ORIGINAL ARTICLE - PUBLIC HEALTH

APPLYING HEALTH BELIEF MODEL TO STUDY THE ADHERENCE TO COVID-19 PRECAUTIONARY MEASURES AMONG BASIC LEVEL HEALTHCARE WORKERS IN A TERTIARY CARE HOSPITAL, CHENNAI.

Saranya R [1], Chitra A [1], Sudharshini Subramaniam [1]

(1) Institute of Community Medicine, Madras Medical College, Chennai-03.

Abstract

BACKGROUND : Following precautionary measures will be the best way of containing COVID-19 even after vaccine invention or treatment innovation as the latter may not reach remote population. However, differences have been observed in behavioral adherence to precautionary measures among people, especially the basic level healthcare workers who involve in patient care and supportive services, getting constantly exposed to infectious diseases. Here, we aim to explore how the intra-personal factors influence adherence to precautionary measures using Health belief model to plan for an effective behavior change intervention.

OBJECTIVES : 1.To assess the adherence to precautionary measures among basic level healthcare workers in a tertiary care hospital, Chennai.
2.To evaluate health beliefs with respect to COVID-19 and its precautionary measures.

METHODS : A cross-sectional study was conducted among 110 Basic level healthcare workers, chosen by simple random sampling at a tertiary care hospital in Chennai, during the months of November and December 2020. An Interviewer administered semi-structured, pretested questionnaire was used to collect data. The data was entered in MS Excel and analyzed by SPSS 16.

RESULTS : Despite working in a covid care hospital, where exposure is very high, Face mask was properly worn by only 35.5% of the workers. Only 33.6% of the workers ensured safe patient care, maintaining adequate physical distancing of 3 feet. Hand hygiene was followed least following activities like pushing trolley, using lifts. Perceived barrier was very high with mean score of 16.55, while perceived severity was low with mean of 11.78. High correlation was seen between, Hand-wash-Perceived benefits; safe patient care-perceived barrier; touching face-perceived susceptibility; Wearing mask-perceived barrier.

CONCLUSION : This study cast spotlight over the insubstantial health behavior of basic level workers in health care. Effort must be taken to educate them in order to prevent infectious hazardous diseases, as they are the vulnerable exposed group. This will ensure that the health system is strengthened as a whole.

KEY MESSAGES : COVID-19, Precautionary measures, Health belief, Healthcare workers

INTRODUCTION

Due to its exponential growth, there is widespread transmission COVID 19 across nations, the specific treatment of which remains unknown.[1] Though various vaccines have been put into use for its prevention, there is overarching cases of Break through infection. New, highly infectious strains such as Delta, Omicron have emerged and the epidemiology of COVID 19 stays unpredictable. Hence, adherence to personal safety measures will be the exemplary way of containing the disease as they are easily affordable, accessible, and applicable to all population. Individual differences have been observed in behavioral adherence to personal safety measures among people, including health care workers.[2] Due to the rapid spread of the virus and a dearth of verified research, current knowledge on the influence of intrapersonal factors on alleviating the COVID-19 pandemic is sparse. These include perceived susceptibility to acquiring COVID 19 disease, awareness about the severity and consequences of the illness, perceived benefits of following precautionary measures,

conceived barriers to following the precautionary measures such as hindrance to speech/breathing while wearing face mask, use of public transport and cues to action including provision of hand washing facility, awareness made through IEC Programmes, mass media. In this study, we aim to explore how the intrapersonal factors influence the adherence to personal safety measures using Health belief model, for designing an effective behavior change intervention on a community level.

Chennai among other districts in Tamil Nadu has received bountiful COVID 19 cases due to multiple reasons such as high population density, industrialization, large population movement. Health care facilities were flooded

Please Scan this QR Code to View this Article Online
Article ID: 2022:02:03:02
Corresponding Author : Saranya R
e-mail: bsaranyar@gmail.com

with patients, seeking inpatient care owing to the severity of illness. Tertiary care hospitals had intake of self-reported as well as referred patients, making the patient load heavy. Along with doctors and staff nurses, there are basic level health care workers like sanitary workers, food distributors, lift operators, ward workers, security staffs, who involve in care of COVID 19 patients and other supportive services with unstained hearts. They provide preliminary level of care such as bathing the patient, helping the patient while defecation, setting up the bed, laundering, mopping floors, transferring drugs and other materials to wards. They support the treatment of all kind of patients, right from stable to severely ill patients on cardiorespiratory support. In doing so, they get highly exposed to infectious diseases like COVID 19. It is essential to prevent and protect them from such harmful diseases. The first step is to enlighten them about their nature of work and the risk involved and hardly are there any studies to assess their knowledge about disease transmission, risk perception, attitude towards diseases and practice of personal safety measures. Hence, this study was done to assess the beliefs prevailing among the basic level health care workers pertaining to health, which will provide adequate information to plan an effective preventive intervention

METHODOLOGY

A cross-sectional study was done among Basic level healthcare workers in a tertiary care hospital, Chennai, after getting ethical approval from the Institutional Ethics Committee of Madras Medical College, and permission from the Dean of the institution. The study was conducted during the months of November and December 2020. Sample size was calculated using the formula $N = Z^2 sd^2/d^2$, with α being at 5% significance level, 20% absolute precision, SD=0.51 based on a previous study[1], 10% non-response rate as 110. Basic level health care workers encompassing sanitary workers, lift operators, ward workers, security staff were included. List of all basic level workers working in the hospital was obtained from the administration and study participants were chosen by simple random sampling by computer generated random number table. The workers selected were informed about the study and asked for their convenient time and place for administrating the questionnaire. They were then approached individually. Informed consent was obtained from the study participants, after explaining about the study. An Interviewer administered semi-structured, pretested questionnaire, in Tamil language, adopted from a previous study (Adherence to COVID-19 Precautionary Measures: Applying the Health

Belief Model and Generalised Social Beliefs to a Probability Community Sample by Tong et al 3) was used to collect data. This included 40 questions including assessment of face mask worn.

• Demographic data included age, sex, job description, monthly income, education etc.

• Precautionary measures included: Handwashing, face mask wearing, Physical distancing, avoiding touching face without sanitizing, Wearing gloves.

• Health Belief Model items were in the form of Likert and yes/no (for perceived susceptibility, perceived severity, perceived barriers, perceived benefits on a scale of 5: 0- Strongly Disagree; 5- Strongly Agree and for Cues to action 1- yes; 0- No)
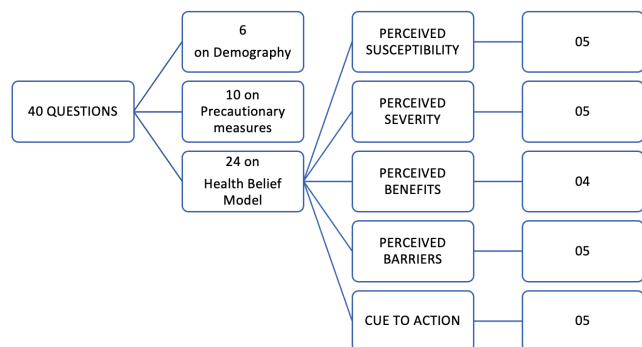
OPERATIONAL DEFINITION :

• **Basic level health care workers :**

Sanitary workers, Lift operators, Ward workers, Security staff working in Rajiv Gandhi Government General Hospital for a duration of at least 6 months.

• **Precautionary measures :**

Personal protective measures advised for the prevention of COVID 19 disease including Handwashing, face mask wearing, Physical distancing, avoiding touching face without sanitizing, Wearing gloves.

• **Hand washing :**

Washing hands with or without soap (using plain water) on various occasions (Before eating, after toilet use, after handling patient things, after pushing trolley, after exiting covid ward, after using lifts, after sanitary works)

• **Hand washing using soap :**

Washing hands using soap, following all the six steps on various occasions (Before eating, after toilet use, after handling patient things, after pushing trolley, after exiting covid ward, after using lifts, after sanitary works)

• **Safe patient care :**

Ensuring physical distancing of at least 3 feet from patients while working in covid ward.

• **Avoiding touching face without sanitizing :**

Not touching eyes, nose, or mouth without sanitizing the hands by washing with soaps or using hand sanitizers while inside the hospital campus.

• **Wearing gloves :**

Wearing disposable gloves while entering covid wards, using lifts in covid ward, pushing trolley, handling patient things and while doing sanitary works.

• **Face mask :**

Wearing face mask inside the hospital campus and removing it only while eating or drinking water, after ensuring seclusion.

• **Appropriate use of face mask:**

Face mask properly worn, covering nose and mouth completely during the time the study participant was interviewed, not removing it or pulling it towards the neck exposing nose and mouth.

FACEMASK ASSESSMENT
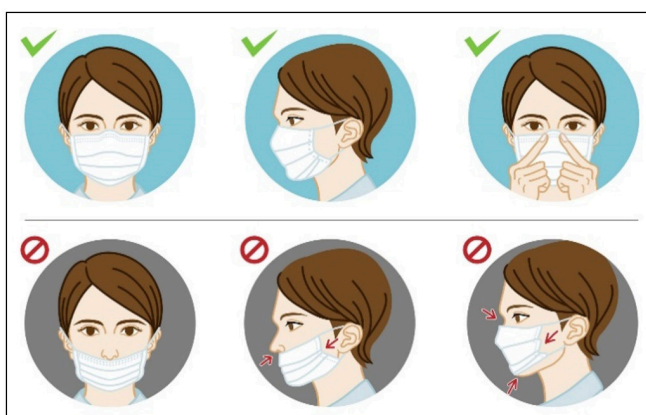
RESULTS :

Table 1 shows the descriptive data of the study participants. In this study, the mean age of the participants was 44.3 years. Females were slightly higher in number, with a proportion of 54.5%. Close to half of the study participants had completed primary schooling and about 27.3% were illiterate. Diabetes mellitus was the most predominant comorbid disease, with a prevalence of 24.5%. The next major comorbid disease was Hypertension, prevalent among 18.2% of study participants. The other conditions included IHD, Bronchial Asthma, Thyroid disorders and stroke.

Adherence to various precautionary measures is shown in the figure 1. All the study participants reported wearing of face mask, However, only 35.5% were wearing the face mask correctly (covering nose and mouth) during the time of interview.

About 94.5 % of the study participants had the habit of washing hands, among whom, only 82.7% used soap for washing hands during various occasions. Only 58.2 % reported not touching face, without sanitizing their hands.

Only 51.8% of the workers used gloves. Safe patient care, by maintaining adequate social distancing was practiced only by 33.6% of the basic level healthcare workers in this study.

Table 1 : Descriptive Data of Study Participants

| Variables	Frequency [n (%)]
Sex	
Male	50 (45.5%)
Female	60 (54.5%)
Age in years (Mean SD)	44.32 (6.9)
Job description	
Ward Worker	37(33.6%)
Security Staff	31(28.2%)
Sanitary Worker	29(26.4%)
Lift Operator	13(11.8%)
Education	
Illiterate	30 (27.3%)
Middle school	26 (23.6%)
Primary school	53 (48.2%)
High school	1 (0.9%)
Comorbidities	
Diabetes Mellitus	27(24.5%)
Hypertension	20(18.2%)
IHD	8(7.3%)
BA	6(5%)
Thyroid Disorder	4(3.6%)
Stroke	1(0.9%)
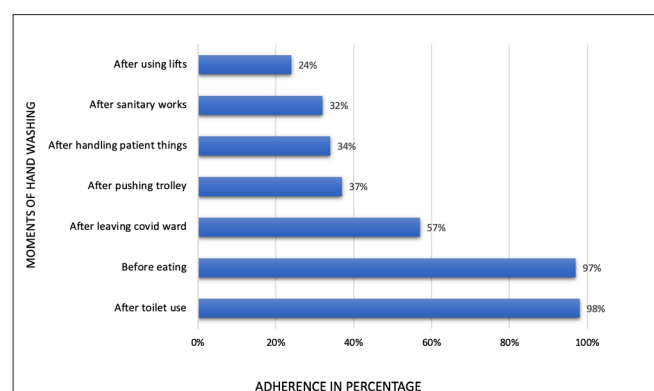
Table 1 : Descriptive Data of Study Participants

In the present study, Adherence to washing hands, as a whole with plain water or using soap, was maximum after toilet use and before eating. It was least following potentially infection prone activities like handling patient things, sanitary works and after using lift.
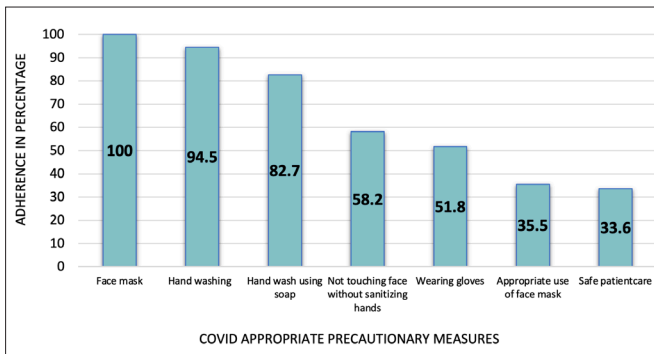
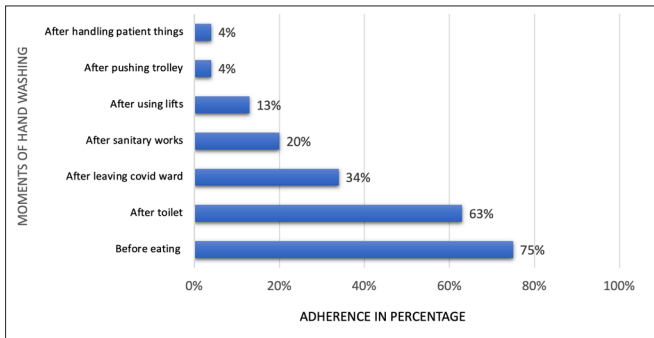*Figure 2 : Analysis of Hand Washing on Various Occasions*

Figure 3 : Analysis of Hand Washing using Soap on Various Occasions

The present study showed, among the participants who washed hands, only 82.7% had used soap for doing the same. Figure 3 depicts the adherence to washing hands using soap on different occasions. It can be seen, this was maximum before eating, followed by toilet use (75% and 63% respectively). However, proper hand washing was not adhered after handling patient things, pushing trolley, after using lifts etc.
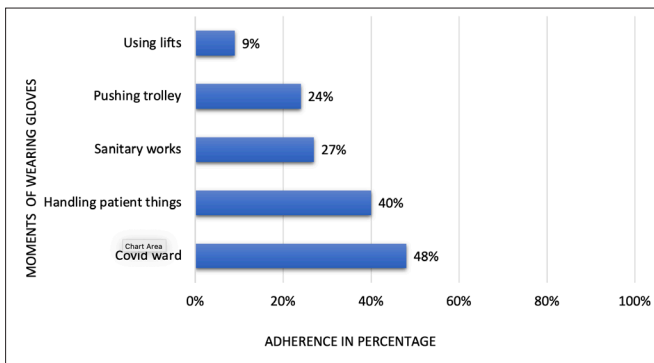

Figure 4 : Analysis of Wearing Gloves on Various Occasions

In the present study only 51.8% of the basic level health care workers wore gloves on one or the other occasion, of which wearing gloves while working in covid ward contributed to the major (48%). Wearing gloves was adhered least while using lifts of covid ward, pushing trolley and sanitary works.
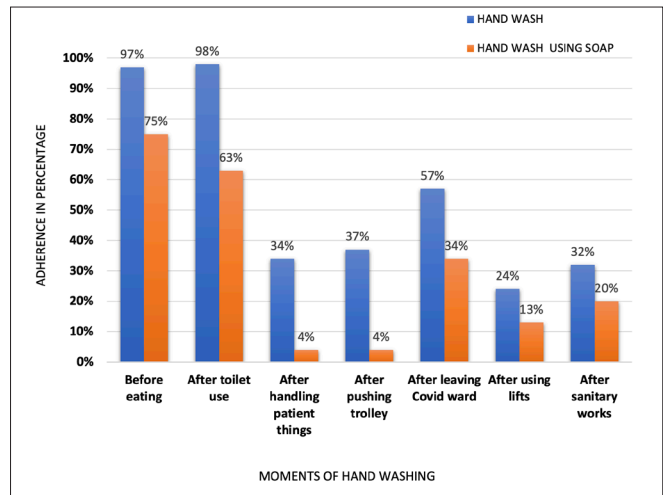

Figure 5 : Comparative Analysis of Hand Hygiene

Figure 5 shows the comparative analysis of hand hygiene practices during various occasions. There was less adherence to washing hands using soap in all the situations assessed. The difference was high in activities like handling patient things and pushing trolley.

Table 2 : Constructs of Health Belief Model

CONSTRUCT	MEAN SCORE	STANDARD DEVIATION	MINIMUM	MAXIMUM
PERCEIVED SUSCEPTIBILITY	12.60	5.88	5	25
PERCEIVED SEVERITY	11.78	6.14	5	25
PERCEIVED BENEFITS	12.62	5.23	4	20
PERCEIVED BARRIERS	16.55	6.52	5	25
CUES TO ACTION	2.73	1.18	1	5

Table 2 shows the mean score of various constructs of Health Belief Model, as reported by the study participants. Perceived Barrier was high with a mean score of 16.5 (out of 25).

This was followed by perceived benefits with mean score around 12.6 out of 20. Cues to action and perceived susceptibility followed these, with a mean score of 2.73 out of 5 and 12.6 out of 25 respectively.

The HBM construct with least score was Perceived Severity with a mean score of 11.78.

Precautionary measures replicate the intrapersonal health risk believes of an individual. In this study we could see that the perception of barrier to adherence to personal safety measures is high and perception of severity of diseases to be low. This correspondingly represents the lower adherence of precautionary measures among the basic level health

care workers who participated in this study.

Table 3: Correlation Between Precautionary Measures & HBM Constructs

HBM \ PRECAUTION	PERCEIVED SUSCEPTIBILITY	PERCEIVED SEVERITY	PERCEIVED BENEFITS	PERCEIVED BARRIERS	CUES TO ACTION
HAND WASH	0.185	0.169	0.450**	-0.233*	0.392**
SAFE PATIENT CARE	0.224*	0.258**	0.127	-0.538**	0.315
TOUCHING FACE WITHOUT WASHING HANDS	-0.412**	-0.378*	-0.002	0.370	-0.031
WEARING MASK	0.041	0.224*	0.233*	-0.718**	0.236*

** Correlation is significant at 0.01 level

* Correlation is significant at 0.05 level

Table 3 shows the correlation between precautionary measures & HBM constructs.
washing hands, safe patient care and washing hands showed positive correlation with all constructs of HBM except perceived barrier. Correlation between washing hands and perceived benefits was maximum with r=0.45. Moderately high negative correlation was seen between perceived barrier and safe patient care with r=-0.54. Strong inverse correlation was seen between wearing mask and perceived barrier, with r=-0.72.

Touching face without proper hand sanitization showed negative correlation between all constructs of HBM except perceived barrier. Moderately high negative correlation was seen with perceived susceptibility with correlation coefficient -0.41.

DISCUSSION

The study results showed that Face mask was worn by 100% of the study participants. In a study by Tong et al.,[3] among general population face mask was worn by 96.4% of the study participants often or always. This reflects the comparatively higher adherence to this precautionary measure among health care workers. However, only 35.5% of them were wearing it appropriately and perceived barrier which had high negative correlation with appropriate face mask wearing was playing a significant role.

In the present study, Hand washing was done by 94.5% of the study participants at one or other occasion and 82.7% of them used soap for washing hands. Hand washing showed moderately high positive correlation with perceived benefits. This could be compared with a study by Bhagavathula et al.,[4] in which 85.4% of healthcare workers reported hand hygiene to be a preventive strategy for covid 19 transmission.

In the present study safe patient care, maintaining adequate

physical distance was practiced only by 33.6% of basic level health care workers and this was negatively correlated with perceived barrier. This can be related to a study by Sesagiri et al.,[5] which examined the public perceptions of physical distancing using HBM. In the latter study, physical distancing was negatively correlated with perceived barrier and positively with perceived severity, thus implying, perceived barrier to be an obstacle to physical distancing in both hospital set up and at community level.

In the present study nearly 58.2 % of the study participants reported touching face, without sanitizing their hands and this was negatively correlated with perceived susceptibility. However, a study by Tong et al.,[3] reported lower prevalence of touching face without sanitizing, as 36.4% and negatively correlated to perceived barrier. This could be attributed to lower health risk behaviour among the study participants in this group.

DISCUSSION

This study shows that the adherence to precautionary measures among basic level health care workers is exiguous, which in turn increases their susceptibility to contagious diseases such as COVID 19, with the perception of severity of the latter being low and perception of barrier to follow the personal safety measures being high in this study group. Significant correlation was seen between various constructs of HBM and level of adherence to precautionary measures, thus establishing the need for emphasis on corrective measures accordingly.

RECOMMENDATIONS

• This study can be replicated in general public for designing an effective behavior change intervention on a community level.
• IEC aiming on intervening the concerned health believes will help in improving adherence to precautionary measures, thereby preventing unnecessary turmoil in relation with health.

LIMITATIONS

The present study assessed adherence to COVID 19 precautionary measures using self-reporting questions, which may have Social desirability bias.

REFERENCES

1. BKumar KVA, Sahana MN (2020) Exponential Growth Impact of COVID-19 Pandemic-World Scenario, Preventive

Measures and Drug Preferences. Health Sci J. Sp. Iss 1: 006.

2. Neelakandan BV, Gopalakrishnan S, Ramachandran H, Anuradha R, Gopichandran V. Health Beliefs Regarding Uptake of Hypertension Screening in an Urban Setting: A Population Segmentation Strategy. Int J Med Public Health. 2018;8(1):11-17.

3. Tong, K.K., Chen, J.H., Yu, E.W.-y. and Wu, A.M.S. (2020), Adherence to COVID-19 Precautionary Measures: Applying the Health Belief Model and Generalised Social Beliefs to a Probability Community Sample. Appl. Psychol. Health Well-Being. doi:10.1111/aphw.12230

4. Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, Bandari DK. Knowledge and Perceptions of COVID-19 Among Health Care Workers: Cross-Sectional Study. JMIR Public Health Surveill. 2020;6(2):e19160. Published 2020 Apr 30. doi:10.2196/19160

5. Sesagiri Raamkumar A, Tan SG, Wee HL. Use of Health Belief Model-Based Deep Learning Classifiers for COVID-19 Social Media Content to Examine Public Perceptions of Physical Distancing: Model Development and Case Study. JMIR Public Health Surveill. 2020 Jul 14;6(3):e20493. doi: 10.2196/20493. PMID: 32540840; PMCID: PMC7363169.