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Impact of Pandemic COVID-19 on the knowledge and attitude of hand hygiene among medical graduates

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Introduction: Hand hygiene is one of the most important measures among infection control practices. Knowledge of hand hygiene among medical graduates crucial in minimizing nosocomial infections. During the pandemic COVID-19, awareness is being created through various routes concerning hand hygiene to combat the pandemic. The current study targeted at determining the impact of awareness programs on hand hygiene awareness among medical graduates. **Materials and Methods:** This was a cross-sectional study based on a questionnaire to evaluate the knowledge of hand hygiene among second-year graduate medical students. The structured questionnaire was sent to the participants through the email and Whatsapp in the form of a google doc link. The degree of knowledge of hand hygiene was determined by dividing the responses into three classes based on a score of more than 75% considered good, 50-74% moderate, and 50% considered poor as less than. Individual responses received and the data analyzed. **Results:** A total of 95 students were included in the study. Out of these 54 (56.84%) were females and 41 (43.16%) males. A preponderance of knowledge level was found to be good (87%) among the participants. It has been observed that the majority of students had a positive attitude towards hand hygiene (98-100%). **Conclusion:** It was noticed from the results obtained in this study, that a significant rise in the knowledge levels and positive attitude among medical graduates during pandemic COVID-19.

Keywords: COVID-19; Hand wash; Hospital-acquired infections, Medical graduates

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Introduction

Human existence is watching an odd time battling against an unseen opponent, the novel coronavirus-19. A cluster of unexplained origin of pneumonia cases appeared in Wuhan, Hubei, China in December 2019, with Clinical findings closely resembling viral pneumonia. Extreme genomic analysis from lower respiratory tract samples revealed a novel coronavirus [1]. The new virus was originally designated by WHO as 2019-nCoV. WHO declared an official designation for the novel coronavirus disease on 11 Feb 2020:

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Coronavirus disease 2019 (COVID-19) [2]. On the very same day, the International Committee on Virus Taxonomy Coronavirus Research Group (CSG) posted a memorandum on bioRxiv, recommending that 2019-nCoV be identified as an extreme acute respiratory syndrome coronavirus 2 (SARS-CoV-2) based on a phylogenetic analysis of associated coronaviruses [3].

As per the existing evidence, the COVID-19 virus is transmitted primarily through respiratory droplets and communication routes between people [4].

Droplet transmission happens when a person is in direct contact (within 1 m) with someone else with respiratory symptoms (e.g., coughing or sneezing) and is thus at risk of exposure to potentially contagious respiratory droplets through his / her mucosa (mouth and nose) or conjunctiva (eyes). Fomites around the infected person in the immediate environment will also play an important role in the transmission of infection [5].

The COVID-19 pandemic has visibly reached a new phase with a rapid rise in countries and all sectors of society must recognize and take steps to protect themselves and avoid infection transmission to others.

COVID-19 pandemic brings undeniable proof that pandemic prevention demands the urgent implementation of non-pharmaceutical proof-based interventions (NPIs) by a motivated and informed population. One of the NPIs is hand hygiene. Maintaining appropriate hand hygiene is the key role in combating any respiratory viral infection.

For several reasons, an analysis of the impact of hand-hygiene interventions to reduce infectious diseases in the community and hospital environment is important. Hand hygiene is considered an essential indicator of prevention for pandemic risks to public health, such as severe acute respiratory syndrome. Thus the awareness is being created through various routes concerning hand hygiene to combat pandemic COVID-19.

The present study was aimed to determine the impact of COVID-19 pandemic on the knowledge and attitude of medical graduates on hand hygiene.

Materials and Methods

Study setting: This study was conducted among the medical graduates of a tertiary care teaching hospital.

Duration and Study type: The present study was conducted over a period of 20 days (April 2020).

This was a cross-sectional questionnaire-based study.

Sampling methods and sample size: A total of 95 participants belonged to second-year medical graduates. A convenience sampling technique was used. All respondents were required to submit a WHO self-administered hand hygiene questionnaire [6].

Inclusion criteria: Undergraduate students of second-year MBBS and those who gave consent to participate in the study.

Exclusion criteria: Students of other undergraduate courses.

Data collection procedure: The structured questionnaire was sent to subjects through the email and Whatsapp in the form of a google doc link. Individual responses received and the data analyzed.

Scoring method: The questionnaire for evaluating the level of knowledge on hand hygiene consists of 10 main questions with sub-questions. The answers were multiple choices, Yes/No type or a single choice, true/false, etc. Further to assess the attitude of participants five more questions were added. The answers were of yes or no type. One point was given correct answers, while the incorrect answers were zero. The degree of knowledge of hand hygiene was determined by dividing the responses into three classes based on a score of more than 75% considered good, 50-74% moderate, and 50% considered poor as less than.

Ethical consideration and permission: Permission was obtained from the institutional ethical committee.

Statistical analysis: A simple percentage method was used to analyze data.

Results

A total of 95 students were included in the study. Out of these 54(56.84%) were females and 41(43.16%) males. A preponderance of knowledge level was found to be good (87%) among male and female undergraduates.

Poor knowledge level score was found to be nil among females whereas male students accounted for 4%. (Table.1)

Table-1: Gender wise distribution of knowledge among medical undergraduates.

Knowledge level	Male	Female	Total
<50 (Poor)	4%	-	4%
50-75 (Moderate)	8%	1%	9%
>75(Good)	33%	54%	87%

Individual correct responses were displayed in table.2. All study participants (100%) were responded to question no.2,8 and question no.10 a by giving correct answers.

Table-2: Correct responses regarding knowledge of hand hygiene.

Question	Correct responses
Q1 Any formal hand hygiene practice in the last three years?	77%
Q2 Will, you consistently use hand washing dependent on alcohol for hand hygiene?	100%
Q3 What is the primary route of transmission of potentially dangerous germs in a health-care facility for patients?	88%
Q4 Which is the most prevalent cause of germs responsible for infections associated with healthcare?	72%
Q5 Any of the following hand hygiene steps avoids bacteria spread to the patient? 5a.Before a patient is contacted. Yes No	77%
5b.Quickly after the risk of infection to body fluids Yes No	92%
5c.When subjected to the immediate surroundings of the patient. Yes No	60%
5d.Just before a sterile/aseptic process. Yes No	91%
Q6 The following hand hygiene steps avoids bacteria transfer to health care staff 6a.Since having touched a patient No	98%
6b Quickly upon exposure to body fluid. Yes No	90%
6c. Just before a sterile/aseptic procedure Yes No	71%
6d.Once a patient has been subjected to the immediate surroundingsYes No	83%
Q7.Of the following claims are accurate for hand rubbing dependent on alcohol and handwashing with soap and water? 7a) Hand rubbing is faster for hand cleaning than hand washingTrue False	89%
7b.Hand rubbing creates more dry skin than hand washingTrue False	67%
7c.Hand rubbing is better against germs than hand washingTrue False	88%
7d.Hand rubbing and hand cleaning shall be carried out subsequently True False	61%
Q8 Total time that alcohol-based hand rubbing takes to remove the germs on hands.	100%
Q9 In the following situations which form of hand hygiene procedure is required? 9a.just before abdominal palpation	83%
9b Before giving an injection	91%
9cHaving cleaned a bedpan	97%
9dAfter removal of hand gloves	61%
9eHaving made a patient's bed	75%
9fUpon access to clear blood	83%
Q10 Rising of the following should be stopped when combined with an increased likelihood of hand colonization of dangerous germs? 10a. Wearing jewelry	100%
10b.Injured skin	97%
10c. Long fingernails	99%
10d.Usage of a hand cream daily	77%

In the present study, concerning the assessment of attitude towards hand hygiene, it has been observed that the majority of students had a positive attitude (98-100%) Table.3

Table-3: Responses regarding attitude towards hand hygiene among medical students.

Questions	Yes	No
Do you carry hand rub in your pocket?	98 %	2%
Does the infection control team have a positive influence on your hand hygiene?	100%	-
Do you think hand hygiene is an essential part of your role?	100%	-
Do infection control banners remind you of hand hygiene?	99%	1%
Do you forget to maintain hand hygiene?	100%	-

Discussion

The present study was aimed to analyze the knowledge level and attitude towards hand hygiene among medical undergraduates during the pandemic COVID-19. At the time of this survey, participants were subjected to extensive media and government awareness programs of the pandemic's need for hand hygiene. The present study revealed the knowledge level of medical graduates concerning hand hygiene was good and found to be satisfactory. Overall, 87% of students scored more than 75 points.

This research also showed the perception of hand hygiene of both the sexes is different from one another. Surprisingly no female participant scored less than 50 points in the questionnaire. This was similar to the study conducted by Herbert et al. However no statistical difference was noticed between the two genders [7]. In yet another study, the female students were found to have a higher level of effective hand hygiene compared with males. This reflects the idea that female students could show better self-assessment for adherence to hygiene guidelines than for males.& Maybe correlated with their propensity to adopt socially appropriate behaviors, the greater conformity of females [8].

Our findings are in contrast with the study conducted in a university in Saudi Arabia found that there was no substantial gap in the knowledge of hand hygiene between the two genders among medical students [9]. All participants in the study revealed 100% correct responses to certain questions such as alcohol as the important ingredient of any hand rub for the maintenance of accurate hand hygiene, and another critical step in the maintenance of proper hand hygiene is contact time. In this study, all the participants agreed that wearing jewelry increases the likelihood of microbial colonization.

Students' correct responses were limited to certain general concepts of hand hygiene but not towards hand hygiene practices concerning WHO 5 movements. This could be due to the message received on television and social media was to protect themselves and not the patient in the health care setting. Various studies from different parts of the world before the pandemic COVID-19 showed poor to moderate levels of knowledge among medical students [10,11,12].

Interestingly, in the present study, the knowledge scores concerning hand hygiene were significantly high among medical graduates. This could be due to extensive campaigns done by government, private organizations and further social media played a key role in creating awareness among the general public as a part to combat existing pandemic COVID-19. But as per Chao Yang, hand washing is "especially significant? for COVID-19 infection control requires further research, since there is no compelling proof that this preventive method is successful in the COVID-19 pandemic [13].

Hand-hygiene may not be helpful if the primary route of transmission is a small-particle aerosol.

There is evidence that tens of times greater quantities of virus are required for virus infection by intranasal drops than with aerosols [14].

However, the knowledge acquired on hand hygiene during the pandemic COVID-19 helps to reduce the other infections such as respiratory infections, gastrointestinal infections, and also most important nosocomial infections in health care settings. There is compelling evidence that better hand hygiene can minimize infection rates. Many as 20 hospital-based investigations of the effect of hand hygiene on the incidence of hospital-acquired infections have been reported between 1977 and 2008.15.

According to Oliveira et al., it was noticed that the professionals exaggerate their hand hygiene adhesion levels, while self-reporting (87.9 percent) and it is was very different from the observed rate (19.0 percent) [16]. This behavior of overestimating opinions and performing widely acceptable answers that benefit from the use of the questionnaire test. And by using this form, medical graduates will almost always record higher rates than they truly do [17].

Limitations

The research has few drawbacks, such as (i) The current study can only conclude that changes in the education and behavior of the students were due to the hand hygiene programs given to the general population during the COVID-19 pandemic, but cannot be assured that better practices were followed unless they are measured during the clinical postings. (ii) The questionnaire was distributed only among a particular semester of students. (iii) As the students were not available during the study period on the campus, the survey

Was done online. These limitations can be overcome by conducting a further survey among all medical graduates on campus after the pandemic.

Conclusion

It was noticed from the results obtained in this study, that a significant rise in the knowledge levels and positive attitude among medical graduates during pandemic COVID-19. Further, studies have to be carried out to demonstrate hand hygiene adherence rates during the clinical postings after or during the COVID-19 pandemic. Acquired knowledge and attitude related to hand hygiene during pandemic COVID-19 can be sustained by implementing continuous strategies such as training that target on hand hygiene techniques, indications, recognition of opportunities for this procedure (five moments described by WHO).

What does the study add to the existing knowledge?

The majority of previous studies reported a poor and moderate level of knowledge among medical graduates. The present study revealed that there is a significant rise in the knowledge levels especially general concepts of hand hygiene and positive attitude among medical graduates during pandemic COVID-1.

Author's contribution

Both the authors, **Dr. N. Rajkumar** and **Dr. S. Khaja Moinuddin** have made a substantial contribution to the work reported in the manuscript in terms of the concept, data analysis, manuscript preparation, and manuscript editing.

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