

**Effects of customised child friendly mask along with PPE during Covid 19 upon dental anxiety amongst 5 to 10 year old children-a cross sectional study**

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**Abstract**

Background and aim: Ensuing covid19 situation, the attire of Paediatric dentist with the personal protective equipment (PPE) may interfere in communicating with the child and may provoke the dental anxiety. Thus, it is necessary to modify the dentist attire according to the

child’s acceptance. The study aims to assess the acceptance of child’s friendly mask among children and relate it to dental anxiety during covid19.

Design: A cross sectional study recruited 342 children of 5 to 10 years of age around India. The study was carried out from May to July 2020 through a video call. Both the

dentist attire, PPE with surgical mask and PPE with child friendly mask were shown to the child. And the children were asked to rate their anxiety based on facial image scale. The Data collected were analyzed through Microsoft excel and imported to SPSS Statistical Software version 21.

Results: The PPE with child friendly mask was the most preferred and accepted attire followed by the PPE with surgical mask. Both the younger and middle age group children less anxious for child friendly mask with PPE than compared to surgical mask with PPE ( $p=0.00$ ), older age group children are comfortable with both the attire. The preference was differed among boys and girls. Middle and older age group girls preferred child friendly mask over the surgical mask ( $p=0.45$ ). And boys in the older age group preferred both the attire ( $p=0.00$ ).

Conclusion: Child-friendly appearance of dentist attire would be more appropriate for children of younger age-group and could be considered for those visiting the dentist for the first time. Thus, it can be concluded that the novel child's friendly mask will be helpful in better interaction with the child during covid19 and also in reducing the child's anxiety related to the dentist attire

**Keywords:** Child Friendly Mask, COVID 19, Dental Anxiety, PPE.

## Introduction

Covid19 a novel disease, has created a global level pandemic affecting the dentists primarily due to the aerosol generating procedures. This must not alter the effectiveness of the treatment given by the dentist. In pediatric practice, providing good-quality work depends not only within the methods and techniques but also on the interaction between the dentist and the child which helps in motivating and improving the working environment. The foremost common hindrance faced is that the uncooperative behavior of young children who do not

cooperate with dental procedures because of their fear of the dentist and the dental treatment<sup>1</sup>. The prevalence of dental anxiety among children is found to be 84.4% in south Indian populations<sup>2</sup>. Before any verbal communication with the dentist during the first visit at the dental clinic, the impression of the dentist is based on the grooming, cleanliness, and attire of the dentist<sup>3</sup>. In the present covid19 situation, the appearance of dentist with the PPE(Personal protective Equipment), may interfere in communicating with the child in the dentistry and it is going to be challenging and children may develop negative effects with the dentist's attire. When wearing masks, goggles and/or face shields, non-verbal communication is impaired. Subtle facial cues are absent or can be misread and lip-reading is impossible, and also this particular attire may increase the anxiety of the child. It has been observed from previous studies that younger children are more anxious than older ones<sup>4,5</sup>. Children often make judgments about their dentist based on his or her appearance<sup>6</sup>. As a child enters a dental clinic, a doctor's appearance plays a significant role in instilling a positive impression within the child's mind. Thus, the dentist attire should be most appealing to the young patients to manage their fear and anxiety about the dentist and dental treatment<sup>7</sup>. With the skills of animation designing and cartooning, an Innovative Novel, child-friendly masks was designed, with images such as animal's face and cartoon characters like spiderman, customized favoring children which may encourage the child to interact better. The present study is conducted with an aim to evaluate the acceptance of child's friendly mask among the children and relate it to dental anxiety during this condition of covid19

## Methodology

This cross-sectional observational study is to assess the effect of child friendly mask and relate it to dental anxiety

amongst children of 5 to 10 years of age residing in same geographical area during covid19. Children were sub divided into 3 major groups based on their age, younger age group (5 to 6y), middle age group (7 to 8 y), older age group (9 to 10y) The children under the study population were selected based on inclusion and exclusion criteria. The inclusion criteria were that the child's age should be between 5-10 years. The exclusion criteria were that medically compromised children and children who are not willing to participate. Initially, a pilot study was conducted on 30 samples based on a video call, because there was no studies in the literature comparing the effect of child's friendly mask with PPE in the reduction of dental anxiety at different age group. During the pilot study all the children were interviewed on a videocall, both the dentist attire, PPE with surgical mask and PPE with child friendly mask were shown to the child on a video call. And the children were asked to rate the anxiety based on facial image scale. Intra-examiner reliability was assessed (Kappa statistics > 0.8) by recalling the same children in the video call and asked them to rate the anxiety based on facial image scale. Using the proportion, the sample size is calculated using the formula  $n = (Z^2 \times P(1/P))/e^2$ . The sample size was estimated to be 342. The study was initiated subsequent to the approval from Institutional Ethical Committee. A total of 342 children between 5 and 10 years of age were selected for the study. The convenient sampling is used to select the samples in the study population. Each child in the study population were interviewed personally in a video call, both the dentist attire PPE with surgical mask and PPE with child friendly mask were shown to the child on a video call. The Facial Image scale is a reliable and valid measure and children can easily respond to this faces rating scale<sup>8</sup>. It comprises a row of five faces ranging from very happy to very unhappy (scores ranging from 1 to 5; the unhappiest

face which depicted highest anxiety was assigned a score of 5 and the happiest face was assigned a score of 1) is used to assess the child anxiety. All the data's were collected and statistically analysed. Descriptive approach was used in the data analysis. Chi-square test was used to determine the relationship between different variables

Fig 1: PPE with surgical mask



Fig 2: PPE with customised child friendly mask



Name of the child:

Age:

Gender:

FACIAL IMAGE SCALE PPE with surgical mask:






Code	Emotional reaction
1 	Very Happy
2 	Happy
3 	Indifferent
4 	Sad
5 	Very sad

Fig 3: Image showing facial image scale

**Results**

Out of 342 children 152 were boys and 190 were girls. Children in the age group of 5-6 years were considered as younger children (n=116) and 7-8 years were grouped as middle (n=116) and 9-10 years were grouped as older children (n=110). All the children were categorized into anxious and non-anxious based on the facial image scale. Among 190 girls 64.4% were graded as very happy, 35.3% graded as happy and 5% graded as indifferent for PPE with child friendly mask. While for PPE with surgical mask followed by 32.6% very sad, 40.5% sad, 26.3%

indifferent, 5% happy respectively. Among 152 boys 69.1% were graded as very happy and 30.9% were graded as happy for PPE with child friendly mask. While for PPE with surgical mask followed by 17.8% very sad, 37.5% sad, 27.6% indifferent, 17.1% happy respectively. Chi-square goodness of fit test was performed to assess the difference between male and female children in preferring different masks. The results revealed that there was statistically significant difference between male and female in preferring child friendly mask (p=0.45). A total 116 (33.6%) children of the younger age group were graded as sad for surgical mask with PPE, and 66.4% of children were graded as very sad for surgical mask with PPE while (100%) children were found to be happy for child friendly mask with PPE. In one hundred and sixteen children of the middle age group 7.8% graded as very sad, 62.9% graded as sad, 21.6% graded as indifferent, and 7.8% children were graded as happy for PPE with surgical mask. While (100%) of children were graded as very happy for PPE with child friendly mask. In one hundred and ten children of older age group 2.7% graded as very sad, 20% graded as sad, 60.9% graded as indifferent and 16.4% children graded as happy for PPE with surgical mask while 99.1% children found to be happy for PPE with child friendly mask. Overall acceptance of child friendly mask over surgical mask showed 100% among the children of different age groups. Whereas for surgical mask with PPE followed by 30% very sad, 40% sad, 20% indifferent and 10% happy respectively.

Table 1: Gender variation in acceptance of surgical mask

Normal Mask					
Gender	Happy	Indifferent	Sad	Very Sad	P Value
Male	26	42	57	27	0.00
	17.1%	27.6%	37.5%	17.8%	
Female	1	50	77	62	
	.5%	26.3%	40.5%	32.6%	

Acceptance of normal surgical mask based on gender  $p \leq 0.05$  was considered statistically significant Chi-square goodness of fit test was used

Table 2: Gender variation in acceptance of child friendly mask

Child Friendly Mask				
Gender	Very Happy	Happy	Indifferent	P Value
Male	105	47	0	0.45
	69.1%	30.9%	.0%	
Female	122	67	1	
	64.2%	35.3%	.5%	

Acceptance of child friendly mask based on gender  $p \leq 0.05$  was considered statistically significant

Table 3: Variation in acceptance of different mask among middle age group children

		Age Group of 7 To 8 Years (Middle)					P
		Very Happy	Happy	Indifferent	Sad	Very Sad	
Normal	Count	0	9	25	73	9	0.00
	% within G	.0%	7.8%	21.6%	62.9%	7.8%	
Child Friendly	Count	116	0	0	0	0	
	% within G	100.0%	.0%	.0%	.0%	.0%	

Table 4: Variation in acceptance of different mask among younger age group children

		Age Group of 5 To 6 Years (Younger)			p
		Very Happy	Sad	Very Sad	
Normal	Count	0	39	77	0.00
	% within G	.0%	33.6%	66.4%	
Child Friendly	Count	116	0	0	
	% within G	100.0%	.0%	.0%	

Table 5: Variation in acceptance of different mask among older age group children

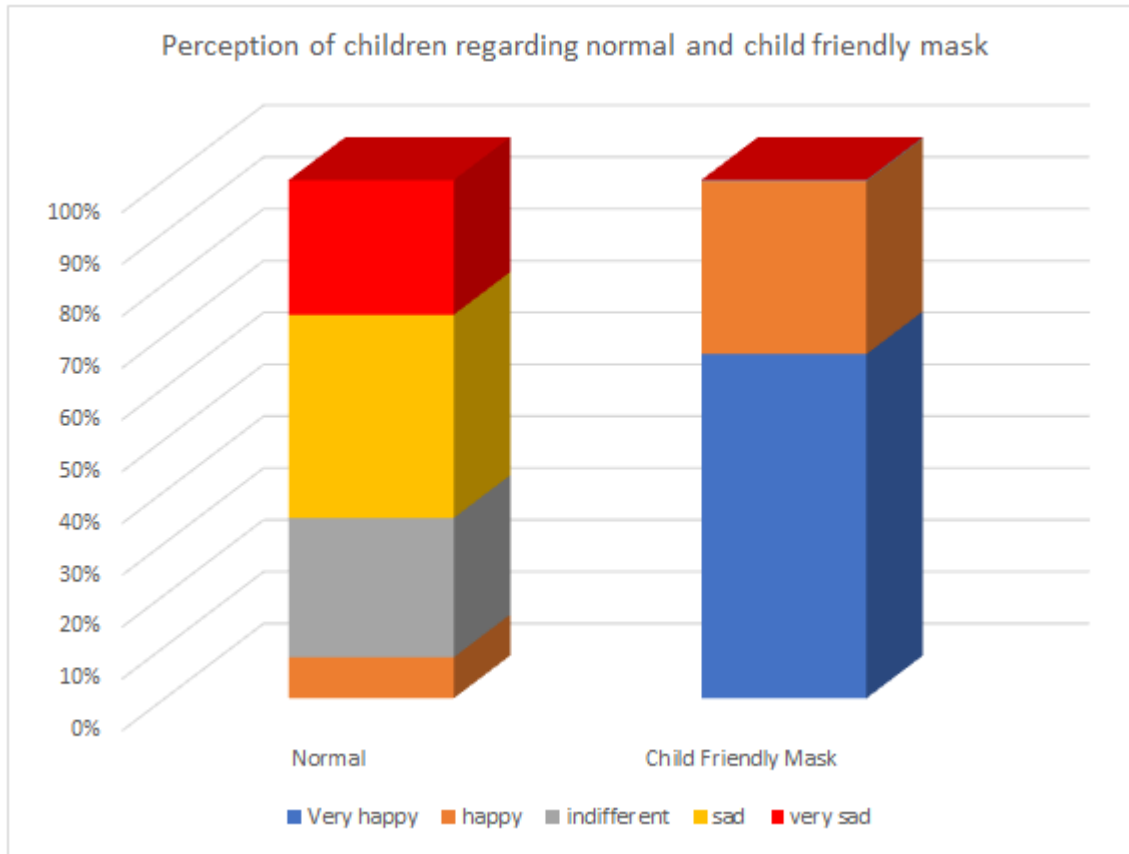
		Age Group Of 9 To 10 Years ( Older)					p
		Very Happy	Happy	Indifferent	Sad	Very Sad	
Normal	Count	0	18	67	22	3	0.00
	% within G	.0%	16.4%	60.9%	20.0%	2.7%	
Child Friendly	Count	109	0	1	0	0	
	% within G	99.1%	.0%	.9%	.0%	.0%	

Acceptance of normal surgical mask based on different age group children  $p \leq 0.05$  was considered statistically significant Chi-square goodness of fit test was used

Table 6: Variation in acceptance of surgical mask vs children friendly mask among children of different age group.

Group		N	Mean Rank	Chi Square	P
Normal Mask	Primary	116	260.51	184.6	0.00
	Middle	116	157.41		
	Upper Middle	110	92.49		
Child Friendly Mask	Primary	116	131.64	42.5	0.00
	Middle	116	191.90		
	Upper Middle	110	192.02		

Figure 4: Overall perception of children regarding normal mask and child friendly mask



## Discussion

This study provides the need for modification in the dentist attire according to patient's age, especially during covid19 scenario the dentist attire with PPE and child friendly mask would improve the quality of dental visits and reduce the anxiety level of the children in dental office during subsequent dental visits. A conventional mouth mask was modified by attaching customised coloured artistic works on it and was shown to children as a child friendly mask. The animism component utilized in the child friendly mask used in this study grabbed the children's attention to attract and motivate them. The present study was evaluated by a single, Paediatric dentist, so that the risk of bias on the outcome measures could be minimized. The anxiety level was evaluated using facial image scale. The study done by Fazzila Fathima and Ganesh Jeevanandan stated that the FIS is a valid measure

of dental anxiety for employment with young children in the clinical context. The results of this study suggest that there is a strong correlation among children, of their dentist's attire and the mouth mask worn by them. This study supports and provides a similar result obtained by the study conducted by Panda et al<sup>9</sup>, who stated that, the children have strong preference and perception regarding their dentist's attire<sup>9</sup> Younger age group children (5 to 6y) preferred more of child friendly mask with PPE, which is similar to the study done by Kuscu et al.,<sup>10</sup>. The reasons for their preference and acceptance of child friendly mask includes, friendly appearance, cartoon outlook and not scary. Their anxious feeling are more towards PPE and surgical mask. Most of the children belonging to the younger age group were anxious on seeing their dentist with PPE. This result is in agreement with the study done by Alsarheed et al., and Panda et al., who had reported

that children did not prefer the use of protective wear<sup>1,9</sup>. Children may be intimidated by protective devices such as face shield, masks, eye glasses and may be unaware of the protective purposes they serve. Dentists may calm the fears of patient, especially children, by explaining the purpose of the protective devices<sup>1</sup>. Preference level is gradually shifted in the middle and older age group children. Especially middle age group boys (7 to 8 y) and older age group children (9 to 10y) are less anxious for PPE with surgical mask and they are comfortable with both the surgical mask and child friendly mask. Whereas girls in the middle age group highly preferred child friendly mask and they are more anxious for the PPE with surgical mask. Majority of the children showed reduced dental anxiety in relation to child friendly mask with PPE than compared with surgical mask with PPE. This study is carried out on a video call considering the current covid19 situation. Future research on this population can be carried out on the clinical setup. Further experimental studies assessing behavioural changes and treatment acceptance on using modified child friendly PPE can also be done.

### Conclusion

In conclusion, age and sex are important variables that determine children's preferences of dentist's appearance. Younger age group children preferred their dentist to wear child friendly mask than compared to surgical mask and middle and older age group are comfortable with the both. As children grow older and mature, the fear of dentist +attire diminishes. These novel customized child's friendly mask will be helpful in communicating with the child following covid19 and also in reducing the child's anxiety related to the dentist attire

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