Assessment of knowledge, attitude and practice of parents towards prevention of Covid-19 infection in children: a hospital based cross-sectional study in Kolkata, India

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Abstract

Background: The Covid-19 pandemic has immense health consequences and all individuals are at risk including children. The World Health Organisation (WHO) has recommended Covid-19 appropriate behaviour as an effective measure for Covid-19 prevention.

Objectives: To assess the knowledge, attitude and practice (KAP) related to prevention of Covid-19 among parents of children attending a medical college hospital in Kolkata, India.

Method: A cross-sectional study was carried out among parents of children aged 1-5 years who attended the paediatric outpatient department over a period of three months using a pretested semi-structured questionnaire. Appropriate statistical tests were used to identify factors influencing KAP. $p < 0.05$ was considered statistically significant.

Results: Among 153 participants, the overall correct KAP responses were 68.8%, 78.3%, and 74.6% respectively. Knowledge scores significantly differed across place of residence and educational status. Knowledge and practice scores were significantly positively correlated. Parents having moderate and good knowledge level had more satisfactory practices and it was statistically significant ($p<0.05$). Satisfactory practice was also significantly more among male subjects ($p<0.05$).

Conclusions: Parents were aware about the mode of spread and symptoms of Covid-19 in children but awareness about presentation with central nervous system or gastrointestinal tract involvement was lacking. Parents had positive attitudes and adopted good practices towards prevention of Covid-19 in children. Knowledge scores significantly differed across place of residence and educational status. Parents having moderate and good knowledge level had more satisfactory practices for prevention of Covid-19. Social distancing was followed by the majority. The decision of lockdown and closure of schools by the government was favoured by the majority of parents.

(Key words: Covid-19, Parents, Knowledge, Attitude, Practices)

Introduction

On 30th January 2020 the World Health Organization (WHO) declared Covid-19 a Public Health Emergency of International Concern and on 11th of March declared it a pandemic[1-3]. Confirmed paediatric cases of Covid-19 were 2% in the United States, 2.2% in China, 1.2% in Italy and 0.8% in Spain[4]. The coronavirus disease pandemic has physical, social, cultural, psychological and mental impacts on children. Preventive measure of wearing masks, hand sanitization and physical distancing which are effective in adults, are equally important in children[5]. Children may be asymptomatic or have mild non-specific symptoms like fever, cough and cold[5]. As the pandemic progresses, spectrum and severity in children may change[6]. Asymptomatic infection in children may act as a link in community transmission[7]. As the disease spreads globally, public health guidelines such as wearing face mask and social distancing are important measures to interrupt epidemic transmission[8]. Therefore, assessing KAP of parents can provide baseline information to determine changes in behaviour about taking precautions against the virus that will aid preventive programmes for health promotion[8].

The first Covid-19 case in India was reported in January 2020. As the number of cases increased, the Indian government enforced a nationwide lockdown on March 24, 2020[9]. The Covid-19 pandemic has disrupted health services worldwide and immunization services in particular have been affected in both rich and lower income countries[9]. However, it is important that all routine vaccinations

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in the universal immunization programme are given without delay[10,11]. As the health and social awareness depend on literacy and KAP of people of varied diversity, this survey is particularly important to create awareness. This study was carried out in the paediatric outpatient department (OPD) of a tertiary care hospital and medical college in Kolkata to assess the KAP of parents towards their children regarding prevention of spread of the disease in-spite of their diversity of sociocultural and economic conditions. This will help to strengthen the preventive, promotive and curative measures against Covid-19 to save the future citizens of India.

Objectives

1. To assess the knowledge regarding symptoms, transmission and prevention of Covid-19 infection among parents of children aged 1-5 years.
2. To assess the attitude and practices of parents towards their children regarding prevention of spread of Covid-19 infection.

Method

This was a cross-sectional study conducted in a medical college among 153 parents of children aged 1-5 years who attended the paediatric OPD over 3 months from January-March 2021. Parents who did not give consent and parents who were critically ill or attending emergency services were excluded from the study. Universal sampling method was adopted.

A pre-designed, pre-tested, semi-structured questionnaire was used to collect data on socio-demographic characteristics, knowledge about Covid-19 (symptoms in children, mode of transmission and prevention), attitude and practice of preventive measures adopted against Covid-19 in children. For scoring of responses all the negative or undecided responses counted as '0' and positive responses as '1'. Open ended questions were asked regarding the new lifestyle changes adopted by them in the past year of Covid-19 pandemic.

Data analysis: Data were collected using face-to-face interview, entered in Microsoft Excel sheet and analysed by SPSS version 20 and STATA MP16. Frequencies were expressed as percentages and distribution of variables were displayed using suitable diagrams. Kolmogorov-Smirnov test was used to check the normality of data. Normally distributed data were expressed as mean ± standard deviation, while nonparametric data were expressed in median (interquartile range). Correlations between knowledge scores and other continuous variables (participant's age, attitude and practice score) were made using Pearson / Spearman correlation coefficient based on normality of data. Similarly, comparisons between total knowledge score and categorical demographic variables (residence and educational status) were made using appropriate non-parametric tests. The degree of association was quantified using odds ratio. A p-value <0.05 was considered significant.

Ethical issues: The study was approved by Institutional Research Board/IEC, ESI-PGIMSR & ESIC Medical College, Kolkata, India on 09/03/2021. Informed written consent was obtained from the parents participating in the study.

Results

A total of 153 parents of the children attending paediatric OPD participated in this study of whom 90 (58.8%) were females and 63 (41.2%) were males. Mean age of the parents was 33 ± 6.98 years; 58.2% of the participants were from urban areas. Figure 1 shows the educational status of the participants and it was found that 54.3% of parents had high school education.

Figure 2 shows that the parents received information regarding Covid-19 mainly from electronic and print media (47%) followed by friends/relatives (37.3%).

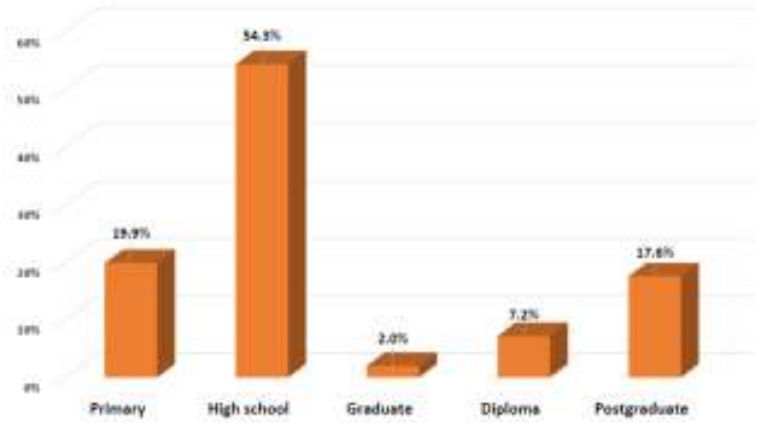

Fig.1 Education status of participants

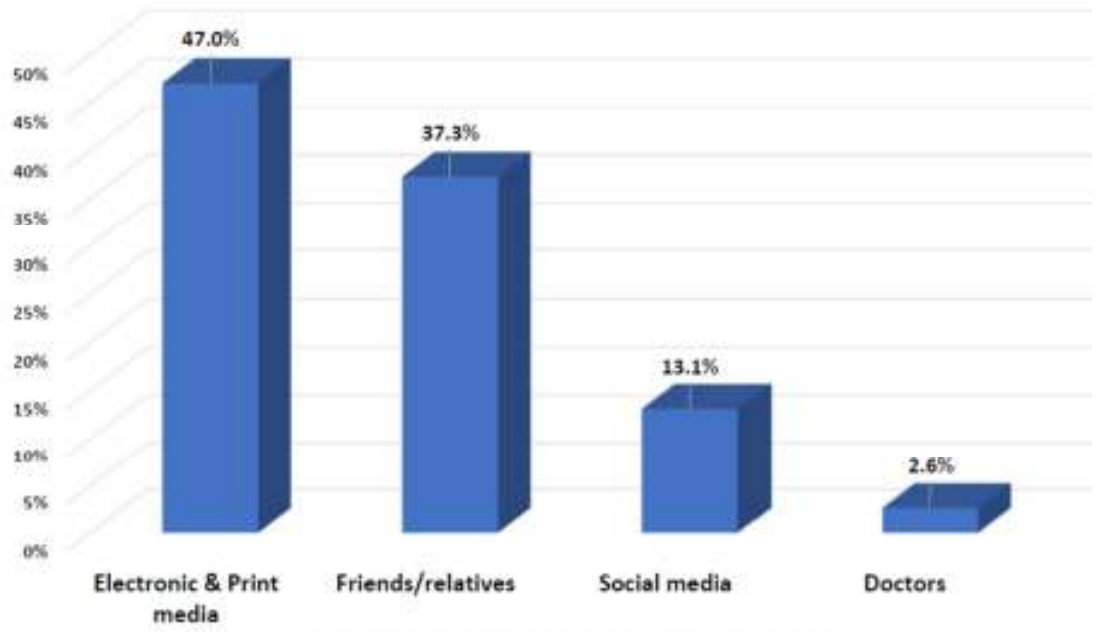

Fig.2 Source of information regarding Covid19

Nearly 45% participants stated that though some of their family members suffered from Covid-19 infection, none of the children were infected or had any symptoms following quarantine/isolation. It was also stated by 62.7% parents that following lockdown (closure of schools and restriction of outdoor activities) their children have gained weight in the last one year.

Knowledge about Covid19 infection

Information was gathered about knowledge of the parents regarding mode of transmission and symptoms of Covid-19 in children. Of the parents, 43 stated that the symptoms in children are the same as in adults. It was also believed by 44% parents that children are immune to Covid-19 infection.

Table 1 enumerates the knowledge of participants about Covid-19.

Table 1: ***Awareness of parents about Covid-19 (n=153)***

Characteristic	Number (%)
Symptoms of Covid-19	
Fever	149 (97.4)
Upper respiratory tract symptoms like sore throat, running nose, cough	134 (87.6)
Body aches	122 (79.7)
No symptoms	33 (21.6)
Involvement of nerves / brain	32 (20.9)
Mode of transmission of Covid-19 infection	
Covid19 can spread by coughing / sneezing / talking	133 (86.9)
Asymptomatic people can spread infection	105 (68.6)
Children are more immune to Covid19 infection	68 (44.4)
Prevention of transmission of Covid-19 infection	
Use of mask helps preventing Covid19 infection	145 (94.8)
Should not touch nose/mouth/eyes without washing hands	143 (93.5)
Should wash hands with soap/sanitizer for 20 minutes after blowing nose/ coughing/ sneezing	134 (87.6)
There is definite treatment of Covid19 infection	57 (37.3)

The overall correct response rate based on knowledge of symptoms, mode of transmission and prevention of Covid-19 infection was 68.8%. Table 2 shows the questions related to attitude and practice related to Covid-19.

Table 2: ***Questions about attitude and practice related to Covid-19 (n=153)***

Characteristic	Response
Attitude	
1. Frequent washing/sanitizing hands effective in prevention of infection	Agree/Disagree
2. Using public transport may increase risk of infection	Agree/Disagree
3. It's better to stay indoors to protect from getting infected	Agree/Disagree
4. Health supplements may have a protective role	Agree/Disagree
5. Infected children/ family members should be isolated	Agree/Disagree
6. Agree with Govt.'s policy of lockdown & closing of school	Agree/Disagree
7. Vaccines may help to control Covid19	Agree/Disagree
Practice/Preventive measures	
1. Using masks for children and self while going out	Yes/No
2. Restricted outdoor movement	Yes/No
3. Social distancing and avoiding handshakes	Yes/No
4. Taking bath and washing clothes after returning home	Yes/No
5. Using sanitizers/soap	Yes/No
6. Regular washing of vegetables/ fruits after buying	Yes/No
7. Prefer food cooked at home	Yes/No
8. Online shopping to reduce visits to market	Yes/No
9. Telephonic consultation with doctor for child's sickness	Yes/No
10. Using health supplement/natural immunity sources	Yes/No
11. Avoiding attending social events	Yes/No

Attitude of parents towards prevention of Covid-19

Attitude of the parents was assessed by a 7-point questionnaire (Table 2). Of the parents 92.8% felt that it is important to frequently wash/sanitize hands for preventing Covid-19 infection. Increased risk of spreading Covid-19 infection on use of public transport was agreed by 92% respondents; 86.3% opined that staying indoors is helpful in protection, while 68% believed that natural immunity boosters like 'amla', health supplements, etc. may provide some benefit; 68 participants mentioned that infected family members should be isolated; 89% of parents agreed with the government idea of lockdown and closing down schools to prevent spread of Covid-19. Among the parents 63.3% were hopeful that Covid19 vaccines will help to prevent the infection. The overall positive attitude response was reasonably good (78.3%) in parents visiting paediatric OPD.

Practices in parents towards prevention of Covid-19 in children

Parents' responses about various practices to prevent Covid-19 in children was taken. Of the parents 96% used masks by self and children while going out, while 92% limited their outdoor movement. The survey showed that the participants mostly preferred to use cloth mask (60%) followed by N95 mask (22%) (Figure 3).

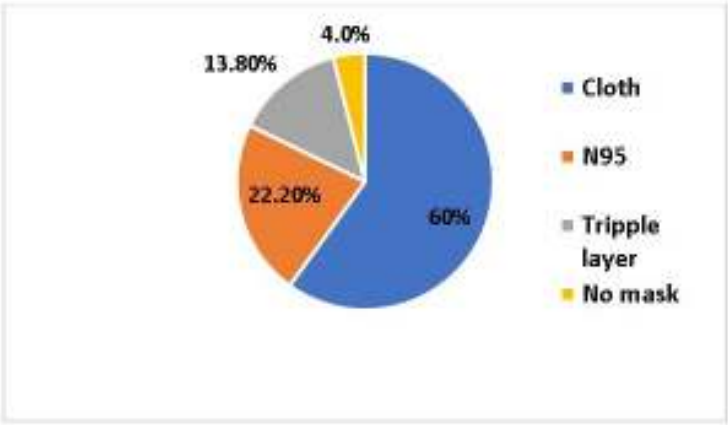

Fig.3 Type of face masks used by participants

Of the participants 87% practised regular handwashing with soaps/sanitizers. Washing of clothes /taking bath after returning home was done by 88.2%. Limitation of outdoor activity for children/family members and maintaining social distancing was followed by 92% parents. For

preventing infection, 84% preferred homemade food and use of health supplement / natural immunity sources like amla and turmeric were practised by 57% parents. Attending social functions / gatherings was avoided by 44% of participants; 58% of parents resorted to online or telephonic consultation for their child's ailments. Online shopping was preferred over going to the market by 68% participants. The overall response rate for appropriate practices in preventing Covid-19 was 81.4 %.

Covid-19 pandemic had affected the routine immunization programme which is an important measure to prevent against infectious diseases in the paediatric population. It was observed in our study that about 28% children either missed or delayed their routine immunisation during this pandemic.

Knowledge, attitude and practice scores

For scoring of responses all negative / incorrect responses were counted as '0' and positive / correct responses as '1'. Median scores regarding Covid-19 knowledge, attitude and practice were 8, 6 and 9 respectively. (Table 3).

Table 3: ***Knowledge, attitude and practice scores regarding Covid-19***

Parameter	Mean (SD)	Median	Q1	Q3
Knowledge	8.26 (1.66)	8	7	9
Attitude	5.48 (1.22)	6	5	6
Practice	8.96 (1.42)	9	8	10

Table 4 shows that knowledge scores significantly differed across place of residence and educational status ($p<0.05$). However, though male participants had higher knowledge score than females, it was not statistically significant ($p>0.05$).

Table-4: ***Comparison of knowledge scores based on demographic characteristics***

Characteristic	n (%)	Mean Rank	Statistical Significance	
Gender				
Male	63 (41.2)	79.65	(Mann-Whitney U test) z=0.631; p=0.528	
Female	90 (58.8)	75.14		
Place of residence				
Urban	89 (58.2)	83.62	(Mann-Whitney U test) z=2.221; p=0.026	
Rural	64 (41.8)	67.79		
Educational status				
Primary	29 (18.95)	71.73	(Kruskal-Wallis test) $x^2 = 12.38$ df = 3 p=0.006	
High School	83 (54.25)	38.67		
Graduate	14 (09.15)	75.45		
Postgraduate	27 (17.65)	101.80		
Pairwise comparison of knowledge score by educational level				
Col Mean - Row Mean	**Graduate**	**High school**	**primary**	**Conover test**
High school	-0.880660 p=0.1900			
Primary	0.004135 p=0.4984	1.185798 p=0.1188		
Postgraduate	-2.679481 p=0.0041	-2.834641 p=0.0026	3.304801 p=0.0006	

When the level of knowledge was classified according to the score, poor knowledge corresponded to score <7, moderate knowledge to score between 7 and 9 and good knowledge referred to score ≥9 (considering 1st quartile and 3rd quartile as cut-off values since data was not normally distributed). Accordingly, the numbers of participants with poor, average and good knowledge were 20 (13.1%), 65 (42.5%) and 68 (44.4%). Practice scores showed a positive correlation with knowledge score (r=0.237, p=0.003). Taking median practice score 9 as cut-off value, practices for Covid 19 prevention was considered as satisfactory if the score is ≥9.

Table-5 shows the association of satisfactory Covid-19 prevention practice with gender and knowledge level. It was found that people having moderate and good knowledge level had more satisfactory practices and it was statistically significantly ($p<0.05$). Satisfactory practice was also significantly more among male subjects ($p<0.05$).

Table 5
Association of satisfactory Covid-19 prevention practice with gender and Covid-19 awareness (n=153)

Characteristic	Satisfactory Practice		Chi-square test
	Yes	No	
Gender n (%)			$x^2 = 4.59$;
Female	52 (57.8)	38 (42.2)	df=1;
Male	47 (74.6)	16 (25.4)	p=0.032
Knowledge level n (%)			
Poor	13 (65.0)	07 (35.0)	x^2=12.13
Moderate	25 (38.5)	40 (61.5)	df = 2
Good	16 (23.5)	52 (76.5)	p=0.002

Discussion

The cross-sectional study done among parents of children attending paediatric OPD to assess the KAP of parents regarding prevention of spread of the disease shows that majority of the parents relied on print and electronic media for their information on Covid-19, while some depended on information from family and friends, rather than social media. Regarding modes of transmission, 86.7% parents stated that Covid-19 infection can spread by coughing, sneezing or talking. Both these findings were similar to the Jordanian study[12]. In our study, fever was stated as the most common symptom (97.4%), followed by respiratory symptoms (87.6%) like sore throat, running nose and cough, the findings being similar to the study by Abuhammad S[12]. However, only 22% parents in our study believed that children may have asymptomatic infection, compared to 61% parents in the Jordanian study[12].

The overall correct knowledge response rate was 68.8% which was lower than the 83% reported by Pal R, *et al*[13] and the 80.6% reported by Tomar BS, *et al*[11]. The mean knowledge score of our participants (8.26) was also low as compared to the 12.4 by Pal R, *et al*[13] (%)[13] and the 11.36 by Tomar BS, *et al*[11]. In our study, knowledge scores were significantly higher ($p<0.05$) in urban population and in higher education status (postgraduates), but there was no significant gender difference in knowledge scores. The findings are similar to the study by Pal R, *et al*[13] but in contrast to a Chinese study[14] where females had higher knowledge scores.

Concerning attitudes of parents towards Covid-19, about 71% believed that vaccines will help to control Covid-19, whereas the response was much higher in other studies (94-98%)[11,15,16]. About 68% of our subjects believe that citrus food (amla, etc) may help preventing Covid-19, which was almost similar (63%) to the finding of Tomar BS, *et al*[11]. In other similar Indian studies, only 30% participants agreed eating citrus fruits prevents infection[17]. In our study 89% parents supported government decision of lockdown and closing of the schools, and it was almost similar to another study in India where 96% parents supported lockdown and closing down of schools[11]. The overall positive attitude response in our study was 78.3% which was lower than the study by Tomar BS, *et al*[11].

Regarding practices for prevention of Covid-19, frequent handwashing was practised by 88% of our study participants and it was similar (87.8%) to the findings of the Malaysian study[16] but higher than Saudi Arabian study (73%) by Al-Hanawi MK, *et al*[15]. In our study social distancing was maintained by 91.5% subjects, whereas it was lower (84.6%) in the Saudi Arabian study[15]. Use of face masks was much higher in our study (96%) than the Malaysian study (51%)[16].

The overall response rate of correct practices for Covid-19 prevention was about 81.4%, comparable to 83% in another Indian study[11]. The mean practice score in our study was 8.96 ± 1.42. Practice scores showed a positive correlation with knowledge score ($r=0.237$, $p=0.003$) i.e., people having moderate and good knowledge level had more satisfactory practices and it was statistically significant ($p<0.05$). It was similar to the observation of Pal R, *et al* ($r=0.019$: $p<0.01$)[13]. Our study shows that about 72% of the parents had immunised their children during the pandemic period, though 28% children missed or delayed their routine immunisation. In an observational study done in Rajasthan, significant drop in immunisation coverage by 6.9-10% was noted during the lockdown period[9]. As per WHO report, India experienced a large drop in immunization services, with DTP-3 coverage falling from 91% in 2019 to 85% in 2020[18].

The main limitation of the study was the small sample size. The study was conducted during the Covid-19 pandemic where attendance of patients in all OPDs was low as people were not generally visiting hospitals except for emergencies. Moreover, data were collected using face-to-face interview and not using the online survey tool which generally yields more sample size. The socio-economic and education profile of patients attending government hospital are not suitable for such online mode of data collection in our study population. Our total study participants were 153. A similar study in India by Pal R, *et al*[19] had a sample size of 212. A study by

Ebrahim A, *et al*[20] using *online* Google form had a sample size of 306. Considering the Covid-19 situation prevailing at the time of study and mode of data collection, a sample size of 153 may be considered reasonable. A study with a larger sample size is needed to confirm the study findings. Since the study was done when Covid-19 vaccination was not yet available for the general population, the awareness and apprehension related to vaccination could not be assessed.

Conclusions

Parents were aware about the mode of spread and symptoms of Covid-19 in children but awareness about presentation with central nervous system or gastrointestinal tract involvement was lacking. Parents had positive attitudes and adopted good practices towards prevention of Covid-19 in children. Knowledge scores significantly differed across place of residence and educational status. Parents having moderate and good knowledge level had more satisfactory practices for prevention of Covid-19. Social distancing was followed by the majority. The decision of lockdown and closure of schools by the government was favoured by the majority of parents.

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