# Effectiveness of Targeted Health Education with Focus on Knowledge and Practice among Hospital Sanitation Workersdesignated in Isolation Wards as Part of the Pandemic Preparedness for COVID-19

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## Abstract

**Context:** Hospital sanitation workers are at the frontlines of the global crisis caused by COVID-19 and face the challenge of lack of awareness about the disease and methods of protecting themselves and others from getting infected. A targeted health education intervention was conducted among them on knowledge and practice regarding basic epidemiology, clinical features and prevention of COVID-19.

**Aim**: To evaluate effectiveness of targeted health education intervention with focus on knowledge and practice regarding COVID-19 pandemic among hospital sanitation workers

**Settings and Design**: Quasi-experimental one group pre test, post test design

**Methods and Material:** Study was done among 46 hospital sanitation workers using structured questionnaire covering demographic variables, knowledge on the basic epidemiological characteristics, clinical features and practice on the prevention of COVID-19. After obtaining informed consent, pre-test was conducted and a targeted health education was given. On the 3rd day, post-test was conducted using same questionnaire. The mean pre and post test scores were calculated and difference between the scores was analyzed.

**Statistical analysis used**: Data was analyzed using SPSS version 25. Demographic information was tabulated using descriptive statistics. The difference between the mean pre test and post test scores was analyzed using paired t test.

**Results**: The mean pre test score was 9.39±1.5, with 35(76%) having good and 11(24%) poor pre test scores. Those in the age group 36-45 years had significantly higher pre test scores compared to other age groups (p=0.03). The mean post test score was 10.6±1.13. There was a statistically significant improvement in the post test scores of the study subjects (p=0.001). Hence, the targeted health education intervention was effective in improving the knowledge and practice of hospital sanitation workers regarding basic epidemiology, clinical features and prevention of COVID-19.

**Conclusions:** Given the heightened vulnerability of hospital sanitation workers to nosocomial infections, all health care institutions should integrate targeted health education intervention into their epidemic response plan.

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***Key-words****: COVID-19, targeted health education, hospital sanitation workers, pandemic*

## Introduction

An acute respiratory disease, caused by a novel

coronavirus; "The Coronavirus Disease 2019" (COVID-19), first emerged in December 2019 in Wuhan, the capital of Hubei Province in China and the disease continues to spread globally. On 30th January 2020, World Health Organization (WHO) officially declared the COVID-19 epidemic as a public health emergency of international concern and on 11th March 2020, the disease was declared a pandemic. As of 24thApril 2020, more than 2.27 million cases of have been reported in more than two hundred countries and territories, resulting in over 193,000 deaths. More than 760,000 people have recovered from the disease so far[1].

The virus that causes COVID-19 is named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its emergence marked the introduction of a highly pathogenic and pandemic coronavirus into the human population in this century.COVID-19 spreads from person to person by droplets and contact. The most common symptoms of COVID-19 are fever, tiredness, cough, sore throat. Some patients may have breathing difficulty, loss of smell, runny nose, or diarrhea[2]. Some people become infected but don't develop any symptoms and most people (about 80%) recover from the disease without requiring special treatment and care.

Research into treatment and vaccine development for COVID-19 is ongoing, but are several months away. At the same time, there is intense pressure on the global health care workforce who battle in the frontline, including doctors, nurses, paramedical staff and other health care staff in hospitals. This potentially overwhelming burden of illness poses great stress on the capacity of the health system and also there is risk of infection to the health care staff. Figures from China's National Health Commission show that more than 3300 health-care workers have been infected as of early March and, by the end of February at least 22 had died. In Italy, 20% of responding health-care workers were infected, and some have died[3].Transmission to the family members of these health care workers is also widely reported from both symptomatic and asymptomatic individuals. This highlights the urgent need for prevention of cross infection, which requires careful preparedness, extreme vigilance, active management and protection of the frontline health care staff.

Among the hospital staff, the sanitation workers are the often overlooked group of people at the frontlines of the global crisis caused by COVID-19. They put their lives at risk every day and play a critical role in preventing the spread of the virus, by ensuring the hospital wardsincluding the isolation wards, theatres, outpatient departments and hospital toilets are kept clean and hygienic. They are often forced to work in unprotected and stigmatized environment and their contribution often goes unappreciated.Sanitation workers are at high risk like the medical professionals and the community health workers who deal with COVID-19 patients. One of the biggest challenges they face is lack of proper awareness about the various aspects of the disease and methods of protecting themselves and others from getting infected with COVID-19. As health care professionals, it is our duty to equip our hospital sanitation workers by keeping them adequately informed and providing appropriate training to them regarding COVID-19, including the basic epidemiology, signs and symptoms, measures to protect themselves from contracting infection while taking care of patients.

With the above objective, a targeted health education intervention was conducted on knowledge and practice regarding basic epidemiology, clinical features and prevention of COVID-19 among the hospital sanitation workers in our institution.

## Objective

To evaluate the effectiveness of targeted health education intervention with focus onknowledge and practice regarding COVID-19 pandemic among hospital sanitation workers

## Methodology

The purpose of this interventional study was to obtain hospital sanitation workers'general awareness andpractice regarding the basic epidemiology, clinical features and prevention of COVID-19 and to evaluate the effectiveness of targeted health education intervention on the same.The questionnaires were distributed before the health education session and the participants were told to tick the correct answer from given options. The item generation pool of the questionnaire wasbased on the following areas: Personal information; current knowledge regarding the basic epidemiology and clinical

features and practice on prevention of COVID-19.

We used a quasi-experimental one group pre test, post test design and was carried out in March 2020.The study population consisted of 46 hospital sanitationworkers who were assigned to be posted for duty in the proposed isolation ward for taking care of COVID-19 patients/suspects. The inclusion criteria were age between 18-55 years, those who were able to read & write in the local language, Malayalam. The study tool consisted of a structured questionnaire with questions on demographic variables, knowledge on the basic epidemiological characteristics, clinical features and practice on the prevention of COVID-19. The content validity of the tool was assessed by epidemiologist and faculty of the department of community Medicine in our institution and the item level CVI (Content validity index) was found to be 0.8. The reliability of structured knowledge questionnaire was calculated using Kuder Richardson 20 (KR20) and it was found to be 0.75.

**Data collection and study procedure**

After obtaining informed consent from the participants, pre-test was conducted by using the structured questionnaire and a targeted health education session was given to them. The sessions were conducted by dividing the study group into four batches for ensuring social distancing in view of the COVID-19 outbreak. On the 3rdday, a post-test was conducted using the same questionnaire. For each individual category/ domain, descriptive statistics were used to find out the percentages of respondents for multiple choice questions and yes/no type responses. For questions on awareness about COVID-19, each correct answer, a score of 1 is given and score 0 was given to the wrong answer. Total score was calculated by summing up the scores for each participant.The cut-off cumulative score of 75% (9 points out of 12) was arbitrarily chosen for categorization of good and poor scores. The awareness levels were categorized as good if the score is ≥ 9 and poor if the score is below 9.

Data was analyzed using SPSS version 25. During data analysis, demographic information was tabulated using simple descriptive statistics such as frequencies, percentages, mean and standard deviation. The mean of pre and post test score were calculated and the difference between the scores was analyzed using paired t test.

Results

All the participants, (n=46) were working as hospital cleaning staff. The mean age of the study population was 45±7.6 years. Majority, 18(39.1%) of them were in the age group 36-45 years.The distribution of study participants according to socio-demographic variables is shown in Table 1.

**Table 1: Distribution of study participants according to socio-demographic variables**

| Sociodemographic variables | Frequency | Percentage |
|---|---|---|
| Age | | |
| <35 | 15 | 32.6 |
| 36-45 | 18 | 39.1 |
| 46-55 | 13 | 28.3 |
| Educational status | | |
| Below Secondary | 34 | 73.9 |
| Secondary & above | 12 | 26.1 |

| | | |
|---|---|---|
| Socioeconomic status | | |
| Below poverty line | 30 | 65.2 |
| Above poverty line | 16 | 34.8 |
| Duration of working in the hospital setting | | |
| <5 years | 19 | 41.3 |
| ≥5 years | 27 | 58.7 |

The mean pretest score of the study population was found to be 9.39±1.5. Among the study subjects, 35(76%) had good pretest score and 11(24%) had poor pretest score.

**Fig:1: Distribution of study subjects according to their pretest scores.**

Those who are in the age group 36-45 years had good knowledge and practice regarding COVID-19 as compared to the other age groups before the health education session.Table 2 shows age-wise comparison of the pretest scores of the study subjects.

**Table 2: Age-wise comparison of pretest scoresof the study subjects**

| Age(years) | N | Pretest score | | p value |
|---|---|---|---|---|
| | | Mean | SD | |
| <35 | 15 | 9.67 | 1.45 | 0.03* |
| 36-45 | 18 | 9.72 | 1.64 | |
| 46-55 | 13 | 8.62 | 1.19 | |

Majority of the study subjects had a good knowledge regarding the basic epidemiology and clinical featuresof COVID-19, with 87% of them giving correct answers to questions about basic epidemiology and clinical features of the disease. Only 70% of them gave correct responses to questions regarding prevention of COVID-19. Comparison between the age groups and the mean pretest scores was done using ANOVA. Those who are in the age group 36-45 years were found to have better pretest scores compared to the other age groups, and this difference was statistically significant (p value 0.03). Other socio-demographic variables such as educational qualification, socioeconomic status and years of work experience in hospital setting did not have any association with their knowledge and practice regarding COVID-19 (Table 3)

**Table 3: Association between knowledge scores and selected demographic variables**

| Sociodemographic variables | Pretest score | | Chi square value | p value |
|---|---|---|---|---|
| | Good | Poor | | |
| Age | | | | |
| <35 | 13 | 2 | 2.46 | 0.29 |
| 36-45 | 14 | 4 | | |
| 46-55 | 8 | 5 | | |
| **Educational status** | | | 2.16 | 0.14 |
| Below Secondary | 24 | 10 | | |
| Secondary & above | 11 | 1 | | |
| Socioeconomic status | | | 0.08 | 0.7 |
| Below poverty line | 20 | 10 | | |
| Above poverty line | 15 | 1 | | |
| **Duration of working in the hospital setting** | | | 1.04 | 0.3 |
| <5 years | 13 | 6 | | |
| ≥5 years | 22 | 5 | | |

The mean post test score of the study subjects was 10.6±1.13. The difference between the pre and post test scores of the study group was analyzed using paired t test. Table 4depicts that the mean pretest score of study population was 9.39±1.51 and mean post-test score was 10.57±1.13 with the mean difference at 1.17. The computed t value (6.97) was found to be statistically significant at 0.05 level of significance; from which it can be inferred that the targeted health education intervention was effective in improving the knowledge and practice of hospital sanitation workers regarding basic epidemiology, clinical features and prevention of COVID-19.

**Table 4: Comparison of mean pretest and post test scores of study subjects**

| Scores | N | Mean | SD | Mean Difference | t value | p Value |
|---|---|---|---|---|---|---|
| Pre test score | 46 | 9.39 | 1.51 | 1.174 | 6.97 | <0.001* |
| Post test score | 46 | 10.57 | 1.13 | | | |

Fig 2 shows the distribution of study subjects according to their pretest and post test scores. Before the session, 35(76%) had good pretest score and 11 (24%) had poor score. After the session, the study subjects with good post test score increased to 44(96%) and those with poor post test score was only 2(4%).

**Fig 2: Distribution of study subjects according to their pretest and post test scores**

We did comparison of the pretest and post test scores of the study subjects based on each domain of COVID-19, namely, the knowledge on the basic epidemiology, clinical features and practice of prevention.

Table 5shows that the computed "t" value of 2.54 for the domains of knowledge on the basic epidemiology and clinical featuresand computed "t" value of 6.86 for the domain of practice of prevention of COVID-19 was found to be statistically significant at 0.05 level of significance. This indicates that the difference between the pre-test and post-test knowledge and practice scores in each domain was a true difference and not by chance, therefore it can be inferred that the targeted health education intervention was effective in enhancing the knowledge and practice of hospital sanitation workers regarding basic epidemiology,clinical features and prevention of COVID-19 pandemicin all the domains.

**Table 5: Domain wise Mean, Mean difference, standard deviation, and "t" value of pretest and posttest knowledge and practice score of study subjects**

| Domains | N | Mean | SD | Mean Difference | t Value | p Value |
|---|---|---|---|---|---|---|
| Knowledge on basic Epidemiology & clinical features of COVID-19 | | | | | | |
| Pretest | 46 | 4.11 | 0.85 | 0.304 | 2.54 | 0.015* |
| Post test | 46 | 4.41 | 0.65 | | | |
| Practice on Prevention of COVID-19 | | | | | | |
| Pretest | 46 | 5.28 | 1.20 | 0.869 | 6.864 | <0.001* |
| Post test | 46 | 6.15 | 0.94 | | | |

## Discussion

To the best of our understanding, so far, no studies have been done among hospital sanitation workers who are mainly entrusted with maintaining hygienic and clean hospital environment conducive to patient care related to COVID-19.They are the frontline workers and they need to be adequately informed and trained regarding epidemiology, prevention and control of this pandemic in order to ease their worries regarding taking care of COVID-19 patients/suspects and to protect themselves and others from this contagious disease.

In our study, all the participants were working as hospital cleaning staff. The mean age of the study population was 45±7.6 years, 73.9%workers had secondary level of education and majority (58.7%) were having experience above 5years. In a study done among house keeping staff in Bhubaneswar by NandakumarPaniyadi et al; majority of the subjects belonged to the age group above 32 years, 84% were having work experience above one year and 60% were having secondary level of educational qualification[4]. The proportion of study subjects who were below poverty line (BPL) was 65.2%. In the study done in Haryana by Akoijamsangitadevi and Malar kodiaathi, on knowledge of sanitary workers regarding bio medical waste management,most of the subjects (60%) were having monthly income less than 3000[5].

The mean pretest knowledge score of our study population was 9.39±1.5. Among the study subjects, 35(76%) had good pretest score and 11(24%) had poor pretest score. In a study done by AkshayaSrikanthBhagavathula et al about 'Novel Coronavirus (COVID-19) knowledge and perceptions among healthcare workers'; a significant proportion of HCWs had poor knowledge of its transmission (61%) and symptoms onset (63.6%) and showed a positive perception of COVID-19 prevention and control. They found out that, factors such as age and profession are associated withinadequate knowledge and poor perception of COVID-19 and educational interventions are urgently needed to reach health care workers beyond the borders[6].

Giao Huynh et al, conducted a study about the knowledge and attitude toward COVID-19 among healthcare workers at district 2 hospital, Ho Chi Minh City Vietnam, which foundthat healthcare workers had a mean knowledge score of 1.86±0.43 (range 1-5). Approximately two thirds of the participants knew the mode of transmission, the isolation period and treatment. Majority of healthcare workers had good knowledge and positive attitude toward COVID-19 and the study also suggested additional education interventions and campaigns for healthcare workers[7].

Demographic variables such as education, years of work experience & income were independent of knowledge and practice score regarding COVID-19 pandemic and this finding is similar to the study done by NandakumarPaniyadi et al, where knowledge and practice scoresregarding BMW disposal was independent of socio-demographic factors[4].

The major findings in our study were, those who are in the age group 36-45 years had good knowledge and practice regarding COVID-19 as compared to the other age groups before the health education session and majority of the study subjects had a good knowledge regarding the basic epidemiology and clinical features of COVID-19, with 87% of them giving correct answers to questions about basic epidemiology and clinical features of the disease. Only 70% of them gave correct responses to questions regarding prevention of COVID-19. In another study done by Pranav D. Modiet al abouttheCOVID-19 awareness among healthcare students and professionals in Mumbai Metropolitan region, the major findings were, the overall awareness was adequate and the highest percentage of correct responses were from undergraduate medical students and the lowest was from non-clinical/administrative staff. More than three-fourths of the responders were aware of the various infection control measures like rapid triage, respiratory hygiene, and cough etiquette and they found out that there is a need for regular educational interventions and training programs on infection control practices for COVID-19 across all healthcare professions. Occupational health and safety are of paramount importance to minimize the risk of transmission to healthcare students and professionals and provide optimal care for patients[8].

In our study, a significant difference was found between the mean pre test and post test scores, in the knowledge and practice domains, which shows that the

targeted health education intervention was effective in improving the knowledge and practice of hospital sanitation workers regarding basic epidemiology, clinical features and prevention of COVID-19. This finding is consistent with most other studies that there is a need for regular intervention and training regarding various aspects of COVID-19[4,6,8].

## Conclusion

The targeted health education intervention among the hospital sanitation workers designated in isolation wards was effective as evidenced by the significant improvement in their post test knowledge and practice scores across all the areas of COVID-19 pandemic. Given the heightened vulnerability of hospital sanitation workers to nosocomial infections, a proper communication strategy can help in mitigating the risk of infection. The right approach in health education can facilitate their understanding of infection prevention methods. In summary, all health care institutions should integrate the targeted health education intervention into their epidemic response plan

**Ethical Clearance**: Taken from Institutional Ethics Committee

**Source of Funding**: Self

**Conflict of Interest**: Nil

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