

Original Research Article

A descriptive study to assess the knowledge and practices related to cough and sneeze etiquette among health care providers, respiratory patients and their attendants in a tertiary care centre

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ABSTRACT

Background: The emergence of respiratory infections including Tuberculosis, COVID-19, influenza A and B viruses have a significant impact on health worldwide. Cough and sneezing etiquette including respiratory hygiene have been recommended as most cost-effective preventative tool to reduce such transmission.

Methods: A cross-sectional descriptive study was conducted among health care providers, respiratory patients and their attendants admitted in the Respiratory Medicine department at a tertiary care hospital for 6 months duration i.e., from December 2022 to May 2023, aiming to assess the knowledge and practices related to cough and sneeze etiquette. A total of 200 study subjects were interviewed with the help of a semi-structured questionnaire. The study findings were recorded and analyzed using SPSS version 20.

Results: Out of 200 subjects, most 95 (47.5%) of subjects belonged to the age group between 40 to 60 and 109 (54.5%) were females and 91 (45.5%) were male. Majority of the participants were medical students; 62 (31%) followed by paramedical staff; 49 (24.5%), laborers and doctors; 26 (13%). Only 88 (44%) participants had heard about cough etiquette. Most common source of information regarding the proper cough and sneeze etiquette among the participants was television or internet; 112 (61%). The patients and their attendants were having poor knowledge regarding the proper cough and sneeze etiquette.

Conclusions: The knowledge and practice of cough and sneezing etiquette was not satisfactory especially among the general population. There is the utmost need for awareness regarding the knowledge and correct practice of cough etiquette.

Keywords: Cough etiquette, Sneeze etiquette, Hand hygiene, Respiratory infections

INTRODUCTION

Recent rise in respiratory infections including coronavirus disease 19 (COVID-19), rhinovirus, influenza A and B viruses, parainfluenza viruses, or adenovirus, tubercle bacillus have a significant impact on health worldwide.¹ Tuberculosis (TB) is a major global health problem, and it is stated to be a global emergency for humanity by the

World Health Organization (WHO) in 1993. Cough is the primary mechanism for transmission of Mycobacterium tuberculosis and other airborne respiratory infections. Aerosol in the 1-5 µm size range are small enough to remain airborne is known to be transmitted by airborne infections like TB and these aerosols can disperse on air currents. Numerous aerosol-generating respiratory activities including coughing or sneezing leads to spread

of these infections by droplet generation.^{2,3} World Health Organization strongly recommends the application of and compliance with basic infection control precautions including proper cough or sneeze etiquette practice to prevent transmission of respiratory infections via droplet-spread in health care facilities.⁴ Cough etiquette is defined as source control measures intended to contain respiratory secretions in order to limit transmission of respiratory pathogens spread by droplet or airborne routes; especially during seasonal outbreaks of viral respiratory tract infections in the community.⁵

The knowledge and regular cough and sneezing etiquette practice is one of the important preventative measures for infection control in healthcare settings. Despite the abundance and availability of information regarding the cough etiquette, poor compliance with this regard hinders the prevention of airborne respiratory infections.⁴ Hence, we planned to conduct a study to assess and improve the awareness and practices regarding cough etiquettes among the health care providers, respiratory patients and their attendants attending a tertiary care hospital.

METHODS

This was a cross-sectional descriptive study conducted among health care providers, respiratory patients and their attendants admitted in the respiratory medicine department at Maharishi Markandeshwar Medical College and Hospital a tertiary care hospital in north India. Duration of the study was 6 months i.e., from December 2022 to May 2023.

Inclusion and exclusion criteria

Subjects willing to participate for the study and age more than 18 years were included in the study. All subjects not willing for participate were excluded from the study. All the subjects admitted in the respiratory department due to any etiology fulfilling the inclusion and exclusion criteria were enrolled consecutively in the study.

Written informed consent was obtained from each study participant before obtaining any information from them. Total 200 participants were enrolled in the study. All demographics details were noted in predesigned proforma. Subjects were further divided into four study groups viz, Doctors, Nurses, Nursing students, and Others i.e., patients and patient attendants. The information pertaining to the knowledge about cough hygiene transmission of respiratory illnesses, and various cough etiquette practices were collected using questionnaire proforma as per previous study by Shrivastava et al by co-investigator on day of admissions under the supervision of the principal investigator.⁶ Each correct answer in the information category awarded with a score of 1 and each incorrect response was given a score of 0. The total score was noted in proforma at the end of interview and more than 80% correct response

was labeled as good response. All participants were also evaluated for gaps/reasons for not practicing the cough and sneeze etiquette practices among each participant as per questionnaire in proforma. All participants were then subjected to teaching and demonstration session of adequate cough and sneeze etiquette practices using posters/pamphlets or video by co- investigator daily as per the Center for Disease Control and Prevention (CDC) guidelines for cough etiquette and preventing transmission of infectious agents in healthcare settings for total 6 consecutive days.⁷ Participants were re-evaluated on the 7th day using a questionnaire proforma and correct response and improvement in comparison to first response was evaluated and results were presented in graphical form. The correct response of more than 80% questions was considered as good practice and response less than 80% was considered as poor practice.

Definition

Cough hygiene was defined as “cover your mouth and nose with a tissue whenever coughing or sneezing; use the nearest waste receptacle to dispose of the tissue after use, perform hand washing with soap and water or hand rubbing with disinfectant”.⁷

Statistical analysis

Data entry was done in Microsoft Excel using google form and statistical analysis was done using SPSS Version 20 software. Frequency distribution was calculated for all the variables.

RESULTS

Out of 200 subjects, most 95 (47.5%) of subjects belonged to the age group between 40 to 60 years and 109 (54.5%) were females and 91 (45.5%) were male, (Table 1). Most 167 (83.5%) of the participants belonged to lower Socio-economic class. Majority of the participants were medical students 62 (31%) followed by paramedical staff 49 (24.5%), laborers and doctors 26 (13%). The correlation between knowledge and correct practice of cough and sneezing was not significant. The (Table 2) shows the knowledge regarding cough and sneeze etiquette among study participants. Most of the participants (181, 91%) were aware about the transmission of respiratory infection, however, only 88 (44%) participants have heard about cough etiquette. Most common source of information regarding the proper cough and sneeze etiquette among the participants was television or internet (112, 61%) followed by nursing or paramedical staff (33, 16.5%) and others (doctors, friends and family members etc.). Majority of participants were unaware (109, 54.5%) and 103, 51.5%) of correct practices regarding respiratory and cough hygiene respectively.

Most of subjects (152, 76%) were practicing the cough and sneeze etiquette while coughing and sneezing, where

covering mouth and nose with hands was the most common measure used by them (123, 61.5%).

Table 1: Baseline Socio-demographic details of the study participants.

Parameters		N	%
Age (years)	18-40	48	24
	40-60	95	47.5
	>60	57	28.5
Sex	Male	91	45.5
	Female	109	54.5
Religion	Hindu	167	83.5
	Muslim	28	14
	Others	5	2.5
Literacy	Literate	161	80.5
	Illiterate	39	19.5
Socio-economic status	Upper	6	3
	Middle	95	47.5
	Lower	99	49.5
Occupation	Doctor	26	13
	Paramedical staff	49	24.5
	Medical Student	62	31
	Labour	26	13
	Homemakers	22	11
	Others	15	7.5

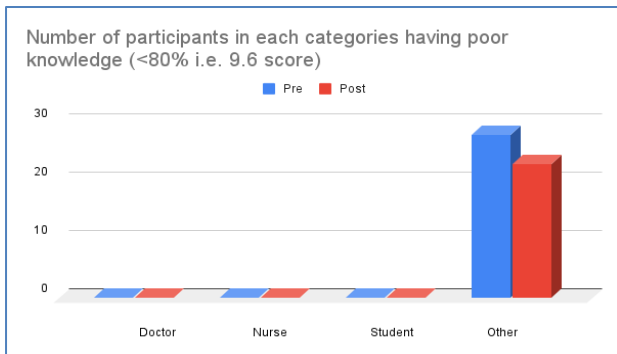


Figure 1: Knowledge of cough or sneeze etiquette among the four groups of participants.

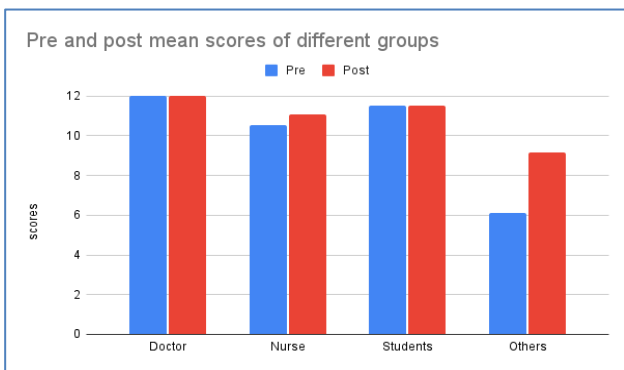


Figure 2: Vertical bar graph showing knowledge of proper cough and sneeze etiquette before (pre) and after teaching (post) among the participants in each group.

Table 2: Knowledge about the cough/sneeze etiquette and respiratory infection among the participants.

Question	Responses	N (%)
Transmission of respiratory infection	By coughing, sneezing, spitting	182 (91)
	By direct contact	73 (36.5)
	By blood	27 (13.5)
Ways to prevent transmission of respiratory infection	Covering mouth while coughing	91 (45.5)
	Use of face mask	93 (46.5)
	Avoid spitting	42 (21)
	Avoid contact with others	23 (11.5)
Have you ever heard about cough etiquette?	Yes	88 (44)
	No	112 (56)
Source of information	Doctors	28 (14)
	Paramedical staff	33 (16.5)
	Friends, neighbors	27 (13.5)
	Television, internet	112 (61)
What do you mean by respiratory hygiene?	Correct response	91 (45.5)
	Incorrect response	109 (54.5)
What do you mean by hand hygiene?	Correct response	97 (48.5)
	Incorrect response	103 (51.5)
Can cough etiquette prevent spread of infection to others	Yes	157 (78.5)
	No	43 (21.5)

Most participants (109, 54.5%) practice hand hygiene after every episode of coughing or sneezing. However, 91 (45.5%) of participants were not practicing hand hygiene after every episode of coughing or sneezing. Most common reasons for not practicing cough etiquette and any hand hygiene among the participants were unawareness about cough etiquette 117 (58%) and unawareness about hand hygiene 121 (60.5%). Subjects were further divided into four groups including; Doctors, Nurses, Students, and Others (patients and patient attendants). On further subgroup analysis most of the patients and their attendants (others group) were having poor knowledge (less than 80% score) regarding the proper cough and sneeze etiquette (Figure 1). Most of the participants in the study have shown improvement in the knowledge (more than 80% score) regarding the proper cough and sneeze etiquette when compared to the score of pre teaching results (Figure 2).

DISCUSSION

This study aimed to identify cough etiquette knowledge and practice level among health care providers and others including patients and their attendants in the department of respiratory medicine at a tertiary care hospital in

Himachal Pradesh. Out of a total 200 participants 95 (47.5%) of subjects belonged to the age group between 40

to 60 and 109 (54.5%) were females and 91 (45.5%) were male.

Table 3: Practices related to cough and sneeze etiquette among the study participants.

Question	Responses	N (%)
Are you practicing any preventive measures/Parameters cough etiquettes while coughing/sneezing?	Yes	152 (76)
	No	48 (24)
Which measures are you practicing?	Covering mouth and nose with hands	123 (61.5)
	Covering mouth and nose with handkerchief	49 (24.5)
	Tissue Use of face mask	19 (9.5)
	Spitting in dustbin	6 (3)
	Other	3 (1.5)
How frequently do you practice these measures	Always	121 (60.5)
	Intermittently	79 (39.5)
How do you practice hand washing	With water	103 (51.5)
	With soap and water	72 (36)
	Hand sanitizer or disinfectant	25 (12.5)
Do you practice hand hygiene after every episode of coughing or sneezing?	Yes	109 (54.5)
	No	91 (45.5)
How frequently do you practice these measures	Always	106 (53)
	Intermittently	94 (47)
Reasons for not practicing any etiquette while coughing/sneezing	Unaware about cough etiquettes	117 (58.5)
	Severity and frequency of bouts of cough	18 (09)
	Unavailability of handkerchief/tissue paper No benefit with such practices	37 (18.5)
	No benefit with such practices	20 (10)
	Any other	8 (04)
Reasons for not practicing hand hygiene	Unaware about the benefit	121 (60.5)
	Non availability of water or soap or sanitizer	56 (23)
	Other	23 (11.5)

Most of our study participants 181 (91%) were aware about the transmission of respiratory infection, but, only 88 (44%) participants have heard about cough etiquette. However, the majority of our study participants were unaware of correct practices regarding respiratory and cough hygiene 109 (54.5%) and 103 (51.5%) respectively.

In the similar cross-sectional descriptive study conducted among respiratory symptomatic patients in Tamil Nadu, out of 240 subjects, all study participants were aware about cough and sneeze etiquette, however, correct knowledge about respiratory hygiene was found in only 22 (9.1%) participants.⁸ In other two similar studies conducted in Korea and Japan, noted 61.5% and 56.1%, of participants had correct knowledge about cough etiquette respectively.⁹⁻¹¹ Similar result was observed in our study in which 54.5% participants had correct knowledge about cough etiquette. Most participants in our study 109 (54.5%) practiced hand hygiene after every episode of coughing or sneezing. However, 91 (45.5%) of participants were not practicing hand hygiene after every episode of coughing or sneezing, which was lesser than

that found in the study done by Shrivastava et al.⁸, wherein 208 (86.7%) of participants were not practicing hand hygiene. This disparity might be due to poor knowledge of study populations, mostly patients, whereas our study included doctors and medical students being more aware about hand hygiene practices. On the other hand, only 18 (7.5%) and 49.8% participants showed correct knowledge about hand hygiene in the study conducted in India and Korea respectively, which is less than what we found in our study.^{8,10} This might be due to difference in education and a greater number of health care professionals in our study.

In present study the most common reason for not practicing any cough and sneeze etiquette among the participants was unawareness about cough etiquette 117 (58.5%) followed by unavailability of handkerchief/tissue paper 37 (18.5%). On the contrary, one Indian study showed unavailability of handkerchief or tissue paper was noted as the most common reason for not practicing cough etiquettes in 42 (44.2%) participants followed by 34(35.8%) who were unaware about cough etiquettes.⁸ Similar results were made in a Korean study where

practice of respiratory hygiene was found to be significantly higher ($p < 0.05$), among those carrying a handkerchief or carrying tissues and those who are aware of respiratory hygiene and cough etiquette.⁹ Various studies conducted in France and Germany have shown that surgical masks are not effective in blocking transmission of viral diseases, whereas frequent hand washing could be effective in preventing spread of viruses.¹² The score of cough etiquette knowledge was highest among the health care professionals (doctors, nursing staff and nursing students) in our study. However, cough etiquette knowledge was poor among the patient and their attendants which further improved after 6 consecutive days of teaching about the proper cough etiquette practices. The correlation between knowledge and correct practice was not significant, suggesting the need for regular sensitization regarding the awareness and importance of cough etiquette knowledge among the health care professionals and general populations visiting hospitals. In our study, 152 (76%) of participants were practicing some kind of preventive measures during coughing or sneezing. Covering the mouth and nose with a handkerchief was the most common method among them. Similar results were noted in a study conducted in India where 122 (84.1%) participants were covering mouth and nose with hands while only 14 (9.7%) were using face masks.⁸ In another study which was conducted in Bangladesh, it was found that 81% of participants were coughing or sneezing in the open air uncovered, 11% into their hands and 7% into their clothing.¹² In our study the most common reason for not practicing hand hygiene was unawareness about the benefits 121 (60.5%) followed by non-availability of soap or sanitizer 56 (23%). In contrast to our findings, a study conducted in Canada noted, 77% of the study population were well aware that the appropriate hand hygiene was an effective measure in reducing chances of transmission of respiratory infections like viral flu.¹³

Most common reasons or barriers for not practicing cough/sneeze etiquette and any hand hygiene among the participants were unawareness about cough etiquette 117 (58%) and unawareness about hand hygiene 121 (60.5%), followed by unawareness regarding the benefits of such practices. Most of the participants in our study have shown improvement in the knowledge (more than 80% score) and practice about the proper cough and sneeze etiquette compared to pre teaching results. This suggests, cough etiquette knowledge and practice level were revealed to be rather low among nursing students, patients and their attendants. Education and social marketing are needed to be developed to encourage the practice level of cough etiquette among the health care professionals, patients and general public in general.

Limitations

Our study has some limitations including low sample size and study population limited to only one center which might not be generalized to overall population. Further

study with higher sample size including multiple centers will be required for more generalized results regarding knowledge and attitude of population about cough/sneeze etiquette.

CONCLUSION

The knowledge and practice of cough and sneezing etiquette was not satisfactory among the general population and health care providers, specifically in medical and paramedical students in the present study. The correlation between knowledge and correct practice of cough and sneezing was not significant. Hence, there is the utmost need for awareness regarding the knowledge and importance of cough etiquette practice knowledge among the health care professionals and general public to prevent respiratory airborne diseases.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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