

Research Article

Knowledge and Perception of Paediatric COVID-19 among Interns and Final Year Medical Students - A Cross-sectional Study

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A B S T R A C T

Introduction: In India, the Ministry of Health and Family Welfare (MoHFW) reports that 8% of the COVID-19 cases were contributed by children less than 17 years which could be a sizable number considering our population size. In a resource-limited country like India, the immediate future doctors will be expected to play a crucial role as frontline health care workers against COVID-19.

Objective: To assess the knowledge and perception of students with regard to paediatric COVID-19.

Method: A descriptive cross-sectional study was done among medical students of Final year MBBS (Part I and II) and Interns/CRRIs (Compulsory Rotatory Residential Internship) from two medical colleges of Chennai. After obtaining ethical approval, data were collected using a validated structured self-administered questionnaire through online Google forms and analysed using SPSS version 21 software.

Results: Of the 655 participants included in the study, 213 (32.5%) were Final MBBS Part I students, 278 (42.4%) final MBBS Part II students and 164 (25.1%) were CRRIs. Most participants (83.2%) had adequate knowledge. 68.7% agreed to work in paediatric fever clinics. Majority were confident about their competency in counseling parents of children (90.7%) and adequate PPE measures (86%). However, few participants (26.3%) felt they were competent to identify complications in children.

Conclusion: With COVID-19 pandemic in its second year, the medical students have developed adequate knowledge of COVID-19 in paediatric patients and they can help the health workers in times of need.

Keywords: COVID-19, Medical Students, CRRIs, Knowledge

Introduction

COVID-19 is the ongoing pandemic caused by coronavirus labeled SARS CoV-2, which has spread all over the world in a few months' duration. As of 28th October 2021, WHO has reported 244,897,472 cases including 4,970,435 deaths.¹ India reported its first case on Jan 30th, 2020.² Since then, India had reported 3,42,15,653 cases and 4,55,653 deaths, and approximately 8% of the positive cases were contributed by population below 17 years of age.^{3,4}

SARS CoV-2 predominantly causes mild upper respiratory tract infection in children. Studies have shown that majority (> 90%) of children fall under the asymptomatic/ mild/moderate category of the disease spectrum.⁵ Severe or critical COVID-19 in children contributes about 5.9% in comparison to 18% of adults with the disease.⁶ Multisystem inflammatory syndrome in children [MIS-C] is a severe form of the disease that has been more often reported in children.⁷ Systematic review by Hoang A et al., analysed data from various countries reported till May 14th 2020, which included 7780 paediatric patients. They reported that the Intensive care unit's need for observation/ treatment was around 3.3%. This study also highlighted that majority of children had milder disease.⁸

COVID-19 pandemic has created a sense of uncertainty among medical students about their role in this crisis. Medical students have played a crucial role during the Spanish flu epidemic in 1918.⁹ Studies during the H1N1 pandemic from the University of Alberta, 2007 and The University of Michigan medical school and health system, 2011 showed that majority of medical students preferred to volunteer services during the pandemic.^{10,11} The Harvard medical school in the United States of America has formed the HMS COVID-19 Student response team during this COVID-19 pandemic.

Various studies have been done to assess the awareness, knowledge, and perception of healthcare professionals in relation to COVID-19 in India. Modi PD et al.¹² completed an online questionnaire-based survey with 1562 members which included students and staff from institutions in Mumbai. The study reported overall 71.2% correct responses, while some lacked knowledge in mask/respirator application (45.4%), and 52.5% were aware of appropriate hand hygiene techniques. There is a paucity of data on knowledge and perception of students with regard to paediatric COVID-19. Hence this study was undertaken to address these knowledge gaps.

Methodology

Study Population

A descriptive cross-sectional study was done among students of Final year MBBS (Part I and II) and CRRIs from

two medical colleges in Chennai, from September 2020 to October 2020 after obtaining Institutional ethical committee approval from the institutes (104/ IHEC/ August 2020 & IRC/ 041/ 27-08-2020). All Final MBBS part-1 and part-2 students and interns willing to participate and after obtaining informed consent were included in the study. Those not consenting to take part were excluded. The participants were selected by convenience sampling technique. The sample size calculation was done using EpiCalc-2000 based on the assumption the proportion of good knowledge is 50% with a confidence level of 95% and precision of 5%.

Study Tool

A self-administered questionnaire was used to document the responses of the participants. The questions were prepared using WHO, CDC and ICMR guidelines by a team of paediatricians. The questionnaire was distributed to seven experts to assess the content domains and was remodified using the suggestions given by the experts. A pilot survey was done among 20 randomly selected subjects to study relevance and clarity. Internal consistency of the questions was checked using Cronbach's alpha. Based on these results refinements were made to the questionnaire before final dissemination.

The questionnaire was divided into four sections. Section 1 collected the demographic details. Section 2 collected details of sources of information available to the participants. This section had 'Most Often Used, Somewhat Used and Seldom Used' options. It also rated the reliability of sources used by students. Section 3 had 13 questions that were designed to test knowledge of paediatric COVID-19 4 questions on general information, 2 questions on transmission, 2 on preventive measures, 2 on signs and symptoms, and 3 on management. Each question carried 1 point for the correct answer. Based on similar studies, adequate knowledge was considered if the participants scored 9 or more points out of 13 and poor knowledge if the score was less than 5.¹³ 75% (>9/13 answers) and above denoted that the participant has a good knowledge of paediatric COVID-19 while 40% (<5/13 answers) and below denoted poor knowledge. Section 4 had questions on the perception of students on paediatric COVID-19 as well as the perception of their competency in identifying and managing paediatric COVID-19 patients.

Data Collection Process

The questionnaire was converted to a google form. The links thus generated were sent by Email to all participants. Google form responses were collated into an EXCEL sheet for data cleaning and management.

Statistical Analysis

Descriptive statistics was used to describe and summarise features from the collected data. Chi-square test was used to

evaluate the association between the categorical variables. $P > 0.05$ was accepted as the statistical significance level. All the statistical analyses were done using SPSS version 21 software.

Results

A total of 655 participants were included in the present study with 247 (37.7%) males and 408 (62.3%) females. Among the study participants, 213 (32.5%) were Final MBBS Part I, 278 (42.4%) were Final MBBS Part II and 164 (25.1%) were Interns (Figure 1).

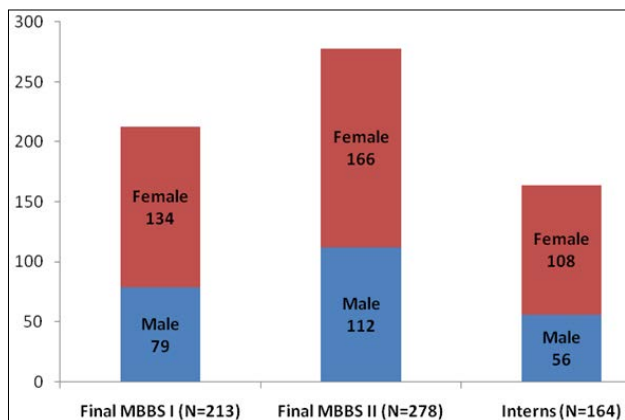


Figure 1. Gender Distribution and Year of Study of Participants

When participants were asked about contact with COVID-19 patients (Figure 2), 28.5% of participants were found to have contact with them. Among the study participants, 213 (32.5%) were Final MBBS Part I, 278 (42.4%) were Final MBBS Part II and 164 (25.1%) were CRRIs (Figure 2).

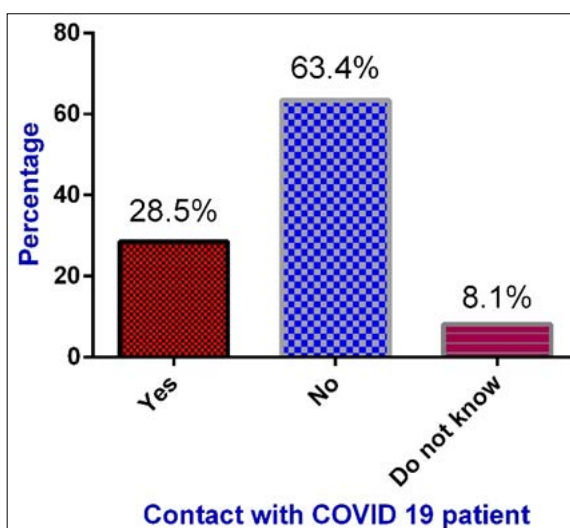


Figure 2. Participants' Contact with COVID-19 Patient

When the participants' source of knowledge regarding paediatric COVID-19 was explored (Table 1), it was identified that many of the participants opined that they got the knowledge through the internet (75.9%). This was followed

by other sources like doctors/ health workers (66.7%) and TV/ news channels (61.0%).

Table 1. Participants' Responses towards the Sources regarding Paediatric COVID-19

S. No.	Source	Yes n (%)	No n (%)
1.	Family/ friends/ neighbours	354 (54)	301 (46)
2.	Internet- Google and other search engines	497 (75.9)	158 (24.1)
3.	WhatsApp	231 (35.3)	423 (64.7)
4.	Facebook	77 (11.8)	577 (88.2)
5.	Instagram	205 (31.5)	449 (68.5)
6.	TV/ news channels	399 (61.0)	255 (39.0)
7.	Radio	41 (6.3)	613 (93.7)
8.	Doctors/ health workers	436 (66.7)	218 (33.3)
9.	NGOs	38 (5.8)	616 (94.2)
10.	Newspapers	258 (39.4)	396 (60.6)
11.	Books and journals	115 (17.6)	539 (82.4)

Many participants (58.2%) felt useful and happy to be posted in paediatric fever clinic (Figure 3). Majority of the participants (68.7%) agreed to choose posting in paediatric fever clinics.

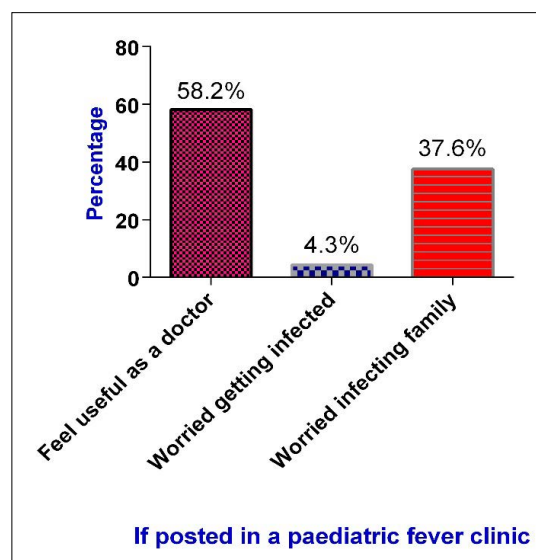


Figure 3. Participants' Response on their Feeling if Posted in a Paediatric Fever Clinic

When the level of knowledge regarding COVID-19 was assessed (Table 2), it was found that 545 (83.2%) participants showed a good knowledge level. There is no significant difference ($p > 0.05$) in the level of knowledge among the different years of study.

Table 2. Participants' Knowledge Level towards Paediatric COVID-19

	Knowledge Level		Total n (%)	P Value
	Average n (%)	Good n (%)		
Final MBBS Part I	34 (16)	179 (84)	213 (100)	P = 0.362
Final MBBS Part II	53 (19.1)	225 (80.9)	278 (100)	
CRRi	23 (14)	141 (86)	164 (100)	
Total	110 (16.8)	545 (83.2)	655 (100)	

The responses to the questions related to the perception are given in Table 3. Most of the participants (52.4%) responded that children are more susceptible to COVID-19 than adults. Further, when the participants were asked the severity of illness between the children and adults, most of them (4.7%) disagreed that the severity is more in children than that of adults.

Table 3. Participants' Responses to the Questions related to the Perception of Paediatric COVID-19

S. No.	Questions	Agree n (%)	Disagree n (%)	Do not know n (%)
1.	Children are more susceptible to COVID-19 than adults	343 (52.4)	250 (38.2)	62 (9.5)
2.	COVID-19 illness in children is more severe and has more complications than in adults	275 (42)	293 (44.7)	87 (13.3)
3.	If given a choice I would accept a posting in the paediatric fever clinic	450 (68.7)	106 (16.2)	99 (15.1)

The questions related to the various competencies regarding paediatric COVID-19 (Table 4) revealed that the majority of the participants expressed that they were competent in various procedures related to paediatric COVID-19. Many participants were confident about their competency of PPE measures (86%). However, only a few participants (26.3%) were competent to identify multisystem inflammatory syndrome in children. Many participants (90.7%) were also confident about their competency in counseling parents.

Table 4. Participants' Competency in Paediatric COVID-19

S. No.	Competency	Yes n (%)	No n (%)	Don't know n (%)
1.	Can do triage	368 (56.1)	117 (17.9)	170 (26.0)
2.	Can manage a suspected paediatric COVID-19 case	296 (45.2)	176 (26.9)	183 (27.9)
3.	Can obtain a sample for COVID-19 testing	371 (56.6)	170 (26.0)	114 (17.4)
4.	Can take PPE measures	563 (86.0)	44 (6.7)	48 (7.3)
5.	Can order pneumonia treatment	282 (43.1)	195 (29.8)	178 (27.2)
6.	Can identify multisystem inflammatory syndrome in children	172 (26.3)	252 (38.6)	230 (35.1)
7.	Can counsel COVID-19 positive mothers with regard to breastfeeding	492 (75.1)	85 (13.0)	78 (11.9)
8.	Can counsel parents of children regarding preventive measures against COVID-19	594 (90.7)	30 (4.6)	31 (4.7)
9.	Can start oxygen using appropriate oxygen delivery device	289 (44.5)	169 (26.0)	191 (29.4)

Many (86%) were confident about their competency of PPE measures (Table 4). 90.7% were also confident about their competency in counseling parents of children regarding preventive measures against COVID-19. 26.3% were competent to identify multisystem inflammatory syndrome in children.

Discussion

With the number of people infected with COVID-19 still increasing in many parts of the world, the immediate future doctors (CRRIs and Final year students) will be the frontline health care workers against coronavirus.¹

Of the total diagnosed COVID-19 cases 1 to 5% are children, which could be a sizeable number considering the Indian population size.⁴

Given the expected prolonged nature of this pandemic and large population in a country like India, the medical students, especially final years and the CRRIs are expected to play a crucial role in the nearby future. There are many studies on the knowledge and perception of COVID-19 in adults. However, as of today, there are no publications on the knowledge and perception of students with regard to paediatric COVID-19. Hence this study was undertaken to assess the same.

Various studies have been done to assess the awareness, knowledge, perception of healthcare professionals in relation to COVID-19 in India. Modi PD et al., completed an online questionnaire-based survey with 1562 members which included students and staff from institutions in Mumbai.¹² The study reported overall 71.2% correct responses, while some lacked knowledge in mask/respirator application (45.4%), and 52.5% were aware of appropriate hand hygiene techniques. Singh et al. conducted a web-based, cross-sectional study among 392 medical students in Southern Haryana which found overall knowledge about COVID-19 disease satisfactory.¹³ The study also revealed a large number (85%) afraid of getting infected or infecting family members.

In our study, we found that 83.2% of participants showed good knowledge level with no significant difference in the level of knowledge among different years of study. This is comparable to an Indian study by Singh et al. and an Ecuadorian study by Lincango-Naranjo E et al. and a Saudi Arabian study by Alsoghair Met al.¹³⁻¹⁵ The reason for this level of good knowledge could be a high volume of news reports, information and continued medical education programmes that have been made available through online media as well as through newspapers and television. This conforms to the fact that the most commonly used source of knowledge for participants in our study was the internet (75.9%).

Most participants (68.7%) expressed willingness to work in a paediatric fever clinic though more than half were worried about infecting self or family. This is in contrast to the Lincango-Naranjo E et al. study where more than half of the participants had a negative attitude towards volunteering their services.¹³ However the reason for the negative attitude could be explained by the fear of infection.

Assessment of perception of competencies revealed varied results in our study. Participants perceived themselves as competent in counseling parents (90.7%) or using PPE measures (86%); however half of them were not confident in treating COVID-19 (54.8%) or its complications (73.3%). Caliskan et al. reported a high perception of efficiency in their students if their knowledge base was good.¹⁶ A point to be noted with these observations is that a strong knowledge base and good perception (attitude) domain

would not necessarily translate into good skills domain unless adequate training is imparted.

Prasad K et al. in a survey of 20,947 health care workers reported 49% had burnout, 43% suffered work overload and 38% reported anxiety or depression during the COVID-19 pandemic.¹⁷ Though the roles of medical students in this pandemic have not been clearly delineated, with a little additional training in paediatric COVID-19, our medical students and CRRIs could prove to be valuable in handling further COVID-19 waves.

Limitations of the study are that it assesses the perception of competencies in participants and not the actual skills. Secondly, this study was conducted before the second wave of COVID-19 pandemic in India and before the Indian vaccination programme began. This study highlights the need for enlightening the students about COVID-19 safety practices and to allay their fears about the disease. In the present study, the medical students showed adequate knowledge on paediatric COVID-19. Further, many students felt proud to work in paediatric fever clinics. The present study also showed that the students have adequate confidence in taking care of paediatric COVID-19 patients.

Conclusion

The present online questionnaire-based study has provided useful data on the medical students' knowledge and perception of paediatric COVID-19 patients. Knowledge gaps as identified by this study can be filled by adding various competencies on COVID-19 to the existing curriculum. More than a year of pandemic is over and the world has started the vaccination programme to combat the disease; no wonder the medical students have developed adequate knowledge and perception on COVID-19, especially in paediatric patients.

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Conflict of Interest: None

References

1. World Health Organization [Internet]. Coronavirus disease (COVID-19) dashboard; [cited 2021 Oct 28]. Available from: <https://COVID-19.who.int/>
2. The Wire [Internet]. Health ministry reports one positive case of Wuhan coronavirus in Kerala; [cited 2020 Jan 27]. Available from: <https://thewire.in/health/health-ministry-reports-one-positive-case-of-wuhan-coronavirus-in-kerala>. Accessed 30th January 2020.

3. Government of India. COVID-19 dashboard. Available from <https://www.mygov.in/COVID-19>
4. Sahi PK, Jhamb U, Dabas A. Pediatriccoronavirus disease 2019: clinical features and management. *Indian Pediatr.* 2021 May;58(5):453-60. [PubMed] [Google Scholar]
5. Ludvigsson JF. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *ActaPaediatr.* 2020 Jun;109(6):1088-95. [PubMed] [Google Scholar]
6. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, Tong F. Epidemiology of COVID-19 among children in China. *Pediatrics.* 2020 Jun;145(6):e20200702. [PubMed] [Google Scholar]
7. De-Biasi RL, Song X, Delaney M, Bell M, Smith K, Pershad J, Anusinha E, Hahn A, Hamdy R, Harik N, Hanisch B, Jantusch B, Koay A, Steinhorn R, Newman K, Wessel D. Severe coronavirus disease-2019 in children and young adults in the Washington, DC, Metropolitan Region. *J Pediatr.* 2020 Aug;223:199-203.e1. [PubMed] [Google Scholar]
8. Hoang A, Chorath K, Moreira A, Evans M, Burmeister-Morton F, Burmeister F, Naqvi R, Petershack M, Moreira A. COVID-19 in 7780 pediatric patients: a systematic review. *EClinicalMedicine.* 2020 Jun;24:100433. [PubMed] [Google Scholar]
9. Starr I. Influenza in 1918: recollections of the epidemic in Philadelphia. *Ann Intern Med.* 1976 Jul;85(4):516-8. [PubMed] [Google Scholar]
10. Herman B, Rosychuk RJ, Bailey T, Lake R, Yonge O, Marrie TJ. Medical students and pandemic influenza. *Emerg Infect Dis.* 2007 Nov;13(11):1781-3. [PubMed] [Google Scholar]
11. Waight G, Berhane A, Orton L, Cinti S, Billi J, Kim CS. The role of the medical students in influenza pandemic response. *J EmergManag.* 2011;9:60-6. [Google Scholar]
12. Modi PD, Nair G, Uppe A, Modi J, Tuppekar B, Gharpure AS, Langade D. COVID-19 awareness among healthcare students and professionals in Mumbai Metropolitan region: a questionnaire-based survey. *Cureus.* 2020 Apr;12(4):e7514. [PubMed] [Google Scholar]
13. Singh A, Panika RK, Surana A, Gupta V, Goyal P, Singh M. Evaluation of knowledge and perceptions among medical undergraduate students toward novel coronavirus (COVID-19) in Southern Haryana, India: a cross-sectional study. *Indian J Health SciBiomed Res.* 2020;13:91-7. [Google Scholar]
14. Lincango-Naranjo E, Espinoza-Suarez N, Solis-Pazmino P, Vinueza-Moreano P, Rodriguez-Villafuerte S, Lincango-Naranjo J, Barberis-Barcia G, Ruiz-Sosa C, Rojas-Velasco G, Gravholt D, Golembiewski E, Soto-Becerra P, Khan M, Ortiz-Prado E. Paradigms about the COVID-19 pandemic: knowledge, attitudes and practices from medical students. *BMC Med Educ.* 2021 Feb;21(1):128. [PubMed] [Google Scholar]
15. Alsoghair M, Almazyad M, Alburaykan T, Alsultan A. Medical students and COVID-19: knowledge, preventive behaviors, and risk perception. *Int J Environ Res Public Health.* 2021;18:842. [Google Scholar]
16. Çalışkan F, Mıdık Ö, Baykan Z, Şenol Y, Tanrıverdi EÇ, Tengiz Fİ, Gayef A. The knowledge level and perception toward COVID-19 among Turkish final year medical students. *Postgrad Med.* 2020 Nov;132(8):764-72. [PubMed] [Google Scholar]
17. Prasad K, McLoughlin C, Stillman M, Poplau S, Goelz E, Taylor S, Nankivil N, Brown R, Linzer M, Cappelucci K, Barbouche M, Sinsky CA. Prevalence and correlates of stress and burnout among US healthcare workers during the COVID-19 pandemic: a national cross-sectional survey study. *EClinicalMedicine.* 2021 May;35:100879. [PubMed] [Google Scholar]