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# Hand Hygiene: major panacea for prevention of the spread of Covid-19 in a Nigerian south-western university

***Adesina, K.A., Afolalu, O.O., Oyekale, R.A., Afere, D.M.**

**Abstract**

**Introduction:** An essential component of the Covid-19 response and a crucial public health intervention is the promotion of better hand hygiene. While several studies contend that good hand cleanliness is essential for lowering the prevalence of infectious diseases worldwide, college students have been found to inadequately wash their hands, which increases their chances of contracting the Covid-19 virus. This study aims to assess the knowledge and practice of hand hygiene among undergraduates of Osun State University, Osogbo campus.

**Methods:** This study utilized a descriptive cross-sectional design to elicit a response from 271 male and female undergraduates of the University. A 34-item self-developed questionnaire comprising open and closed-ended questions served as the instrument for data collection. Data were analyzed in SPSS 25 using descriptive and inferential statistics at a 0.05 level of significance.

**Results:** The study revealed that half (53%) had a fair knowledge of hand hygiene towards Covid-19 prevention, (51%) had low practice and (41%) perceived unavailability of soap and water as a barrier to its practice. The result also showed that there is a significant relationship between knowledge of hand hygiene and gender ($x^2$=8.681; df=3; P=0.001). Also, a significant relationship exists between knowledge and practice of hand hygiene in the prevention of Covid-19 ($x^2$=144.775, P=0.00). However, there is no significant relationship between the course of study and knowledge of hand washing among respondents ($x^2$= .871, P=0.647).

**Conclusions:** The study revealed that fair knowledge and moderate practice of hand hygiene exists among the respondents, coupled with many barriers such as lack of soap that hindered adequate practice, which calls for careful and immediate action through public health involvement.

**Keywords:** Knowledge, Practice, Hand hygiene, Barriers.

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# Hygiène des mains : Panacée majeure pour la prévention de la propagation du Covid-19 dans une université du sud-ouest du Nigéria

***Adesina, K.A., Afolalu, O.O., Oyekale, R.A., Afere, D.M.**

**Résumé**

**Introduction :** Une composante essentielle de la réponse au Covid-19 et une intervention cruciale de santé publique est la promotion d'une meilleure hygiène des mains. Alors que plusieurs études affirment qu'une bonne propreté des mains est essentielle pour réduire la prévalence des maladies infectieuses dans le monde, il a été constaté que les étudiants se lavent mal les mains, ce qui augmente leurs risques de contracter le virus Covid-19. Cette étude vise à évaluer les connaissances et la pratique de l'hygiène des mains chez les étudiants de premier cycle de l'Université d'état d'Osun au campus d'Osogbo .

**Méthode de l'étude:** Cette étude a utilisé une conception transversale descriptive pour obtenir une réponse de 271 étudiants et étudiantes de premier cycle de l'Université. Un questionnaire auto-développé de 34 items comprenant des questions ouvertes et fermées a servi d'instrument pour la collecte de données. Les données ont été analysées dans SPSS 25 à l'aide de statistiques descriptives et inférentielles à un niveau de signification de 0,05.

**Résultat de l'étude:** L'étude a révélé que la moitié (53 %) avaient une bonne connaissance de l'hygiène des mains en vue de la prévention du Covid-19, (51 %) avaient une faible pratique et (41 %) percevaient l'indisponibilité du savon et de l'eau comme un obstacle à sa pratique. Le résultat a également montré qu'il existe une relation significative entre la connaissance de l'hygiène des mains et le sexe ( $x^2$=8,681 ; df=3 ; P= 0,001 ). Aussi, il existe une relation significative entre la connaissance et la pratique de l'hygiène des mains dans la prévention du Covid-19 ( $x^2$ =144,775, P=0,00 ). Cependant, il n'y a pas de relation significative entre le programme d'études et la connaissance du lavage des mains chez les répondants ( $x^2$ = 0,871, P = 0,647 ).

**Conclusion:** L'étude a révélé qu'il existe une connaissance équitable et une pratique modérée de l'hygiène des mains parmi les répondants, associées à de nombreux obstacles tels que le manque de savon qui a entravé une pratique adéquate, ce qui nécessite une action prudente et immédiate grâce à l'implication de la santé publique.

**Mots-clés :** Connaissances, pratique, hygiène des mains, barrières

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## INTRODUCTION

In practically every region of the world, the studied human coronaviruses (HCoVs) are a recognized cause of the common cold. Because of their virulence, two highly pathogenic HCoVs were discovered in the 21st century, which increased their significance. The severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV) were responsible for the devastating outbreaks of HCoV. Through animal reservoirs, the zoonotic infection spread to people and turned into a pandemic. In the Chinese city of Wuhan, there were suspected instances of pneumonia recorded in December 2019. A novel coronavirus has been identified as the cause of this disease. The infection was later referred to as COVID-19. Shortly thereafter, the infection was declared a pandemic by the World Health Organization (WHO) and a medical emergency worldwide (1,2). Thus becoming a highly contagious and life-threatening disease (3).

Nigeria has a total confirmed cases of 161,388 and recorded 10,363 as of June 2021 (4). Nigeria confirmed her first case of COVID-19 on 27th February 2020 when an Italian citizen in Lagos tested positive for the virus (4).

Since COVID-19 became a pandemic, numerous steps have been attempted to flatten the curve of infection spread, in addition to preventive measures. Monitoring the pattern of infection is crucial to prevent the negative effects of an epidemic threat in which hand hygiene was instituted as one of the essential measures to curtail the transmission of the disease (5,6).

Hand hygiene is defined as the behavior of cleaning the hands with soap and water and by hand-rubbing using hand sanitizer without water (7). Hand washing is an inexpensive and effective way to prevent infection and control disease (8). Research is clear that proper hand hygiene is the key to reducing the occurrence of Coronavirus in many different types of communities, including healthcare settings, daycare centers, and grade schools (9) . Poor hand hygiene was significantly linked to a higher incidence of the Covid-19 virus (10) .

People who are not regular hand washers have been shown to have an increased incidence of Covid-19 virus which can lead to inevitable bed rest and most likely unwanted death (11,12). Amid the Covid-19 pandemic, closed environments and low levels of hand washing contribute to disease transmission on college campuses which is similar to that in hospitals (3).

It is commonly understood universally that fostering greater hand washing is vital for controlling Covid19 and a crucial public health approach. (13,14) While innumerable studies posit that proper hand washing, is the key to reducing the occurrence of infectious diseases in different types of communities, college students have been found to inadequately wash their hands, which increases their chances of contracting Covid-19 virus (12). Improper hand hygiene is an important contributing factor to contracting infectious diseases among college students (10). The Center for Disease Control and WHO have published simple-to-follow hand-washing guidelines (14,15). Similarly, various interventions have been developed to improve hand hygiene practices and compliance in the community (16). However, poor hand-washing practices and low compliance are prevalent among students and even the healthcare system (10,17)

A meta-analysis of 30 hand hygiene studies found that improvements in hand washing decreased the prevalence of gastrointestinal diseases by 31% and upper respiratory tract infections by 21%, (9). It also mentions that in sub-Saharan Africa, where sanitation and hygiene habits are poor, washing hands with soap might cut the incidence of infectious diseases by 52%, and hand washing promotion has been projected to save many lives (18,19).

Even though evidence from previous studies (20,21) has shown hand hygiene to be an important measure in the prevention of COVID-19 transmission, there is a dearth of data on the practice of hand hygiene in higher institutions of learning that serves as the seat of intellectuals, who are expected to comply to hygiene practice. Therefore this study serves to assess the knowledge and practice of hand hygiene towards the prevention of Covid-19 among undergraduates of Osun State University. The guiding objectives of the study are to (a) determine the knowledge of hand hygiene in the prevention of Covid-19 among undergraduates of Osun State University, Osogbo campus (b) assess the practice of hand hygiene towards Covid-19 prevention (c) determine the barriers to hand hygiene practice among the undergraduates.

## MATERIALS AND METHODS

### Study Setting, Designs, and Population

This study utilized a descriptive cross-sectional design to assess the knowledge and practice of hand hygiene among undergraduates of Osun State University, Osogbo campus. The study population consists of selected students

from the College of Science Engineering and Technology (SET) and College of Health Sciences (CHS) respectively from the target population of undergraduates in the school. The research was undertaken in April 2021 for 7 days.

**Data Collection Tools and Sampling**

The instrument for data collection was self-developed by the researcher comprising four sections A-D. Section A: deals with sociodemographic characteristics, comprising 7 questions. Section B, which consists of 11 items with True/False responses obtains information from the undergraduates on their knowledge of hand hygiene in the prevention of COVID-19. A "True" response denotes a positive response, which received a score of 2, whereas "False" denotes a negative response, which received a score of 1. Section B had a total maximum score of 22 and a minimum score of 11. A score between 1 and 11 indicates low knowledge, while 12-22 is assigned a good knowledge score.

Section C, which consists of 11 items with a "Yes or No" response, addresses the practice of hand hygiene. A favorable reaction is indicated by "Yes," whereas a negative response is indicated by "No." A "Yes" response indicates the positive practice of hand hygiene while a "No" responses indicate no practice. Section C had a total maximum score of 22 and a minimum score of 11. A score between 1 and 11 indicates low practice, while 12-22 is assigned a good practice score.

Section D, comprising 5 questions focuses on barriers to hand hygiene practice. The instrument was a self-structured questionnaire designed by the researcher and validated by face and content validity index by two research experts in the field of health sciences, who are authors of this manuscript (KAA & AOO). The instrument's reliability was determined and a Cronbach alpha value of 0.7 for total item correlation indicates the internal consistency of the instrument.

Fisher's formula ($n = Z^2pq/d^2$) for estimating the sample size was used to calculate the sample size. Since the proportion of respondents that had good knowledge of handwashing in a previous study revealed 80% using a 95% confidence level and 0.05 level of precision, the sample size of 246 undergraduates emerged (22). After adjusting the sample size for a 10% attrition rate, a sample of 271 emerged as respondents from whom data was obtained. Before the recruitment of eligible respondents, students' record was obtained from the heads of each department. Participants were recruited for the study by multi-stage sampling. In stage one, the CHS and SET were purposively selected from the six colleges at Osun State University. In stage two, each college was clustered into faculty, from which the following 3 departments were randomly selected (Nursing, Medicine, and Civil-and Engineering). To ensure equitable distributions across each department, participants from each department were stratified based on levels of study and selected by a simple random sampling technique, which formed stage three. Data collection was undertaken at different times in the various departments where participants were selected.

**Data Analysis and Presentation**

After gathering the data, a statistical package for social sciences (SPSS) 25 was used for analysis. Descriptive statistics of frequencies, percentages, mean and standard deviation were used to describe the study population with relevant variables. Beyond descriptive statistics, inferential statistical tools of chi-square were used to analyse the hypothesised variables.

**Ethical Consideration:** Approval was obtained from the Osun State University College of Health Sciences Ethics Committee. Participants were informed of the nature of the study and written informed consent was obtained prior to the start of the study.

**RESULTS**

Table 1 shows the demographic characteristics of the participants. The majority 184 (67.9%) of the participants were age 20 years or less, with more females 157 (57.9%) than males 114 (42.1%). 123(45.6%). More Christians and 146 (53.9%) than Muslims; with 114 (42.1%) participants from CHS and 157 (57.9%) from the college of SET. The majority of the respondents were of the Yoruba ethnic group 240 (88.6%).

As revealed in Figure 2, showing the overall level of knowledge of hand hygiene towards prevention of covid-19, a significant number, greater than half of the respondents 146 (53%) demonstrated good knowledge of hand hygiene towards covid-19 prevention while 125 (47%) had low knowledge.

Table 2 demonstrates that more than 50% of the respondents 154 (56.8%) practiced hand washing for 20 seconds, 137 (50.6%) do not sneeze into their arm/elbow, 148 (54.6%) did not avoid shaking hands whilst greeting and 160 (59%) washed hands before going to bed.

Additionally, 153 (56.5%) did not maintain a distance of at least one meter whilst meeting others for protection against the virus, 156 (57.6%) never avoided touching their faces, 175 (64.6%) do not stay at home quite often, 175 (64.6%) do not wash hands after money exchange, 175 (64.6%) wash hands after blowing nose, and 155 (57.2%) wash hands after sneezing.

From Figure 2**,** more than half of the respondents 140 (51%) had good practice of hand hygiene towards covid-19 prevention while 131(48%) had poor practice.

As shown in Table 3, the barriers to the practice of hand hygiene reveal that 133(49.1%) experienced unavailability of materials for the promotion of good hand hygiene practice, while 111 (41.0%) reported the lack of running water on campus or in the hostel as obstacles. Similarly, a good number indicated unavailability of soap or detergent 111 (41.0%), lack of understanding of how important hand hygiene is 118 (43.5%), and personal habit 115(42.4%)

According to Table 4, there is a statistically significant relationship between practicing good hand hygiene and knowledge towards the prevention of Covid-19 ($x^2$= 144.775, *P=0.00*). This implies knowledge of hand hygiene in the prevention of covid-19 determines the practice and good knowledge denotes a good practice, while poor knowledge indicates poor practice.

Table 5 shows that there is no statistically significant relationship between the course of the study and knowledge of hand washing among the respondents ($x^2$=.871, P=0.647).

Table 6 demonstrates a substantial *significant relationship* between gender and knowledge of hand hygiene ($x^2$=8.681; df=3; P =0.001).

## DISCUSSION

This study assessed the Knowledge and Practice of hand hygiene towards prevention of Covid-19 among 271 Undergraduates of Osun State University, Osogbo campus. The socio-demographic characteristics revealed that the majority of the respondents were less than or equal to 20 years of age, with more females than males. The majority were (88.6%) from the Yoruba ethnic group basically because the study was conducted in Southwest Nigeria, which is predominantly constituted by the Yoruba ethnic group.

This study has showed that less than half of those surveyed were aware that staying at home can lower their risk of contracting an infection, more than half knew that washing their hands for 20 seconds can help prevent them against Covid-19 virus, more than half knew that sneezing or coughing into their arm/elbow can prevent the spread of the Covid-19 virus. These statements were corroborated by the report of the Centers for disease control and WHO on the prevention of Covid-19, who opined that regular hand washing, staying at home, washing hands with soap and water or hand sanitizing can prevent transmission of Covid-19 virus (3,4). Similarly, our findings showed that more of our participants were unaware of older adults being at higher risk of contracting COVID-19. This result is in tandem with the findings conducted in the South Western part of Nigeria, where some of the respondents perceived COVID-19 as an exaggerated event that led to the poor practice of hand hygiene as a preventive strategy (23). Whereas, it contradicts a documented study that shows the elderly group has a higher chance of perceived risk of contracting Covid-19 when found in crowded areas (24).

In general, our study revealed that there *i*s a significant relationship between knowledge of hand hygiene and gender. This finding corroborates the result of a study conducted in Sub-Saharan Africa (25) and contradicts a similar Nigerian study (26). The gender disparities reported in a previous study were linked to the unavailability of hand-washing materials in male and female toilets which is worth giving the most urgent attention to (25). *Additionally,* more than half (53%) had a fair knowledge of hand hygiene practices for Covid-19 prevention, which may be linked to the pronouncement of COVID-19 as a global pandemic by the WHO. Additionally, the overall level of practice toward covid-19 prevention is (51%). The finding from this study is similar to the 58.3% frequently reported in a study carried out in Oyo State Nigeria (23), and also similar to another study in southern Nigeria (27). The fact that most of these findings agree with ours suggests that handwashing is widely used in the treatment of infectious disorders. However, its low practice could be linked to the fair knowledge of the preventive practices displayed by our respondents. However, it was higher than a study conducted in Sri Lanka which showed that only 10% had overall good practices, while 27% had moderate practices and the majority (62.5%) were seen to have poor hand hygiene practices (28). Our findings revealed that knowledge of hand hygiene as a preventive strategy for COVID-19 does not translate to practice. This is evident in a Lagos state study

where respondents had good knowledge of hand hygiene (83%), but less (47%) practice (26).
The lack of hand hygiene supplies (49.1%), the absence of running water on campus or in dorms (41.0%), the lack of soap or detergent (43.5%), the lack of awareness of the significance of hand hygiene (42.4%), and personal habits are the most frequently mentioned factors influencing hand hygiene practice.

These findings are consistent with those found in other studies (doi.org) that looked at the most typical obstacles to hand hygiene, including: lack of soaps, antiseptics, detergents, and alcohol sanitizers, lack of running water, and negligence (29,30). In order to prevent COVID, hand hygiene is a serious public health issue that requires immediate intervention to achieve adequate compliance. To stop the spread of COVID-19 and other contagious diseases, the condition of the handwashing facilities in universities needs to be upgraded.

## CONCLUSION

Our study demonstrated that although undergraduates had a poor level of hand hygiene practice, their understanding of the topic was fair. The majority of the participants encountered greater obstacles that prevented practicing adequate hand hygiene. Lack of soap, detergent, or antiseptic is the most frequent barrier. These results demonstrate that much work needs to be done if hand hygiene is to be a successful preventative tool against the spread of COVID-19 in the community. Based on the findings of this study, hand hygiene promotion requires increased public health participation. As safe forms of communication during a pandemic like COVID-19, this can comprise health education efforts on social media, television, and radio stations. When the pandemic is ended, hand hygiene health education can be expanded to local initiatives. In order to solve the numerous physical obstacles that prevent adequate hand hygiene, we advise setting properly equipped hand washing facilities in communities and institutions. To address the issue, further research involving larger populations needs to be done.

**Conflict of interest:** No conflict of interest

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**Table 1: Socio-Demographic Characteristics of the Respondents (n= 271)**

| Variables | Categories | Frequency (n=271) | Percent (%) |
|---|---|---|---|
| Age | = 20 years | 184 | 67.9 |
| | = 21years and above | 87 | 32.1 |
| Sex | Male | 114 | 42.1 |
| | Female | 157 | 57.9 |
| Religion | Christianity | 123 | 45.4 |
| | Islam | 146 | 53.9 |
| | Others | 2 | 0.7 |
| College | CHS | 114 | 42.1 |
| | SET | 157 | 57.9 |
| Department | Nursing Science | 180 | 66.4 |
| | MBBS | 61 | 22.5 |
| | Civil engineering | 30 | 11.1 |
| Level | 200level | 95 | 35 |
| | 300level | 95 | 35 |
| | 400level | 81 | 20 |
| Ethnicity | Yoruba | 240 | 88.6 |
| | Igbo | 22 | 8.1 |
| | Hausa | 9 | 3.3 |

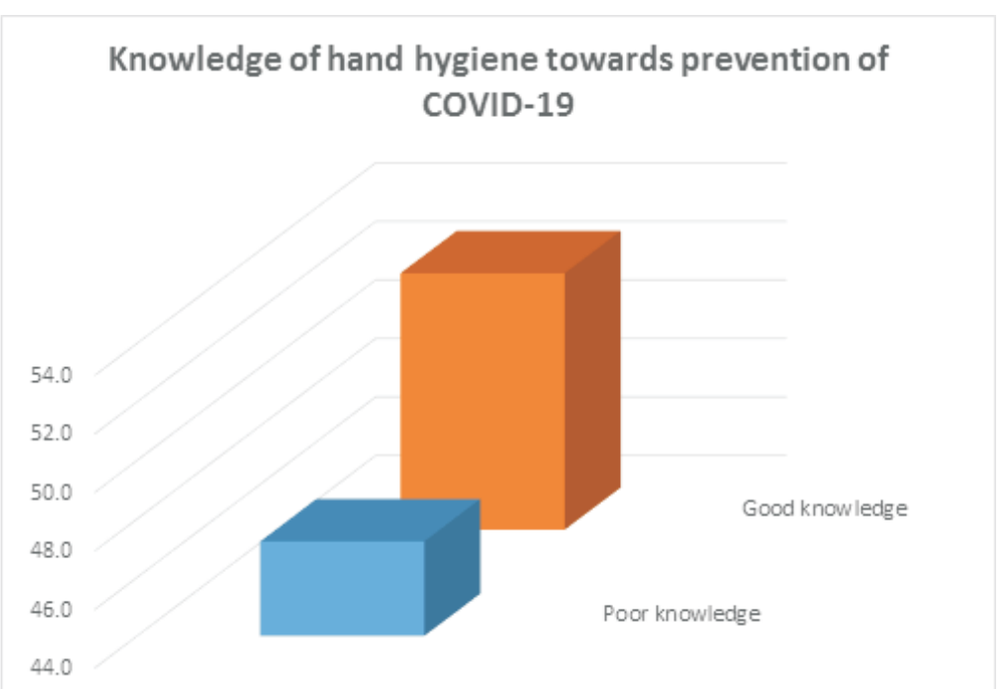


**Figure 1: Showing the overall level of knowledge of hand hygiene towards prevention of covid-19**

**Table 2: Practice of hand hygiene towards prevention of Covid-19 (n=271)**

| Variables | Categories | |
|---|---|---|
| | Yes (%) | No (%) |
| I wash my hands for 20 seconds | 154(56.8%) | 117(43.2%) |
| I sneeze into my arm/elbow | 134(49.4%) | 137(50.6%) |
| I avoid shaking hands whilst greeting | 123(45.4%) | 148(54.6%) |
| I wash my hands before going to bed | 111(41%) | 160(59%) |
| I maintain a distance of at least one meter whilst meeting others for protection against the virus | 118(43.5%) | 153(56.5%) |
| I avoid touching my face | 115(42.4%) | 156(57.6%) |
| Do you stay at home quite often | 96(35.4%) | 175(64.6%) |
| I wash my hands after the money exchange | 96(35.4%) | 175(64.6%) |
| I wash my hands after blowing my nose | 118(43.5%) | 153(56.3%) |
| I wash my hands after sneezing | 116(42.8%) | 155(57.2%) |

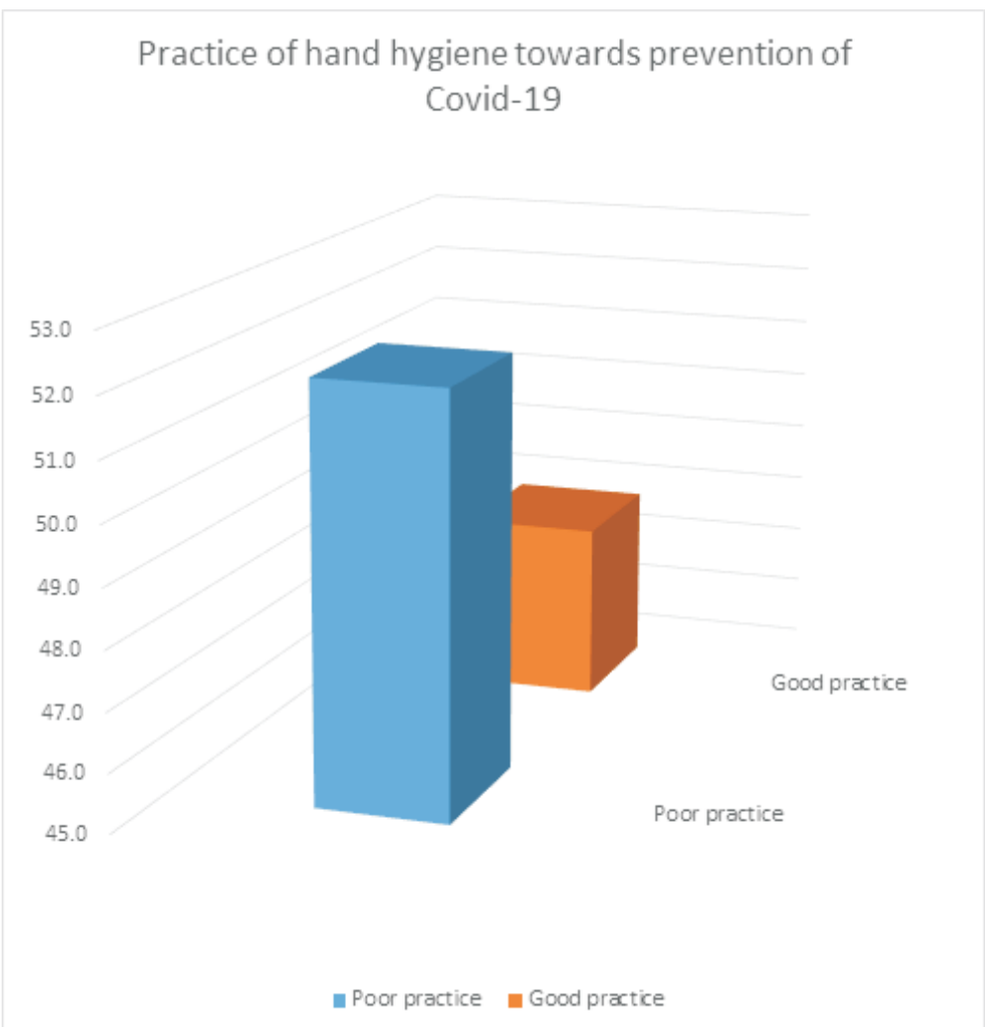


**Figure 2: Showing Summary of Hand Hygiene Practice toward Prevention of Covid-19**

**Table 3: Barriers to Hand Hygiene Practice Towards Prevention of Covid-19 (n=271)**

| Variables | Categories | |
|---|---|---|
| | Yes (%) | No (%) |
| Unavailability of material to ensure hand hygiene | 133(49.1%) | 138(50.9%) |
| Lack of running water on campus or in the hostel | 111(41.0%) | 160(59%) |
| Unavailability of soap or detergent | 111(41%) | 160(59%) |
| Lack of awareness of the importance of hand hygiene | 118(43.5%) | 153(56.3%) |
| Personal habit | 115(42.4%) | 156(57%) |

**Table 4: Relationship between knowledge of hand hygiene and practice of hand hygiene towards prevention of Covid-19 among the respondents (n=271)**

| Variables | Categories | Knowledge of hand hygiene as Covid-19 prevention | | Total | X | df | P |
|---|---|---|---|---|---|---|---|
| | | Poor knowledge | Good knowledge | | | | |
| The practice of hand hygiene towards the prevention of Covid-19 | Poor practice | 116 | 25 | 141 | 144.775[a] | 1 | 0.000 |
| | Good practice | 12 | 118 | 130 | | | |
| Total | | 128 | 143 | 271 | | | |

**Table 5: Relationship between the course of study and knowledge of hand washing among the respondents (n=271)**

| Variables | Categories | Knowledge of hand hygiene as Covid-19 prevention | | Total | X | df | P |
|---|---|---|---|---|---|---|---|
| | | Poor knowledge | Good knowledge | | | | |
| Department | Nursing Science | 88 | 92 | 180 | .871[a] | 2 | 0.647 |
| | MBBS | 28 | 33 | 61 | | | |
| | Civil engineering | 12 | 18 | 30 | | | |
| Total | | 128 | 143 | 271 | | | |

$X^2$=Pearson chi square value, df=degree of freedom, P =Probability value

**Table 6: Relationship between gender and knowledge of hand washing among the respondents (n=271)**

| Variables | Categories | Knowledge of hand hygiene as Covid-19 prevention | | Total | X | df | P |
|---|---|---|---|---|---|---|---|
| | | Poor knowledge | Good knowledge | | | | |
| Sex | Male | 68 | 46 | 114 | 8.681[a] | 3 | 0.001 |
| | Female | 72 | 85 | 157 | | | |
| Total | | 140 | 131 | 271 | | | |

Sex ($x^2$=8.681; df=3; p-value=0.001)