

## Assessment of handwashing knowledge as a Covid-19 preventive measure among medical students of Abia State University Teaching Hospital, (ABSUTH) Aba, Abia State Nigeria.

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### Abstract

**Background:** Hand washing is cleaning one's hands with soap and water to remove dirt, microorganisms, and other harmful substances on the hand. Hand washing is essential in the prevention of transmission of infectious disease like Coronavirus disease.

**Objective:** This study aims at assessing the knowledge of hand washing as a COVID-19 preventive measure among medical students of ABSUTH, Aba.

**Method:** This cross-sectional descriptive study was carried out among medical students in ABSUTH, Aba, Abia State. A self-administered semi-structured questionnaire was adopted to obtain information from the 430 students. Numerical variables were summarized using mean and standard deviation; categorical variables were summarized using frequency and proportions.

**Results:** 430 consenting ABSUTH medical students with a response of 380 (86.2 %) participated in this study. Most subjects were aged between 21-25 years (73.9 %) and were mainly females. Most student, 324 (85.3 %), had heard of Covid-19, and 154 (40.1 %) knew that proper hand washing with soap had a protective effect on Covid-19. Social media 128 (33.7 %) was a significant source of information. Some students (185) (48.7 %) wash their hands with soap on running water, believing that handwashing should be 30 seconds to 1 minute. The majority of students, 274 (72.1 %), believe handwashing should be done at least 6 to 10 times a day.

**Conclusion:** Medical students showed variable knowledge of infection prevention and control measures, with good knowledge, including hand hygiene and the number of times handwashing should be done in a day. Simultaneously, some things needed clarification regarding the minimum duration of handwashing and the knowledge of good water and soap.

**Keywords:** Assessment, handwashing knowledge, Covid-19 preventive measure, ABSUTH medical students

### Introduction

#### Background

Hand washing is cleaning one's hands with soap and water to remove dirt, microorganisms, and other harmful substances on the hand. It is simply part of hygiene, the science that deals with health promotion and the prevention of diseases in public health practices.[1] Hand washing is essential in the prevention of transmission of infectious diseases, as was discussed by a German physician named Ignae Semmelwiers about one hundred and fifty years ago. Semmalwers discovered that contaminated hands spread diseases like puerperal fever. [2] Recently, one of the most critical diseases in society that

can be prevented by hand washing is Coronavirus disease 2019 (COVID-19).

Coronavirus disease is defined as an illness caused by a novel coronavirus called severe acute respiratory syndrome coronavirus-2(SARS-COV-2, formerly called 2019-nCOV), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China.[3] It was initially reported to the WorldHealth Organization (WHO) on December 31, 2019. On January 30,2020, the WHO declared the COVID-19 outbreak a global health emergency [4]. On March 11, 2020, the WHO announced COVID-19

as a worldwide pandemic, it is the first of such designation since expressing H1N1 influenza as a pandemic in 2009.[5] However, the WHO has, as of May 6, 2023, reversed herself to say that Covid – 19 is no more an outbreak of global health emergency.[6]

Respiratory infections such as COVID-19 can be transmitted through droplets of different sizes.[7] According to current evidence, COVID-19 virus is primarily transmitted between people through droplets and contact routes. The airborne transmission was not reported in an analysis of 75,465 COVID-19 cases in China.[8]

Therefore, transmission of the COVID-19 virus can occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person; thus, hand washing significantly reduces the spread of Coronavirus.

It is important to note that the goals of the public and private partnership of hand washing (PPPHW) are to reduce the indices of diarrhea and pneumonia in poor communities with soap, support its partners, large-scale natural hand washing intervention, and promote replication spread through hand and can be prevented by proper hand washing with soap and clean water.[9]

Global hand washing day is celebrated every October 15, and its inception in 2008 was designated as the international year of Sanitation by the United Nations General Assembly. It has been reinforcing the call for improved hygiene practice worldwide.[10]

Hand hygiene is a critical healthcare issue globally and is the single most cost-effective and practical measure to reduce the incidence of healthcare-associated infection and the spread of antimicrobial resistance across all settings; from advanced healthcare systems to primary healthcare centers [11]

Despite being a simple action, hand hygiene compliance among healthcare providers is as low as less than 40 %.[12] To address this problem of lack of compliance with hand hygiene, continuous efforts are being made to identify effective and sustainable strategies. One such effort is introducing an evidence-based concept of "my five moments of hand hygiene" by the world health organization. These five moments that call for using hand hygiene include the moment before touching a patient, performing aseptic and clean procedures, being at risk of exposure to body fluids, connecting a patient, and feeling a patient's surroundings. The five steps to wash hands correctly include wetting hands, lathering hands, scrubbing hands, which should last for at least 20 seconds, rinsing hands, and drying

hands using a clean towel or an air drier.[13] Handwashing with soap six to 10 times a day can make a big difference in keeping viruses and bacteria at bay. A recent study from the University College London (UCL) confirmed the importance of handwashing, with results suggesting people that wash their hands between six to 10 times a day are 36 % less likely to contract COVID-19.[14] This concept has been aptly used to improve understanding, training, monitoring and reporting hand hygiene among health workers.[15] Novel Coronavirus disease 2019 (COVID-19) has appeared as one of the most severe pandemics and fatal diseases in human history. It has already affected millions, with thousands dying daily, creating panic and a global deadlock in all spheres of life.

Wuhan's Huanan Seafood wholesale market was found to be the source of the infection [13] that turned into an outbreak. According to the Corona Virus Resource Centre of John Hopkins University and Medicine, 1,498,833 people were confirmed to contract the 2019 NCV by April 9, 2020, in 184 countries, and out of them, 89,435 people died. [16] The scenario is changing every day with an increase in several infection and death.

World Health Organization (WHO) reports that the best way to prevent and slow down the transmission of 2019 NCV is to be well informed about it, the disease, its causes, and the mode of communication and suggest that people wash their hands with soap or hand sanitizers frequently and avoid touching their face, mouth or nose with unwashed or non-sanitized hands and also maintaining social distance. [17] Hand washing with soap is often regarded as the most influential vaccine against infection. [18] Hand washing has received considerable attention during the COVID-19 pandemic. It is a simple, primary preventive measure that most people can do independently. Hand washing with soap and water for at least 20 seconds and using alcohol-based hand sanitizers when soap and water are unavailable is the first defense in stopping the spread of infection [19].

Considering this perspective, we aimed to assess knowledge and perception regarding COVID-19 among the students of ABSUTH, who are assets of the nation and thought to be more knowledgeable and conscious about contemporary happenings at home and abroad. This study aims at assessing the knowledge of hand washing as a COVID-19 preventive measure among medical students at Abia State University Teaching Hospital, Aba.

## Materials and methods

### Study Area

The study was conducted in Umueze Community in OsisiomaNgwa Local Government Area in Aba, Abia State, Southeastern Nigeria. It has 3 wards, one primary health center, and a central market. Abia State is one of the eastern states in Nigeria, created on August 27, 1991, from the Old Imo State.[20] Its administrative capital is in Umuahia. Abia State is bordered northwards by Anambra, Enugu, and Ebonyi states, to the west by Imo State, to the east and southeast by

Akwa Ibom and Cross Rivers States, and the south by Rivers State. The indigenous dwellers of the community are Igbo, whose occupation is farming. They produce yam, cassava, maize, palm oil, and plantain. They are Christians of different denominations but are dominated by the Seventh Day Adventist Church and Orthodox churches. OsisiomaNgwa is a city found in Abia State, Nigeria. It is located at 5.11 Latitude and 7.37 Longitude and at an elevation of 64 meters above sea level. The LGA has an area of 198 Square

kilometers and a population of 220,662 as per 2006 census data of Nigeria projected to 289,100 at 2.7 % in 2016 annual growth rate.[21] Its residents are civil servants, business people, and farmers.

The town houses a tertiary health facility- Abia State University Teaching Hospital, with several Government and privately owned primary, secondary, and tertiary institutions, including a few banks, churches, industries, hotels, hospitals, etc.

### 3.3 Study Population

The study population was 864 students, which comprised 400 level 500, and 600-level undergraduate medical students in Abia State University Teaching Hospital Aba, Abia State.

#### 3.3.1 Inclusion Criteria

All the medical who gave informed consent to participate and fill out the questionnaire.

#### 3.3.2 Exclusion Criteria

Non-medical students. Medical students who didn't give informed consent

#### Sample Size Determination

The sample size will be determined using the formula [22]

$$N = \frac{z^2 \cdot P \cdot Q}{d^2}$$

Were,

N = Minimum sample size

Z = Standard normal deviate, usually set at 1.96 which corresponds in 95% confidence level.

P = Proportion with deserved characteristics = 50%

Q = I.P (Proportion in the target population not having the deserved characteristics)

D = Degree of accuracy usually set at 0.05

### Result

430 questionnaires were distributed to the study participants, but 380 participants returned their questionnaires, giving 86.2 % recovery,

$$N = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$N = \frac{384.16 \times 0.25}{0.0025}$$

$$N = 0.96004 - 384.16 = 0.025$$

Therefore, minimum sample size (N) = 384

Adjustment for non-response,  $N_s = N/\text{response rate}$

Assumed response rate = 82% i.e.  $0.82 \times 384 / 0.82 = 469.38$

$$N_s = 384 / 0.90$$

$$= 429.67$$

$$= 430$$

Therefore, sample size used = 430

#### Sampling Techniques

The sampling technique was systematic sampling from the class registers of the three classes, 400 level, 500 level, and 600 level totaling 864, and a sample size of 430. The sample fraction was  $430/864$  (1/2), the sampling frame was 001 to 864, and the sampling interval was 2. Starting point lies between 001 and 002, and a table of random numbers was consulted to select 002 as the starting point. With a sampling interval of 2, 430 students were chosen between 001 and 864.

#### Ethical Considerations

Ethical approval for this work was sought and obtained from the ethics and research committee of Abia State University Teaching Hospital, Aba. Permission was obtained from the Umunze community Abayi, OsisiomaNgwa, and informed consent was obtained from the participants. All information received from our respondents was handled with utmost confidence.

which was the response rate, and the findings are presented below in tables. The mean age of the respondents was  $24 \pm 5.94$ .

**Table 1:** Socio-demographic characteristics of the respondents.

Variables		Frequency	Percentage (%)
Age group	≤ 20	28	7.4
	21 – 25	281	73.9
	26 – 30	41	10.8
	31 – 35	7	1.8
	36 – 40	8	2.1
	≤ 41	15	3.9
Sex	Male	150	39.5
	Female	230	60.5
Tribe	Igbo	368	96.8
	Hausa	2	0.5
	Yoruba	3	0.8
	Efik	7	1.8
Class level	400 level class	130	34.2

	500 level class	126	33.2
	600 level class	124	32.6
Mothers' level of education	Secondary education	118	31.1
	Tertiary education	262	68.9
Mother's occupation	Teaching	120	31.6
	Trading	94	24.7
	Civil service	166	42.7

Table 1 shows the socio-demographic characteristic of the students. The Majority of the students, 281 (73.9 %), were found in the age range of 21 – 25 years, while the most minor 7 (1.8 %), were in the age range of 32 – 35 years; female students, 230 (60,5 %) constituted the Majority, of the students while male 150 (39.9 %) constituted the minority. The Majority of the students, 368 (96.8 %), were Igbo, while the most minors 2 (0.5), were Hausa; the Majority of the

students, 130 (34.2 %), were in 400 level classes, while the most minor 124 (32.6 %), were in 600 level classes. The Majority of the students' mothers, 262 (68.9 %), had tertiary education, while the minority of the student's mothers, 118 (31.1 %), had secondary education. The Majority of the mothers of the students, 166 (42.7 %), were civil servants, while the minority of the mothers of the students, 94 (24.7 %), were traders.

**Table 2:** Proportion of students who have heard of Covid-19.

Variables		Frequency	Percentage (%)
Students who have heard of Covid-19	Yes	324	85.3
	No	76	14.7
Total		380	100.0

Table 2 shows the proportion of students who had heard of Covid-19, majority of the students, 324 (85.3%) were aware of having heard of covid-19, while 76 (14.7%) of the students were not aware of Covid-19 having not heard of the disease.

**Table 3:** Proportion of students who knew that proper hand washing with soap has a preventive effect on Covid-19

Variables		Frequency	Percentage (%)
Proportion of students who knew that proper hand washing with soap has a preventive effect on Covid-19	Yes	154	40.1
	No	226	59.9
Total		380	100.0

Table 3 shows the proportion of students who knew that proper handwashing with soap had a preventive effect on Covid-19. The majority, 226 (59.9 %), said they didn't know, while 154 (40.1 %)

said proper handwashing with soap had a preventive effect on covid-19.

**Table 4:** Sources of information on Covid-19 for students.

Variables		Frequency	Percentage (%)
Sources of information on Covid-19 for students	Friends	42	11.0
	School	60	15.8
	Social Media	128	33.7
	Mass Media	72	19.0
	Community	45	11.8
	Church	33	8.7
Total		380	100.0

Table 4 shows possible sources of information for students on Covid-19; social media 128 (33.7 %) constituted the majority of the sources

for students, while details from church 33 (8.7 %) constituted the least to students.

**Table 5:** Availability of good water supply and soap as necessities for handwashing

Variables		Frequency	Percentage (%)
Availability of good water supply and soap as necessities for handwashing	Always	89	23.4
	Sometimes	291	76.6
Total		380	100.0

Table 5 shows the role of good water supply and soap availability in handwashing as a preventive measure. A few students, 89 (23.4 %), said that the availability of good water and soap is always essential

for handwashing, while the majority of the students, 291 (76.6 %), said that the availability of good water and soap is sometimes necessary for handwashing.

**Table 6:** Minimum duration of handwashing with soap at a time

Variables		Frequency	Percentage (%)
Minimum duration of handwashing with soap at a time	Less than 30 seconds	195	51.3
	30 seconds – 1 minute	185	48.7
Total		380	100.0

Table 6 shows the minimum duration of handwashing with soap at a time. The majority of the students, 195 (51.3 %), said that handwashing with soap for less than 30 seconds was the minimum

duration, while 185 (48.7 %) students said that handwashing with soap for 30 seconds to 1 minute was the minimum duration.

**Table 7:** Number of times handwashing with soap should be done daily.

Variables		Frequently	Percentage (%)
Number of times handwashing should be done in a day.	At least 1 – 2 times	37	9.7
	At least 3 – 5 times	69	18.2
	At least 6 – 10 times	274	72.1
Total		380	100.0

Table 7 shows the number of times handwashing should be done in a day; the majority of the students, 274 (72.1 %), said that handwashing with soap should be done at least 6 – 10 times a day, which is the gold

standard, while 69 (18.2 %) said that handwashing should be 3 to 5 times a day and 37 (9.7 %) said that handwashing should be 1 to 2 times a day.

## Discussion

Many of the respondents in this study were aged between 21-25years (73.5 %), with more females (60.5 %). The mean of the respondents was 24 ± 5.94. Of the majority of the mothers of the respondents, 262 (68.9 %) had tertiary education, and the majority of the mothers of the respondents, 166 (42.7 %) were civil servants.

In this study, the majority of the students, 324 (85.3 %), were aware of Covid-19, but few of the students, 154 (40.1 %), knew that proper handwashing with soap had a preventive effect on Covid-19. In a study in Saudi Arabia, 46 % of the students thought that handwashing is a potential protective measure against diseases, whereas 34 % thought it only removes dirt [23], which appears similar to our study. In another study in Jordan, 81.4 % of the participants had good knowledge, which is higher than our research.[24] Having adequate knowledge is a prerequisite to building positive preventive practice and formulating a positive attitude. In contrast, lack of knowledge is a risk factor that makes the healthcare worker more vulnerable to being infected with COVID-19.[25,26] The outcome of these studies is in line with a cross-sectional web-based survey in South Eastern

Nigeria [25] during the lockdown period and showed that the majority of health workers (88.59 %) had good knowledge and good preventive measure (81.39 %) of Covid-19. However, these are outside our study. In addition, one of the most recent online cross-sectional studies [27] showed that most participants had good Covid-19 knowledge, but they were not reflected in their protective measures. Also, in Lebanon [28], it was reported that Lebanese doctors had good Covid-19 knowledge but needed to understand how to use personal protective equipment. Furthermore, it was reported that 99.5 % of the health workers in Bangladesh [29] had good covid-19 knowledge and 88.8 % protective measure. It was also reported in a study in Egypt [30] that knowledge played a crucial role in Covid-19 preventive measure.

In another study conducted at Jordan University Hospital,[31] most of the students (91.2 %) reported being aware of standard isolation precautions. Although self-reported awareness and actual knowledge and application may differ in students, this percentage is much higher than the self-reported rate among students in Qatar (48.4 %).[32] The

finding consolidates this disparity between self-reported awareness and medical students' knowledge; fewer medical students reported correct responses to specific questions in hand hygiene, transmission of communicable diseases, and infection control measures

About one-third of their students reported not being exposed to hand hygiene training and that hand hygiene needed to be embedded in their clinical training. Nevertheless, most of the students (92.7 %) claimed to have sufficient knowledge about hand hygiene, which is comparable to a medical student in Qatar,<sup>32</sup> and slightly lower compared to findings among nursing students in Ireland,<sup>33</sup> considering that nearly all of their students (99 %) have received hand hygiene training. Medical students are at high risk of acquiring hepatitis B and HIV through exposure to patients, possibly contaminated equipment, and the hospital environment. Therefore, adequate knowledge about these diseases is substantial in preventing transmission.<sup>[34]</sup> Sufficient knowledge is a prerequisite for using preventable measures such as handwashing, wearing gloves, using good water and soap, and reducing social distancing. There was a difference in knowledge scores between staff who had a policy regarding COVID-19 prevention at the workplace and those who didn't have such a policy. The preventive approaches could be based on local healthcare authorities, CDC, or other resources. This result was supported by a study in Saudi Arabia <sup>[35]</sup> in 2022, where it was found that following the CDC policy can prevent the spread of COVID-19 from infected patients to staff.

In another study in Dominica <sup>[36]</sup> like our study, the participants had a generally high level of awareness of hand washing hygiene. This outcome can result from the advent of the covid-19 pandemic, which has caused an increase in public enlightenment on the need for frequent hand washing as a critical preventive measure for the disease, among other steps. This reason for a high level of awareness has been shown by other similar studies <sup>37,38</sup> In a study to detect the level of knowledge and practice as a preventive measure to combat COVID-19 disease in Saudi Arabia, it was revealed that 84 % of the population realizes and practices handwashing.<sup>[38]</sup> This awareness, however, needed to be better among the respondents of this present

## Conclusion

Medical students showed variable knowledge of infection prevention and control measures, with good knowledge, including hand hygiene and the number of times handwashing should be done in a day. Simultaneously, some things needed clarification regarding the minimum duration of handwashing and the knowledge of good water

## Recommendations

To reduce the spread of COVID-19 through handwashing, we therefore, recommend as follows: Proper health education on handwashing should be incorporated into the school curriculum, provision of good water supply and soaps at strategic points in the

study, as evident in some of their responses on specific details about handwashing hygiene. For example, some participants felt washing their hands 1-3 times a day was sufficient to meet their hygienic requirements. Some also indicated that 5 seconds was okay as the minimal time needed for hand washing via alcohol-based hand rub may need to be corrected. The participants of this study are not isolated in this knowledge gap. In a study conducted among students in Saudi Arabia.<sup>[37]</sup>

The insufficient knowledge observed in our study and that in Saudi Arabia could be because a large percentage of the participants, especially among the 400-level and 500-level students, were yet to have any formal training on handwashing hygiene, which is essential, mainly because of the nature of the profession they are training for. Therefore, training on handwashing must be formalized among medical students, especially at the inception of their coming to school. The primary source of information 128 (33.7 %) was Social media; however, there other sources such as mass media 72 (19.0 %), schools 60 (15.8 %), Community 45 (11.8 %), Friends 42 (11.0 %), and Church 37 (8.7 %), This finding was in line with a study in Jordan<sup>24</sup> where healthcare workers' sources of knowledge regarding COVID-19 were radio, TV, and internet website, formal authorities, and physicians. These results are similar to Vietnam <sup>[39]</sup>, where it was noted that social media was the primary source of information regarding COVID-19 among healthcare workers.

In our study, the majority of the students, 274 (72.1 %), stated that handwashing should be done at least 6 to 10 times a day, which is the gold standard; however, the rest of the students indicated that it should be between 1 and 5, this misconception was observed in Saudi Arabia <sup>[37]</sup> where some of the participants felt washing their hands 1-3 times a day was sufficient to meet their hygienic requirements. Some also indicated that 5 seconds was all right as the minimal time needed for hand washing via alcohol-based hand rub, which may need to be corrected.

Handwashing with soap is crucial in preventing water- and foodborne diseases by 50 % to 70 %, and pneumonia, impetigo, and diarrhoeal infections by 40 % to 50 %.<sup>[40]</sup>

and soap. A more thorough assessment of curricula and possible predictors of students' learning should be advocated, in addition to employing continuous measures to improve students' knowledge and preventive measures of covid-19 and other infections.

hospital, school authorities should post general guidelines at each handwashing site, further studies to be done on handwashing practice to demonstrate the reduction of COVID—19 spread.

**Conflicts of Interest:** The authors declare no conflicts of interest regarding the publication of this paper.

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