

Nutritional and immunisation status of children visiting hospital during COVID-19 pandemic in Kathmandu, Nepal

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Abstract

Background: Coronavirus disease-2019 (COVID -19) outbreak and lockdown measures have given challenges related to food production, food supply chain, indulgence in low healthy processed food, lack of public transportation, difficulties in accessing emergency and regular health services. Nepal already has high burden of child mortality (39 deaths per 1000 live births) and this pandemic situation has put children at greater risk of facing hunger, malnutrition, lack of routine immunisation, communicable disease outbreak, and many more psychological as well as physical health issues.

Objectives: This study identifies nutritional status and gap in routine vaccination in children during COVID-19 pandemic thereby help in modelling action plan to prevent an outpouring in malnutrition and vaccine preventable infections in children.

Methods: This hospital-based analytical cross-sectional study done after ethical clearance among 138 children of ages one to 59 months old from 1st January 2021 to 1st August 2021 attending paediatric clinic of KMCTH.

Results: In this study, 20 (14.4%) of the children were stunted, 23 (16.6%) were wasted and 15 (10.8%) were categorised under undernutrition, three (2.2%) were overweight and three (2.2%) were obese. There were significantly more male children stunted than female (p-value = 0.005). Thirty-five (33.3%) of less than 15 months children were reported to have delay of more than two weeks in routine immunisation of children. A significant delay of more than four weeks was observed in 29 (27.6%).

Conclusion: Indirect impact of COVID-19 pandemic in children like malnutrition and gap in routine vaccination needs to be addressed seriously in Nepal.

Key words: Coronavirus disease 2019; Impact; Nutrition status; Pandemic; Routine vaccination.

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INTRODUCTION

As an impact of coronavirus disease-2019 (COVID -19), it is estimated to have another 83 million more undernourished people in world.¹ This pandemic threatens to reverse decades of progress toward eliminating preventable child deaths.² Sharp declines are expected in access to child health and nutrition services.³ If coverage of essential services drops by 45% for six months, a startling projection of child deaths is estimated.⁴ The global prevalence of child wasting can also rise by 14.3% during the first 12 months of the pandemic.⁵ This estimated increase in child wasting could be only the tip of the iceberg, other forms of child malnutrition, including stunting, micronutrient deficiencies, and overweight are also expected to rise. The community's failure to act now will have devastating long-term consequences for children. History shows, large-scale emergencies increases morbidity and mortality in children.⁶ But the related data of this part of community is not up to date. The objective of this study was to know nutritional and vaccination status in children of the community during this pandemic situation.

METHODOLOGY

This was a hospital-based analytical cross-sectional study done among one month to 59 months old children attending Paediatric Clinic of Kathmandu Medical College Teaching Hospital (KMCTH). Cases were taken by consecutive sampling technique. The reference was overall prevalence of wasting which was 10% from Nepal Demographic and Health Survey (NDHS) survey 2016. The sample size derived was 138 by using formula $\text{sample size} = Z_{1-\alpha/2}^2 p(1-p) / d^2$.⁷ Informed consent was taken from all the parents beforehand. Ethical approval was taken from the institutional review committee of Kathmandu Medical College (KMC-IRC, Ref. 1712202005). The study was conducted from 1st January 2021 to 1st August 2021. Anthropometric measurements (height and weight), other demographic details, were collected in predesigned validated proforma. Vaccination details were obtained from issued vaccination card of each child. Children with incomplete data were excluded. The national childhood immunisation schedule of Nepal was taken as routine vaccination required for children.⁸ Weight in kilogram (kg), length (for less than two years) in centimetre (cm), or height (for two years or above) in centimetre were measured in calibrated bathroom scale, infantometre or stadiometre. The three indices: Height-for-age, weight-for-height, and weight for-age were expressed as standard deviation units as compared to the median of reference data. The reference data was taken from World Health Organisation (WHO) Multicentre Growth Reference Study Group (2007).⁹ Based on the WHO classification, the z-scores < -2.0 was considered to classify stunted, wasted, and underweight children based on their HAZ (height for age z score), WHZ (weight for height z score), and WAZ (weight for age z score) values respectively. Similarly severe wasting and stunting were defined when weight for height and height for age z-scores < -3. All the data were calculated using IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). A probability level of ≤ 0.05 was considered to be statistically significant.

RESULTS

Out of 138 children enrolled in this study 74 (53.6%) were male and 64 (46.4%) were female. Among total children abnormal height for age was found in 30 (21.7%), abnormal weight for height in 36 (26.0%), and abnormal weight for age in 21 (15.2%) children. Twenty (14.4%) of the children were stunted, 23 (16.6%) were wasted, and 15 (10.86%) were under undernutrition. However, three (2.2%) of cases were overweight and three (2.2%) were obese.

Table 1: Distribution of children according to anthropometric values, n (%)

Anthropometric values	Weight for age	Height for age	Weight for height
Very low (<3SD)	1 (7)	6 (4.3)	9 (6.5)
Low (<2SD)	14 (10.1)	14 (10.1)	14 (10.1)
Normal	117 (84.8)	108 (78.3)	102 (73.9)
High (>2SD)	3 (2.2)	5 (3.6)	5 (3.6)
Very high (>3SD)	3 (2.2)	5 (3.6)	8 (5.8)
Total	138	138	138

In this study no significant relationship of wasting or undernutrition was found in children with gender of children (p-value of 0.276 and 0.227 respectively). However, there were significantly more male children with stunting than female in the study.

Among total 138 children, 105 (76%) were under 15 months of age. In these children, 35 (33.3%) were reported to have delay of more than two weeks in immunisation of children. A significant delay of more than four weeks was observed in 29 (27.6%). However 41 (39%) reported that the scheduled vaccines were given on time or within two weeks of the due date. It was also identified that no significant association between significant vaccine delay and presence of wasting (p-value = 0.140) or stunting (p-value = 0.715) in children.

DISCUSSION

Based on the NDHS 2016, trends of nutritional status of children under-five from 2001 to 2016 were: Stunting 57% in 2001 to 36% in 2016, wasting 11% in 2001 to 10% in 2016, and underweight 43% in 2001 to 27% in 2016.¹⁰ Previous available data of Nepal clearly verifies declining trend in all three parameters (stunting, wasting, and underweight). However, in year 2021 the data collected after pandemic of COVID-19 and subsequent lockdown in Kathmandu revealed drastic overall differences in all three parameters of growth in under-five children. Abnormal height for age was found in 30 (21.73%), abnormal weight for height in 36 (26.08%), and abnormal weight for age in 21 (15.2%) children. In a study done by Chettri et al. in 2016 at Kathmandu, abnormal height-for-age was found in 14.6%, abnormal weight-for-height in 23.6% and abnormal weight-for-age in 19.8%.¹¹ As the data was compared with data of this study, it was found that there was rise in abnormality in height for age, weight for height, and abnormal weight for age parameters. Under-five children of western Nepal in 2014 also had 20.2% underweight, 34% stunted and 15.1% wasted children.¹² This study revealed that wasting is

higher in children under-five today than in previous National survey, western Nepal and Kathmandu data.¹⁰⁻¹² Wasting often indicates recent and severe weight loss, thereby indicating the changing scenario of health situation of children made by recent major changes in lives of people due pandemic of COVID-19. This study also identified higher percentage of severely stunted, severely underweight under-five children, and severely wasted children as compared to previous studies.^{11,12} This study did not find any significant association of wasting and undernutrition with gender while stunting in males were significantly higher which was not comparable with Chataut et al. study.¹³ Twenty-three percent of parents reported delay of more than one month in immunisation of children in Saudi Arabia during COVID-19 pandemic.¹⁴ In this study done in Kathmandu, much higher prevalence of significant delay of more than four weeks was observed but no significant association between significant vaccine delay and presence of wasting ($p = 0.140$) or stunting ($p = 0.715$) in children was identified. Vaccine-preventable diseases (VPDs) remain an important issue that requires adherence to recommendations to prevent severe illnesses in children. Delayed or missed vaccination makes children

susceptible to certain preventable diseases and may also affect herd immunity. According to the WHO, VPD is a threat to 80 million children worldwide because of the disruption of healthcare systems due to the COVID-19 pandemic.¹

However, this study is performed at a single-centre, tertiary care hospital cited in Kathmandu with a small sample size, so it does not reflect rural scenario thereby being a limitation of this study.

CONCLUSION

Wasting and severe wasting in under-five children from Kathmandu is up scaling as compared to previous multiple data of Nepal. This study also identified that the COVID-19 pandemic affected the timeliness of routine childhood vaccinations in Kathmandu. Thereby showing need of extensive survey in large scale in Nepal for further modelling action plan to prevent an outpouring in malnutrition and vaccine preventable infections in children of Nepal.

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