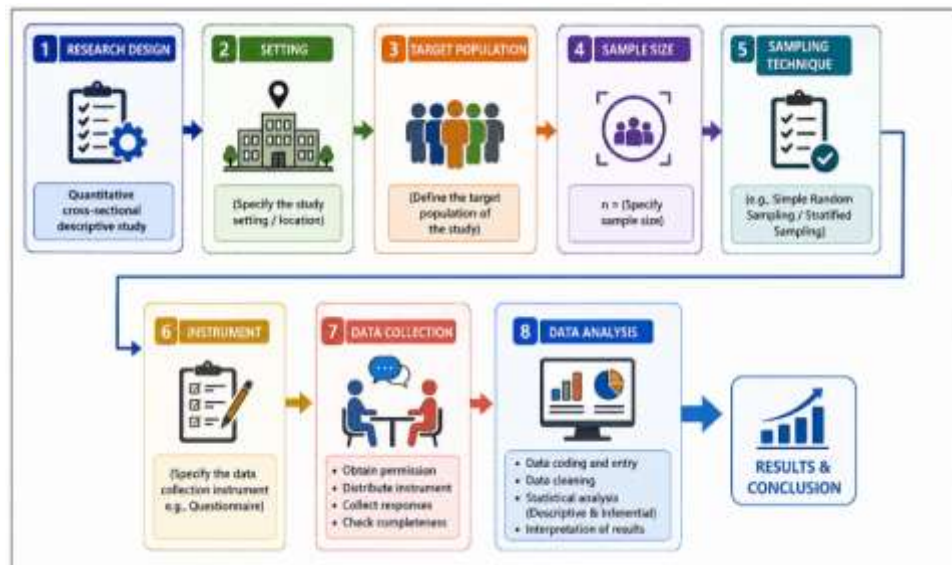


Figure 2. Schematic Representation of Research Methodology [27]

4. RESULTS AND DISCUSSION

Table 1. Percentage Distribution of Respondents' Demographic Characteristics N = 60

No.	Variables	Frequency	Percentage
1.	Age		
	21-30 years	51	85
	31-40 years	5	8.3
	41-50 years	3	5
	≥51 years	1	1.7
2.	Sex		
	Male	41	68.3
	Female	19	31.7
3.	Profession		
	Lab science	10	16.7
	Medicine	8	13.3
	Nursing	19	21.7
	Pharmacy	12	20.0
	Medical imaging	11	18.3
4.	Years of experience		
	0-5 years	32	53.3
	6-10 years	21	35.0
	11-15 years	2	3.3
	≥16 years	5	8.3
5.	Area of practice		
	Ward	25	41.7
	Pharmacy	13	21.7
	Theatre	2	3.3
	Clinic	7	11.7
	Lab	13	21.7

6.	Educational qualification		
	Certificate	6	10.0
	Diploma	22	36.7
	HND/Degree	23	38.3
	MSc	7	11.7
	PhD	2	3.3

Table 2. Level of Knowledge on Hand Hygiene among Healthcare Workers

S/No	Level of Knowledge	Score Range	Frequency	Percentage
1.	Poor	≤ 40%	10	16.7
2.	Average	50-60%	16	26.7
3.	Good	70-100%	34	56.7



Figure 3. Level of Practice Hand Hygiene [28]

Table 3. Hand Hygiene Knowledge by Demographic Characteristics

Sociodemographic Variables		Level of Knowledge						Chi-Square	P-Value
		Poor		Average		Good			
		F	P	F	P	F	P		
Age	21-30 years	10	16.67	12	20.00	29	48.33	4.98	0.55
	31-40 years	0	0	2	3.33	3	5.00		
	41-50 years	0	0	1	1.67	2	3.33		
	≥51 years	0	0	1	1.67	0	0.00		
Sex	Male	9	15	11	18.33	21	35	2.89	0.24
	Female	1	1.67	5	8.33	13	21.67		
Profession	Lab science	2	3.33	1	1.67	7	11.67	19.63	0.01
	Medicine	2	3.33	1	1.67	5	8.33		
	Nursing	1	1.67	4	6.67	14	23.33		
	Pharmacy	4	6.67	2	3.33	6	10		
	Medical imaging	1	1.67	8	13.33	2	3.33		
Years of experience	0-5 years	7	11.67	4	6.67	21	35	14.36	0.03
	6-10 years	2	3.33	8	13.33	11	18.33		

	11-15 years	1	1.67	0	0	1	1.67		
	≥16 years	0	0	4	6.67	1	1.67		
Area of practice	Ward	2	3.33	7	11.67	16	26.67	12.89	0.12
	Pharmacy	6	10	1	1.67	6	10		
	Theatre	0	0	1	1.67	1	1.67		
	Clinic	0	0	3	5	4	6.67		
	Lab	2	3.33	4	6.67	7	11.67		
Educational qualification	Certificate	1	1.67	0	0	5	8.33	17.55	0.03
	Diploma	3	5	9	15	10	16.67		
	HND/Degree	1	1.67	6	10	16	26.67		
	MSC	4	6.67	1	1.67	2	3.33		
	PhD	1	1.67	0	0	1	1.67		

4.1. Discussion

Table 1 the results indicate most in the 21-30 age group (85%) with a small proportion in the 31-40 group (8.3%). Majority participants are male accounted for 68.3%. according to profession, nursing is 21.7% and pharmacy 20.0% are the dominant. 53.3% had 0-5 years of experience and 35% have 6-10 years. In terms of area of practice, 41.7% in ward and 21.7% in lab. The most common educational qualifications are Higher National Diploma/Degree and Diploma accounted for 38.3% and 36.7% respectively.

Table 2 showed the respondents levels of knowledge based on their scores. Approximately 16.7% of participants are classified as having "Poor Knowledge" with scores of 40.0%. 26.7% fall under "Average Knowledge" which includes scores extending from 50% to 60%. Large of the respondents, accounting for 56.7%, exhibits "Good Knowledge" with scores in the ranging from 70% to 100%.

Figure 1 conceptual frame work based on Becker's Health Belief Model [26]. **Figure 2** schematic representation of the research methodology which comprises research design, setting, target population, sample size, sampling technique, instrument, data collection and analysis [27]. **Figure 3** pie chart shows that majority (96.7%) of respondents had positive practice, while only 3.3% of demonstrate negative practice [28].

The **Table 3** displayed the relationship between socio-demographic characteristics and the levels of knowledge. Knowledge level significantly differs with age (Chi-square = 4.98, $p = 0.55$), participants aged 21-30 years have higher (good) knowledge, while those aged 31-40 years demonstrate average knowledge. The 41 to 50 and 51 years and above categories have a higher percentage of poor knowledge. Sex is not significantly related to knowledge levels (Chi-square = 2.89, $p = 0.24$), both sex (males and females) show alike knowledge dispersals.

There is a statistically significant association between profession and level of knowledge (Chi-square = 19.63, $p = 0.01$), medical imaging professionals (Radiographers) have a higher percentage of good knowledge, while majority Laboratory Scientists exhibit poor knowledge. Pharmacy, Medicine and Nursing professionals have mixed knowledge disseminations. Knowledge level significantly associates to years of experience (Chi-square = 14.36, $p = 0.03$); those with 0 to 5 years have good knowledge, while 11 to 15 years have Poor knowledge. 6 to 10 years and 16 years above category have mixed knowledge disseminations.

The association between area of practice and knowledge level is not statistically significant (Chi-square = 12.89, $p = 0.12$), diverse practice areas show mixed knowledge distributions. Educational qualification is significantly associated with knowledge levels (Chi-square = 17.55, $p = 0.03$); MSc. and PhD holders have a higher good level of knowledge, while Diploma holders demonstrate Poor knowledge; Certificate and Higher National Diploma/Degree holders' exhibits mixed knowledge distribution

5. CONCLUSION

In conclusion the results showed that most of the HCWs had good knowledge, and positive practice towards hand hygiene. There was statistically significant relationship between the participants' level of

knowledge and their designated socio-demographic characteristics (profession, educational qualification and years of experience). Base on this findings recommendation were given to conduct the study on large sample in order to generalize the results.

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Author Contribution Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Sulaiman Umar	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Zakari Usman	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓
Yahuza Garba	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓
Samaila Abba	✓	✓		✓		✓		✓		✓	✓	✓	✓	✓
Babangida Abubakar	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

Conflict of Interest Statement

Nil

Informed Consent

Formal permission was obtained from all participants of this study.

Ethical Approval

Institutional Ethical Clearance was obtained before the commencement of the study.

Data Availability

The data for this study will be available from the co-author upon request.

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BIOGRAPHIES OF AUTHORS

	Mr. Sulaiman Umar , Is a lecturer at the Department of Nursing Science, College of Health Sciences, Federal University Birnin Kebbi, Nigeria. Currently he is a PhD Nursing scholar at Faculty of Nursing Sciences, Madonna University Nigeria. He has a rich blend of experience and passion to Nursing profession; with 15 years post registration as a Nurse. His area of research interests includes critical care, cardiothoracic, emergency, oncology and neonatal nursing. Mr. Sulaiman has practice and developed a deep expertise in nursing education, administration, research and clinical practice. His commitment to mentorship and teaching continue to inspire future Nurses. Email: rnumarsulaiman91@gmail.com
	Mr. Zakari Usman , is a Lecturer in the Department of Nursing Science, Faculty of Allied Health Sciences, College of Health Sciences, Usmanu Danfodiyo University Sokoto, Sokoto State, Nigeria. He is actively involved in teaching, guiding and mentoring nursing students in both theoretical and clinical aspect of their training; organizing and presenting at conferences and webinars. His area of professional interest includes Maternal Health Nursing, Child Health Nursing, Nursing Informatics, Sustainable Development and Public Health Nursing. Mr. Zakari possess information literacy expertise, computer proficiency, familiarity with online media, project management skills and

	effective communication and interpersonal skills. He is eager to share information, innovations, and ideas while also continuing to learn. Having worked in various contexts, he appreciates diverse cultures and practices, Mr. Zakari is passionate about improving patient care outcomes through quality nursing education and research and he is looking forward to contribute to the success of an innovative and forward-thinking organization. Email: uthmanzak@gmail.com
	Mr. Yahuza Garba^{id}, Is a Nurse Intern at Federal Teaching Hospital Birnin Kebbi, Kebbi State, Nigeria. Yahuza is passionate about quality patient care and professional growth. He is currently gaining clinical experience in patient assessment, care delivery, health promotion and evidence-based practice. His professional interests include medical-surgical nursing, critical care nursing and nursing research. He is committed to improving patient outcomes through compassionate care, clinical competence and ethical practice, with a strong focus on lifelong learning and contributing to the future of nursing. Email: yahuxerh@gmail.com
	Mr. Samaila Abba^{id}, is a Lecturer in the Department of Nursing Science, College of Health Sciences, Abdullahi Fodiyo University of Science and Technology, Aliero, Kebbi State, Nigeria. He is actively involved in teaching, guiding and mentoring nursing students in both theoretical and clinical aspect of their training. His area of professional interest includes adult health nursing, child health nursing and intensive care nursing. Mr. Abba is passionate about improving patient care outcomes through quality nursing education and research, and he is committed to fostering professional competence and ethical practice among future nurses. Email: abbaismail6@gmail.com
	Mr. Babangida Abubakar^{id}, is a Bachelor of Nursing Science Degree (BNSc) holder and a master of science in nursing (MNSc) student at Usmanu Danfodio University Sokoto having interest in both academic and clinical practices with keen interest in research publications and evidence-based nursing practice. He practiced general nursing work in peripheral hospital as a registered nurse before specializing in Ear Nose, and Throat Nursing. He currently works with Kebbi State Teaching Hospital (K.S.T.H) Birnin-Kebbi at Ear, Nose and Throat Unit of the hospital. He has more than 15years of clinical experience and is also a dean nursing student's affairs officer. He is also involved in teaching and mentoring nursing and midwifery students. He also participated in various conferences, seminars and workshops in nursing and midwifery profession. He is a versatile nurse with various nursing and midwifery council registrations. He is such a hardworking, honest and dedicated person. Email: bagudobabangida@gmail.com