

Original Research Article

Practices of face mask use and associated factors during COVID-19 pandemic among school-going children in Shimla city

Deepak Sharma¹, Naveen Sharma², Ashna Sharma², Ambika Sood^{2*}, Rakesh Sharma²

¹MMU, Medical College, Solan, Himachal Pradesh, India

²Department of Pediatrics, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India

Received: 10 June 2022

Revised: 30 June 2022

Accepted: 04 July 2022

*Correspondence:

Dr. Ambika Sood,

E-mail: drambikasood@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The aim of the study was to determine the practices of face mask use and associated factors during the COVID-19 pandemic among school-going children in Shimla city.

Methods: An observational study was performed in October 2021 to November 2021, with 703 students chosen using a simple random sampling procedure in Shimla city. Data was collected based on observation and analyzed using Epi info version 7. To predict the relationship between the student mask-wearing compliance and its associated factors, a univariate analysis was done.

Results: A total of 703 students, 41.8% (n=294) were males while 58.2% (n=409) were females, 40.5% (n=285) <15 years while 59.5% (n=418) >15 years of age. 97.2% (n=683) were Hindu and 72% (n=506) were studying in Government schools. All of the observed (100%) were wearing masks. 76.2% (n=536) students were using cloth mask, 12.1% (n=85) N95 masks while 11.7% (n=82) surgical masks. 81.8% (n=575) covered their mouth, as well as nose, 3.7% (n=26), had masks below the chin, 2.6% (n=18) had only their mouth covered while 11.9% (n=84) had partially covered their nose. Cloth mask was considerably more used by girls besides that there was no significant difference in the type of face mask according to age, standard of class, father's occupation and type of school. The face mask was significantly more appropriately used by the students <15 years old and studied in junior classes, there was no significant difference in mask-wearing habits according to gender, father's occupation and type of school.

Conclusions: Every student was wearing a mask, and most had good face coverage. School authorities should plan and implement IEC activities, about, types of face masks and their proper usage.

Keywords: Practices, Face-mask utilization, COVID-19 pandemic, School children, Shimla city

INTRODUCTION

Wearing face masks by school students may help to reduce the risk of transmission and the incidence of COVID-19 among them. Widespread use of face masks is thought to be a good public health strategy to protect against such respiratory diseases and save lives. Wearing well-fitted face masks should be used as part of a comprehensive approach suggested by WHO which also includes maintaining a physical distance of at least 1 meter, avoiding crowded and closed spaces, proper

ventilation of classrooms, cleaning hands regularly with soap and water, alcohol-based sanitizers, covering sneezes and coughs with a tissue or bent elbow, contact tracing, quarantine, isolation and other infection prevention and control (IPC) measures.¹⁻⁴

In settings like schools where the chances of cluster transmission of SARS-CoV-2 and its variants are high, wearing a well-fitting mask that covers the nose and mouth is recommended for all school children whether in the classroom or interacting with other students during

breaks.⁵⁻⁷ Schools of Himachal Pradesh were first shut down when the first wave of COVID-19 swept across the state, in March 2020. Education department was allowed to reopen schools from class 8th onwards w.e.f. 11 October 2021 on all working days by all COVID-19-related protocols adhering to the safety guidelines and appropriate behavior following the improvement in the COVID-19 situation. The government announced that students attending classes in offline mode must be required to use face masks, maintain respiratory etiquette, and social distancing so that they do not contract COVID and everyone attending the classes including the teaching and non-teaching staff are protected.^{8,9}

But during the ongoing COVID-19 pandemic, recommendations and common practices regarding face mask use by the general public as well as school students have varied greatly. There had been much debate globally and locally about the type of face masks. There are different types of face masks available and in use by the community and these include N95, surgical masks and cloth masks.^{10,11}

Identifying students' practice about the use of face masks was crucial to detect vulnerabilities and respond rapidly to avoid the spread of the infection.¹⁰ Relatively little research had been published concerning mask-wearing behavior and compliance in children in Himachal Pradesh. This study aimed to determine the practices of face mask use and associated factors in the COVID-19 pandemic among school-going children in Shimla city.

Objectives

The objective of this study was to determine the practices of face mask use and associated factors in the COVID-19 pandemic among school-going children in Shimla city.

METHODS

We conducted an observational, study from October 2021 to November 2021 at Indira Gandhi Medical College, Shimla, on school-going children, between the ages of 10-18 years, studying in either government or private schools, in Shimla city.

Sample size

Assuming that 50% of school children in Shimla city had adequate practices of face mask utilization, 5% absolute error, 95% confidence level and 5% nonresponse rate, our minimum sample size came out to be 400. But we had taken 703 school children in our study.

Inclusion criteria

Students who were willing to participate in the study were included.

Exclusion criteria

Students who were not willing to participate in the study were excluded.

Study tool

A pretest semi-structured questionnaire containing questions regarding socio-demography and pattern of mask utilization was created and utilized in the study after pilot testing.

Validity of tool

Validity of tools was done by the experts in this field. Data was collected and recorded by the school based on their observation of the children and entered in a Microsoft excel spreadsheet, cleaned for errors and analyzed with Epi Info V7 Software with an appropriate statistical test in terms of frequencies, percentage, mean standard deviation.

To predict the relationship between the student mask-wearing compliance and its associated factors, a univariate analysis was done. A p value of 0.05 was taken as statistically significant.

Ethical considerations

Participants' confidentiality and anonymity were maintained.

An observational study was performed from October-November 2021 among 703 students chosen using a simple random sampling procedure in Shimla city. Data were collected based on their observation and analyzed using Epi info version 7. To predict the relationship between the student mask-wearing compliance and its associated factors, a univariate analysis was done. A p value of 0.05 was taken as statistically significant.

RESULTS

In our study, a total of 703 students participated, among them, 41.8% (n=294) were males while 58.2% (n=409) were females and 40.5% (n=285) were less than 15 years of age while 59.5% (n=418) were above 15 years.

The mean age of study participants was 15.44±1.903 years. 45% (n=316) were lower than the 10th standard while 55% (n=387) were in the 10th or above standard. Considering the socio-demographic pattern, fathers of 55.2% (n=388) of the students were in government/private jobs whereas 44.8% (n=315) were in business or farmer or self-employed. 97.2% (n=683) were Hindu by religion. 72% (n=506) were studying in Government schools while 28% (n=197) were enrolled in private schools (Table 1).

Table 1: Socio-demographic characteristics of study participants and mask habits.

Characteristics		Frequency	Percent
Gender	Male	294	41.8
	Female	409	58.2
Age group (years)	<15	285	40.5
	>15	418	59.5
Mean age (years)	15.44 ±1.903		
Class	<10	316	45.0
	>10	387	55.0
Father's occupation	Government/private job	388	55.2
	Business/farmer/other own work	315	44.8
Religion	Hindu	683	97.2
	Muslims	11	1.6
	Sikh	7	1.0
	Christian	2	.3
Type of school	Government	506	72.0
	Private	197	28.0
	Total	703	100.0
Mask used	Yes	703	100
	No	0	0
Type of mask	Cloth	536	76.2
	N95	85	12.1
	Surgical	82	11.7
Mask habits	Covering mouth as well nose	575	81.8
	Below chin	26	3.7
	Covering mouth only	18	2.6
	Partially covering Nose	84	11.9
Total		703	100.0

Table 2: Socio-demographic pattern of mask use.

Mask type		Cloth		N95/surgical		Total	P value
Socio-demographics characteristics		Percentage (N)	Percentage (N)	Percentage (N)	Percentage (N)	N (%)	
Sex	Male	37.5 (201)	55.7 (93)	41.8 (294)	0.000		
	Female	62.5 (335)	44.3 (74)	58.2 (409)			
Age group (years)	<15	39.9 (214)	42.5 (71)	40.5 (285)	0.588		
	>15	60.1 (322)	57.5 (96)	59.5 (418)			
Class	<10	45.5 (244)	43.1 (72)	45 (316)	0.594		
	>10	54.5 (292)	56.9 (95)	55 (387)			
Father's occupation	Government/private job	54.9 (294)	56.3 (94)	55.2 (388)	0.789		
	Business/farmer/own job	45.1 (242)	43.7 (73)	44.8 (315)			
Type of school	Government	71.8 (385)	72.5 (121)	72 (506)	0.922		
	Private	28.2 (151)	27.5 (46)	28 (197)			
Total		100 (536)	100 (167)	100 (703)			

Table 3: Association of proper mask-wearing habits and socio-demographic characteristics among study participants.

Characteristics			Mask habits		Total	P value
			Adequate	Not adequate	Percentage (N)	
			Percentage (N)	Percentage (N)	Percentage (N)	
Sex	Male	Count	42.2 (54)	41.7 (240)	41.8 (294)	0.921
	Female	Count	57.8 (74)	58.3 (335)	58.2 (409)	
Age group (years)	<15	Count	60.2 (77)	36.2 (208)	40.5 (285)	0.000

Continued.

Characteristics	Mask habits		Total	P value		
Class	>15	Count	39.8 (51)	63.8 (367)	59.5 (418)	
	<10	Count	61.7 (79)	41.2 (237)	45 (316)	
	>10	Count	38.3 (49)	58.8 (338)	55 (387)	
Father's occupation	Govern ment/pr ivate job	Count	58.6 (75)	54.4 (313)	55.2 (388)	0.432
	Busines s/farme r/own job	Count	41.4 (53)	45.6 (262)	44.8 (315)	
Type of school	Govern ment	Count	66.4 (85)	73.2 (421)	72 (506)	0.128
	Private	Count	33.6 (43)	26.8 (154)	28 (197)	
Total		Count	100 (128)	100 (575)	100 (703)	

Every student (100%) was wearing a mask. 76.2% (n=536) students were using cloth mask, 12.1% (n=85) were using N95 masks while 11.7% (n=82) were using surgical masks. 81.8% (n=575) had their mouth and nose covered with a mask, 3.7% (n=26) had masks were below the chin, 2.6% (n=18) had only their mouth covered while 11.9% (n=84) had masks partially covering the nose (Table 1).

In this study, cloth mask was significantly more used by girls while N95/surgical mask was preferred by boys. Besides that, there was no significant difference in the type of face mask used according to other socio-demographic variables like age, standard of class, father's occupation and type of school (Table 2).

It was observed that the mask was more effectively (covering their mouth as well as nose), adequately, used by the students, less than 15 years old, studying in junior classes, besides this there was no significant difference in mask wearing habits according to gender, father's occupation and type of school (Table 3).

DISCUSSION

The major purpose of this study was to assess the practices of face mask use and associated socio-demographic factors among students in Shimla city during the COVID-19 pandemic.

As a part of the Himachal Pradesh Government guidelines, the management of educational institutions must ensure strict use of face masks, social distancing, and use of sanitizers in their premises.^{8,9} In the present study, every student (100%) was wearing a mask. It meant that guidelines were fully adhered to by the students as well as school authorities. Overall utilization of face masks by students was more than in other studies conducted in various parts around the globe.¹²⁻¹⁴ Masks are part of a larger package of preventative and control strategies that can help to restrict the spread of respiratory viral infections like COVID-19 and can be used for the

protection of healthy students to protect themselves when in contact with an infected student or for source control to prevent onward transmission. 76.2% (n=536) students were using cloth masks, 12.1% (n=85) were using N95 masks and 11.7% (n=82) were using surgical masks.

Similar findings were reported in the studies done by Mwesige et al and Barrios et al while the study done by Duong et al showed that only 23.1% of students were using reusable cloth masks.¹²⁻¹⁴ In our study, 81.8% (n=575) had covered their mouth as well as nose with a mask, 3.7% (n=26) had their masks below the chin, 2.6% (n=18) had only covered their mouth, while 11.9% (n=84) had only partially covered their nose with mask. Contrary to our findings, the studies by Mwesige et al and Mueller et al reported that only 62.3% and 70% of students were wearing face masks correctly, respectively.^{12,15}

Reusable cloth masks had been recommended for use among the general public, including in schools by the WHO.¹⁶ Besides, cloth masks were re-usable, durable and hence cheaper in the long run for students. As per the government guidelines, for masks to be most effective, they should have multiple layers of fabric, snugly cover both the nose and mouth, with no gaps on the sides and don't have a vent. Given the significant number of students using reusable cloth masks in this study, it's important to emphasize proper coverage of mouth and nose, storage and cleanliness to ensure that the masks were as effective as possible in reducing transmission of COVID-19.^{16,17}

In this study, cloth mask was frequently used by girls while N95/surgical mask by boys. Besides, there was no significant difference in the type of face mask used according to other socio-demographic variables like age, standard of class, father's occupation and type of school. In contrast to our findings, in many studies in school and community settings, adherence to face masks was increased with age.^{17,18} In our study, it was observed that the mask was adequately (covering their mouth as well as

nose) utilized by the students less than 15 years old and studying in junior classes. Besides, there was no significant difference in mask-wearing habits according to gender, father's occupation and type of school. Contrary to our study findings, Chen et al in their study found that good mask-wearing behavior was significantly higher in older children and whose mothers' had higher education level while in the study done by Mwesige et al boys wearing face-masks more appropriately than girls.^{12,17}

Limitations

The major limitation of our study was that our sample size was small, also we did not observe the mask habits over a period of time or at different times in the day as mask use can vary from outside school, within the class, in the playground and in the recess, so more observational studies were required where children may be observed over a period of time to know their mask use habits.

CONCLUSION

The study concluded that every student was wearing mask in the schools and most of the students had good face mask-wearing practices to limit the spread of COVID-19 in the school as well as in the community. Despite these findings, there is still much more to be done in terms of mask-wearing practices among students to reach 100% awareness. Schools and other relevant authorities should develop policies and guidelines that cover the many types of face masks and their proper way of using them among students. For this school authorities should plan and implement IEC activities among school students and their parents.

Funding: No funding sources

Conflict of interest: None declared

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

REFERENCES

- Brooks JT, Butler JC. Effectiveness of mask wearing to control community spread of SARS-CoV-2. *JAMA.* 2021;325(10):998-9.
- Martinelli L, Kopilaš V, Vidmar M, Heavin C, Machado H, Todorović Z, et al. Face masks during the covid-19 pandemic: a simple protection tool with many meanings. *Front Public Health.* 2021;8:606635.
- Mayo Clinic. Fact sheet: How well do face masks protect against COVID-19? Available at: <https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-mask/art-20485449>. Accessed on 20 May 2022.
- CDC. Fact sheet: Science brief: community use of masks to control the spread of SARS-CoV-2, 2021. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/masking-science-sars-cov2.html>. Accessed on 20 May 2022.
- WHO. Fact sheet: Advice on the use of masks for children in the community in the context of COVID-19, 2020. Available at: <https://apps.who.int/iris/bitstream/handle/>. Accessed on 20 May 2022.
- CDC. Operational Guidance for K-12 Schools and Early Care and Education Programs to Support Safe In-Person Learning, 2022. Available at: <https://www.cdc.gov/coronavirus>. Accessed on 20 May 2022.
- Kids health. Fact sheet: Coronavirus (COVID-19): kids and masks, 2022. Available at: <https://kidshealth.org/en/parents>. Accessed on 20 May 2022.
- Hindustan Times. Fact sheet: Schools to reopen in Himachal for classes 9-12 from today, 2021. Available at: <https://www.hindustantimes.com/india>. Accessed on 20 May 2022.
- Outlook India. Fact sheet: Himachal Pradesh to resume physical classes for primary school students this month: all you need to know, 2022. Available at: <https://www.outlookindia.com>. Accessed on 20 May 2022.
- Sikakulya FK, Ssebuufu R, Mambo SB, Pius T, Kabanyoro A, Kamahoro E, et al. Use of face masks to limit the spread of the COVID-19 among western Ugandans: Knowledge, attitude and practices. *PLoS One.* 2021;16(3):0248706.
- Howard J, Huang A, Li Z, Tufekci Z, Zdimal V, Westhuizen HVD, et al. An evidence review of face masks against COVID-19. *Proc Natl Acad Sci U S A.* 2021;118(4):2014564118.
- Mwesige D, Nalugya A, Bulafu D, Tigaiza A, Nagawa BT, Balinda E, et al. Face mask use and associated factors among students in rural Eastern Uganda amidst the COVID-19 pandemic. *medRxiv.* 2021;6(27):21-5.
- Barrios LC, Riggs MA, Green FA, Czarnik M, Nett NJ, Staples JE, et al. Observed Face Mask Use at Six Universities- United States, September-November 2020. *MMWR.* 2021;70:208-11.
- Duong MC, Nguyen HT, Duong BT. A cross-sectional study of knowledge, attitude, and practice towards face mask use amid the COVID-19 pandemic amongst university students in Vietnam. *J Community Health.* 2021;46:975-81.
- Mueller AS, Diefendorf S, Abrutyn S, Beardall KA, Millar K, O'Reilly L, et al. Youth mask-wearing and social-distancing behavior at in-person high school graduations during the COVID-19 pandemic. *J Adolesc Health.* 2021;68(3):464-71.
- WHO. Fact sheet: WHO Coronavirus (COVID-19) Dashboard, 2021. Available at: <https://covid19.who.int/>. Accessed on 20 May 2022.
- Public Health Ontario. Wearing masks in public and COVID-19-what we know so far. Toronto, ON:

Queen's Printer for Ontario, 2020. Available at: <https://www.publichealthontario>. Accessed on 20 May 2022.

18. Chen X, Ran L, Liu Q, Hu Q, Du X, Tan X. Hand hygiene, mask-wearing behaviors and its associated factors during the COVID-19 epidemic: a cross-sectional study among primary school students in

Wuhan, China. *Int J Environ Res Public Health.* 2020;17(8):2893.

Cite this article as: Sharma D, Sharma N, Sharma A, Sood A, Sharma R. Practices of face mask use and associated factors during COVID-19 pandemic among school-going children in Shimla city. *Int J Res Med Sci* 2022;10:1692-7.