Acceptability of Covid-19 vaccine for healthy children and its associated factors: Parents' perception from a study conducted in Galle district of Sri Lanka

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Abstract

Introduction: Vaccination has proved effective in mitigating Covid-19 transmission and severe infection. Sri Lanka has launched a programme to vaccinate children aged 12-18 years with chronic illnesses. However, vaccination of healthy children is under discussion. Acceptability of the vaccine would determine the success of the programme.

Objectives: To assess the acceptability of Covid-19 vaccine among parents of children without chronic illness at Teaching Hospital Karapitiya (THK) and selected Private Hospitals in the Galle District.

Method: A cross-sectional study was conducted among a convenient sample of 472 parents attending paediatric care at THK and selected Private Hospitals in the Galle District in 2021. Data were collected using a self-administered questionnaire. Multiple logistic regression was used to identify associated factors with vaccine acceptability at a 0.05% significance level.

Results: The response rate was 83.9% (n=396). The majority (86.6%) was aware of the Covid-19 vaccination programme for children with chronic illnesses in Sri Lanka. Television (67.4%) and social media (18.4%) were the primary sources of information related to the vaccination. Nearly 82% (n=324) parents were in favour of vaccinating their children, 268 (82.7%) expecting a reduction of disease severity following vaccination. Fear of immediate side effects (52.7%) and long-lasting health problems (27.7%) were identified as the main reasons for deciding not to vaccinate. Parents who were Sinhalese (OR=2.26, 95%CI=1.18-4.32), having a child suffering from a chronic medical illness (OR=2.51, 95%CI=1.01-6.26) and parents who were aware that some countries have already begun vaccination for healthy children (OR=2.54, 95%CI=1.38-4.68), were more likely to favour vaccination. In contrast, parents who had experienced significant side effects following vaccination among family members (OR=0.31, 95%CI = 0.13-0.73) were unwilling to vaccinate their children.

Conclusions: A high acceptance rate was noted for Covid-19 vaccination for healthy children.

(Key words: Covid-19, Vaccination, Children, Acceptability, Sri Lanka)

Introduction

Covid-19 infection is caused by a coronavirus named SARS COV-2. It was first found in China in late 2019 and became a global pandemic within a few months[1]. In both adults and children Covid-19 illness has a wide range of presentation.

Though primary symptomatic infection and severe pneumonia are significantly less in the paediatric population, there is a higher occurrence of the multisystem inflammatory syndrome (MIS-C), a potentially lethal complication of Covid-19 infection[2]. Therefore, it is essential to adopt preventive strategies among children to minimise the disease burden.

Vaccination has proved to be effective in mitigating transmission and severe Covid-19 infection and is considered to be one of the main preventive strategies[3]. By the first week of February 2022, Sri Lanka managed to provide Covid-19 vaccine for 66% of the total population and it is among the highest vaccinated countries in the world[4]. Moreover, Sri Lanka has already launched a programme to vaccinate children with chronic medical problems aged 12-18 years from September 2021 onwards. As the second phase of the vaccination programme, Sri Lanka plans to vaccinate school children between ages of 12 and 18 with a single dose of the Pfizer vaccine[6,7]. Some

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countries have already started vaccinating children aged 5 years and above[3]. However, no decision has been taken in Sri Lanka about the vaccination of children less than 12 years.

Although vaccine hesitancy is a significant public health concern worldwide, Sri Lanka is considered a country with a high vaccine coverage for all childhood vaccines[7]. In addition, care-seeking behaviour is high among Sri Lankan parents, and it is identified as one contributory factor for the low childhood mortality in Sri Lanka[8]. Several studies were done to assess the parental acceptability and influential factors of Covid-19 vaccination for children in many countries but no such studies were conducted in Sri Lanka[9-14]. It is crucial to assess the acceptability before implanting a vaccine in the community.

Objectives

To assess parents' perceptions and attitudes regarding the Covid-19 pandemic and the introduction of Covid-19 vaccination to children in Sri Lanka.

Method

Study design and study sample: A cross-sectional study was conducted among 396 parents/guardians attending paediatric care from November 2021 to January 2022 at Teaching Hospital Karapitiya (THK) and selected Private Hospitals in the Galle District, Sri Lanka. Parents/guardians of children who had already received the vaccine were excluded from the study.

Sample size: This was calculated using the formula given by Lwanga and Lemeshow for the sample size calculation in cross-sectional studies[15]. The expected proportion of parents/guardians willing to vaccinate their children for Covid-19 infection was taken as 56.8% based on a study done by Galanis P, *et al*[16]. Level of significance and absolute error of precision was taken as 0.05 in sample size calculation. The study sample was selected based on judgemental sampling considering the feasibility for data collection.

Study instrument: A self-administered questionnaire consisting of four components was used as the study instrument:

Part A: Basic sociodemographic data.
Part B: Immunization history of children.
Part C: Covid-19 related family information.
Part D: Perception and willingness to vaccinate their children against Covid-19.

Data collection: Data were collected by the research team after prior approval. The co-investigators addressed any queries of the participants during the same encounter as a self-administered questionnaire was provided for data collection.

In addition to the routine health encounter, it took around 10 minutes to fill out the questionnaire for each study subject. Therefore, measures were adopted to minimize the waiting time of the participants.

***Ethical issues*:** Approval to conduct the study was obtained from the Ethical Review Committee of the Sri Lanka College of Paediatricians (Ref. No. SLCP/ERC/2021/30). Patients were enrolled in the study during their routine clinic visits after obtaining informed written consent from the parents and assent from the children. The participation was entirely on a voluntary basis and it was emphasized that at any point, participants can refuse to take part in the study, and that there will not be any change in the standard of care depending on their decision on taking part in the survey.

Data analysis: Data were entered into Excel and analysed using Statistical Package for Social Sciences version 20. Frequency, proportion, mean (standard deviation), median (inter-quartile range) were calculated to summarize descriptive data. Descriptive data were presented using frequency distribution tables. Chi-square test and binary logistic regression were used to identify influential factors to vaccinate children against Covid-19 among parents/guardians. Study variables that demonstrated statistically significant associations with the willingness to vaccinate children against Covid-19 among parents/guardians in Chi-square test were used as independent variables in binary logistic regression to control effect of confounding. $p<0.05$ was considered significant.

Results

A sample of 472 parents participated in the study with a response rate of 83.9%. Sociodemographic information of the sample is shown in Table 1. All respondents were either mothers (n=308, 77.8%) or fathers (n=88, 22.2%).

The majority (n=368, 92.9%) of parents had vaccinated their children according to National Immunization Programme; among them, a minority (n=12, 3.2%) of children had experienced some form of reactions to vaccines. Nearly 17% (n=67) had children suffering from chronic medical illnesses.

Table 1: ***Sociodemographic information among parents/guardians attending paediatric care (n=396)***

Sociodemographic information	Number (%)
Ethnicity	
Sinhala	333 (84.1)
Muslim	56 (14.1)
Tamil	07 (01.8)
Father's education level	
Primary	35 (08.8)
Secondary	305 (77.0)
Graduate	48 (12.1)
Postgraduate	08 (02.0)
Father's occupation	
Government sector	130 (32.8)
Private sector	258 (65.2)
No permanent job	08 (02.0)
Mother's education level	
Primary	35 (08.8)
Secondary	292 (73.7)
Graduate	61 (15.4)
Postgraduate	08 (02.0)
Mother's occupation	
Government sector	92 (23.2)
Private sector	48 (12.1)
Housewife	256 (64.6)
Number of children in the family	
Single child	125 (31.6)
More than one child	271 (68.4)

Covid-related information was assessed related to child and family (Table 2). The majority of parents (n=343, 86.6%) was aware that the Sri Lankan government started Covid-19 vaccination programme for children aged 12-18 years with chronic diseases. Moreover, 80.6% of parents (n=319) knew that some countries have already begun vaccinating healthy children against Covid-19 infection. However, 96.0% (n=380) parents suggested the importance of implementing a programme to educate parents about the Covid-19 vaccination in healthy children.

Table 2: ***Covid-related information related to child and family (n=396)***

Covid-related information	n (%)
Parent's Covid-19 vaccination status	
Vaccinated	384 (97.0)
Unvaccinated	12 (03.0)
Experience of significant side effects by parents or family members after Covid-19 vaccination	
Yes	30 (07.6)
No	366 (92.4)
Having unvaccinated adult in the family	
Yes	23 (05.8)
No	373 (94.2)
Infected with Covid-19 infection (Parents/ any family member)	
Yes	47 (11.9)
No	349 (88.1)
Any child in the family infected with Covid-19 infection	
Yes	28 (07.1)
No	368 (92.9)
Main source of information on Covid-19 vaccination	
Television	267 (67.4)
Social media	73 (18.4)
Healthcare professional	37 (09.3)
Other (Radio, newspaper etc.)	19 (04.9)

Willingness to vaccinate children against the Covid-19 infection among parents attending paediatric care at THK and selected private hospitals in Galle District was 81.8% (n=324). Identifying the vaccine as an excellent way to protect children from severe disease (n=268, 82.7%) and identifying that vaccinating children is important to ensure the health of other family members (n=56,17.3%) were the main reasons to favour vaccination of children against Covid-19 infection by parents who had accepted the vaccination process for healthy children. Reasons by parents for the non-acceptance of Covid-19 vaccination for healthy children are shown in Table 3.

Table 3: ***Reasons for non-acceptance of Covid-19 vaccination for healthy children (n=72)***

Main reason for unacceptance of Covid-19 vaccination	Number (%)
Fear of immediate side effects	38 (52.7)
Fear of long-lasting health problems	20 (27.7)
Not enough data on children's safety	06 (08.3)
May not protective for new Covid-19 mutations	03 (04.2)
Myths and rumours	05 (06.9)

Parents who were Sinhalese (p<0.01), educated (father p<0.05, mother p <0.01), having a child suffering from chronic medical illness (p<0.05) and aware that some countries have already begun vaccination for healthy children (p<0.01), were more likely to vaccinate while parents who had experienced significant side effects following vaccination among any family member (p<0.01) were less likely to vaccinate their children. Those six factors which were significant in Chi square test analysis were used as independent variables for multiple regression analysis using enter method (Table 4).

However, parental Covid-19 vaccination status (χ^2=0.01, df=1, p=0.89), having any family member infected with Covid-19 infection (χ^2=0.38, df=1, p=0.53), having any child infected with Covid-19 infection (χ^2=1.12, df=1, p=0.28) and having history of allergic reaction or side effects to any other vaccine (χ^2=0.38, df=1, p=0.53) did not show statistically significant association with willingness to accept Covid-19 vaccine for healthy children in Chi square test analysis.

Parents who were Sinhalese (OR=2.26, 95%CI=1.18-4.32), having a child suffering from chronic medical illness (OR=2.51, 95%CI=1.01-6.26) and aware about some countries already began vaccination for healthy children (OR=2.54, 95%CI=1.38-4.68), were more likely to vaccinate while parents who had experience of significant side effects following vaccination among any family member (OR=0.31, 95%CI=0.13-0.73) were less likely to vaccinate their children. Parent's education level did not affect the decision on vaccinating healthy children for Covid-19 infection after controlling confounding effect in binary logistic regression.

Table 4: ***Assessment of influential factors to vaccinate children against Covid-19 infection among parents/guardians attending paediatric care using multiple logistic regression (n=396)***

Factor	Willingness for vaccine acceptance		Total	OR (95% CI) significance
	Willing *(n=324)*	Not willing *(n=72)*		
Ethnicity-n(%)				
Sinhala	280 (84.1)	53 (15.9)	333 (100.0)	2.26 (1.18-4.32)
Muslim, Tamil, others	44 (69.8)	19 (30.2)	63 (100.0)	0.014*
Having chid with chronic medical illness				
Yes	61 (91.0)	06 (09.0)	61 (91.0)	2.51 (1.01-6.26)
No	263 (79.9)	66 (20.1)	329 (100.0)	0.047*
Father's educational level				
Primary	33 (94.3)	02 (05.7)	35 (100.0)	2.52 (0.54-11.67)
Secondary and above	291 (80.6)	70 (19.4)	361 (100.0)	0.235
Mother's educational level				
Primary	35 (100.0)	0 (0.0)	35 (100.0)	$2.7x10^8$ (0.0-0.0)
Secondary and above	289 (80.1)	72 (19.9)	361 (100.0)	0.998
Experiencing significant side effects by parents/ family member after Covid-19 vaccination				
Yes	19 (63.3)	11 (36.7)	30 (100.0)	0.31(0.13-0.73)
No	305 (83.3)	61 (16.7)	366 (100.0)	0.007*
Aware that some countries have already begun vaccinating healthy children against Covid-19				
Yes	270 (84.6)	49 (15.4)	319 (100.0)	2.54 (1.38-4.68)
No	54 (70.1)	23 (29.9)	77 (100.0)	0.003*

**Significant at 0.05 level*

Discussion

This is the first study in Sri Lanka to assess Covid-19 vaccine acceptance rate. Though no previous Sri Lankan studies are available to compare the findings, the vaccine acceptance rate in the current study is higher than a few studies done elsewhere[9,10,11]. However, a study in Canada in December 2021 showed a higher vaccine acceptance rate among parents[17]. In China, in September 2020, Zang KC, *et al.* conducted an online survey among factory workers to assess the acceptability of vaccination against Covid-19 for children under 18 years of age. Of them, 72.6% showed their willingness to vaccinate their children[9]. However, this study was done before the availability of the vaccine, even for adults. In general, immunization coverage for routine childhood vaccines in Sri Lanka is around 99%, whereas the global figure ranges from 83-86%[18,19]. The high vaccine acceptability rate is considered the main reason for the successful national immunization programme in Sri Lanka[18]. This could be the reason for the higher acceptability of the Covid-19 vaccine. However, the current study was conducted almost one year after starting the vaccination programme for adults and soon after starting the vaccine for children with chronic disorders. In contrast, previous studies were conducted before the availability of the vaccine[9-11]. The counter-argument is that parents would have heard about more side effects of the vaccine once it was available than when it was not available, resulting in a higher refusal rate. Therefore, without further studies, it is not possible to comment on the timing of the studies between the acceptability. Sri Lanka experienced the highest disease burden in August-September 2021[20], and the current study was carried out a few weeks after the pandemic's peak. This would have caused some participants to accept a preventive option despite its novelty.

The current study showed that the main reasons for accepting the vaccine were to protect their children against severe infections and ensure the health of the other family members. Similar reasons were given as the main reasons for acceptance in previous studies[9,11]. In contrast, a study in Turkey showed that nearly 2/3 of parents refused to give Covid-19 vaccine to their children. The principal reasons for this vaccine refusal were fear of side effects, doubtful efficacy, and the vaccine's novelty[9-11]. Similarly, the current study showed that the fear of side effects is the main reason for refusing the vaccine.

Parents who have children with chronic diseases had positive attitudes towards the vaccination. By the time the study was conducted, the government had already started vaccinating children with chronic illness, which would have contributed to the positive attitudes. This is in contrast to the findings of the study by Goldman RD, *et al*[11] where more parents of children suffering from chronic illness refused to vaccinate. The current study showed no relationship between vaccine acceptability and the level of education. A similar finding was observed in previous studies[11,17]. McKinnon B, *et al*[17] have shown that black race and deprived neighbourhoods were associated with less vaccine acceptance. Similarly, the current study revealed that Sinhalese, the most common ethnic group, had a higher acceptance rate than other ethnicities. Low income has been identified as a reason for high vaccine refusal in a few previous studies[12,17]; however, we have not assessed the income status of the participants.

Zhang KC, *et al*[9] assessed the social media influence on the decision on Covid-19 vaccination. There was a significant association between the decision on the Covid-19 vaccination and social media inputs. Furthermore, a study in Turkey showed that the vaccine refusal rate was higher among parents who used social media frequently[20]. On the contrary, television remained the primary source of information related to the COVID-19 vaccine in the current study. However, the study did not assess the influence of different sources of information towards making decisions on childhood Covid-19 vaccination.

While there was a high vaccine acceptance rate in the tested cohort, it was less than the vaccine acceptance rate of routine childhood vaccines in Sri Lanka. Therefore, the authors recommend carrying out awareness campaigns among parents before implementing Covid-19 vaccination among healthy children.

Conclusions

Willingness to vaccinate children against the Covid-19 infection among parents attending paediatric care at THK and selected private hospitals in Galle District is 81.8%. Fear of side effects is the main reason for refusing the vaccine.

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