



Exploring Malnutrition Patterns and Associated Factors Among Children Below Six Years Attending the Outpatient Department of Dr. Jamal Ahmed Rashid Hospital in Sulaymaniyah, Iraq

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Abstract

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Background: malnutrition in throughout early childhood remains the important health problem in Iraq and it's a disorder which arises when a child consumes insufficient or excessive amount of one or more of the nutrients, significantly leading to health problems. **Aim :** To estimate the prevalence of malnutrition and its contributed socio-demographic, economic, and health-related factors among children under six years attending a major hospital outpatient department in Sulaymaniyah, Iraq. **Methods:** A cross-sectional study was conducted in hospital setting between March 2025 to July 2025. A systematic random sample of 420 child-caregiver pairs was selected. Information were collected using structured questionnaire and anthropometric measurements. The nutritional status was categorised based on WHO Growth Standards. Bivariate and multivariate logistic regression analyses was carried out to estimate factors associated with malnutrition. **Results:** Any malnutrition (stunting, wasting, or underweight) was 30.7%. Stunting was most commonly observed (14.8%), then underweight (11.7%) and wasting (7.9%). On bivariate analysis, low family income ($p=0.024$) was significantly associated with malnutrition ($\chi^2=9.48$). Multivariate analysis confirmed low income as the strongest predictor. Children from families earning <300,000 IQD/month (aOR=2.22, 95% CI: 1.05–4.73) and 500,000–800,000 IQD/month (aOR=2.46, 95% CI: 1.15–5.28) had significantly higher odds of malnutrition versus the highest income group. Health and dietary factors were not significant independent predictors. **Conclusion:** Malnutrition is a potential public health problem in this population, with stunting being the primary concern. Socioeconomic status, not health or dietary practices, is the fundamental determinant. Effective interventions must therefore extend beyond nutritional education to include robust economic support and poverty alleviation programs to address the root causes.

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1. Introduction

Malnutrition continues to be a major global public health issue, particularly affecting children under five years old in low- and middle-income nations. The nutritional status is the result of imbalance between energy and macro/micro-nutrient intake, with malnutrition occurring as stunting (low height-for-age), wasting (low weight-for-height) and underweight (low weight-for-age)—

which has been reported to be the major public health issue in the country such as Iraq (1). The first 1000 days of life is a critical window for growth and development, with malnutrition in this period conferring risk of irreversible cognitive deficits, immune dysfunction, and chronic disease burden through the life course, maintaining cycles of poverty and illness (2, 3).

The nutritional situation in Iraq is complicated and multifarious, as it has been heavily influenced by over three decades of violence, trade sanctions and political turmoil that resulted in the collapse of food security, health care provision and social capital (4). Based on results of the 2018 Multiple Indicator Cluster Survey (MICS), national prevalence of malnutrition among children younger than five years were 12.6% for stunting, 2.9% for wasting, and 7.2% for underweight (5). But, these numbers obscure large regional differences. Kurdistan Region, including Sulaymaniyah Governorate, has had better coverage in the past because of its stability; however side effects from internal displacement and economical crises challenge it (5). A summary of local studies conducted in the recent past reveal an average prevalence rate that is quite high, possibly up to 18.6% (6-10).

However, no comprehensive facility-based study has been conducted that assess the proximate and underlying factors of malnutrition at local level in Sulaymaniyah. This kind of research is important for targeting interventions. This study seeks to bridge that gap by examining the prevalence and factors associated with malnutrition among these 6-month-to-5-year-old children in the outpatient clinic of Dr. Jamal Ahmed Rashid Hospital, one of the largest healthcare institutions in Sulaymaniyah.

2. Methods

Study Design and Setting

A cross-sectional study was carried out at the outpatient department of Dr. Jamal Ahmed Rashid Hospital in Sulaymaniyah, Iraq, over a four-month period from March 2025 to July 2025.

Study Population and Sampling

The study population consisted of children aged 0-71 months attending the outpatient department. Children with chronic conditions significantly affecting growth or those requiring emergency care were excluded. A systematic random sampling method was employed. The minimum sample size was calculated as 364 using the formula for a single population proportion ($P=18.6\%$, $d=4\%$, $CI=95\%$), which was inflated to 420 to account for non-response.

Data Collection Tools and Techniques

Data were collected using two primary tools:

1. A **structured questionnaire** administered to caregivers, covering socio-demographic details, economic status, infant and young child feeding practices, past ill-health and environmental factors were employed to gather data from caregivers.
2. **Anthropometric measurements:** Weight was measured to the nearest 0.1 kg using a calibrated digital scale. Length/height was measured to the nearest 0.1 cm using an infantometer or stadiometer. Mid-upper arm circumference (MUAC) was measured to the nearest 0.1 cm. All measurements were taken in duplicate by trained research assistants following WHO standards.

Data Processing and Analysis

Data were entered into Excel and analyzed using SPSS v26.0. Anthropometric Z-scores (WAZ, HAZ, WHZ) were calculated using WHO Anthro software. Nutritional status was defined per WHO criteria: Stunting ($HAZ < -2$), Wasting ($WHZ < -2$), Underweight ($WAZ < -2$), Overweight ($WHZ > +2$), Obesity ($WHZ > +3$). A composite variable, "any malnutrition," was created for children presenting with at least one of these conditions.

Descriptive statistics were calculated. Bivariate analysis utilising Chi-square testing evaluated the relationships between independent factors and the outcome. Variables having a p-value < 0.25 in bivariate analysis were incorporated into a multivariate logistic regression model to ascertain independent predictors of malnutrition while controlling for relevant confounders. A p-value less than 0.05 was deemed statistically significant.

3. Results

Socio-Demographic Characteristics and Prevalence of Malnutrition

A total of 420 children were included in the analysis. The socio-demographic characteristics are summarized in Table 1. The sample was nearly evenly distributed by sex (51.2% female), and most families resided in urban areas (62.1%). The majority of mothers (85.5%) and fathers (88.3%) had at least a primary education. Economically, 36.7% of families reported a monthly income between 300,000-500,000 Iraqi Dinars (IQD).

The overall prevalence of any form of malnutrition was 30.7%. As shown in Table 2, stunting was the most prevalent form (14.8%), followed by underweight (11.7%) and wasting (7.9%).

Table 1: Socio-demographic and Economic Characteristics (N=420)

Characteristic	Category	Frequency (n)	Percentage (%)
Sex of Child	Male	205	48.8
	Female	215	51.2
Residence	Urban	261	62.1
	Rural	159	37.9
Maternal Education	Illiterate	61	14.5
	Primary	139	33.1
	Secondary	137	32.6
	University	83	19.8
Monthly Family Income (IQD)	< 300,000	110	26.2
	300,000 - 500,000	154	36.7
	500,000 - 800,000	98	23.3
	> 800,000	58	13.8

Table 2: Nutritional Status of Children (N = 420)

Nutritional Status	Normal n (%)	Malnourished n (%)
Weight-for-Age (Underweight)	371 (88.3)	49 (11.7)
Height-for-Age (Stunting)	358 (85.2)	62 (14.8)
Weight-for-Height (Wasting)	387 (92.1)	33 (7.9)
Any Malnutrition*	291 (69.3)	129 (30.7)

Any malnutrition = child had at least one of underweight, stunting, or wasting.

Factors Associated with Malnutrition

Bivariate analysis (Table 3) revealed that **family monthly income** was the only socio-demographic factor with a statistically significant association with malnutrition status ($\chi^2=9.48$, $p=0.024$). A clear gradient was observed, with the highest prevalence of malnutrition in the lowest income brackets. Other factors, including parental education, birth history, vaccination status, and recent infections, showed no significant association.

Table 3: Association Between Selected Factors and Malnutrition (N=420)

Variable	Category	Normal n (%)	Malnourished n (%)	p-value
Family income (IQD)	< 300,000	70 (24.1)	40 (31.0)	0.024
	300,000 - 500,000	115 (39.5)	39 (30.2)	
	500,000 - 800,000	60 (20.6)	38 (29.5)	
	> 800,000	46 (15.8)	12 (9.3)	
Birth weight	Low birth weight	45 (15.5)	20 (15.5)	0.992
	Normal birth weight	246 (84.5)	109 (84.5)	
Vaccination status	Not up-to-date	49 (16.8)	17 (13.2)	0.342
	Up-to-date	242 (83.2)	112 (86.8)	

Multivariate logistic regression analysis (Table 4) confirmed the primacy of socioeconomic factors. After adjusting for confounders, children from the lowest (<300,000 IQD) and middle (500-800,000 IQD) income groups had 2.22 and 2.46 times higher odds of malnutrition, respectively, compared to the wealthiest children. Living in rented accommodation was associated with a significant 38% reduction in the odds of malnutrition (aOR=0.62, 95% CI: 0.40–0.97). A separate model evaluating health and dietary factors was not statistically significant.

Table 4: Multivariate Logistic Regression of Factors Associated with Malnutrition

Factor	Category	Adjusted Odds Ratio (aOR)	95% Confidence Interval (CI)
Family Income (Ref: >800,000 IQD)	< 300,000 IQD	2.22	1.05 – 4.73*
	300-500,000 IQD	1.30	0.62 – 2.72
	500-800,000 IQD	2.46	1.15 – 5.28*
Housing Tenure (Ref: Owned)	Rented	0.62	0.40 – 0.97*
Model Fit		Nagelkerke R² = 0.063	

**Statistically significant ($p < 0.05$)*

4. Discussion

A high percentage of under six malnutrition (30.7%) was revealed in this study with chronic stunting (14.8%) as the major element. This proportion is higher than the national average (as assessed in 2018 MICS) (5) but comparable to syntheses of recent local studies (6-10), possibly reflecting regional differences or compounding impacts of economic difficulties and the COVID-19 pandemic. The most striking result is the overwhelmingly dominant effects of low SES as the primary determinant of childhood

malnutrition. % This result is congruent with the UNICEF model that considers that poverty is a fundamental factor that affects all of the underlying (household food insecurity, care practices, environment) and immediate causes (inadequate dietary intake, disease) of malnutrition (11). Our results are also importantly revealing in that proximate mediators commonly targeted by interventions - breastfeeding, dietary diversity and recent illness were not significant independent predictors once SES was included. This implies that in this specific context, the financial capability of a family determines its ability to obtain sufficient wholesome food, health care and healthy living environment irrespective of parental knowledge and feeding practices.

The protective effect of tenanted accommodation Despite appearing counterintuitive, this finding may act as a marker for confounders that were not accounted for. It may suggest that renters along with their households tend to live closer to health facilities, markets and employment centers thanks also to the access they enjoy in urban areas, as opposed to owners who possibly are more concentrated in relatively less favorable (not only remote but certainly poorer) rural contexts. This result highlights the intricate nature of socioeconomic drivers and deserves qualitative exploration. The major shortcomings of the present study are a) its cross-sectional nature that does not allow to infer causality, and b) the hospital-based approach which may have imposed some selection bias thus precluding generalization of our findings to the entire community. Additionally, depending of care giver's memory regarding feeding practices could have recall bias.

5. Conclusion

The current study suggests that childhood malnutrition, especially stunting, still imposes a major public health concern in Sulaymaniyah- Iraq. The evidence is clear that the underlying problem is one of socio-economic disadvantage and not ignorance over health or feeding practices. Hence, interventions directed to nutritional education or supplementation will prove inadequate. Effective public health efforts to reduce malnutrition will need to involve multiple approaches, with a powerful economic dimension. These should include social protection, poverty reduction, and livelihood interventions targeting the poorest families to effectively tackle underlying causes of this age-old issue.

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Conflict of interest: The authors disclose no conflicts of interest.

Ethical Considerations

All ethical formalities were observed according to the guidelines of research ethics committee of College of Medicine, University of Sulaimani. Informed consent to participate was obtained from all caregiving participants. Anonymity was observed at all times and children seen to be malnourished were referred for appropriate care within the hospital.

Authors' contribution: The first author originated and structured the study, gathered and analysed data, interpreted results, composed and amended the text, and sanctioned the final version. The second author supervises all the work.

References

1. World Health Organization. Malnutrition. 2021. URL: No DOI; fact sheet available at <https://www.who.int/news-room/fact-sheets/detail/malnutrition/>
2. Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 2013;382(9890):427-51. DOI: [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
3. Victora CG, Adair L, Fall C, et al. Maternal and child undernutrition: consequences for adult health and human capital. *Lancet*. 2008;371(9609):340-57. DOI: [https://doi.org/10.1016/S0140-6736\(07\)61692-4](https://doi.org/10.1016/S0140-6736(07)61692-4)
4. Garfield R. The impact of economic sanctions on health and well-being. *Relief and Rehabilitation Network*. 1999;31. URL: No DOI; report available at <https://odi.org/en/publications/the-impact-of-economic-sanctions-on-health-and-well-being/>
5. UNICEF & Central Statistical Organization Iraq. Iraq Multiple Indicator Cluster Survey 2018. Baghdad: UNICEF; 2018. URL: No DOI; report overview at <https://mics.unicef.org/news/iraq-2018-mics-datasets-survey-findings-report-and-snapshots-released>

6. Ahmed; Hawramei. Risk factors of malnutrition among preschool children in Sulaimani. 2022. doi.org/10.33899/mjn.2022.175560
7. Saddam; Bahir. Assessment of malnutrition among children in Karbala. 2021. DOI: 10.36295/ASRO.2021.24536
8. Fateh et al. Nutritional status of children in Kalar city. 2022. DOI: 10.1186/s12889-022-14071-2
9. Abdulzahra; Ahmed; Kadhem. Prevalence of malnutrition in Babylon Governorate. 2022. DOI: 10.53730/ijhs.v6nS2.8394
10. Diyya et al. Nutritional status among children in Sulaymaniyah. 2024. doi.org/10.48047/AFJBS.6.15.2024.10887-10902
11. UNICEF. The UNICEF Conceptual Framework on the Causes of Malnutrition. New York: UNICEF; 2015. : No DOI; framework available via UNICEF resources.