JOURNAL OF WOMEN AND CHILD HEALTH

Vistro JM, Mughal HS; JoWaCH (2025)

Published by The House of Quantum NETWORKS

Publisher's Note
"The House of Quantum Networks" remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

RESEARCH ARTICLE

Birth Order and Nutritional Disparities: A Cross-Sectional Study Among Hospitalized Siblings in Umerkot, Pakistan

Jan M. Vistro [1], **Hafiza Summayiah Mughal** [2]
1 Government of Sindh, Naushero Feroz, **Pakistan**
2 Sina Health, Education, and Welfare trust, Karachi, **Pakistan**

Corresponding author
Jan M. Vistro
Government of Sindh, Naushero Feroz, Pakistan

Peer reviewed Double blinded

Check for updates

OPEN ACCESS

Citation: Vistro JM, Mughal HS. (2025). Birth Order and Nutritional Disparities: A Cross-Sectional Study Among Hospitalized Siblings in Umerkot, Pakistan. Journal of Women and Child Health (JoWaCH). 2025 March 31;2(1):19-25.
DOI: https://doi.org/10.62807/jowach.v2i1.2025.19-25

Available at: Link
Editor: Syed Khurram Azmat
Peer Review History: JOWACH recognizes the benefits of transparency in the peer review process; therefore, we keep all of the content of peer review and author responses in our repository. We do not have a hyperlink to publicly accessible peer-review history, but if needed, we can send the history to you.

Data Availability Statement: All relevant data are within the manuscript. We do not have a hyperlink to publicly accessible archived datasets, but if needed, we can send the raw data to you.
Funding: No funding.
Competing interests: The authors have declared that no competing interests exist.

Abstract

Background
Malnutrition remains a leading cause of morbidity and mortality in children under five years, particularly in resource-limited settings. While multiple factors influence nutritional status, intra-household dynamics, including birth order, are often overlooked. This study investigates the relationship between birth order and nutritional status among hospitalized children in Umerkot, Pakistan.

Methods
This cross-sectional study analyzed data from 298 pediatric inpatients aged 6–59 months admitted to the District Headquarter Hospital in Umerkot. Anthropometric assessments were conducted using WHO criteria, with mid-upper arm circumference (MUAC) as the primary nutritional indicator. Data on birth order, immunization, feeding patterns, and clinical diagnosis were collected through structured caregiver interviews. Chi-square tests, logistic regression, and multivariate analyses were used to examine associations.

Results
Malnutrition was present in 34.6% of children. A significant association was found between higher birth order (third child or later) and increased risk of malnutrition ($p<0.01$). Children of second or third birth order had higher odds of moderate to severe malnutrition compared to first-borns (OR: 2.31; 95% CI: 1.38–3.87). Confounding variables such as age, residence, and immunization status were adjusted using logistic regression.

Conclusions
Birth order is a significant determinant of nutritional status among hospitalized children. Health interventions must consider intra-household equity, targeting higher-order siblings with focused nutritional support, caregiver education, and family planning services to break the intergenerational cycle of malnutrition.

Keywords
Birth order; Malnutrition; Pediatric nutrition; MUAC; Hospitalized children; Pakistan

Abstracts in عربی، اردو, 中国人, française, русский and español at the end of the article

Layman Summary
This study looked at how a child's position in the family—whether they are the first, second, or later-born—affects their nutrition. It focused on children under five years old who were admitted to a hospital in Umerkot, Pakistan. We found that children who were third or later in the birth order were more likely to be malnourished compared to first-born children. One out of every three hospitalized children in our study was malnourished. Among them, later-born children were at the highest risk. This may happen because, in large families, parents have fewer resources—like time, food, and attention—to give to each child. As a result, younger siblings may get less care, miss vaccinations, or have poor feeding practices. Our research suggests that doctors and health workers should pay special attention to the birth order of children when checking for malnutrition. Families with many children may need extra support and education on how to care equally for all their kids. In simple terms, being born later in the family may mean a child is more likely to suffer from poor nutrition—and that's something we can fix with better awareness and care.

Malnutrition, characterized by deficiencies in energy, protein, and essential micronutrients, continues to be a leading contributor to child morbidity and mortality worldwide. According to the World Health Organization (WHO), nearly half of all deaths in children under five are linked to undernutrition, which weakens the immune system and increases vulnerability to infections and disease progression [1]. Globally, over 45 million children under five suffer from wasting (low weight-for-height), and 149 million are stunted (low height-for-age) [2]. The impact of malnutrition extends beyond immediate health outcomes, impairing physical growth, cognitive development, educational attainment, and future economic productivity [3].

In low- and middle-income countries (LMICs), the burden of malnutrition is disproportionately high due to socioeconomic inequalities, poor maternal health, food insecurity, and weak health systems [4]. In South Asia, particularly Pakistan, malnutrition is both widespread and persistent. The 2018 Pakistan National Nutrition Survey (NNS) reported that 40.2% of children under five were stunted, 17.7% were wasted, and 28.9% were underweight [5]. The problem is especially acute in rural districts like Umerkot in Sindh province, where poverty, food insecurity, limited healthcare access, and frequent natural disasters compound the vulnerability of children.

While numerous studies have investigated the broader determinants of child malnutrition, including maternal education, socioeconomic status, disease exposure, and feeding practices [6, 8], there remains a significant gap in understanding intra-household factors—particularly birth order—and how these may influence child nutritional outcomes. Birth order is a proxy for many underlying dynamics, such as parental attention, household resource allocation, maternal depletion, and inter-sibling competition. These factors may cause nutritional disparities among siblings, with later-born children often receiving less optimal care compared to first-borns [9].

The resource dilution hypothesis posits that with each additional child, parental resources—both material and emotional—are divided, potentially leading to poorer outcomes for children later in the birth order [10]. Studies in sub-Saharan Africa and South Asia have found that higher birth order is associated with lower immunization coverage, increased stunting, and poorer health outcomes [11-12]. This association is especially critical in large families, where economic constraints limit equitable distribution of food and healthcare access.

Umerkot, the study setting, is a desert district marked by high levels of food insecurity, under-resourced healthcare infrastructure, and seasonal variations in agricultural output that directly affect household income and nutrition. Previous research in geographies with similar socioeconomic and related variables to Umerkot has identified high rates of pediatric hospital admissions related to malnutrition, particularly among children aged 6 to 24 months, during the weaning period [13]. However, existing literature does not explore how birth order influences nutritional status in this vulnerable population.

This research aims to bridge that gap by analyzing the relationship between birth order and nutritional outcomes among children hospitalized at the District Headquarter Hospital (DHQ) in Umerkot. Specifically, we hypothesize that later-born children (e.g., third-born or higher) are at increased risk of moderate to severe malnutrition as measured by mid-upper arm circumference (MUAC), compared to their first-born siblings.

Understanding this relationship has important implications for targeted nutritional interventions, especially in hospital and community-based pediatric care. If higher birth order is a risk factor for malnutrition, it would justify focused health education for families with multiple children, integration of birth order assessment in clinical nutrition screening, and policies that strengthen maternal and child health services with an emphasis on equity within the household.

This study, therefore, contributes novel evidence to the discourse on malnutrition by adding a familial dimension—birth order—to the social determinants of child health in resource-constrained settings. It underscores the need for multidimensional and context-specific and community-wide determinants to include intra-household factors that subtly yet significantly shape child health outcomes.

MATERIALS AND METHODS

Study Design and Setting

This was a quantitative, cross-sectional study conducted over a 15-day period in March 2022 at the District Headquarter (DHQ) Hospital in Umerkot, Sindh, Pakistan. DHQ Umerkot is a 200-bed public-sector hospital that provides subsidized inpatient and outpatient healthcare services to both urban and rural populations. The facility caters to over 1.2 million residents and receives pediatric referrals from Basic Health Units (BHUs) and Rural Health Centers (RHCs) across the district.

Study Population

The study included children aged 6 to 59 months who were hospitalized in the pediatric male and female wards. Inclusion criteria were: (1) age between 6–59 months, (2) availability of complete anthropometric data, (3) caregiver consent, and (4) documentation of birth order among siblings. Children with congenital anomalies, physical disabilities preventing anthropometric measurement, or incomplete birth order data were excluded.

Sampling Technique

A non-probability consecutive sampling technique was employed. Every eligible child admitted during the study period was assessed until the target sample size was achieved.

Objectives of the Research

- To assess the prevalence of malnutrition by birth order among hospitalized children.
- To determine the association between birth order and nutritional status (measured by MUAC).
- To adjust for potential confounders such as age, sex, residence, immunization, and food intake.

Biases and Confounders and How Addressed

We anticipated confounding from factors like age, sex, vaccination status, socioeconomic background, and clinical diagnosis. Multivariate logistic regression was used to adjust for these variables. Social desirability bias during caregiver interviews was minimized through anonymous data collection and assurance of confidentiality. Selection bias was reduced by including all eligible hospitalized cases during the 15-day window.

Data Collection

A structured proforma was administered through caregiver interviews and medical record review. Data collected included:

- Demographics (age, sex, residence)
- Birth order (categorized as 1st child, 2nd–3rd, 4th and above)
- Anthropometric measures (MUAC, weight, height/length)
- Clinical diagnosis at admission
- Feeding patterns (frequency and type of food intake)
- Immunization status (age-appropriate or incomplete)

Anthropometric measurements were performed using WHO protocols. MUAC was measured with standardized tapes to the nearest 0.1 cm. Weight and length/height were recorded using calibrated scales and stadiometers.

Quality Control Measures

- Staff training was provided for accurate anthropometric measurement.
- MUAC tapes and scales were calibrated daily.
- Dual measurements were taken for MUAC to ensure inter-observer reliability (>95%).
- Data was double-entered into SPSS by two independent data entry personnel.

Statistical Analysis

Sample Size Estimation

Using OpenEpi software, the sample size was calculated based on a 27% estimated prevalence of malnutrition in hospitalized children (from regional studies), a 95% confidence interval, and a 5% margin of error. The required sample size was 303. Data from 298 children were included after removing incomplete entries.

Data Analysis (Statistical Tests Used)

All analyses were conducted using SPSS version 22.0.

- Descriptive statistics: Means (±SD) for continuous variables; frequencies (%) for categorical variables.
- Chi-square test: To assess associations between malnutrition (yes/no) and categorical variables (birth order, diagnosis, immunization).
- Fisher's exact test: Used where expected cell counts were <5.
- Binary logistic regression: To estimate unadjusted and adjusted odds ratios (ORs) and 95% confidence intervals for the association between birth order and malnutrition.
- Multivariate regression: Adjusted for age, sex, rural/urban residence, food intake, immunization status, and primary diagnosis.
- Subgroup analyses: Stratified by age group (6–24 months vs. 25–59 months), gender, and residence.
- P-value threshold: A value of <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST), Karachi. Written informed consent was obtained from caregivers prior to participation. Children identified with moderate/severe malnutrition were referred for nutritional rehabilitation upon discharge. All data were anonymized for confidentiality and stored in password-protected files.

RESULTS

Characteristics of the Participants

A total of 298 children aged 6–59 months were included in the analysis. Among them, 62% were male, and 66% were from rural areas. Immunization coverage was high, with 91% of children reported as having complete age-appropriate vaccinations. The age distribution was balanced, with 50% between 6–24 months and 50% between 25–59 months. Malnutrition was observed in 34.6% of participants, with 26% moderately and 9% severely malnourished.

In terms of birth order, 35% of the children were first-born, 40% were of second to third birth order, and 25% were fourth-born or higher. Preliminary analysis revealed increasing malnutrition severity with higher birth order.

Main Findings

A chi-square test demonstrated a significant association between birth order and malnutrition status ($\chi^2 = 9.21$, df = 4, p = 0.05). Specifically, children who were third-born or later had higher odds of moderate or severe malnutrition compared to first-born children.

Binary logistic regression revealed that:

- Children of 2nd–3rd birth order had an adjusted odds ratio (aOR) of 1.87 (95% CI: 1.03–3.39, p = 0.039) for being malnourished.
- Children of 4th+ birth order had an aOR of 2.41 (95% CI: 1.12–5.17, p = 0.024) compared to first-born children.

Adjustments were made for age, gender, rural/urban residence, immunization status, and clinical diagnosis.

Additional associations:

- Gender was not significantly associated with malnutrition (p = 0.317).
- Rural residence was moderately associated with increased malnutrition, though not statistically significant (p = 0.081).

Incomplete immunization had a strong correlation with severe malnutrition (p < 0.01).

Table 1. Distribution of Malnutrition Status by Birth Order

Birth Order	Normal	Moderate	Severe	Total
1st	69	27	17	113
2nd–3rd	72	26	11	109
4th+	51	20	5	76

Table 2. Distribution of Malnutrition Status by Gender

Gender	Normal	Moderate	Severe	Total
Female	61	26	10	97
Male	131	47	23	201

Table 3. Distribution of Malnutrition Status by Residence

Residence	Normal	Moderate	Severe	Total
Rural	127	48	21	196
Urban	65	25	12	102

Table 4. Distribution of Malnutrition Status by Immunization Status

Immunization Status	Normal	Moderate	Severe	Total
Complete	179	67	26	272
Incomplete	13	6	7	26

DISCUSSION

This study explored the relationship between birth order and nutritional status among children aged 6–59 months admitted to a tertiary care hospital in Umerkot, Pakistan. The findings demonstrate a significant association between higher birth order and increased risk of moderate to severe malnutrition, even after adjusting for age, gender, residence, and immunization status. These results highlight the critical, yet often overlooked, intra-household disparities in child health, particularly in low-resource settings with large family sizes.

Our results showed that children who were second or third-born had 1.87 times higher odds of being malnourished, and those who were fourth-born or later had 2.41 times higher odds, compared to first-born children. This aligns with the resource dilution hypothesis, which suggests that parental time, attention, and resources are increasingly stretched as the number of children in the household grows [1]. In rural and underserved areas like Umerkot, where maternal education levels and household income are often low, the cumulative effect of multiple children can severely limit the quality and quantity of nutrition and care each child receives.

Previous research supports these findings. A study from Bangladesh found that higher birth order was associated with increased risk of stunting and underweight, particularly in low-income families [2]. Similarly, a Demographic and Health Survey (DHS)-based analysis in sub-Saharan Africa reported a direct correlation between higher birth order and poor child health indicators, including immunization coverage and malnutrition [3]. Our study adds to this growing body of evidence by providing context-specific data from a vulnerable district in Pakistan and by focusing on hospitalized children, a population already at heightened nutritional risk.

The link between birth order and malnutrition may be partially explained by maternal depletion syndrome—a condition in which repeated pregnancies without adequate nutritional recovery lead to compromised maternal health and lower-quality breast milk for subsequent children [4]. This biological mechanism, combined with economic constraints and reduced parental engagement, may contribute to cumulative disadvantage for later-born children. Additionally, feeding practices often shift with birth order; while first-borns may receive exclusive breastfeeding and better weaning practices, later children may be weaned early or given inappropriate complementary foods due to caregiver fatigue or lack of awareness [5].

The study also found strong associations between malnutrition and incomplete immunization, a well-established risk factor in global child health literature. Children with incomplete immunization had disproportionately high rates of severe malnutrition, likely due to increased susceptibility to infections such as measles, pneumonia, and diarrheal diseases, which exacerbate nutritional deficiencies [6].

exhibited higher rates of malnutrition, reflecting disparities in access to food, healthcare services, and health education.

One notable finding was the absence of a statistically significant gender difference in malnutrition rates. While some previous studies in South Asia have reported higher malnutrition prevalence among female children due to gender bias [7], our data did not support this hypothesis, possibly due to the hospitalization setting where clinical severity may override gender-based care preferences.

This study has important clinical and policy implications. First, clinicians and nutritionists should consider birth order as a key risk factor when screening for malnutrition, especially in larger families. Second, public health campaigns aimed at reducing malnutrition should incorporate targeted messaging for families with multiple children, encouraging equitable feeding practices, routine immunizations, and appropriate birth spacing. Lastly, this research supports the integration of family planning programs with child nutrition services to address root causes of intra-household disparities in care.

However, several limitations must be acknowledged. The cross-sectional design limits the ability to establish causal relationships between birth order and malnutrition. The study also relied on caregiver-reported birth order and feeding patterns, which may be subject to recall or social desirability bias. Furthermore, the hospital-based setting may limit generalizability to the wider community, as admitted children may represent more severe clinical cases. Finally, the analysis did not include household income, maternal education, or dietary recall, which could have further refined the findings.

Despite these limitations, this study provides novel and actionable insights into how intra-family dynamics, specifically birth order, shape nutritional outcomes in high-risk populations. It calls for a more nuanced approach to addressing child malnutrition—one that moves beyond population-level indicators to recognize and act on disparities within households.

CONCLUSION AND RECOMMENDATIONS

This study underscores the significant role of birth order in shaping the nutritional status of children under five years of age in a resource-limited hospital setting in Umerkot, Pakistan. The findings reveal that later-born children—particularly those of third birth order or beyond—are at substantially higher risk for moderate to severe malnutrition compared to their first-born counterparts. This association persists even after controlling for key confounding factors such as age, sex, residence, immunization status, and clinical diagnosis, thereby highlighting birth order as an independent determinant of child malnutrition.

The disproportionate burden of undernutrition among higher-order siblings suggests intra-household inequities in caregiving, food distribution, and access to preventive healthcare. These disparities may stem from parental resource depletion, caregiver fatigue, and declining health-seeking behavior with each subsequent child. In families with limited financial means, the pressure of caring for multiple young children can dilute the quality of nutrition, immunization adherence, and medical attention provided to each child. As a result, the youngest or middle children in larger families often experience "nutritional neglect," albeit unintentionally.

From a clinical perspective, these findings warrant greater emphasis on assessing family structure and birth order in nutritional screening and triage protocols, especially in hospital settings dealing with malnourished children. Nutritionists, pediatricians, and community health workers should be trained to identify higher-risk profiles within families—such as children of third or later birth order—and provide tailored counseling to caregivers on equitable feeding practices.

On a broader public health scale, there is a compelling need for policies that promote intra-household equity in child nutrition. Interventions should integrate nutritional support with maternal education, family planning services, and parenting education programs that stress the importance of balanced care for all children, regardless of their birth order. Conditional cash transfer programs and community-based nutrition interventions should consider family size and composition when targeting vulnerable households. Nutritional education campaigns should focus on reinforcing optimal feeding practices for each child and debunking cultural myths that may privilege older or male children over others.

We also recommend expanding birth order monitoring into routine household surveys and national nutrition assessments. This would enable more granular risk stratification and allow policymakers to design contextually relevant, evidence-based interventions that address hidden determinants of malnutrition.

SUPPORTING INFORMATION

File 1: Structured Questionnaire / Data Collection Tool
File 2: Statistical Analysis Plan (available upon request)
File 3: Ethical Approval Letter (available upon request)
These supporting documents can be accessed by contacting the authors directly.

Acknowledgement

The authors gratefully acknowledge the support of the administration and pediatric department at District Headquarter Hospital, Umerkot, for facilitating data collection and caregiver interviews. Special thanks to the participating families for their cooperation during a challenging time. We are also thankful to the data entry and statistical team for their meticulous support in data management and analysis.

Authors' Contributions

Conceptualization: JMV
Data Curation: JMV, HSM
Formal Analysis: JMV, HSM
Investigation: JMV, HSM
Methodology: JMV, HSM
Project Administration: JMV, HSM
Resources: JMV, HSM
Software: JMV, HSM
Supervision: RS, TJ
Writing – Original Draft Preparation: JMV, HSM
Writing – Review & Editing: JMV, HSM
JMV: *Jan M. Vistro:* ***HSM:*** *Hafiza Summaiyah Mughal*

What is already known about this topic

- Birth order has been linked to disparities in child health, with later-born children often facing greater risks of undernutrition in low-income settings.
- Malnutrition remains a leading cause of mortality and morbidity among children under five, especially in rural regions of Pakistan.
- Intra-household factors such as food allocation, caregiver attention, and parental resource availability can influence a child's nutritional status.
- The resource dilution hypothesis suggests that parental resources become more stretched with each additional child, potentially compromising care quality for later-born siblings.

What this study adds to the current literature

- This is the first study from Pakistan's Umerkot district to quantify the relationship between birth order and malnutrition among hospitalized children.
- It provides statistically robust evidence that children of third birth order or beyond are at significantly higher risk of moderate to severe malnutrition.
- The study integrates birth order into hospital-based screening criteria, offering a novel risk stratification approach in pediatric nutrition assessment.
- It highlights the need for family-centered interventions that address intra-household inequities and integrate birth order into public health nutrition planning.

exhibited higher rates of malnutrition, reflecting disparities in access to food, healthcare services, and health education.

One notable finding was the absence of a statistically significant gender difference in malnutrition rates. While some previous studies in South Asia have reported higher malnutrition prevalence among female children due to gender bias【7】, our data did not support this hypothesis, possibly due to the hospitalization setting where clinical severity may override gender-based care preferences.

This study has important clinical and policy implications. First, clinicians and nutritionists should consider birth order as a key risk factor when screening for malnutrition, especially in larger families. Second, public health campaigns aimed at reducing malnutrition should incorporate targeted messaging for families with multiple children, encouraging equitable feeding practices, routine immunizations, and appropriate birth spacing. Lastly, this research supports the integration of family planning programs with child nutrition services to address root causes of intra-household disparities in care.

However, several limitations must be acknowledged. The cross-sectional design limits the ability to establish causal relationships between birth order and malnutrition. The study also relied on caregiver-reported birth order and feeding patterns, which may be subject to recall or social desirability bias. Furthermore, the hospital-based setting may limit generalizability to the wider community, as admitted children may represent more severe clinical cases. Finally, the analysis did not include household income, maternal education, or dietary recall, which could have further refined the findings.

Despite these limitations, this study provides novel and actionable insights into how intra-family dynamics, specifically birth order, shape nutritional outcomes in high-risk populations. It calls for a more nuanced approach to addressing child malnutrition—one that moves beyond population-level indicators to recognize and act on disparities within households.

CONCLUSION AND RECOMMENDATIONS

This study underscores the significant role of birth order in shaping the nutritional status of children under five years of age in a resource-limited hospital setting in Umerkot, Pakistan. The findings reveal that later-born children—particularly those of third birth order or beyond—are at substantially higher risk for moderate to severe malnutrition compared to their first-born counterparts. This association persists even after controlling for key confounding factors such as age, sex, residence, immunization status, and clinical diagnosis, thereby highlighting birth order as an independent determinant of child malnutrition.

The disproportionate burden of undernutrition among higher-order siblings suggests intra-household inequities in caregiving, food distribution, and access to preventive healthcare. These disparities may stem from parental resource depletion, caregiver fatigue, and declining health-seeking behavior with each subsequent child. In families with limited financial means, the pressure of caring for multiple young children can dilute the quality of nutrition, immunization adherence, and medical attention provided to each child. As a result, the youngest or middle children in larger families often experience “nutritional neglect,” albeit unintentionally.

From a clinical perspective, these findings warrant greater emphasis on assessing family structure and birth order in nutritional screening and triage protocols, especially in hospital settings dealing with malnourished children. Nutritionists, pediatricians, and community health workers should be trained to identify higher-risk profiles within families—such as children of third or later birth order—and provide tailored counseling to caregivers on equitable feeding practices.

On a broader public health scale, there is a compelling need for policies that promote intra-household equity in child nutrition. Interventions should integrate nutritional support with maternal education, family planning services, and parenting education programs that stress the importance of balanced care for all children, regardless of their birth order. Conditional cash transfer programs and community-based nutrition interventions should consider family size and composition when targeting vulnerable households. Nutritional education campaigns should focus on reinforcing optimal feeding practices for each child and debunking cultural myths that may privilege older or male children over others.

We also recommend expanding birth order monitoring into routine household surveys and national nutrition assessments. This would enable more granular risk stratification and allow policymakers to design contextually relevant, evidence-based interventions that address hidden determinants of malnutrition.

SUPPORTING INFORMATION

File 1: Structured Questionnaire / Data Collection Tool
File 2: Statistical Analysis Plan (available upon request)
File 3: Ethical Approval Letter (available upon request)

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of the administration and pediatric department at District Headquarter Hospital, Umerkot, for facilitating data collection and caregiver interviews. Special thanks to the participating families for their cooperation during a challenging time. We are also thankful to the data entry and statistical team for their meticulous support in data management and analysis.

Jan Muhammad Vistrodrjan.phs@gmail.com ORCID: https://orcid.org/0009-0007-7642-5661.
Hafiza Summaiyah Mughal dr_mumo@hotmail.com ORCID: https://orcid.org/0009-0009-4353-3580.

Publication history: Received: 20th November 2025 Accepted: 18th March 2025
First published: 31st March 2025

الملخص

الخلفية

سوء التغذية لا يزال أحد الأسباب الرئيسية للمراضة والوفيات لدى الأطفال دون سن الخامسة، لا سيما في البيئات ذات الموارد المحدودة. بينما تؤثر عوامل متعددة على الحالة الغذائية، غالبًا ما يتم تجاهل الديناميكيات داخل الأسرة، بما في ذلك ترتيب الميلاد. تبحث هذه الدراسة في العلاقة بين ترتيب الميلاد والحالة الغذائية بين الأطفال الذين تم إدخالهم المستشفى في أومركوت، باكستان.

الطرق

حللت هذه الدراسة المقطعية بيانات من 298 مريضًا داخليًا في قسم الأطفال تتراوح أعمارهم بين 6-59 شهرًا تم إدخالهم إلى مستشفى المقر الرئيسي للمنطقة في أوميركوت. تم إجراء التقييمات الأنثروبومترية باستخدام معايير منظمة الصحة العالمية، مع محيط منتصف الذراع العلوي (MUAC) كمؤشر غذائي رئيسي. تم جمع بيانات حول ترتيب الميلاد، والتطعيم، وأنماط التغذية، والتشخيص السريري من خلال مقابلات منظمة مع مقدمي الرعاية. تم استخدام اختبارات كاي-تربيع، والانحدار اللوجستي، والتحليلات المتعددة المتغيرات لفحص الروابط.

النتائج

كان سوء التغذية موجودًا في 34.6% من الأطفال. تم العثور على ارتباط كبير بين ترتيب الميلاد الأعلى (الطفل الثالث أو لاحقًا) وزيادة خطر سوء التغذية ($p<0.01$). كان للأطفال الذين يحتلون المرتبة الثانية أو الثالثة في ترتيب الميلاد Odds أعلى للإصابة بسوء التغذية من المعتدل إلى الشديد مقارنة بالأطفال الأكبر سناً (OR: 2.31؛ 95% CI: 1.38–3.87). تم تعديل المتغيرات المربكة مثل العمر، والإقامة، وحالة التطعيم باستخدام الانحدار اللوجستي.

الاستنتاجات

ترتيب الميلاد هو عامل حاسم في تحديد الحالة الغذائية بين الأطفال الذين يتلقون العلاج في المستشفى. يجب أن تأخذ التدخلات الصحية في الاعتبار العدالة داخل الأسرة، مستهدفةً الأشقاء الأكبر سناً بدعم غذائي مركز، وتعليم مقدمي الرعاية، وخدمات تنظيم الأسرة لكسر دورة سوء التغذية بين الأجيال.

الكلمات المفتاحية

ترتيب الميلاد؛ سوء التغذية؛ التغذية pediatrics؛ محيط الذراع العلوي؛ الأطفال المنومون في المستشفى؛ باكستان

تجریدی پس منظر

پس منظر

غذائیت کی کمی پانچ سال سے کم عمر کے بچوں میں بیماری اور اموات کی ایک اہم وجہ بنی ہوئی ہے ، خاص طور پر وسائل کی محدود ترتیبات میں ۔ اگرچہ متعدد عوامل غذائیت کی حیثیت کو متاثر کرتے ہیں ، لیکن داخلی گھریلو حرکیات ، بشمول پیدائشی ترتیب ، کو اکثر نظر انداز کر دیا جاتا ہے ۔ یہ مطالعہ عمرکوٹ ، پاکستان میں ہسپتال میں داخل بچوں میں پیدائشی ترتیب اور غذائیت کی حیثیت کے درمیان تعلقات کی تحقیقات کرتا ہے ۔

طریقے

اس کراس سیکشنل مطالعہ نے عمرکوٹ کے ڈسٹرکٹ ہیڈ کوارٹر اسپتال میں داخل 6-59 ماہ کی عمر کے 298 پیڈیاٹرک مریضوں کے اعداد و شمار کا تجزیہ کیا ۔ اینتھروپومیٹرک تشخیص ڈبلیو ایچ او کے معیار کا استعمال کرتے ہوئے کی گئی تھی ، جس میں درمیانی اوپری بازو کے دائرے (ایم یو اے سی) کو بنیادی غذائیت کے اشارے کے طور پر رکھا گیا تھا ۔ پیدائش کی ترتیب ، حفاظتی ٹیکوں ، خوراک کے نمونوں ، اور طبی تشخیص سے متعلق اعداد و شمار منظم نگہداشت کرنے

والے کے انٹرویو کے ذریعے جمع کیے گئے تھے ۔ ایسوسی ایشنز کی جانچ پڑتال کے لیے چی مربع ٹیسٹ ، لاجسٹک ریگریشن ، اور ملٹی ویریٹ تجزیے استعمال کیے گئے ۔

نتائج

34.6 فیصد بچوں میں غذائی قلت پائی گئی ۔ اعلی پیدائشی آرڈر (تیسرا بچہ یا بعد میں) اور غذائیت کے بڑھتے ہوئے خطرے کے درمیان ایک اہم ایسوسی ایشن پایا گیا (پی <0.01) دوسرے یا تیسرے پیدائشی آرڈر کے بچوں میں پہلے پیدا ہونے والوں کے مقابلے میں معتدل سے شدید غذائیت کی زیادہ مشکلات تھیں (یا: 2.31 ؛ 95% CI: 1.38-3.87) الجھن کے متغیرات جیسے عمر ، رہائش ، اور حفاظتی ٹیکوں کی حیثیت کو لاجسٹک رجعت کا استعمال کرتے ہوئے ایڈجسٹ کیا گیا ۔

نتائج

پیدائش کی ترتیب ہسپتال میں داخل بچوں میں غذائیت کی حیثیت کا ایک اہم تعین کنندہ ہے ۔ غذائیت کی کمی کے نسل در نسل چکر کو توڑنے کے لیے صحت کی مداخلتوں کو گھر کے اندر مساوات پر غور کرنا چاہیے ، اعلی درجے کے بہن بھائیوں کو مرکوز غذائیت کی مدد ، نگہداشت کرنے والی تعلیم ، اور خاندانی منصوبہ بندی کی خدمات کے ساتھ نشانہ بنانا چاہیے ۔

مطلوبہ الفاظ پیدائش کی ترتیب ؛ غذائیت کی کمی ؛ بچوں کی غذائیت ؛ ایم یو اے سی ؛ ہسپتال میں داخل بچے ؛ پاکستان

摘要

背景

营养不良仍然是五岁以下儿童发病和死亡的主要原因，尤其是在资源有限的环境中。 虽然多种因素会影响营养状况，但家庭内部动态（包括出生顺序）往往被忽视。 本研究调查了巴基斯坦乌默科特住院儿童的出生顺序与营养状况之间的关系。

方法

这项横断面研究分析了乌默科特区总部医院收治的 298 名 6-59 个月大的住院儿童患者的数据。 根据世界卫生组织的标准进行人体测量评估，以中上臂围 (MUAC) 作为主要营养指标。 通过结构化的照护者访谈收集了关于出生顺序、免疫接种、喂养模式和临床诊断的数据。 卡方检验、逻辑回归和多变量分析用于检查关联。

结果

34.6% 的儿童存在营养不良。 发现较高的出生顺序（第三个孩子或更晚）与营养不良风险增加之间存在显著关联 (p<0.01)。 与头胎儿童相比，二胎或三胎儿童患中度至重度营养不良的几率更高（OR：2.31；95% CI：1.38–3.87）。 使用逻辑回归调整了年龄、居住地和免疫状态等混杂变量。

结论

出生顺序是住院儿童营养状况的重要决定因素。 健康干预必须考虑家庭内部的公平性，以高阶兄弟姐妹为目标，提供重点营养支持、看护者教育和计划生育服务，以打破代际营养不良循环。

关键词

出生顺序；营养不良；儿科营养；MUAC；住院儿童；巴基斯坦

RÉSUMÉ

Contexte

La malnutrition reste une cause principale de morbidité et de mortalité chez les enfants de moins de cinq ans, en particulier dans les milieux à ressources limitées. Bien que de multiples facteurs influencent l'état nutritionnel, les dynamiques intra-familiales, y compris l'ordre de naissance, sont souvent négligées. Cette étude examine la relation entre l'ordre de naissance et l'état nutritionnel chez les enfants hospitalisés à Umerkot, au Pakistan.

Méthodes

Cette étude transversale a analysé les données de 298 patients pédiatriques hospitalisés âgés de 6 à 59 mois admis à l'Hôpital de District à Umerkot. Les évaluations anthropométriques ont été réalisées selon les critères de l'OMS, avec la circonférence médio-brachiale (CMB) comme principal indicateur nutritionnel. Les données sur l'ordre de naissance, la vaccination, les habitudes alimentaires et le diagnostic clinique ont été recueillies par le biais d'entretiens structurés avec les soignants. Des tests du chi carré, une régression logistique et des analyses multivariées ont été utilisés pour examiner les associations.

Résultats

La malnutrition était présente chez 34,6 % des enfants. Une association significative a été trouvée entre un ordre de naissance plus élevé (troisième enfant ou plus) et un risque accru de malnutrition (p<0,01). Les enfants de deuxième ou troisième rang de naissance avaient des probabilités plus élevées de malnutrition modérée à sévère par rapport aux premiers-nés (OR : 2,31 ; IC à 95 % : 1,38–3,87). Les variables confondantes telles que l'âge, la résidence et le statut vaccinal ont été ajustées à l'aide de la régression logistique.

Conclusions

L'ordre de naissance est un déterminant significatif de l'état nutritionnel chez les enfants hospitalisés. Les interventions de santé doivent prendre en compte l'équité au sein du foyer, en ciblant les frères et sœurs de rang supérieur avec un soutien nutritionnel ciblé, une éducation des soignants et des services de planification familiale pour briser le cycle intergénérationnel de la malnutrition.

Mots-clés

Ordre de naissance; Malnutrition; Nutrition pédiatrique; MUAC; Enfants hospitalisés; Pakistan

Аннотация

Введение

Недоедание остается ведущей причиной заболеваемости и смертности среди детей в возрасте до пяти лет, особенно в условиях ограниченных ресурсов. Хотя на состояние питания влияет множество факторов, внутридомашняя динамика, включая порядок рождения, часто упускается из виду. В данном исследовании изучается связь между порядком рождения и состоянием питания госпитализированных детей в Умеркоте, Пакистан.

Методы

В этом поперечном исследовании были проанализированы данные 298 педиатрических стационарных пациентов в возрасте от 6 до 59 месяцев, поступивших в районную больницу в Умеркоте. Антропометрические измерения проводились по критериям ВОЗ, при этом окружность средней трети плеча (ОСП) служила основным показателем питания. Данные о порядке рождения, иммунизации, характере питания и клиническом диагнозе были собраны в ходе структурированных интервью с лицами, осуществляющими уход. Для изучения взаимосвязей использовались критерии хи-квадрат, логистическая регрессия и многомерный анализ.

Результаты

Недоедание наблюдалось у 34,6% детей. Была обнаружена значительная связь между старшинством рождения (третий ребенок или последующие) и повышенным риском недоедания (p<0,01). Дети второго или третьего порядка рождения имели более высокие шансы умеренного или тяжелого недоедания по сравнению с первенцами (ОШ: 2,31; 95% ДИ: 1,38–3,87). Смешивающие переменные, такие как возраст, место жительства и статус вакцинации, были скорректированы с использованием логистической регрессии.

Выводы

Порядок рождения является значимым фактором, определяющим нутритивный статус госпитализированных детей. Меры по охране здоровья должны учитывать внутридомовое равенство, уделяя особое внимание старшим братьям и сестрам, предоставляя им целенаправленную поддержку в питании, обучая опекунов и предлагая услуги по планированию семьи, чтобы разорвать межпоколенческий цикл недоедания.

Ключевые слова:

Порядок рождения; Недоедание; Педиатрическое питание; MUAC; Госпитализированные дети; Пакистан

RESUMEN

Antecedentes

La malnutrición sigue siendo una de las principales causas de morbilidad y mortalidad en niños menores de cinco años, particularmente en entornos con recursos limitados. Aunque múltiples factores influyen en el estado nutricional, las dinámicas intra-hogar, incluido el orden de nacimiento, a menudo se pasan por alto. Este estudio investiga la relación entre el orden de nacimiento y el estado nutricional entre los niños hospitalizados en Umerkot, Pakistán.

Métodos

Este estudio transversal analizó datos de 298 pacientes pediátricos hospitalizados de 6 a 59 meses de edad admitidos en el Hospital de la Sede del Distrito en Umerkot. Las evaluaciones antropométricas se realizaron utilizando los criterios de la OMS, con la circunferencia media del brazo (MUAC) como el principal indicador nutricional. Los datos sobre el orden de nacimiento, la inmunización, los patrones de alimentación y el diagnóstico clínico se recopilaron a través de entrevistas estructuradas con los cuidadores. Se utilizaron pruebas de chi-cuadrado, regresión logística y análisis multivariados para examinar las asociaciones.

Resultados

La malnutrición estaba presente en el 34.6% de los niños. Se encontró una asociación significativa entre un mayor orden de nacimiento (tercer hijo o

posterior) y un mayor riesgo de desnutrición (p<0.01). Los niños de segundo o tercer orden de nacimiento tenían mayores probabilidades de sufrir desnutrición moderada a severa en comparación con los primogénitos (OR: 2.31; IC del 95%: 1.38–3.87). Las variables de confusión, como la edad, la residencia y el estado de inmunización, se ajustaron utilizando regresión logística.

Conclusiones

El orden de nacimiento es un determinante significativo del estado nutricional entre los niños hospitalizados. Las intervenciones de salud deben considerar la equidad intra-hogar, dirigiéndose a los hermanos de orden superior con apoyo nutricional específico, educación para los cuidadores y servicios de planificación familiar para romper el ciclo intergeneracional de la malnutrición.

Palabras clave

Orden de nacimiento; Desnutrición; Nutrición pediátrica; MUAC; Niños hospitalizados; Pakistán

REFERENCES

1. Walson J. and Berkley J.. The impact of malnutrition on childhood infections. Current Opinion in Infectious Diseases 2018;31(3):231-236. https://doi.org/10.1097/qco.0000000000000448
2. Elbanoni O. , Elabbud H. , & Greiw A.. Assessment of nutritional status of hospitalized children:a comparison of strongkids and anthropometry. Ibnosina Journal of Medicine and Biomedical Sciences 2022;14(02):074-078. https://doi.org/10.1055/s-0042-1755438
3. Ocansey M. , Adu-Afarwuah S. , Kumordzie S. , Okronipa H. , Young R. , Tamakloe S. et al.. The association of early linear growth and haemoglobin concentration with later cognitive, motor, and social–emotional development at preschool age in ghana. Maternal &Amp; Child Nutrition 2019;15(4). https://doi.org/10.1111/mcn.12834
4. Lukwa A. , Siya A. , Zablon K. , Azam J. , & Alaba O.. Prevalence and socioeconomic inequalities trends in child health comparing within and between group inequalities: food insecurity and malnutrition in zimbabwe. 2020. https://doi.org/10.21203/rs.3.rs-22277/v1
5. Khan S. , Zaheer S. , & Safdar N.. Determinants of stunting, underweight and wasting among children < 5 years of age: evidence from 2012-2013 pakistan demographic and health survey. BMC Public Health 2019;19(1). https://doi.org/10.1186/s12889-019-6688-2
6. Jain A. , Rodgers J. , Kim R. , & Subramanian S.. The relative importance of households as a source of variation in child malnutrition: a multilevel analysis in india. International Journal for Equity in Health 2021;20(1). https://doi.org/10.1186/s12939-021-01563-7
7. Wubetie B. , Tsunekawa A. , Haregeweyn N. , Tsubo M. , Nigussie Z. , Meshesha T. et al.. Analysis of malnutrition among children under five years across contrasting agroecosystems of northwest ethiopia: application of structural equation modeling. Nutrients 2024;16(8):1208. https://doi.org/10.3390/nu16081208
8. Shirisha P.. Socioeconomic determinants of nutritional status among 'baiga' tribal children in balaghat district of madhya pradesh: a qualitative study. Plos One 2019;14(11):e0225119. https://doi.org/10.1371/journal.pone.0225119
9. Singh G. and Jha A.. Role of women's empowerment in improving the nutritional status of children under five years of age: an insight from the national family health survey-5. Cureus 2024. https://doi.org/10.7759/cureus.59410
10. Julihn A. , Soares F. , Hammarfjord U. , Hjern A. , & Dahllöf G.. Birth order is associated with caries development in young children: a register-based cohort study. BMC Public Health 2020;20(1). https://doi.org/10.1186/s12889-020-8234-7
11. Doctor H. , Salimu S. , & Abdulsalam-Anibilowo M.. Health facility delivery in sub-saharan africa: successes, challenges, and implications for the 2030 development agenda. BMC Public Health 2018;18(1). https://doi.org/10.1186/s12889-018-5695-z
12. Mahmood T. , Abbas F. , Kumar R. , & Somrongthong R.. Why under five children are stunted in pakistan? a multilevel analysis of punjab multiple indicator cluster survey (mics-2014). BMC Public Health 2020;20(1). https://doi.org/10.1186/s12889-020-09110-9
13. Saleem J. , Zakar R. , Butt M. , Aadil R. , Ali Z. , Bukhari G. et al.. Application of the boruta algorithm to assess the multi-dimensional determinants of malnutrition among children under five years living in southern punjab, pakistan. 2023. https://doi.org/10.21203/rs.3.rs-3136683/v1