

Original Research Article

Impact of determinants on nutritional status among children up to five years at tertiary care hospital, HIMS, Sitapur, Uttar Pradesh

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Received: 14 January 2021

Revised: 29 January 2021

Accepted: 30 January 2021

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ABSTRACT

Background: Malnutrition in children occurs as a complex interplay among various factors like maternal health, dietary practices, hand washing and other hygiene practices, low birth weight, episode of diarrhoea and acute respiratory infection within the last 6 months are often associated with undernutrition in most developing nations including India. Objective of the study were to assess the determinants of maternal and child health, hygienic practice, health services for underweight and their association among apparently healthy children.

Methods: The present study was hospital based descriptive cross-sectional study conducted from June 2019 to December 2019. The sample size calculated was 410, and accounting for 10% nonresponsive, the sample size calculated was 451. The data obtained were compiled and entered in MS-excel 2010 and analysed by using institutional SPSS (22.0).

Results: Mother's age at marriage <18 years belong to 68 (15.1%) children significantly low proportion as compared to marriage >18 years 383 (84.9%) including underweight 41 (22.5%) and mother's age at child birth <18 years belong to 46 (10.2%) children significantly very low proportion in comparison to child birth >18 years including underweight 30 (16.6%). Birth weight <2.5 kg belongs to significantly 136 (30.1%) children including underweight 72 (39.8%) and significantly birth order >2 belong to 135 (29.9%) children including underweight 39 (21.6%). Exclusive breast feeding belongs to 149 (33.0%) children including underweight 62 (34.2%)

Conclusions: Health education and its reinforcement especially in the area of maternal & child health care services is required.

Keywords: Underweight, Undernutrition, Children, Mothers

INTRODUCTION

Children with low weight-for-age are known as underweight. Undernutrition makes children in particular much more vulnerable to disease and death; around 45% of deaths among children up to 5 years of age are linked to undernutrition and these mostly occur in low and middle-income countries. Malnutrition in children occurs

as a complex interplay among various factors like maternal health, home environment, dietary practices, hand washing and other hygiene practices, low birth weight, episode of diarrhoea and acute respiratory infection within the last 6 months are often associated with undernutrition in most developing nations including India.¹ Unhealthy diet and poor nutrition are among the top risk factors for these diseases globally, every country in the world is affected by one or more forms of

malnutrition and combating malnutrition in all its forms is one of the greatest global health challenges. On 1 April 2016, the United Nations (UN) general assembly proclaimed 2016–2025 the United Nations decade of action on nutrition. The decade is an unprecedented opportunity for addressing all forms of malnutrition. It sets a concrete timeline for implementation of the commitments made at the second international conference on nutrition (ICN2) to meet a set of global nutrition targets and diet-related NCD targets by 2025. The developmental, economic, social, and medical impacts of the global burden of malnutrition are serious and long lasting, for individuals and their families, for communities and for countries.² Objective of the study was to assess the determinants of maternal and child health, hygienic practice, health services for underweight and their association among apparently healthy children.

METHODS

The study was conducted among mothers having children between 0-5 years of age group in OPD hours at malnutrition clinic situated in Hind hospital. It consists of mainly village population from nearby talukas-blocks and most of the men are labors and female housewives. The present study was hospital based descriptive cross-sectional study conducted from June 2019 to December 2019. According to NFHS-4 underweight population up to 5 years age group was 39.5%, sampling unit was the children up to 5 years and sample size was calculated based on the universal formula;

$$n = z^2 pq/d^2$$

Where, $z=1.96$, (at 95% confidence levels), $p=39.5$ (prevalence of underweight), $q(100-p)=60.5$, absolute precision 'd' taken at 10%=3.9. The sample size calculated using the above formula was 410, and accounting for 10% nonresponsive, the sample size calculated was 451.2, therefore, sample size of the study was finalized to 451 children up to five years. To conduct this study, a structured questionnaire was developed, and all the questions were framed according to objectives of the study. Data were collected using systemic random sampling preformed questionnaire, which includes maternal and child health factors, hygienic practice and health services factors in which exclude those children whose parents were not willing to participate in study and those severely ill. Written informed consent was taken from parents or family head and age of children was confirmed either by parents stated or available records. An anthropometric measurement like weight was recorded with minimum clothes, using weighing machine. The index of nutritional status like 'weight for age' was compared with the WHO growth charts for particular age and sex. Mainly used under nutrition indicators was underweight used to evaluate the growth status of children. The data obtained were compiled and entered in MS-excel 2010 and analysed by using institutional SPSS (22.0) software for chi square statistical test, presented in percentages (%) and proportions form, 95% confidence level was used for the study and $p \leq 0.05$ was considered significant.

RESULTS

Total 451 children were enrolled in the study and their maternal health factors were mentioned (Table 1).

Table 1: Nutritional status of children as per maternal health factors.

Variable	Normal N (%)	Underweight (weight for age) N (%)	Total N (%)	Chi square test	P value
Mother's age at marriage					
<18	27 (10.0)	41 (22.5)	68 (15.1)	$\chi^2=12.576$ d.f.= 1	0.0004
>18	243 (90.0)	140 (77.5)	383 (84.9)		
Mother's age at birth					
<18	16 (5.9)	30 (16.6)	46 (10.2)	$\chi^2=12.278$ d.f.= 1	0.0005
>18	254 (94.1)	151 (83.4)	405 (89.8)		
ANC check-up					
3	94 (34.8)	64 (35.3)	158 (35.0)	$\chi^2=0.0003$ d.f.= 1	0.9856
>3	176 (65.2)	117 (64.7)	293 (65.0)		
Type of Pregnancy					
Preterm	54 (20.0)	36 (19.9)	90 (19.9)	$\chi^2=0.0008$ d.f.= 1	0.9970
Full term	216 (80.0)	145 (80.1)	361 (80.1)		
Birth Weight					
<2.5	64 (23.7)	72 (39.8)	136 (30.1)	$\chi^2=9.745$ d.f.= 1	0.0004
>2.5	206 (76.3)	109 (60.2)	315 (69.9)		
Birth order					
2	174 (64.4)	142 (78.4)	316 (70.1)	$\chi^2=9.482$ d.f.= 1	0.0021
>2	96 (35.6)	39 (21.6)	135 (29.9)		

Table 2: Nutritional status of children as per child health factors.

Variable	Normal N (%)	Underweight (weight for age) N (%)	Total N (%)	Chi square test	P value
Exclusive breast feeding					
Yes	87 (23.2)	62 (34.2)	149 (33.0)	$\chi^2=0.1208$ d.f.= 1	0.7278
No	183 (67.8)	119 (65.8)	302 (67.0)		
Intake of colostrum					
Yes	41 (15.2)	27 (14.9)	68 (15.1)	$\chi^2=0.006$ d.f.= 1	0.9378
No	229 (84.8)	154 (85.1)	383 (84.9)		
Age of complementary feeding (months)					
6	77 (28.5)	59 (32.6)	136 (30.1)	$\chi^2=0.6730$ d.f.= 1	0.4120
>6	193 (71.5)	122 (67.4)	315 (69.9)		
Bottle feed					
Yes	84 (31.1)	67 (37.0)	151 (33.5)	$\chi^2=0.0003$ d.f.= 1	0.9856
No	186 (68.9)	114 (63.0)	300 (66.5)		
ARI episodes in past 6 month					
Yes	32 (11.9)	37 (20.4)	69 (15.3)	$\chi^2=5.525$ d.f.= 1	0.0187
No	238 (88.1)	144 (79.6)	382 (84.7)		
Diarrhoea episodes in past 6 month					
Yes	60 (22.2)	57 (31.5)	117 (25.9)	$\chi^2=1.725$ d.f.= 1	0.1890
No	210 (77.8)	124 (68.5)	334 (74.1)		
Immunization status					
Complete	188 (69.6)	114 (63.0)	302 (67.0)	$\chi^2=1.874$ d.f.= 1	0.1711
Incomplete	82 (30.4)	67 (37.0)	149 (33.0)		

Table 3: Nutritional status of children as per hygienic practice and health services factors.

Variable	Normal N (%)	Underweight (weight for age) N (%)	Total N (%)	Chi square test	P value
Hand washing practices of mother after defecation					
Yes	239 (88.5)	142 (78.4)	381 (84.5)	$\chi^2=0.0003$ d.f.= 1	0.9856
No	31 (11.5)	39 (21.6)	70 (15.5)		
Hand washing practices of mother before feeding					
Yes	162 (60.0)	109 (60.2)	271 (60.0)	$\chi^2=7.623$ d.f.= 1	0.0058
No	108 (40.0)	72 (39.8)	180 (40.0)		
Hand washing practices of mother before cooking					
Yes	203 (75.2)	135 (74.6)	338 (74.9)	$\chi^2=0.0011$ d.f.= 1	0.9735
No	67 (24.8)	46 (25.6)	113 (25.1)		
Use of soap for hand wash by mother					
always	119 (44.1)	71 (39.2)	190 (42.1)	$\chi^2=0.8850$ d.f.= 1	0.3551
sometimes	151 (55.9)	110 (60.8)	261 (57.9)		
Nails of child					
Trimmed	181 (67.0)	121 (66.8)	302 (67.0)	$\chi^2=0.0016$ d.f.= 1	0.9671
Untrimmed	89 (33.0)	60 (33.2)	149 (33.0)		
Distance of nearest PHC					
<5 kms	199 (73.7)	72 (39.8)	271 (60.1)	$\chi^2=50.596$ d.f.= 1	<0.0001
>5 kms	71 (26.3)	109 (60.2)	181 (39.9)		
Growth monitoring at anganwadi centre					
Yes	233 (86.3)	128 (70.7)	361 (80.0)	$\chi^2=15.502$ d.f.= 1	<0.0001
No	37 (13.7)	53 (29.3)	90 (20.0)		
Deworming					
Yes	205 (75.9)	72 (39.8)	277 (61.4)	$\chi^2=58.502$ d.f.= 1	<0.0001
No	65 (24.1)	109 (60.2)	174 (38.6)		

Mother's age at marriage <18 years belong to 41 (22.5%) underweight children and mother's age at childbirth <18 years belong to 30 (16.6%) underweight children. ANC check-up=3 belong to 64 (35.3%) underweight children, preterm pregnancy belongs to 36 (19.9%) underweight children and full-term pregnancy belong to 145 (80.1%) underweight children. Birth weight <2.5 kg belongs to 72 (39.8%) and birth order >2 belongs to 39 (21.6%), underweight children. Child health factors were depicted in (Table 2). Exclusive breastfeeding was observed in 62 (34.2%) underweight children, and intake of colostrum was found among 27 (14.9%) underweight children. Complementary feeding started after 6 months among 122 (67.4%) underweight children and bottle feeding was found among 67 (37.0%) underweight children. ARI and diarrhoea episode in past 6 months was found among underweight children 37 (20.4%) and 57 (31.5%) respectively and incomplete immunization observed among 67 (37.0%) underweight children. Hygienic practice and health services factors were depicted in (Table 3). Hand washing practice of mothers was not found after defecation among 39 (21.6%) underweight children, before feeding 72 (39.8%) underweight children, before cooking 46 (25.6%) underweight children and always use soap for hand wash by mother was found among 71 (39.2%) underweight children. Untrimmed nails of children were found among 60 (33.2%) underweight children and distance of located PHC >5 km was found 109 (60.2%) underweight children. Growth monitoring at Anganwadi center was not found among 53 (29.3%) underweight children and deworming was not observed among 109 (60.2%) underweight children.

DISCUSSION

The present study identifies certain maternal and child health care services factor which was observed among underweight children as compared to normal children. Mother's age at marriage <18 years significantly in low proportion as compared to marriage >18 years among underweight children while opposite finding reported by Tiwari SR et al. study and similarly mother's age at childbirth <18 years significantly very low proportion in comparison to childbirth >18 years among underweight children where similar finding observed by Gondikar A et al. study.^{4,5} ANC check-up=3 belong to more than one-third of underweight children as compared to ANC check-up >3 among nearly two-third underweight children and one-fifth of preterm pregnancy found among underweight children in comparison to full-term pregnancy among four-fifth of underweight children where similar result observed by Ansuya et al study.⁶ Birth weight <2.5 kg observed among two-fifth of underweight children significantly as compared to birth weight >2.5 kg among three-fifth of underweight children where similar result observed by Shukla et al and birth order >2 found among above two-fifths underweight children significantly in comparison to birth order <2 among nearly four-fifths of underweight children that

show similar observation by Gondikar et al, Ansuya et al, Shukla et al and opposite observation by Tiwari et al study.^{4,7}

Exclusive breastfeeding was observed among one-third of underweight children as compared to nearly one-fourth of normal children where similar result observed by Tiwari et al, Ansuya et al and opposite result observed by Shukla et al and colostrum intake was found nearly similar result observed by Tiwari et al and opposite result observed by Ansuya et al study.^{4,6,7} Complementary feeding started after 6 months among two-third of underweight children which shown similar observation by Shukla et al and bottle feeding was found among nearly two-fifth of underweight children that shown similar finding reported by Ansuya et al study.^{6,7} ARI episodes in past 6 months was observed significantly among one-fifth of underweight children and diarrhoea episodes in past 6 months among nearly one-third underweight children that shown similar finding reported by Tiwari et al study.⁴ Incomplete immunizations were detected among nearly two-fifth of underweight children which shown similar findings by Gondikar et al, Shukla et al and opposite findings by Tiwari et al study.^{4,5,7} Rafath et al study as compared to similar finding observed for handwashing practices of mother and comparatively less proportion observed for always use soap for hand wash by mother in the present study.⁸ Untrimmed nails were detected among one-third of underweight children and distance of located PHC >5 km was placed among three-fifth of underweight children highly significant which shows similar result reported by Biswas et al that distance of a health center affect health status.⁹ Growth monitoring at anganwadi center and deworming was not found among nearly one-third of underweight children which shown similar result detected by Malik et al and among three-fifth of underweight children that shown similar finding observed by Ganguly et al study respectively highly significant.^{10,11}

Limitation

Limitation of this hospital-based study was that the effect of maternal and child health care services factor cannot be applied on up to 5-years of children, therefore, the community-based study was needed for a more precise assessment.

CONCLUSION

The results of the study indicate that determinants affect the nutritional status of children and are associated with maternal age class, birth weight and order, comorbidities and health check-up. Improvement in age of marriage and utilization of family planning practice and health care services which helps to improve the nutritional status of their children. Health education and its reinforcement especially in the area of maternal and child health care services is required.

ACKNOWLEDGEMENTS

Authors would like to thank the staff of malnutrition clinic and department of community medicine, HIMS, Sitapur, Uttar Pradesh, as well as study subjects.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Pachori R, Sillapasuwani J. Impact of determinants on nutritional status among children up to five years at tertiary care hospital, HIMS, Sitapur, Uttar Pradesh. *Int J Community Med Public Health* 2021;8:1391-5.