

Hand Hygiene Practices among Nurses and Midwives at the Hospital in the Covid-19 Era

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Abstract: The purpose of this study is to assess hand hygiene practices among nurses and midwives at the hospital in this COVID-19 era. The survey employed a health facility-based cross-sectional study design and a simple random sampling technique to recruit respondents. A sample size of 114 nurses and midwives was selected for the study. A structured study questionnaire was used to collect data from respondents. Descriptive statistics were conducted on participants' sociodemographic characteristics and knowledge of COVID-19. A Pearson chi-square test was conducted to determine the strength of the association between sociodemographic variables and knowledge of COVID-19. The Spearman rank-order correlation coefficient is used to establish the correlation between the dependent and the predictor variables. The study demonstrated that nurses and midwives had fair knowledge (51.8%) of the COVID-19 pandemic and hand hygiene practices. The study also indicated that a significant positive correlation existed between nurses' and midwives' knowledge of COVID-19 and the processes of hand hygiene [Spearman (Rho) = 0.681, P = 0.001]. Moreover, a positive correlation was found between nurses' and midwives' knowledge of COVID-19 and hand hygiene compliance [Spearman (Rho) = 0.391, P = .0001] in preventing COVID-19 infection. At the end, it was established that the level of health workers' knowledge on COVID-19 has a significant relationship to hand hygiene processes and compliance with infection prevention control. However, the study recommends that the Government of Ghana, through the Ministry of Health and its agencies such as GHS and CHAG, among others, embark on intensive health promotion and educational programs for health care providers to keep them informed about the COVID-19 pandemic.

Keywords: Hand hygiene, handwashing, practices, nurses, midwives, handwashing facilities

1. INTRODUCTION

The Coronavirus disease 19 (COVID-19) pandemic of 2020, which started in Wuhan, China, in December 2019 resulted in over 100 million confirmed cases and 2 million deaths globally by late January 2021. Treatment options are limited and in the absence of a vaccine, until recently, mitigation by non-pharmaceutical interventions (NPIs) has gained prominence (Teng et al., 2020). Both the World Health Organization (WHO) and governments of individual countries, including the United Kingdom (UK), have promoted health-related behaviours such as hand washing and social distancing to protect communities and individuals from the transmission of the causative virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Ghana had its first imported case of COVID-19 in Accra, the nation's capital, and the regional capital of the Greater Accra Region, on 12-03-2020 (Saire & Sanford-quainoo, n.d.). The disease then

rapidly spread across the other regions. The Coronavirus disease has overcome geographical barriers achieving a remarkable proliferation. Because of that, different countries started public health protocols to control the spread of the virus, much of them related to social distancing, hand washing, and lockdown of the cities.

Hand washing with soap and water and the use of alcohol-based hand sanitizers, is widely accepted as the cornerstone of infection control in a hospital setting (Roshan et al., 2020). Hand hygiene is considered an important measure to prevent the transmission of pathogens in health care facilities, and it is proven that improving hand hygiene compliance significantly reduces healthcare-acquired infections, and has been recommended as an important strategy to help prevent the spread of COVID-19 in hospitals (Moore et al., 2021). Healthcare staff should have ready access to a

sink with warm water for washing hands using soap and water, and not required when using alcohol-based hand gel. Soap should be obtained from a liquid dispenser – not from a bar of soap, which can harbour germs – or alcohol-based hand gel should be used. Moisturiser, which is not required when using alcohol-based hand gel, and paper towels, which can be disposed of, should be available when using soap and water (Hillier, 2020).

The WHO also recommends that individuals wash hands often with soap and water for at least twenty seconds, especially after going to the toilet or when hands are visibly dirty, before eating, and after blowing one's nose (WHO, 2020). When soap and water are not available, the CDC recommends using an alcohol-based hand sanitizer with at least 60% alcohol (CDC, 2021). For areas where commercial hand sanitizers are not readily available, the WHO provides two formulations for local production. In these formulations, the antimicrobial activity arises from ethanol or isopropanol. Hydrogen peroxide is used to help eliminate bacterial spores in the alcohol; it is "not an active substance for hand antisepsis." Glycerol is added as a humectant (WHO, 2020). Sustaining good hand hygiene practices in low resource settings like the urban areas of Ghana should include education, the provision of essential supplies, and regular hand hygiene audits and feedback (Appiah L. et al 2019). Studies had demonstrated that health care adherence to hand hygiene had increased from 63% to 76%, however, thousands of health workers are affected by preventable hospital infections annually in both the developed and developing nations (Manuel et al., 2018). This study, therefore, sought to determine hand hygiene practices as a strategy to decrease hospital infections among health care providers at the Hospital.

2. MATERIALS AND METHOD

Research Design

Descriptive cross-sectional study design was deployed for this study. The study utilised the descriptive study design with the view of getting the clear picture of the relationship between hand hygiene practices and infection prevention control in this era of COVID 19. A cross-sectional study is an observational and a non-

interventional study, which involves gathering data from a cross-section of a population over a short period of time or at a single point in time.

Sampling Technique and Sample Size

It is difficult to use an entire population for a study and this requires the use of a sample of a population. Sampling involves the selection of a number of observations from the target population. In order to reduce bias, a simple random sampling technique, which is a probability-based sampling technique, was used in selecting 114 health workers from St. De porres Hospital in Eikwe District. With a 5% level of precision.

Data collection procedure

The data collection was done in English and Twi where necessary to enhance thorough understanding of the questions. The primary tool for data collection is a structured questionnaire. In order to ensure data validity and reliability, two (2) research assistants were adequately trained three (3) days prior to pre-testing and the final data collection regarding the overall research in order to have in-depth knowledge about the study. The training was thus to ensure their thorough understanding of the research topic, objectives and the sensitivity of the topic and need for confidentiality of information provided by respondents. The training was also to ensure them diligently and effectively administer the questionnaires. Prior to data collection, the overall goal of the study was thoroughly explained to the staff in order to gain their informed consent. Staff who were willing to participate in the study were given questionnaires to answer with consistent assistance from the researchers and the research assistants.

Data analysis

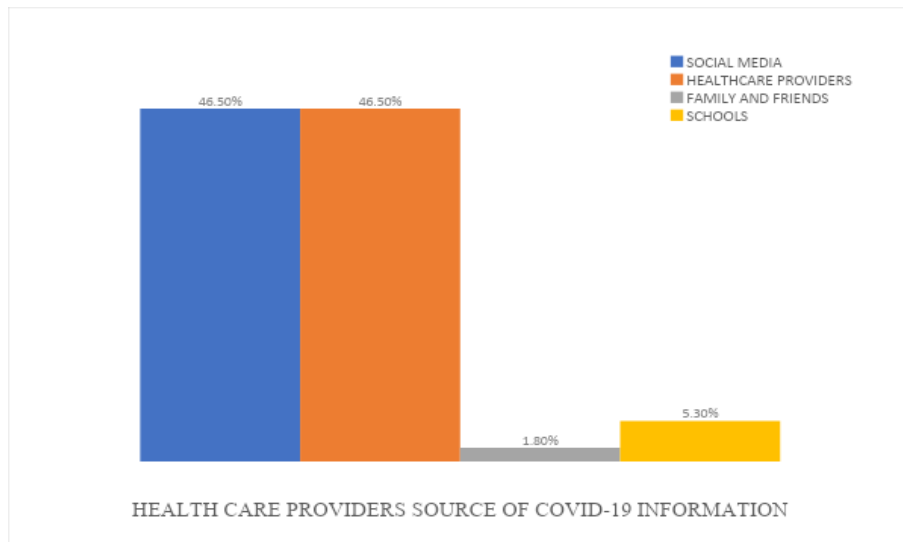
Statistical Package for the Social Sciences (SPSS version 25) is the data analysis tool that was used to analyze quantitative data of this study. Questionnaires after being collected was thoroughly checked through to ensure all questions were accurately answered and errors were corrected to ensure completion before entering it into the SPSS for rigorous data analysis. Descriptive analysis was done at the univariate and multivariate levels and data was presented in frequencies using tables and figures.

3. RESULTS

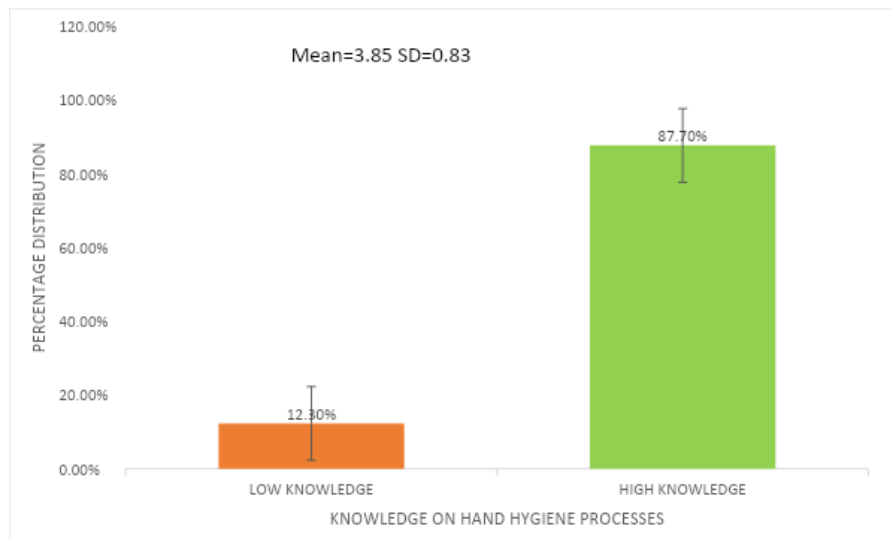
Table 3.1 Sociodemographic characteristics.

Variable	Category	Frequency (N=114)	Percentage (%)
Gender	Male	54	47.4
	Female	60	52.6
Marital status	Single	53	46.5
	Married	46	40.4
	Divorced	15	13.2
Education	Diploma	41	36.0
	Degree	30	26.3
	Masters	12	10.5
	Doctorate	4	3.5
	Others	27	23.7
Hospital position	CHN	3	2.6
	SCHN	2	1.8
	Midwife	28	24.6
	Nurse	81	71.1
Period of work with hospital	Below 2 years	27	23.7
	2-5 years	46	40.4
	6-8 years	22	19.3
	Above 8 years	19	16.7

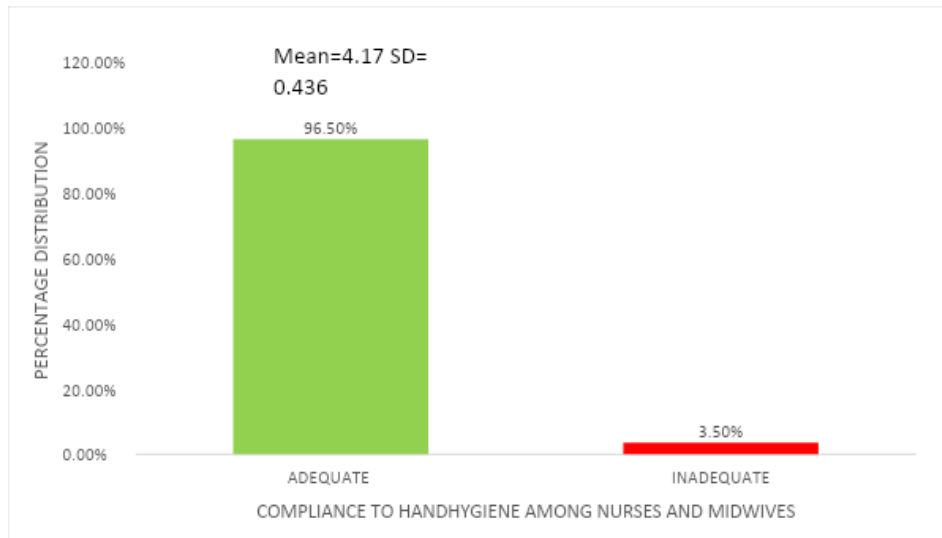
Most (52.6%, n=60) of the respondents were females whilst (47.4%, n=54) were males. About (46.5%, n=53) were single, (40.4%, n=46) of respondents were married and (13.2%, n=15) were divorced. About (36.0%, n=41) of the respondents had diploma, (26.3%, n=30) of participants had degree, (10.5%, n=12) had masters, (3.5%, n=4) had doctorate and (23.7% n=27) had other education. The (71.1%, n=81) of the respondents were nurses, (24.6%, n=28) were midwives, (2.6%, n=3) were CHN and (1.8%, n=2) were SCHN. Concerning the duration of work, most of the participants (40.4%, n=46) worked between (2-5) years, (23.7%, n=27) worked below 2 years, (19.3%, n=22) worked between (6-8) years whilst (16.7%, n=19) working period was above 8 years.

Figure 3. Distribution of source of COVID-19 information among nurses and midwives.

The figure above depicted the sources of COVID-19 information of respondents. About (46.5%) of the respondents receive COVID-19 information from social media and health care providers. Also, (5.3%) of the participants sourced information on COVID-19 from schools, whilst (1.8%) received information on COVID-19 from family and friends.

Figure 3.3: Knowledge on hand hygiene processes among nurses and midwives.

The figure above shows that, the majority (87.7%) of nurses and midwives had high knowledge on hand hygiene processes whilst about 12.3% had low knowledge on hand hygiene processes in preventing COVID-19 virus at the hospital.

Figure 3.4 Hand hygiene compliance among nurses and midwives.

From the figure above, it is indicated that, the majority (96.5%) of nurses and midwives had adequate compliance to hand hygiene practices whilst about 3.5% had inadequate compliance to hand hygiene practices (figure 3.4).

Table 3.5 Association between Sociodemographic characteristics and Knowledge on COVID-19

Variable	Category	Fair Knowledge n (%)	Good Knowledge n (%)	χ^2 (P-value)
Gender				3.45 (0.043)*
	Male	23(42.6)	31 (57.4)	
	Female	36 (60.0)	24 (40.0)	
Marital Status				0.97 (0.613)
	Single	28 (52.8)	25(47.2)	
	Married	25 (54.3)	21 (45.7)	
	Divorced	6 (40.0)	9 (60.0)	
Education				5.62 (0.230)
	Diploma	26 (63.4)	15 (36.6)	
	Degree	14 (46.7)	16 (53.3)	
	Masters	4 (33.3)	8 (66.7)	
	Doctorate	3 (75.0)	1 (1.9)	
	Others	12 (44.0)	15 (55.6)	
Position				4.09 (0.025)
	CHN	2 (66.7)	1 (33.3)	
	SCHN	2 (100)	0 (0.00)	
	Nurse	44 (54.3)	37 (45.7)	
	Midwife	11 (39.3)	17 (60.7)	
Period of work				3.74 (0.290)
	<2 years	15 (55.6)	12 (44.4)	
	2-5 years	26 (56.5)	20 (43.5)	

	6-8 years	12 (54.5)	10 (45.5)
	>8 years	6 (31.6)	13 (68.4)

χ^2 : Chi-square, *PV<0.05: statistically significant.

Pearson chi-square test set at 95% confidence interval was used to determine the strength of association between knowledge on COVID-19 and respondents' Sociodemographic characteristics. The gender of nurses and midwives indicated a statistically significant relation to knowledge on COVID-19 ($\chi^2=3.45$, $p=0.043$) (table 3.5).

Table 3.6 Correlation between respondent's knowledge of COVID-19 and processes of hand hygiene in preventing COVID-19.

Knowledge on COVID-19	Minimum score	Maximum Score.	Mean. score	Standard Deviation	Spearman (Rho)	P-value	N
Processes of Hand hygiene	3.08	4.57	4.67	0.310	0.681**	0.001	114

** Correlation is significant at the 0.01 level (2-tailed), N: number of participants.

The Spearman rank order correlation coefficient (rho) was used to determine the correlation between nurses and midwives' knowledge on COVID-19 and processes of hand hygiene on COVID-19 during the COVID-19 Era. There was a statistically significant positive correlation between knowledge on COVID-19 and its processes of hand hygiene among nurses and midwives in preventing COVID-19, Spearman rho (114) = 0.681, $p<0.001$ (table 3.6).

Table 3.7: Correlation between knowledge on COVID-19 and hand hygiene compliance

Knowledge on COVID-19	Minimum score	Maximum Score.	Mean. score	Standard Deviation	Spearman (Rho)	P-value	N
Hand hygiene Compliance	2.0	5.0	4.17	0.44	0.391**	.0001	114

** Correlation is significant at the 0.01 level (2-tailed), N: number of participants.

The Spearman rank order correlation coefficient (rho) was used to investigate the relationship between nurses and midwives' knowledge on COVID-19 and hand hygiene compliances. There was a positive association between nurses' and midwives' knowledge on COVID-19 and hand hygiene compliance to COVID-19 preventive protocols and such relationship was statistically significant, Spearman rho (114) = 0.391, $p<.0001$ table (3.7).

4. Discussion

The current study's findings indicated that nurses and midwives' knowledge of COVID-19 and its processes of hand hygiene practices was high, representing 87.7% of the respondents. The study also established a significant positive correlation between nurses and midwives' knowledge of COVID-19 and hand hygiene processes. These current study findings are consistent with a study conducted in China that indicated that most medical professionals in China adopt good hand hygiene practices as COVID-19 preventive practices, and this finding relates well to this current study (Si M. et al., 2020).

A similar study conducted in China, by Lai et al., (2019), revealed that health care provider's adequate hand hygiene practices relieve them of psychological burdens related to COVID-19 and these associates well with this study's findings.

Additionally, in a study, conducted to determine the impact of COVID-19 on health care workers, it was found that health care providers who were directly involved in the diagnosis, treatment, and patient care and ensure good hand hygiene practices do not suffer heavy psychological effects and this is also consistent with this current study finding (Sun P. et al., 2021). Another study that associates well with the findings of this present study, indicated that a significant

relationship exists between the management of COVID-19 by healthcare providers and hand hygiene processes. The study revealed that timely intervention based on effective and frequent hand hygiene practices of nurse and midwives prevent the acquisition and spread of the COVID-19 by nurses and midwives and this should be considered as an effective way of dealing with the spread of COVID-19 (Chew M. et al., 2020). According to the findings of a study conducted by Nguyem et al., (2021), to determine the impact of COVID-19 among health care workers, it was found that, the psychological effects of COVID-19 are greatly impacted on HealthCare workers who do not practice hand hygiene processes than any other people in the community. This contributes to increasing the psychological effects of COVID-19 among nurses and midwives. A recent cross-sectional study conducted by Carmassi et al., (2020), found that a significant proportion of healthcare workers were at a higher risk of developing psychological effects especially if they refuse to practice hand hygiene processes as an effective way of decreasing the spread of COVID-19 among them.

This study found that the majority (96.5%) of healthcare workers comply with hand hygiene compliance during the COVID-19 Era. The study also established that a significant positive correlation existed between nurses and midwives' knowledge on COVID-19 and their compliance to hand hygiene practices. The study, therefore, indicated that healthcare providers who had good knowledge of COVID-19 comply with hand hygiene practices that help in reducing the spread of the COVID-19 virus among healthcare providers and patients. This finding supports the outcome of a cross-sectional study conducted to determine healthcare providers' hand hygiene practices during patient care. The survey revealed that a positive significant relationship existed between healthcare providers' knowledge of COVID-19 and compliance to hand hygiene practices during patient care (Huang F. et al., 2021). This finding supports the outcome of a cross-sectional study conducted to determine health care providers' hand hygiene practices during patient care. The survey revealed that a positive relationship exists between healthcare providers' knowledge of COVID-19 and compliance to hand hygiene during patient pandemics (Huang F. et al., 2021).

In a similar study conducted by Mayem et al., (2021), it was demonstrated that a higher proportion of healthcare workers adhered to hand hygiene practices during the COVID-19 Era. The study further indicated that healthcare workers who comply with hand hygiene practices such as hand washing with soap under

running water and with alcohol-based sanitizer had good knowledge of COVID-19. It was observed that a significant correlation existed between the level of nurses and midwives' knowledge on COVID-19 and compliance to hand hygiene protocols among healthcare workers and these findings were consistent with the outcome of this current study. A related cross-sectional study conducted to determine adherence to hand hygiene among healthcare workers during the COVID-19 pandemic reported that, about 95% of healthcare workers comply with hand hygiene practices during the COVID-19 pandemic. This finding is associated well with the outcome of the current study, which demonstrated that about 99.1% of healthcare providers who had good knowledge of COVID-19 had good compliance to hand hygiene (Lippke et al., 2020). The implications associated with increased knowledge on COVID-19 outbreak and hand hygiene practices among healthcare workers reduces; cross-contamination between health care providers and patients. It also ensures the provision of aseptic procedures during the care of patients by nurses and midwives and decreases COVID-19 incidence and exposure, hence helping to decrease the spread and severity of COVID-19 among individuals, communities, and nations.

5. Conclusions

This study established that the majority (51.8%) of the nurses and midwives at Eikwe Hospital had fair knowledge of COVID-19, and the respondents' sources of COVID-19 information from health care providers and the electronic media influenced this. The survey also indicated that the nurses and midwives knew hand hygiene processes were an effective means to prevent COVID-19. Lastly, the study revealed that hand hygiene is one of the most relevant and cheapest strategies to prevent healthcare-associated infections. Studies have shown that compliance with hand hygiene among nurses is generally low, and there are several factors that contribute to this. One of the main barriers is the lack of access to hand hygiene facilities, such as sinks and hand sanitizers, which can make it difficult for nurses to perform hand hygiene when necessary. Additionally, busy workloads and time constraints can also influence compliance. To improve hand hygiene practices among nurses, it is essential to promote a culture of safety and infection control in healthcare facilities. This can be achieved through education and training programs that emphasize the importance of hand hygiene and provide nurses with the knowledge and skills needed to perform proper hand hygiene. It is also essential to provide nurses with easy access to hand hygiene facilities and supplies, such as hand

sanitizers, soap, and water. Employers can also implement policies and procedures that require nurses to perform hand hygiene before and after patient contact and provide support and resources to help them comply with these guidelines. Finally, it is crucial to monitor and evaluate hand hygiene compliance among nurses and provide feedback to promote continuous improvement. Regular audits and feedback can help identify areas where compliance is low and develop targeted interventions to address these issues. In summary, promoting hand hygiene practices among nurses is essential to preventing HAIs and the transmission of pathogens in healthcare facilities. This can be achieved through education and training programs, easy access to hand hygiene facilities and supplies, policies and procedures that support compliance, and regular monitoring and evaluation.

6. Recommendations

The study recommends that the Government of Ghana, through the Ministry of Health and its agencies such as GHS and CHAG, among others, embark on intensive health promotion and educational programs for health care providers to keep them informed about the COVID-19 pandemic so that they can gain much knowledge and a better understanding of the COVID-19 pandemic, as this will equip them to ensure adherence to COVID-19 preventive protocols. In addition, qualitative research, which assesses the influence of culture and religion on hand hygiene, is needed to ascertain all the factors that contribute to positive infection prevention and control measures at the hospital.

Author Contributions

The authors confirm being the sole contributors to this work and have approved it for publication.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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