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Cross-sectional study of determinants of undernutrition among children aged 6–36 months in Kabul, Afghanistan

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ABSTRACT

Objectives The current study aimed to find the distribution and factors associated with undernutrition among children aged 6–36 months in Kabul.

Design Cross-sectional study.

Setting Public Ataturk Children's Hospital, Kabul.

Participants 385.

Methods A structured questionnaire was used to collect data on sociodemographic conditions and anthropometry of children. Logistic regression was used to find determinants of undernutrition.

Results The distribution of stunting, wasting and underweight was 38.7%, 11.9% and 30.6%, respectively. Among the children studied, 54% did not receive breast milk within the first hour of birth, 53.2% were not exclusively breastfed, 21% received complementary feeding before the age of 6 months, 22.1% lacked access to safe water and 44.7% did not practise hand washing with soap. The odds of stunting were lower ($p<0.05$) in girls (AOR 5.511, 95% CI 3.028 to 10.030), children of educated fathers (OR 0.288, 95% CI 0.106 to 0.782), those from nuclear families (OR 0.280, 95% CI 0.117 to 1.258), those exclusively breastfed (OR 0.499, 95% CI 0.222 to 1.51) and those practising good hygienic practices (OR 0.440, 95% CI 0.229 to 0.847). Boys had high odd of girls (OR 6.824, 95% CI 3.543 to 13.143) while children of educated fathers (OR 0.340, 95% CI 0.119 to 0.973), those receiving complementary food at 6 months (OR 0.368, 95% CI 0.148 to 1.393) and those practising good hygiene (OR 0.310, 95% CI 0.153 to 0.631) had lower odds ($p<0.05$) of being underweight. Boys (OR 3.702, 95% CI 1.537 to 8.916) had higher odds of being wasted, whereas children of educated mothers (OR 0.480, 95% CI 0.319 to 4.660), those from nuclear families (OR 0.356, 95% CI 0.113 to 1.117), those receiving early breast feeding (OR 0.435, 95% CI 0.210 to 1.341) and those practising hand washing (OR 0.290, 95% CI 0.112 to 0.750) had lower odds ($p<0.05$) of being wasted.

Conclusion This study demonstrated the sex of the child, illiteracy of fathers, not practising hand washing and not observing hygiene, late initiation of breast milk, complementary feeding timings, and lack of proper exclusive breast feeding as contributing factors to the under-nutrition of the children in the study population.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Robust data collection and analysis using structured questionnaires and logistic regression models.
⇒ A diverse population enhances the generalisability of findings within the urban context.
⇒ Detailed and precise measurement of anthropometric data minimises errors and biases.
⇒ The cross-sectional design limits the ability to establish causal relationships between undernutrition and determinants.
⇒ Convenience sampling may introduce selection bias and limit external validity.

INTRODUCTION

Malnutrition refers to deficiencies or excesses in nutrient intake, imbalance of essential nutrients or impaired nutrient utilisation. Undernutrition manifests in four broad forms: wasting, stunting, underweight and micronutrient deficiency.[1] Undernutrition is responsible for nearly one-third of all child fatalities worldwide.[2] Early childhood development, particularly during the first 1000 days from conception to 2 years of age, aids in determining the nutrition and health state of a person's entire life. Undernutrition increases the likelihood of being sick and the severity of the illness. Undernutrition in infancy and toddlerhood can cause lasting growth and cognitive development deficits.[3]

In the context of Afghanistan, it has one of the world's highest rates of stunting, underweight and wasting. Stunting prevents children from reaching their potential. Stunted children are more likely to contract diseases, less likely to get basic healthcare and do not perform well in school.[4] Child malnutrition in the country is not only adverse but also getting worse dramatically with the elapse of time. For instance, 'Afghanistan's National Nutrition Survey 2013' showed that rates of underweight were 25% in under 5 children.[5] Five years later, the 'Afghanistan Health Survey 2018' showcased that the rates of severe stunting were 17.3%, rates of moderate stunting were 36.6% and 5% were wasted, which indicates a tangible rise in the prevalence of undernutrition among children.[6]

Furthermore, in 2021, 14 million Afghans were noted to be deficient in food supplies, with 95% of households not eating.[7] In the same year, the Global Hunger Index ranked Afghanistan 103rd out of 116 nations, indicating a 'serious' level of hunger.[8] The levels of food insecurity have risen due to the recent abrupt halt of foreign aid, as almost 75% of public spending came from foreign aid grants.[9] In 2021, half of Afghan children <5 years of age were expected to have acute malnutrition and at least 1 million children were expected to die due to severe malnutrition.[7] In addition, only 12% of Afghan children 6 months to 2 years of age receive the appropriate composition of meals in quantities adequate for their age.[4] The latest statistics reveal the deaths of 13 000 newborns in Afghanistan since January 2022 due to undernutrition and other health-related diseases.[10] Prior to the regimen change in Afghanistan, according to an estimate by the World Food Programme, 80% of the Afghan population was not getting sufficient food compared with 93% after the Taliban takeover, which could lead to undernutrition issues.[11] According to another study, after the Taliban takeover, 98% of Afghan households were food insecure compared with 70% prior to the regime change.[12]

There are limited studies concerning children and the determinants of undernutrition among them. This might be one of the early studies on the determinants of undernutrition after the Islamic Emirate came to power in August 2021 when international aid diminished significantly and food insecurity began to rise sharply. Therefore, considering this significant research gap, this study was conducted to examine the distribution and determinants of undernutrition among children aged 6–36 months in Kabul, Afghanistan.

METHODS

Study setting and design

A descriptive cross-sectional study was carried out from 1 September 2022 to 31 December 2022 at Ataturk Children's Hospital in Kabul, Afghanistan who visited the hospital were included in the study. Ataturk Children's Hospital is a tertiary care centre attracting patients from diverse regions of the country seeking treatment due to its advanced facilities and highly skilled medical professionals. All children aged 6–36 months visiting the outpatient department (OPD) of the hospital having consent were included. Children who were severely sick (admitted patients, as well as OPD patients with severe illnesses such as high-grade fever or sepsis or any other condition who were unable to provide anthropometric data) or had no consent from their parents were excluded from the study. Data were collected through convenience sampling technique.

Sample size

Using Magnani 1999[13] formula with a CI of 5% and a confidence level of 95%, the sample size calculated was 384. Details on sample size calculation are given below:

Sample size = $Z^2 \times (p) \times (1-p)/c^2$

Where:

Z=Z value (1.96 for 95% CI).

p=Percentage picking a choice, expressed as decimal (0.5 used for sample size needed).

c=CI, expressed as decimal (0.004=±4).

Sample size=$(1.96^2) \times (0.5) \times (1-0.5)/(0.05)^2$=384.16=385.

A total of 405 children were screened in this duration, but due to missing data, 20 children were excluded from the data. Finally, 385 samples were included in the analysis.

Patient and public involvement

None.

Data collection

Data were collected through validated questionnaires.[13 14] Questionnaires were translated into local languages and were pretested on 30 participants and their data were not included in the final analysis. Questionnaires were modified according to the population of Afghanistan.

Variables

Questionnaires were composed of the following variables.

Age, gender, mother's educational level, father's educational level, family type, family size, birth interval, colostrum feeding, initiation of breast feeding, initiation of complementary feeding, exclusive breast feeding up to 6 months, frequency of breast feeding, access to latrine, hand washing practice using soap, access to safe water were assessed according to the literature.[3 13] Stunting, wasting and underweight were assessed according to WHO criteria.[3 14]

Anthropometric measurement

Height was measured using a stadiometer for children older than 2 years to the nearest 0.1 cm. A length board was used for children younger than 2 years to measure length to the nearest 0.5 cm. Paediatric digital scales were used to measure weight to the nearest 0.1 kg. Data were taken in duplicate to eliminate any bias. All equipment was standardised prior to measuring.

Statistical analysis

Anthro 2006 software (developed by WHO) was used to find height-for-age, weight-for-age and weight-for-height in the form of z-scores. Data were analysed by SPSS V.22.0. Descriptive statistics, such as frequencies and percentages, were used. The dependent variables in this study are underweight, stunting and wasting. The independent variables include the sex of the child, age, family type, family size, birth interval, colostrum feeding, initiation of breast feeding, initiation of complementary feeding, exclusive breast feeding up to 6 months, frequency of breast feeding, access to a latrine, hand washing practice using soap and access to safe water. Logistic regression was employed to identify the determinants of stunting,

Table 1 General characteristics of the study population

Characteristics	Frequency	Percentage
Gender		
Boys	182	47.3
Girls	203	52.7
Age group		
6–8	74	19.2
9–11	59	15.3
12–36	252	65.5
Education of mother		
Non-formal	15	3.9
Primary	101	26.2
Secondary	51	13.2
Higher	29	7.5
Illiterate	189	49.1
Education of father		
Non-formal	13	3.4
Primary	97	25.2
Secondary	77	20
Higher	76	19.7
Illiterate	122	31.7
Family type		
Nuclear	198	51.4
Joint	187	48.6
Family size		
Less than 5	84	21.8
More than 5	301	78.2
Birth interval		
More than 2 years	109	28.3
Less than 2 years	178	46.2
First birth	98	25.5
Colostrum feeding		
Yes	324	84.2
No	61	15.8
Initiation of breast feeding		
Within 1 hour of birth	177	46.
After 1 hour of birth	208	54
Initiation of complementary feeding		
Less than 6 months	84	21.8
At 6 months	235	61
More than 6 months	66	17.1
Exclusive breast feeding up to 6 months		
Yes	180	46.8
No	205	53.2
Frequency of breast feeding		
<8/day	157	40.8
>8/day	131	34
Accesses to toilet		
Yes	380	98.7
No	5	1.3
Access to safe water		
Yes	300	77.9
No	85	22.1
Hand washing practice with soap		
Yes	213	55.3
No	172	44.7

wasting and underweight. A p<0.05 was considered as significant.

RESULTS

General characteristics of the study population

The sociodemographic characteristics of the children are presented in table 1. According to the table, there were 182 (47.3%) and 203 (52.7%) boys and girls, respectively. About one-fifth majority (65.5%; n=252) of children were in the age group of 12–36 months. The majority of mothers (189) were illiterate (49.1%). With respect to family type, 198 (51.4%) belonged to nuclear families. About 78.2% of children belonged to greater family size. With regard to birth interval, 178 (46.2%) of children were related to a birth interval of less than 2 years. A great majority of the children (84.2%) had taken the colostrum. Regarding initiation of breast milk, 208 (54%) had taken breast milk after 1 hour of birth. Complementary feeding had been started for 84 (21.8%) of the children in less than 6 months from their birth while 205 (53.2%) were exclusively breastfeed them. Regarding water, 22.1% (n=85) did not have access to safe water while (44.7%; n=172) did not practise hand washing with soap.

Distribution of stunting, wasting and underweight

In this study, 149 (38.7%) of the children were stunted. Stunting was more prevalent among boys (56%; n=102) compared with girls (23.1%; n=47). The distribution of stunting according to age groups is shown in online supplemental figure 1. The prevalence of underweight was 118 (30.6%) out of which 48.3% (n=88) were boys and 14.7% (n=30) were girls. The distribution of underweight is shown in online supplemental figure 2. Underweight was high among children in the age group of 6–8 (40.5%; n=30). The prevalence of wasting among children was 11.9%. The distribution of wasting is shown in online supplemental figure 3.

Determinants of stunting

Table 2 illustrates the determinants of stunting in children. In multivariate logistic regression, we observed a higher proportion of stunting among boys compared

Table 2 Determinants of stunting among 6–36 months children

Determinants of stunting		Stunting			AOR (95% CI)	P value
		Yes	No	Total		
Gender	Boy	102	80	182	5.511 (3.028 to 10.030)	**<0.001**
	Girl	47	156	203		
Age	6–8	25	49	74	1.377 (0.800 to 2.371)	0.248
	9–11	20	39	59	1.370 (0.756 to 2.483)	0.299
	12–36	104	148	252		
Education of mother	Non-formal	8	7	15	1.720 (0.325 to 9.087)	0.523
	Primary	39	62	101	1.078 (0.503 to 2.309)	0.847
	Secondary	16	35	51	1.092 (0.415 to 2.871)	0.858
	Higher or above	7	22	29	0.824 (0.222 to 3.058)	0.773
	Illiterate	79	110	189		
Education of father	Non-formal	7	6	13	0.735 (0.133 to 4.064)	0.724
	Primary	37	60	97	0.544 (0.245 to 1.206)	0.134
	Secondary	31	46	77	0.842 (0.374 to 1.895)	0.678
	Higher or above	22	54	76	0.288 (0.106 to 0.782)	**0.015**
Family type	Nuclear	77	121	198	0.280 (0.117 to 1.258)	**0.036**
	Joint	72	115	187		
Family size	Less than 5	35	49	84	1.530 (0.577 to 4.057)	0.392
	More than 5	114	187	301		
Birth interval	More than 2 years	32	77	109	0.464 (0.170 to 1.270)	0.135
	Less than 2 years	72	106	178	0.745 (296 to 1.874)	0.531
	Firs birth	45	53	98		
Colostrum feeding	Yes	119	205	324		
	No	30	31	61	1.651 (0.747 to 3.647)	0.215
Initiation of breast feeding	Within 1 hour of birth	59	118	177	0.825 (0.441 to 1.543)	0.547
	After 1 hour of birth	90	118	208		
Initiation of complementary feeding	Less than 6 months	31	53	84	0.648 (0.255 to 1.645)	0.361
	At 6 months	96	139	235	0.961 (0.456 to 2.026)	0.918
	More than 6 months	22	44	66		
Exclusive breast feeding	Yes	70	110	180	0.499 (0.222 to 1.51)	**0.0410**
	No	79	126	205		
Frequency of breast feeding	<8/day	61	96	157	0.786 (0.440 to 1.406)	0.417
	>8/day	51	80	131		
Access to toilet	Yes	145	235	380		0.999
	No	4	1	5		
Access to safe water	Yes	111	189	300	0.862 (0.428 to 1.738)	0.679
	No	38	47	85		
Hand washing	Yes	71	142	213	0.440 (0.229 to 0.847)	**0.014**
	No	78	94	172		

AOR, Adjusted odds ratio.

with girls (OR 5.511; 95% CI 3.028 to 10.030). Children with fathers who had higher education had significantly lower odds of experiencing stunting (OR 0.288; 95% CI 0.106 to 0.782). Nuclear families also had lower odds of stunting (OR 0.280, 95% CI 0.117 to 1.258). Additionally, children who had experienced exclusive breast feeding were less likely to be stunted (OR 0.280, 95% CI 0.117 to 1.258). Stunting rates were lower among children who practised hand washing with soap (OR 0.440; 95% CI 0.229 to 0.847).

Table 3 Determinants of underweight among 6–36 months children

Determinants of underweight		Underweight			AOR (95% CI)	P value
		Yes	No	Total		
Sex of child	Boy	88	94	182	6.824 (3.543 to 13.143)	**<0.001**
	Girl	30	173	203		
Age group	6–8	30	44	74	0.664 (0.322 to 1.368)	0.267
	9–11	12	47	59	2.614 (1.076 to 6.354)	**0.034**
	12–36	76	176	252		
Education of mother	Non-formal	7	8	15	5.694 (0.925 to 35.036)	0.061
	Primary	33	68	101	1.683 (0.739 to 3.830)	0.215
	Secondary	15	36	51	2.287 (0.816 to 6.408)	0.116
	Higher or above	6	23	29	1.193 (0.283 to 5.028)	0.810
	Illiterate	57	132	189		
Education of father	Non-formal	6	7	13	0.474 (0.077 to 2.935)	0.423
	Primary	31	66	97	0.768 (0.335 to 1.763)	0.534
	Secondary	25	52	77	0.770 (0.316 to 1.877)	0.565
	Higher or above	17	59	76	0.340 (0.119 to 0.973)	**0.044**
Family type	Nuclear	61	137	198	0.585 (0.240 to 1.424)	0.237
	Joint	57	130	187		
Family size	Less than 5	30	54	84	1.617 (0.570 to 4.588)	0.366
	More than 5	88	213	301		
Birth interval	More than 2 years	27	82	109	0.516 (0.180 to 1.483)	0.219
	Less than 2 years	57	121	178	0.823 (0.309 to 2.188)	0.696
	Firs birth	34	64	98		
Colostrum feeding	Yes	93	231	324		
	No	25	36	61	1.953 (0.844 to 4.521)	0.118
Initiation of breast feeding	Within 1 hour of birth	47	130	177	0.943 (0.484 to 1.835)	0.862
	After 1 hour of birth	71	137	208		
Initiation of complementary feeding	Less than 6 months	23	61	84	0.550 (0.205 to 1.477)	0.235
	At 6 months	74	161	235	0.368 (0.148 to 1.393)	**0.032**
	More than 6 months	21	45	66		
Exclusive breast feeding	Yes	54	126	180	0.858 (0.437 to 1.683)	0.655
	No	64	141	205		
Frequency of breast feeding	<8/day	54	103	157	0.978 (0.517 to 1.850)	0.945
	>8/day	40	91	131		
Access to toilet	Yes	115	265	380	0.334 (0.024 to 4.668)	0.415
	No	3	2	5		
Access to safe water	Yes	87	213	300	1.211 (0.569 to 2.575)	0.619
	No	31	54	85		
Hand washing	Yes	54	159	213	0.310 (0.153 to 0.631)	**0.001**
	No	64	108	172		

AOR, Adjusted odds ratio; CI, Confidence interval.

Determinants of underweight

Table 3 shows that boys had significantly higher odds of underweight (Adjusted odds ratio (AOR) 6.824; 95% CI 3.543 to 13.143) compared with girls. Conversely, children with highly educated fathers had significantly lower odds of being underweight (OR 0.340; 95% CI 0.119 to 0.973). Underweight was more prevalent in the age group of 9–11 months (OR 2.614, 95% CI 1.076 to 6.354, p<0.05). Children whose fathers had a high level of education had lower odds of being underweight (OR 0.340, 95% CI 0.119

to 0.973, p<0.05) compared with others. Among children who began complementary feeding at 6 months, the odds of being underweight were lower (OR 0.368, 95% CI 0.148 to 1.39, p<0.05) compared with other groups. Additionally, hand washing practice was significantly associated with lower odds of being underweight; children who practised hand washing with soap had reduced odds of being underweight (OR 0.310; 95% CI 0.153 to 0.631, p<0.05).

Determinants of wasting

Table 4 demonstrates a significant association between children's gender and wasting. Boys had higher odds of wasting compared with girls (OR 3.702; 95% CI 1.537 to 8.916, p<0.05). Children whose fathers have a high level of education had significantly lower odds of experiencing wasting (OR 0.480, 95% CI 0.319 to 0.660, p<0.05). Children living in nuclear families had lower odds (AOR 0.356, 95% CI 0.113 to 1.117, p<0.05) compared with those living in joint families. Children who received their mother's milk within the first hour had lower odds (OR 0.435, 95% CI 0.210 to 1.341, p<0.05) compared with those who started later. Children who practised hand washing with soap had significantly lower odds of wasting (OR 0.290; 95% CI 0.112 to 0.750).

DISCUSSION

This study assessed the distribution as well as associated factors of undernutrition among children of 6–36 months of age, in Kabul, Afghanistan. Undernutrition was higher among the participants and various factors contributed to undernutrition among the study participants.

In the current study, 38.7% were stunted. Stunting was more prevalent among boys compared with girls. Childhood stunting has also been found to be more prevalent in boys than in girls in another study accomplished in Afghanistan.[15] Studies carried out in Uttar Pradesh, India; Libya; and North Maluku, Indonesia revealed the same outcome.[16 17] Around one-third of the children (30.6%) were underweight out of which 48.3% (n=88) were boys and 14.7% (n=30) were girls. There is the same scenario with respect to underweight in this study as well as in other studies. Boys have lower WAZ (Z score of about 0.13–0.19) even after controlling for other covariables.[15] A systematic review of publications on Asian children and adolescents showed that underweight was more prevalent in boys within the South and West Asian countries while it was more prevalent in girls within the East Asian countries.[18] In this study, only 11.9% of the children were wasted with a high prevalence among boys in comparison with girls. Gender has also been significantly associated with waste not only in Afghanistan but in all South Asian countries except for Maldives and Nepal.[15] A study done in Niakhar, Senegal describes the pattern of concurrent wasting and stunting among children aged 6–59 months. According to the study, even though gender difference disappeared after the age of 30 months, males were more likely to be wasted and stunted simultaneously than females.[19]

Children with fathers having higher education had significantly lower odds of stunting, wasting and underweight. A cross-sectional cluster survey conducted in Bangladesh in 2019 revealed that children with highly educated fathers had a lower risk of stunting.[20] Another study done in Indonesia shows that paternal education leads to a 3% decrease in the odds of child stunting.[21] On the other hand, children with highly educated fathers had significantly lower odds of underweight. According to a study carried out in a semiurban community in Pakistan, low literacy of father and mother may result in poor understanding of child health-related conditions and is associated with the undernutrition of children under the age of 5 years. Illiterate parents are less likely to explicitly describe their children's symptoms to the physician, and this can prevent the children from receiving the best possible care. Illiterate parents will not be able to read and completely understand the health-related information furnished for them in leaflet form.[22] A cross-sectional survey in low-income and middle-income countries also found that children with highly educated fathers had a lower chance of being underweight.[23]

Poor hygiene is a substantial cause of undernutrition in developing countries. Poor hygiene leads to undernutrition in low-income settings. A multiple-country study shows that diarrhoeal diseases comprise 25% of stunting in children under 24 months.[24] Hand washing practice with soap is an essential determinant for gaining and maintaining sound nutrition since harmful microbes, mostly found on the surface of the hands, can avert the body from absorbing nutrients.[25] Similarly, in this research, we found that the odds of stunting, wasting and being underweight were lower among the children who had practised hand washing with soap. Evidence from the Demographic and Health Survey of Ethiopia 2016 also reveals that children with hand washing with soap facilities are less stunted compared with those with no such facility.[26] Furthermore, a study in a rural indigenous community in India supports this finding too, claiming that hand washing with cleansing agents significantly decreases the risk of stunting among children.[27] Furthermore, hand washing practice was significantly associated with being underweight; children who had practised hand washing with soap had lower odds of being underweight. A study in Nepal also shows that there is a significant association between hand washing practices underweight, stunting and wasting.[28] There was a positive linear relationship between hand washing and other hygiene practices and fair nutritional status. The study claims that poor hand washing and sanitation lead to intestinal parasitic infections, consequently leading to undernutrition, including underweight.[28] A cross-sectional study in Indonesia also showcases a significant relationship between hand washing practice and underweight, that is, hand washing and other hygiene practices lower the chance of being underweight among children.[29] Regarding wasting, children who had practised hand washing with soap had significantly lower odds of wasting in the multiple logistic

Table 4 Determinants of wasting among 6–36 months children

Determinants of wasting		Wasting		Total	AOR (95% CI)	P value
		Yes	No			
Sex of child	Boy	35	147	182	3.702 (1.537 to 8.916)	**0.004**
	Girl	11	192	203		
Age group	6–8	12	62	74	0.579 (0.222 to 1.515)	0.266
	9–11	4	55	59	2.883 (0.795 to 10.451)	0.107
	12–36	30	222	252		
Education of mother	Non-formal	3	12	15	3.594 (0.625 to 20.675)	0.152
	Primary	12	89	101	1.782 (0.575 to 5.528)	0.317
	Secondary	3	48	51	0.676 (0.134 to 3.416)	0.636
	Higher or above	4	25	29	0.480 (0.319 to 4.660)	**0.031**
	Illiterate	24	165	189		
Education of father	Non-formal	3	10	13	1.525 (0.223 to 10.434)	0.667
	Primary	10	87	97	0.504 (0.159 to 1.602)	0.245
	Secondary	10	67	77	0.661 (0.203 to 2.155)	0.493
	Higher or above	7	69	76	0.475 (0.120 to 1.885)	0.290
Family type	Nuclear	23	175	198	0.356 (0.113 to 1.117)	**0.047**
	Joint	23	164	187		
Family size	Less than 5	12	72	84	2.981 (0.759 to 11.709)	0.118
	More than 5	34	267	301		
Birth interval	More than 2 years	14	95	109	0.505 (0.127 to 2.007)	0.332
	Less than 2 years	21	157	178	0.537 (0.139 to 2.077)	0.368
	Firs birth	11	87	98		
Colostrum feeding	Yes	40	284	324		
	No	6	55	61	0.737 (0.227 to 2.394)	0.611
Initiation of breast feeding	Within 1 hour of birth	23	154	177	0.435 (0.210 to 1.341)	**0.044**
	After 1 hour of birth	23	185	208		
Initiation of complementary feeding	Less than 6 months	8	76	84	0.497 (0.121 to 2.035)	0.331
	At 6 months	31	204	235	0.980 (0.344 to 2.789)	0.969
	More than 6 months	7	59	66		
Exclusive breast feeding	Yes	20	160	180	1.148 (0.471 to 2.796)	0.761
	No	26	179	205		
Frequency of breast feeding	<8/day	23	134	157	1.405 (0.617 to 3.199)	0.418
	>8/day	15	116	131		
Access to toilet	Yes	45	335	380	0.728 (0.054 to 9.718)	0.810
	No	1	4	5		
Access to safe water	Yes	36	264	300	1.269 (0.465 to 3.464)	0.642
	No	10	75	85		
Hand washing	Yes	19	194	213	0.290 (0.112 to 0.750)	**0.011**
	No	27	145	172		

AOR, Adjusted odds ratio.

regression model after controlling for other variables. A study based on evidence from the Ethiopia demographic and health survey and another study conducted in Nepal reported that hand washing practice was significantly associated with wasting.[26 30]

We found that exclusively breastfed young children had lower odds of being underweight. A study in Indonesia found that stunting can be prevented through exclusive breastfed in low-income settings.[31] Initiation of complementary feeding at 6 months had a low risk of being

underweight. A previous study found a significant association between weaning food and underweight.[32] Early initiation of breast milk prevents wasting. Our findings were in line with previous findings that delayed initiation of breast feeding increases the risk of wasting in children.[33]

There were certain limitations in this study. The study employed quantitative data analysis, omitting detailed questions in the questionnaire. Possible bias exists due to reliance on respondent responses, limiting generalisability as it primarily focuses on destitute individuals in a public hospital in Kabul, Afghanistan. This study might represent and provide good insights into the determinants of undernutrition in a hospital setting in Afghanistan, but there is still a need for community-based research to identify these determinants. Additionally, the cross-sectional design precludes establishing causal relationships between child undernutrition and associated factors. These points can be addressed through longitudinal quantitative studies, qualitative interviews to gain deeper insights into undernutrition, the use of objective measures alongside self-reported data and samples from diverse regions.

Conclusion

This study demonstrated the sex of the child, illiteracy of fathers, not practising hand washing and not observing hygiene, early initiation of breast milk, complementary feed and proper exclusive breast feeding as contributing factors to the undernutrition of the children in the study population. To diminish the burden of child undernutrition in Kabul, the issue must be addressed in two stages. First, basic causes of undernutrition including food security, economic growth and sociocultural reforms must be taken into account through big and national policies. Then, in the second stage, strategies must be designed to improve parental literacy, hygiene, access to safe water and preventing and treating diseases. Awareness must be raised regarding the importance of feeding breast milk in the first hour of birth as well as observing a birth interval of greater than 2 years. This cannot be fulfilled without the education of mothers. The government of Afghanistan must also allow girls and women to go to schools and universities since the education of mothers has a striking role in reducing undernutrition. This study provides insight regarding the determinants undernutrition for policy-makers to make programmatic interventions in Afghanistan to reduce the incidence of undernutrition. The Government of Afghanistan should work alongside international NGOs to reduce the burden of undernutrition.

Contributors MTR and IuH designed and wrote the original draft. MTR and MF collected the data. IuH and NR contributed to the editing and formal analysis. SAZ reviewed the article. The guarantor of the study is (IuH; accepted full responsibility for the finished work and/or the conduct of the study, had access to the data and controlled the decision to publish.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Consent obtained from parent(s)/guardian(s).

Ethics approval This study involves human participants and this study was conducted according to the guidelines laid down in the Declaration of Helsinki, and the ethical committee of Atatürk Children's Hospital, Kabul, Afghanistan (S.N/10/15) and ethical committee of The University of Haripur, Pakistan approved this study (UOH/DASR/2022/1142). Written informed consent was obtained from the caregiver of all subjects. Participants gave informed consent to participate in the study before taking part.

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