COVID-19 unanticipated benefits to hand washing coverage and practices in Health Care Facilities in central Uganda

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Research Article

Keywords: Hand washing coverage, health workers, private, public, Uganda

Posted Date: June 7th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1734849/v1

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Abstract

Over 50% of Healthcare-Associated Infections happen due to the hand of healthcare providers. The majority of health care workers end up not washing their hands because of different reasons. Therefore, this study aimed to assess the proportion of handwashing coverage and the associated factors among health care workers in public and private health care facilities in Ndejje division, Makindye Ssabagabo municipality, Wakiso district.

A descriptive cross-sectional study design was conducted employing both quantitative and qualitative methods of data collection. A total of 350 health care workers were interviewed using a self-administered structured open-ended paper questionnaire. Focus Group Discussions (FGD) guide and an observation paper checklist were also employed for data collection process. The quantitative data was entered in Epidata and exported to SPSS for descriptive univariate analysis. The qualitative data was analyzed manually by thematic analysis to generate codes, subthemes, and key themes.

Our results showed that female health care workers constituted the majority of the respondents 205 (58.6%). The majority 324 (92.6%) of health care workers were from private health facilities. We found out that the proportion of handwashing facilities coverage was 97.7%. Removal of germs 317 (95.5%) was reported as the major reason for washing hands. Health care workers reported that handwashing with soap and water was at times being substituted with the use of a hand sanitizer due to its convenience.

The proportion of handwashing was good coupled with positive attitude towards handwashing. Being a nurse was highly associated with washing hands in both private and public health facilities. High hand washing proportion was attributed to the COVID-19 guidelines which sparked adherence to the standard operating procedures. Different stakeholders should sustain this current handwashing which will curb Water, Sanitation and Hygiene related diseases.

Background

The Global baseline report in 2019 on Water Sanitation and Hygiene (WASH) in healthcare facilities by World Health Organisation (WHO) showed that 74% of healthcare facilities globally had basic water services, meaning water was available from an improved source on the premises (WHO, 2020a). Hand hygiene in health care facilities (HCFs) remains a significant public health challenge (Kayiwa et al., 2020). Global baseline estimates on water, Sanitation, and Hygiene (WASH) in HCFs indicate that 26% of HCFs lack access to an improved water source on the premises, 14% of HCFs have a limited water supply and 12% have no water supply at all (WHO, 2020b). Water service indicators are worse in low-resourced countries (LICs) where 45% of HCFs do not have access to basic water supply (WHO, 2020b). About 16% of HCFs globally also lack hand hygiene facilities at points of care, in addition to lacking soap and water at toilet facilities (WHO, 2017). Additionally, in LICs, HCFs lack reliable access to water, sanitation, and hygiene (WASH) infrastructure. Consequently, health workers are unable to wash their hands at critical points during service delivery. Inadequate WASH compromises the safety and quality of healthcare
services and places a huge preventable risk to both health providers and clients (Bouzid et al., 2018) for example these deficiencies in WASH increase the risk of health facility-acquired infections (HAI). Healthcare-associated infections (HAIs) affect 1.4 million patients at any time worldwide, as estimated by the World Health Organization (WHO) (Cardo et al., 2010, Murphy et al., 2020).

Health care providers’ hands are the main usual mode of the vehicle for the transmission of HCAIs (WHO, 2016). About 50% of HCAIs happens due to the hand of health care providers (Albright et al., 2018). During patient care, unless there is recommended hand hygiene compliance of health care suppliers uninterrupted, hands are contaminated with a microorganism (Rynga et al., 2017). Due to poor hand hygiene practices among health care workers, many patients have suffered from HCAIs (Engdaw et al., 2019). Improper hand hygiene by HCWs is responsible for over 40% of health facility infections (Rynga et al., 2017) even in health facilities within the Ndejje division. These infections are also responsible for nearly 50% of the deaths that occur among patients and health care workers (Rynga et al., 2017). The most likely estimate of disease burden from inadequate hand hygiene amounts to 297 000 deaths (Prüss-Ustün et al., 2014).

In Uganda, there is limited data on WASH in HCFs, however, a study carried out in the southwestern region of the country highlights that Only 38% of the HCFs had wards with handwashing facilities with only 24% of the wards having soap and water (Mulogo et al., 2018). Various health facilities in the areas are well stocked with handwashing facilities with water and soap however the actual practice of handwashing was lacking (Brauer et al., 2020). Therefore, this study aimed to assess the proportion of handwashing facility coverage among health care workers in private and public health facilities in Ndejje division, Makindye Ssabagabo municipality Wakiso district.

Methods

2.1 Study Area

The study was carried out in Ndejje division of Makindye Ssabagabo Municipal Council on the proportion of handwashing coverage and assessment of the associated factors among the healthcare workers in public and private healthcare facilities. This is located in Wakiso district in Central Uganda Kyaddondo County immediately south of Kampala’s Makindye division and physically lies at 0°14’34.0N, 32°33’36.0'E (latitude:0.242789; longitude:32.559987). The municipality includes the following neighbourhood; Mutundwe, Najjanankumbi, Zana, Bunnamwaya, Seguku, Lubowa, Ndejje, Lubugumu, Busaabala, Masajja, Kaazi, Lweza, Kigo, and Kubbiri. Makindye Ssabagabo municipality is one of the fastest-growing municipalities in Uganda and during the national census and household survey of 27 and 28 August 2014, the Uganda Bureau of Statistics (UBOS), enumerated the population of Makindye Ssabagabo Municipality at 284,067 with the highest percentage being the youths. It is the highest densely populated urban centre in Uganda with a fertility rate of 6 children. The population of the males is 132,666 males (46.8%) and that of the females is 150,606 females (53.2%) (Fig. 1).
Ndejje division is made up of 3 wards and 19 cells whereby Seguku ward has 5 cells, Mutungo with 6 cells, and Ndejje ward with 8 cells. There are 3 public and 57 private health care facilities dispersed in all the three wards whose accessibility was by Boda boda with the guidance of the health inspector. Since there were few public health facilities, to draw comparative results between private and public health facilities, all public health facilities were considered together with a representation from private health facilities.

2.2 Study Design

A descriptive cross-sectional study design with mixed methods approach utilizing qualitative and quantitative data collection techniques was utilized.

2.3 Study Population

The study targeted all healthcare workers within registered and non-registered, private and public health facilities in Ndejje division, Makindye Ssabagabo municipality. Different health care workers including medical clinical officers, midwives, health assistants, nurses, health inspectors, medical Lab technicians, medical Lab technologists, medical radiographers, and pharmacy assistants participated in our study. A list containing all the 52 registered health facilities was obtained from the division health department where they are registered and regulated to ensure handwashing facilities are in place was used in the process of data collection. All the three private facilities in the Ndejje division were involved in the study and these included; Mutungo HC II, Sseguku HC II, and Ndejje HC IV together with 38 private facilities. Each private clinic had either 1 or 2 staff, HC II had 4 staff each, HC 1V had 18 staff each, and hospitals had an average of 40 staff each. Healthcare workers in public health facilities together with those in big private health facilities had working schedules and shifts while those who were in small medical clinics, pharmacies, dental clinics, and drug shops worked full-time. There are two hospitals and an estimate of 60 private clinics.

2.4 Sample Size Determination

The sample size was determined using the single population proportion formula (Kish, 1965) for determining sample size in cross-sectional studies, \( N = \frac{Z^2 p (1 - p)}{d^2} \) and a total of 380 health care workers. Ten (10) Focus Group Discussions with each having a total of eight participants were involved in the study with private and public health facilities each having five groups. The FGDs data was collected up to the point of data saturation. These FGDs involved laboratory technicians, nurses, health assistants, nurses, midwives, health inspectors, counsellors and clinical officers.

2.5 Sampling Procedures

For health facility level sampling; all the three public health facilities were purposively selected and other private health facilities from every cell constituted the sample size. With a representation of every cell, an equal number of 2 private health care facilities was conveniently selected from every cell where 38 private facilities were included in the study.
For health worker sampling; each private clinic had either 1 or 2 staff, HC II have 4 staff each, HC 1V have 18 staff each and hospitals had 40 staff each, a random stratified proportionate simple sampling procedure was applied in the selection of study participants from both public and private health facilities. Within each health facility, all health care workers were given equal chances to participate in the study through simple random sampling. A unique number with consideration of the initials was done for all health workers. This was followed by the research assistants and/or the principal investigator randomly picking a representation of the health care workers from the staff in each facility. The selected participants were taken through the consenting process and written consent forms were signed.

Focus Group Discussions were used in the collection of data on the attitudes of health care workers on hand hygiene together with the associated factors. All the FGDs of health care workers from public health facilities had 8 and 9 participants while those for health care workers from private facilities has less than that (7, 6 and 5) due to transport issues since the FGDs were conducted at the division offices. FGDs participated were purposively selected basing on their active role in WASH at the health facility level. These included; incharges, health care workers, private clinics owners, and supervisors. The participants were of different professional cadres, age groups, work experience and they were selected about the facilities they operated. All FGDs were conducted outdoors in the compound under tree shades where COVID-19 prevention guidelines would be properly implemented. Mutungo HC II, Sseguku HC II, and Ndejje HC IV were the venues for the public health care workers while the division was the venue for private health care workers. Data was collected physically by research assistants asking different questions to the respondents and the data was recorded using an audio recorder and then transcribed into notes. These FGDs were heterogeneous involving different staff of different professions sex, age and from different health care facilities. The homogeneity in the FGD was that an FGD for health workers from private did not by any means include an individual from public health facilities and vice versa.

2.7 Data Collection Tools

Structured questionnaire: a semi-structured questionnaire with both open-ended and closed-ended questions. This was adopted from a former study by Ekanem et al 2015 and edited to suit the current study. This was mostly used when collecting the primary data from the health care workers at the health facilities on the proportion of handwashing and its associated factors. The process of data collection took approximately 20 minutes per respondent.

Structured observational checklist; an observation checklist was developed by the research assistant about the study objectives to check on the practices and prevalence of handwashing. This tool had simple observational questions with Yes and No as the responses. A researcher and research assistants used this tool by observing the health facility’s handwashing facility coverage, their state and the compliance of health care workers in hand washing. Data collection using an observational checklist took an average of 5 minutes per session.

A focus group discussion guide was used for the collection of qualitative data. Notes taken together with audio recording was done in the assessment of factors associated with hand hygiene in private and
public health facilities. A smartphone was used in the recording of the sessions. Later these audios were transcribed verbatim.

2.8 Data Collection Procedure

Before data collection started, pre-testing of all the data collection tools was done in Entebbe municipal council with health facilities with similar characteristic as those in the study area. Data was collected by the use of three data collection tools quantitative data (questionnaire and checklist) and qualitative data (FGD guide). Two research assistants of formal education with a minimum qualification of ordinary level certificate were recruited and trained for three days on the process of data collection.

For the qualitative data, Focus Group Discussions (FDGs) were applied in the collection of data on the factors associated with handwashing among healthcare workers. Every group consisted of 10 members and each member who was a health care worker at a given health facility was eligible to participate in the study group. Each participant was given a different code such as M1, M2, M3 among others and questions were asked by the principal investigator or any other trained research assistant. Data was collected by asking different questions to the respondents and the data was recorded using a smartphone audio recorder and then transcribed onto a transcript. Each FGD took about 60–90 minutes.

FDGs each was held for an average time of one hour within the hospital premises for government health facilities and at the division offices under the tree or in the compound for health workers from private health facilities. FGDs for public health care workers had 8 and 9 participants since they did not incur transport in attending the FGDs while those for private health care workers had 5, 6 and 7 participants since they could travel from their facilities to the division where the FGDs were conducted. Each health care worker employed by the health facility had equal chances of participating in the study as an FGD member and was eligible to participate in the study group as an FGD member. Data was collected by asking different questions/themes to the respondents and the data was recorded using a smartphone audio recorder and then transferred onto a transcript.

For quantitative data, the questionnaire was self-administered to the health care worker upon signing the written consent form which provided them time to complete it in their continent time after duty, at weekends and during meal times. The convenient time for filling the questionnaire was one week when the filled questionnaire was picked from the respective health worker. The questionnaire was used to assess the handwashing associated factors among health care workers. This was a semi-structured form where different options were given to the participant to select. An observation checklist was also used by observation for about 2–5 minutes to assess the proportion of handwashing, the practices of handwashing and the condition/state of the handwashing facilities. In private clinics with either 1 or 2 staff, only one respondent was considered to be a study participant whereas in the hospitals, half of the staff were considered. In case the selected facility or health worker refused to take part in the study, the next one was considered. In public facilities, a similar trend of systematically choosing half of the staff as study participants were applied.

Data analysis
For quantitative data, the raw data from paper questionnaires and paper checklists were entered into EPI DATA 3 software and exported to STATA 14.2 for cleaning and analysis. Statistical analysis was done using STATA 14.2, whereby categorical variables were summarized using frequency tables and graphs while continuous variables were summarized using means and standard deviation (SD).

For qualitative data, the codes generated were analysed for consistence and either convergence or divergence. Those that converged formed a particular theme and this was deduced by the data analysis team. Those that diverged also formed a particular theme and this was also noted. Codes were developed from objective of the study and transcribed data, and then entered into the ATLAS.ti version 8 software for analysis. The software developed codes which were reviewed by the research team and enabled categorization of the study findings. Using deductive thematic analysis, the categorized data was used to develop main themes which made the final results of our study.

Results

Social Demographic Characteristics

A response rate of 92.1% (350/380) was obtained for our study. Out of the 350 health care workers who participated in the study, 324 (92.6%) were from private health facilities and 26 (7.4%) from the public health facilities. The public health facilities included; Mutungo HC II, Sseguku HC II, and Ndejje HC IV. Female health care workers constituted the majority 205 (58.6%), more than half 185 (52.9%) were diploma holders and healthcare workers aged 26-35 years had the slightly above average 184 (52.6%) of health workers (Table 1).

Table 1: Socio-demographic characteristics
<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n=350)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>145</td>
<td>41.43</td>
</tr>
<tr>
<td>Female</td>
<td>205</td>
<td>58.57</td>
</tr>
<tr>
<td><strong>Professional cadre</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>117</td>
<td>33.43</td>
</tr>
<tr>
<td>Midwife</td>
<td>76</td>
<td>21.71</td>
</tr>
<tr>
<td>Doctor</td>
<td>15</td>
<td>4.29</td>
</tr>
<tr>
<td>Laboratory technician</td>
<td>51</td>
<td>14.57</td>
</tr>
<tr>
<td>Clinical Officer</td>
<td>68</td>
<td>19.43</td>
</tr>
<tr>
<td>Others*</td>
<td>23</td>
<td>6.57</td>
</tr>
<tr>
<td><strong>Age in years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>79</td>
<td>22.57</td>
</tr>
<tr>
<td>26-35</td>
<td>184</td>
<td>52.57</td>
</tr>
<tr>
<td>56-45</td>
<td>53</td>
<td>15.14</td>
</tr>
<tr>
<td>46-55</td>
<td>30</td>
<td>8.57</td>
</tr>
<tr>
<td>56 and above</td>
<td>4</td>
<td>1.14</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td>123</td>
<td>35.14</td>
</tr>
<tr>
<td>Diploma</td>
<td>185</td>
<td>52.86</td>
</tr>
<tr>
<td>Degree</td>
<td>42</td>
<td>12.00</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>168</td>
<td>48.00</td>
</tr>
<tr>
<td>Married</td>
<td>159</td>
<td>45.43</td>
</tr>
<tr>
<td>Separated/Divorced/Widowed</td>
<td>23</td>
<td>6.57</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>244</td>
<td>69.71</td>
</tr>
<tr>
<td>Muslim</td>
<td>71</td>
<td>20.29</td>
</tr>
<tr>
<td>Pentecost</td>
<td>31</td>
<td>8.86</td>
</tr>
<tr>
<td>Others**</td>
<td>4</td>
<td>1.14</td>
</tr>
</tbody>
</table>

*health inspectors, health assistants, dentists, counsellors, consultants,

### 6.2 Proportion of Hand Washing

All 350 (100.0%) health care workers in the assessed health facilities reported to be having handwashing facilities with 346 (98.9%) having their handwashing facility in good condition with soap, water and evidence of use. Over four in five of the respondents reported having Infection Prevention and Control guidelines in their facilities. The majority 332 (94.9%) of the health care workers washed hands on the day of the interview with 329 (99.1%) using soap and water and 3 (0.9%) using water only. Majority of 342 (97.7%) handwashing facilities in their health care facilities (Figure 2). In the assessed health facilities using an observation checklist, 237 (67.7%) and 198 (56.6%) of the health care workers had handwashing facilities close to the latrine and nearer to the waste bins respectively (Table 2).
### Table 2: Condition of a handwashing facility

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency (N=350)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water available</td>
<td>Yes 342</td>
<td>97.7</td>
</tr>
<tr>
<td></td>
<td>No 8</td>
<td>2.3</td>
</tr>
<tr>
<td>To the latrine</td>
<td>Yes 237</td>
<td>67.7</td>
</tr>
<tr>
<td></td>
<td>No 113</td>
<td>32.3</td>
</tr>
<tr>
<td>Working area</td>
<td>Yes 230</td>
<td>91.4</td>
</tr>
<tr>
<td></td>
<td>No 120</td>
<td>34.3</td>
</tr>
<tr>
<td>The waste bins</td>
<td>Yes 198</td>
<td>56.6</td>
</tr>
<tr>
<td></td>
<td>No 152</td>
<td>43.4</td>
</tr>
<tr>
<td>Road</td>
<td>Yes 245</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>No 105</td>
<td>30.0</td>
</tr>
<tr>
<td>Soap</td>
<td>Yes 330</td>
<td>94.3</td>
</tr>
<tr>
<td></td>
<td>No 20</td>
<td>5.7</td>
</tr>
<tr>
<td>Mechanical condition</td>
<td>Yes 275</td>
<td>78.6</td>
</tr>
<tr>
<td></td>
<td>No 75</td>
<td>21.4</td>
</tr>
<tr>
<td>Sanitary pit/container</td>
<td>Yes 297</td>
<td>84.9</td>
</tr>
<tr>
<td></td>
<td>No 53</td>
<td>15.1</td>
</tr>
<tr>
<td>Ed above the ground</td>
<td>Yes 334</td>
<td>95.4</td>
</tr>
<tr>
<td></td>
<td>No 16</td>
<td>4.6</td>
</tr>
<tr>
<td>Taple for soap</td>
<td>Yes 293</td>
<td>83.7</td>
</tr>
<tr>
<td></td>
<td>No 57</td>
<td>16.3</td>
</tr>
<tr>
<td>Water</td>
<td>Yes 335</td>
<td>95.7</td>
</tr>
<tr>
<td></td>
<td>No 15</td>
<td>4.3</td>
</tr>
<tr>
<td>A cover</td>
<td>Yes 327</td>
<td>93.4</td>
</tr>
<tr>
<td></td>
<td>No 23</td>
<td>6.6</td>
</tr>
<tr>
<td>Operated/pedal/elble tap</td>
<td>Yes 188</td>
<td>53.7</td>
</tr>
<tr>
<td></td>
<td>No 162</td>
<td>46.3</td>
</tr>
</tbody>
</table>

From qualitative findings, it was reported that the proportion of handwashing coverage together with the compliance of health care workers to hand washing was exceedingly high in Ndejje division, Makindye Ssabagabo municipality since it’s a prevention measure for the current pandemic of COVID-19.

“All most every health care facility has a handwashing facility since it is a measure of preventing COVID-19” (FGD, private facility N)

On the other hand, hand washing with water only together with handwashing with soap was reported as being replaced by the use of alcohol-based hand sanitizers. This practice has also escalated within the COVID-19 pandemic and was thought to decline shortly since human behaviours change periodically most especially when the introduced behaviour has not been innate.

“Some of us no longer waste time washing hands with soap since we have our sanitizers. However, this practice of hand hygiene might not last long since we are not used to it” (FGD, private facility M)
3.3 Motivating factors for hand washing among healthcare workers in public and private health facilities

The major source of water for handwashing available at the health facility was tap 320 (91.4%) followed by rain 12 (3.4%), spring water 5 (1.4), and others 12 (3.7%). Among the 332 (94.9%) health care workers who had washed hands on the day of the interview, the reasons for washing hands were; to remove germs 317 (95.5%), good etiquette 4 (1.2%), to look smart/clean 4 (1.2%), and others 7 (2.1%). Health care workers washed hands as a result of water availability on the health facility premises, sufficient time for washing hands, distance to the handwashing facility, and operability of the facility.

From qualitative findings, the following factors were recorded

**Availability of hand washing supplies in various health facilities**

Health care workers reported the need for handwashing materials within the health facility premises to improve their handwashing practices. Such materials included; enough hand washing cans, liquid soap, disinfectants in water, improved hand washing equipment, and a continuous supply of water. These handwashing materials were reported as factors responsible for handwashing among the health workers in Ndejje division.

“We need more and improved handwashing facilities in all stations of the hand health facility so that we have separate ones for us as health care workers without sharing with the patients” *Public health facility staff, facility K*

“Rainwater harvesting techniques should be considered to solve the problem of water shortages............” *Public health facility staff, facility M*

Other water additives were reported ad motivators for handwashing including chlorine and/or Dettol.

“There is need for liquid soap or Dettol within the water used for handwashing or provision of automatic hand sanitisers” *Public health facility staff, facility O*

“Provide water with chlorine and soap” *Private health worker, facility X*

**Information about handwashing**

More guidelines about handwashing should be in place since it was reported as a factor that influences hand washing among health care workers. These guidelines and advice on proper handwashing were proposed to flow continuously from the supervisors to the subordinates.

“Through maintaining the information flow of guidelines and also advising every healthcare worker in the facility to wash hands continually by their supervisors” *Private health worker, Facility Y*

**Attitudes towards Hand Washing**
Different perceptions were obtained on; the preference of hand sanitizers for hand washing with water, the need for information provision, and the preference for PPE (gloves).

Preference for hand sanitizers for hand washing

Health care workers reported that handwashing was at times being substituted with the use of a hand sanitizer due to its time-consuming. In addition, it was reported that handwashing with soap makes hands safer than a hand sanitizer since a sanitizer leaves behind dirt and the debris.

“I would also like to always wash my hands before and after every procedure but unfortunately due to limited time and conflicting priorities, I find myself using a hand sanitizer yet it does not make my hands 100% safe” Private health worker, Clinic X

It was thought that private health facilities have facilities that enable them to record high hand washing practices and prevalence than the government health facilities. This was because government health facilities have their handwashing equipment from donors and the government budget is allocated to that facility unlike the private which receive money from different sources.

“I think we are good at hand washing than the government health facilities since, for them, their equipment relies on the national budget and donations” Private health worker, Clinic Z

Need for training

The need for training together with Information Education Communication (IEC) materials on handwashing might be perceived as a motivator for hand washing among health care workers.

“I think hand washing is highly practiced in places where posters are available” Public health facility staff, facility O

“………. when people are educated/trained, they tend to respond accordingly though it is not a guarantee” Private health worker, Clinic N

In addition, other health care workers reported that the provision of handwashing Information Education and Communication (IEC) materials around the health facility or the handwashing facility could have contributed to the improvement of the current level of handwashing.

“I think they should put posters showing the technique of handwashing on the handwashing equipment to boost the level of handwashing among our health care workers.” Private health worker, Clinic M

“More posters are needed showing the 5 steps of handwashing” Public health facility staff, facility Y

Preference of Personal Protective Equipment

The provision of adequate examination gloves to ensure safety and appropriate hand hygiene was both considered as a substitute and a supplement to handwashing with soap.
“surgical gloves should be highly available to all health care workers at all times to boost hand hygiene in addition to hand washing” Public health facility staff, facility Y

Discussion

Females were the majority and most of the study participants originated from private health facilities. Health care workers washed hands as a result of water availability on the health facility premises, sufficient time for washing hands, distance to the handwashing facility, operability of the facility. This sociodemographic characteristic represents the current population dynamics for Uganda as a country where the females are more than males even. This is in line with another study across the world by Joshi et al where females constituted the majority totaling to greater than 50% (Joshi et al., 2013). Having more nurses in this study could be attributed to the fact that many health facilities recruit the highest number of nurses than other cadres. Our results are in agreement with a this study by Abd et al that also showed more nurses in various health facilities than the males (Abd Elaziz and Bakr, 2009, Jemal, 2018). We also found out that most of our respondents had diploma as a highest qualification. This could be attributed to the fact many cadres who get recruited at the levels of health facilities III, II, IV, private clinics have such a level of training. This was also reported by previous study in Uganda by Jemal where a diploma was reported as a highest level of education (Jemal, 2018).

The proportion of handwashing was 97.7% evidenced by the presence of handwashing facilities, 98.86 reported being having handwashing facilities in good condition, in another study, around 12 participants (3.6%) informed that they had only water or nothing for washing their hands. This rise in the handwashing facilities coverage could be a positive effect of COVID-19 which is coupled by increased investment in preventive medicine but also increased enforcement of the COVID-19 guidelines under the presidential guidelines. Other studies in the past including that of Olum et al attributed this to efforts vested as a result of COVID-19 (Olum et al., 2020). According to the Centers for Disease Control and Prevention, the single most important thing that can be done to keep from getting sick and spreading illness to others is to wash hands with soap’ (American Cleaning Institute (ACI). All stations within the health facility should make it as simple as possible for everyone to clean their hands (CDC, 2018). This study recorded a higher percentage of handwashing facilities in good condition simply because the study was conducted during the second wave of COVID-19 where handwashing was highly promoted by different stakeholders as a prevention and control measure. At the moment, there was an increased awareness and belief that handwashing with soap is critical to minimizing disease spread with specificity to COVID-19. Moreover, experience and literature tell us that new behavioral patterns that emerge in response to health outbreaks or particular events do not last longer (Carver et al., 2010). There is a need for continued maintenance of the proportion of handwashing and the condition of the handwashing facilities.

The current study found that all health care workers reported being having handwashing facilities while 97.19% of them washed hands after visiting the latrine followed by 90.88% after touching surfaces touched by many people like door handles and bed surfaces. Over 87.5% of health workers in Nepal used
the hand hygiene products available to them. In the same study, the frequency of handwashing after exposure to hospitals instruments, blood or other body fluids among the respondents was markedly high (more than 90%) among all professionals. Similarly, hand washing practice after blowing the nose, sneezing or coughing into the hands was higher in nursing students and nurses (more than 90%) (Joshi et al., 2013). In Cairo, a certain study found that the overall hand hygiene compliance among health care workers was 34% (Abd Elaziz and Bakr, 2009). There is, therefore, a need to enforce hand hygiene among health care workers since the presence of handwashing facilities is not a direct reflection of hand washing.

The current study found out that the absence of water was one of the most hindrances of hand washing among health care workers and most of them suggested alternative sources of water like rainwater harvesting. Other hindrances include; the absence of soap at the station, long distance to the handwashing station, poor mechanical condition of the handwashing facility, limited time’ having a hand sanitizer, and the operability of the handwashing facility. This finding is similar to what (Jemal, 2018) reported where 25.8% reported work overload, and 31.9% gave a shortage of time as a reason for not washing their hand. In addition, 28.6% complained of a shortage of water; 8.8% complained of a shortage of soap, and 5.5% complained of a shortage of antiseptic agents and scarce handwashing supplies. Similarly, another study in Ghana reported that handwashing practice is mainly affected by the availability and accessibility of handwashing facilities such as soap, towels and clean running water (Papoe M, 2011). The availability of soap was not sustainable, the continuity of water supply to the handwashing facility not being satisfactory and thus significantly affected hand washing. This is similar to other studies which also recorded P-values less than 0.05 under the chi-square regression analysis (Dobe et al., 2013, Hutton and Chase, 2016). In addition, qualitative results from the current study pointed out the need for continuous supply and provision of water with soap and other disinfectants like chlorine. There is therefore a need to ensure a continuous supply of water and soap. In the current study, hand washing was a result of it being part of IPC measures, presence of handwashing facilities, water, while on the other hand, utilization of a hand sanitizer was considered as a substitute for handwashing. A similar study reported that out of the total 336 participants, 159 (47.3%) reported that “appropriate placement and easy accessibility of soap dispensers and handwashing stations” could be the most important factor influencing the health care workers’ compliance with hand hygiene followed by the importance of formal training on handwashing and hygiene 149 (44.3%) and provision of liquid hand wash instead of soap bars 120 (35.7%) (Joshi et al., 2013). Therefore, handwashing with soap should be combined with the use of a hand sanitizer to combat the likely effects of poor hand hygiene.

As hand washing was reported to be a means of preventing the transmission of germs, some health care workers reported being having no time for handwashing amidst their work schedule. In a similar study, hundred thirty participants (98.5%) in the study agreed that hand washing could be an effective measure in preventing healthcare-associated infection (Joshi et al., 2013). Using hand hygiene as a sole measure for infection prevention and control is unlikely to be successful when other factors such as environmental hygiene, crowding, staff levels and education are present (Abd Elaziz and Bakr, 2009). It was perceived
that the utilization of hand gloves substitutes for handwashing. This is contrary to what the standard should be.

Many diseases and conditions can be spread by not washing hands with soap and clean running water (CDC, 2016). This was true in this study where the majority of the respondents agreed that hand washing was important and prevents cross-contamination of germs. Therefore, to maintain safety, dual hand hygiene should be maintained whereby health workers should wash hands in addition to the use of hand gloves. The utilization of posters to guide health care workers on timely handwashing was reported in the current study. Using posters depicting hand hygiene instructions, and senior health workers playing role models for junior colleagues were also reported in other studies (Joshi et al., 2013). Hand washing can be promoted through hygiene education, germ-health awareness, the use of posters, leaflets, comic books, songs, and drama (Regina I Ejemot-Nwadiaro, 2015). In Bangladesh, posters, guide handbooks, folk songs and street plays related to health and good hygiene are among the factors used to promote and increase knowledge and practice of hygiene-related behaviour such as hand washing (Akter T, 2014).

Our study had several strengths, for example, the study was a mixed study with both qualitative and quantitative methods of collecting data. Secondly, the study was conducted by competent skilled people from the design of data collection tools, data collection, entry, analysis, to report writing. Our study had a relatively big sample size compared to the population of the study area and this gives internal validity for our results. We also translated and pretested the data collection tools which increased the reliability of our results. We explored the situation in both public and private health facilities in an urban and peri-urban settings of Uganda and this gives a better picture of WASH in health facilities in the sub-Saharan African setting.

However, we also had limitations First of all, the study used a self-reported approach during quantitative data collection and this could have caused reporting bias at data collection. Secondly, we had high representation from private than public and therefore the findings could be skewed to the private sector. Thirdly, we allowed the health workers to go with the data collection tools for one week and this could have encouraged discussion or search for the right responses which might have given a false impression of knowledge level. Fourth, we focused on the professional staff are recognized by professional Councils of Uganda and we missed important insights from low class cadres like porters, cleaners, and askaris yet they play significant role in handwashing in health facilities.

Conclusion

From the general perspective, hand hygiene is the simplest method that is effective in terms of cost with its importance in infection prevention and control. Though this is the case, it was found to be high in most healthcare settings. The proportion of hand washing which was evidenced by the coverage of handwashing facilities was very high and appealing among all the health care facilities. The attitudes towards hand hygiene among health workers were generally good. Hand washing was affected by marital status, religion, professional cadre, operability of the handwashing facility, distance to the
handwashing facility and the availability of sufficient water. Therefore, the sensitization on handwashing during the COVID-19 pandemic should be maintained even when the pandemic is gone to sustain the gains in handwashing coverage.

**Abbreviations**

AMR  
Antimicrobial Resistance.  
COVID-19  
Corona Virus Disease 2019  
FGDs  
Focus Group Discussions  
HCWs  
Health Care Workers  
IPC  
Infection Prevention and Control  
MaKSPH  
Makerere University School of Public Health  
MOH  
Ministry of Health  
PPE  
Personal Protective Equipment  
WASH  
Water, Sanitation, and Hygiene  
WHO  
World Health Organization

**Declarations**

*Ethics approval and consent to participate*

An introductory letter was obtained from Makerere University School of Public Health (MakSPH). Administrative clearance to conduct the study was obtained from the Ndejje division through both the Senior Assistant Town Clerk and Health Inspector from the health department. Furthermore, permission was obtained from the different health facility administrators. Only adult health care workers of a consenting age of 18 years and above as per the constitution of Uganda were considered to participate in this study. All respondents were provided with informed consent forms before participating in the study such that they were aware of my study and whether they agree to conduct the research. Privacy and confidentiality were maintained since FGDs were conducted in secure places with restricted access. Both qualitative and quantitative data were coded to hide the respondent's identity. The information obtained in this study was and will continuously be kept confidential and used only for this research.
Consent for publication

Not applicable

Availability of data and materials

The data collected for this study is readily available and can be accessed by sending a request to Ms. Noreen Nasolo, noenassolo@gmail.com

Competing interests

Authors declare no competing interests

Funding

There was no funding for this project.

Authors’ contributions

NN, AWW, JO conceptualized the study, developed study protocol. NN collected and analysed the data. NN and FGK drafted the first version of the manuscript. AWW and JO supervised the study. All authors read and approved the final version of the manuscript.

Acknowledgements

We are so greatful to Mr. Kalema Peregrino, who contributed tirelessly to the studies of the corresponding author. Furthermore, we are profoundly greatful to the leadership of Makindye Ssebugabo municipal council and the health facilities that participated in this study.

Supplementary materials

None

References


AKTER T, A. A. 2014. Factors influencing knowledge and practise of hygiene in Water, Sanitation and Hygiene ( WASH ) programme areas of Bangladesh Rural Advancement Committee.


**Figures**
Figure 1

Map of Uganda showing Wakiso District

Legend
- Red: Wakiso District
- Yellow: Kampala

2.1
97.7

Present
Absent
Figure 2

Hand washing facility coverage in the health facilities

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Appendix.docx