



## **Maternal Mental Health and Sociodemographic Determinants of Child Nutrition Under Five Years**

**Lal Singh Karki**

Associate Professor, Far Western University

Tikapur Multiple Campus

Email: [karkilstmc@gmail.com](mailto:karkilstmc@gmail.com)

DOI: <https://doi.org/10.3126/jotmc.v9i9.90461>

### **Abstract**

The study was conducted in Lamkichuha Municipality, Kailali District, Nepal. The main objective of this study was to examine the relationship between maternal mental health and sociodemographic determinants of child nutrition under five in the study area. This study used a cross-sectional design to collect data from 203 mothers and their children under five years. The collected data were analyzed in descriptive and inferential phases. The children surveyed had a high rate of malnutrition, with over 50 percent of children were stunted, 7 percent were underweighted, and 5 percent were wasted, respectively. Nearly 40 percent of the mothers were noted to have common mental disorders, and in the inferential analysis, there were stunting associations with ethnicity and other socioeconomic factors. Low birth weight was the main factor that led to wasting. Thus, the findings highlight the important socio-economic and psycho-social factors, with maternal mental health as the most influential one in the nutrition of children. Along with child nutrition programs, the study also suggests the use of strategies that target the root causes of social determinants to be able to effectively reduce undernutrition in rural and semi-urban areas. One such intervention could be the implementation of routine maternal mental health screening.

**Keywords:** Child nutrition, Maternal mental health, Mental disorders, Stunting, Undernutrition, Wasting.

### **Introduction**

The World Health Organization (WHO) defines maternal mental health as "a state of well-being where a mother realizes her own capabilities, is able to handle the normal stresses of life, can work productively and effectively, and is also able to make a valuable contribution to her community" (Atif, N., et.al. 2015). Maternal mental health and children's nutrition are critical public health concerns that can greatly impact family and community well-being. Maternal mental well-being describes the mental and emotional state of a mother during pregnancy as well as after

childbirth. A mothers' good mental health can support appropriate child care and nurturing practices, while a poor mental health may lead to inappropriate childrearing practices that negatively influence a child's growth and development (Khan, A.M.,2014).

Globally maternal mental health problems are considered as a major public health challenge. Worldwide about 10 percent of pregnant women and 13 percent of postpartum women experience a mental disorder, primarily depression. In developing countries, this is even higher, i.e. 15.6 percent during pregnancy and 19.8 percent after child birth. In severe cases, mothers' suffering might be so severe that they may even commit suicide. (WHO, 2023). In this way, poor maternal mental health has been strongly linked with negative child nutritional outcomes. It can limit a mother's ability to provide optimal care, including breastfeeding, meal preparation, and attention to a child's nutritional needs (Rahman et al., 2018).

Malnutrition remains one of the most serious issues of global health. It is mostly responsible for half of the deaths of children under five years (UNICEF, 2023). The situation in Nepal is very alarming. Overall, 25 percent of children under five are stunted and 8 percent of children are wasted (NDHS, 2022). The Lancet series on maternal and child undernutrition claims that depressed mothers are a primary cause of stunted growth in children. Therefore, the paper suggested integrating mental health with maternal and child health programmes (Lancet, 2013). Conversely, mental well-being of mothers has been associated with good maternal health outcomes and positive parenting practices that enhance children's socio-emotional development as well as their success in school and other fields (WHO, 2014).

Though, there has been increased attention to maternal and child health and its importance as a global public health issue, there still remains a gap with the Millennium Development Goals (MDGs) in relation to maternal and child health and mortality with many low- and middle-income countries (WHO, 2008). The gap in maternal mental health is a significant factor that contributes to these gaps. The majority of global maternal and child health programs focus on the physical health of the mother and child. They rarely give priority to mental health basically in low and middle-income countries. In order to fill the gaps, maternal mental health needs to be included in the mental and child health programs in such countries. There is a need to address the maternal health in a more complete and comprehensive way including the mental and emotional health of the mother in the perinatal period, as the mother is the key to child development and health interactions with the family and the community (Atif, N., et.al. 2015).

In this regard, Lamkichuha Municipality is also poverty-driven area with low levels of education and limited access to health care facilities. While there are government and non government managed projects aimed specifically at reducing levels of malnutrition in children along with improvement of health of mothers, there are focal overlaps. These cross-cutting issues include the relations of mental health at child nutrition. This highlights the need for intersectoral approach at the nexus of the of the mental and physical health of mothers and children.

As the relationship between maternal mental health and child nutrition is so complex, only a comprehensive-integrated care plan can be effective in addressing the issue. Simultaneous intervention in both problems can give policymakers and health care practitioners a clear picture of the necessary measures to be taken in order to bring about the desired outcomes. This research thus goes beyond to examine the association between maternal mental health and sociodemographic

determinants of child nutrition under five in Lamkichuha Municipality, Kailali, which then becomes a source of evidence for public health interventions in similar rural contexts.

### **Objectives of the Study**

The general objective of this study is to examine the relationship between maternal mental health and sociodemographic determinants of child nutrition under five in Lamkichuha Municipality. The specific objectives are as follows:

- i. To identify the maternal mental health of the mothers.
- ii. To determine the health and nutritional status of children aged 6 to 59 months.
- iii. To analyze the association between maternal mental health and child nutrition status in the study area.

### **Hypothesis of the Study**

- i. Null Hypothesis (H0): There is no significant association between maternal mental health and child nutritional status.
- ii. Alternative Hypothesis (H1): There is a significant association between maternal mental health and child nutritional status.

### **Limitations**

This study was limited to Lamkichuha Municipality, relied only on quantitative data, and included maternal mental health questions that may be affected by recall bias. Time, budget, and resource constraints also restricted the study's scope and depth.

### **Methods and Procedure**

#### **Research Design**

In this study, a cross-sectional design was employed, where both the exposure (maternal mental health) and the outcome (child nutritional status) were measured at the same point in time.

#### **Study Area**

The study was conducted in Lamkichuha Municipality, Kailali District, Nepal. No previous research has been conducted in this area to explore the association between maternal mental health and health outcomes among children under five years of age.

#### **Study Population**

The study population included children aged 6 to 59 months and their mothers residing in Lamkichuha Municipality, Kailali District.

#### **Sampling and Sample Size**

The sample size was determined using the equation  $n = (z^2pq)/d^2$ , which was developed by the statistician William G. Cochran. It was published in his book Sampling Techniques in 1963 (Singh & Masuku, 2014). It has taken a 15.2% prevalence of maternal depression as a basis, as cited in a

research article (Janaki Medical College and Teaching Hospital in Dhanusha), and also a 95% confidence interval and a 5% margin of error. The sample size was calculated to be 198, and with an additional 10% to account for non-response, the final sample size increased to 217. Out of these, 203 participants completed the interviews. The PHC/ORC registers of all 10 wards were used and the lottery method was applied to select mothers with children under five, ensuring that every area of the municipality was equally represented.

### **Data Collection Tools and Techniques**

A structured questionnaire, the Self-Reporting Questionnaire-20 (SRQ-20) and the Warwick Edinburgh Mental Well-being Scale: WEMWBS (Tennant, R., and et.al., 2007), was used to assess maternal mental health. The SRQ-20 was used to identify symptoms of depression, anxiety and psychosomatic complaints whereas the WEMWBS was used to assess positive mental well-being in both hedonic and eudemonic domains.

The nutritional status of children was determined based on standard anthropometric indicators: stunting (height-for-age), wasting (weight-for-height), underweight (weight-for-age), and overweight (weight-for-height), in accordance with WHO reference standards.

### **Data Collection Methods and Data Analysis**

Data were gathered through household interviews and anthropometric measurements of the children. The length/height, weight, and mid-upper arm circumference (MUAC) of children were taken following the WHO guidelines. Maternal mental health was assessed using the WHO recommended Self-Reporting Questionnaire (SRQ-20).

The collected data were analysed using SPSS, applying both descriptive and inferential statistics. Descriptive analysis summarized key information about the participants demographic and socioeconomic factors, maternal and child health characteristics, and children's nutritional status (stunting, wasting, and underweight). These analyses provided a clear overview of the study population and set the foundation for examining associations between maternal mental health and child nutrition outcomes.

### **Ethical Considerations**

Ethical approval was obtained from the concerned local authorities in the study area. Participants provided written informed consent and were informed that their participation in the study was entirely voluntary. They were free to withdraw at any time. The researcher also explained the participants' responsibilities during the data collection process.

## **Results**

### **Prevalence of Common Mental Disorder**

The mental health of the mother is an important factor in the development and nutrition of the child. Mother with common mental disorders (CMDs) like anxiety and depression are unable to provide sufficient nutrition, responsive care, and love to her children. Measuring the prevalence of CMD is a way of estimating its influence on child health and thus positioning the demand for combined mental health and nutrition interventions.

**Figure 1**

Prevalence of Common Mental Disorder

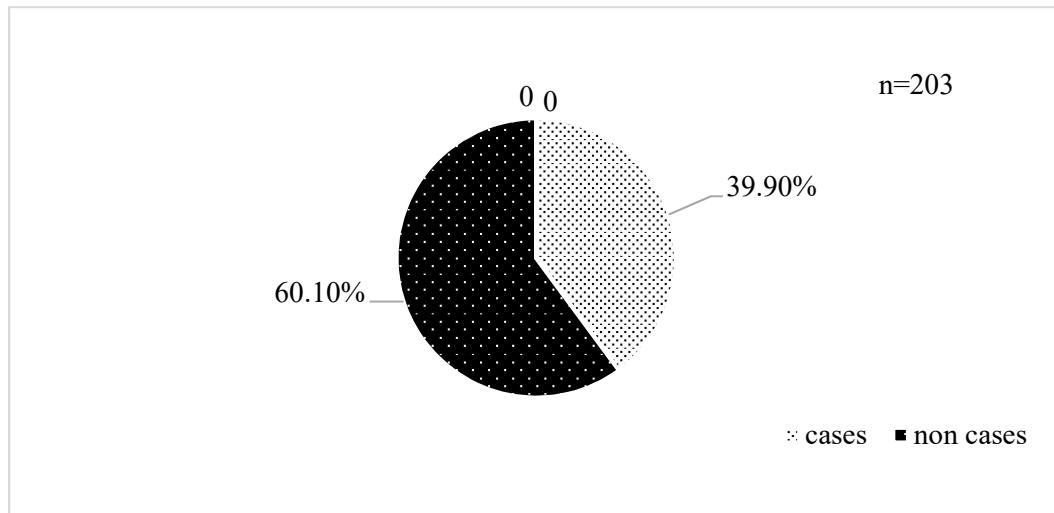


Figure 1 illustrates the distribution of mental health conditions among the participants in the study. Approximately 40 percent of the respondents experienced some form of mental disorder, while 60 percent did not exhibit any mental disorder and were classified as non-cases.

#### **Prevalence of Undernutrition and Maternal Mental Health**

Under nutrition manifested as stunting, wasting, and underweight is a critical indicator of child health and development. Stunting reflects chronic malnutrition, wasting indicates acute malnutrition, and underweight represents overall nutritional deficiency. Assessing the prevalence of these conditions helps evaluate the severity of malnutrition in the population and identify priority areas for targeted intervention.

**Figure 2**

Prevalence of Undernutrition

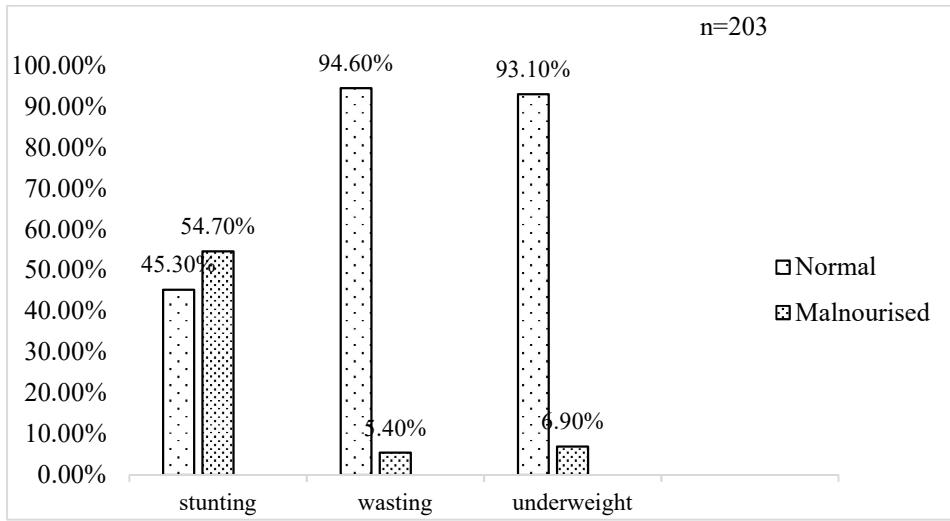


Figure 2 shows the extent of under nutrition within the study population. Over 50 percent of the affected children showed stunting and hence suffered the burden of chronic malnutrition. On the other hand, underweight prevalence was 7 percent, while the prevalence of wasting was 5 percent. On the other hand, the Prevalence of Common Mental Disorder Maternal mental health is very important in child care and nutrition. Maternal mental disorders like anxiety and depression may result in the inability to properly nourish children and provide responsive care and even emotionally support them. The main focus of assessing the prevalence of Common Mental Disorder (CMD) is to determine its possible impact on child health. This prevalence further highlights the integration of mental health and nutrition as a necessity.

### **Analysis of Association**

This section analyzes the association between maternal mental health of a mother and the health condition of children aged 6 to 59 months and below using some techniques of inferential statistics. For the association between the two categorical variables, the p-value of  $< 0.05$  was considered a statistically significant association using the Chi-square method. Along with the mental health condition, the analysis also considered the social variables and health variables such as ethnicity and type of education of the parents, type of occupation, level of income of the household, and geographical location which relates to the economic health of the child of stunted growth, underweight, and wasting. This is to help find the major causes of under-nutrition and the potential impact of maternal psychosocial health in the study population.

### **Association of Sociodemographic Factors and Child Nutritional Status**

Sociodemographic variables that affect stunting include ethnicity, education, occupation, and location of residence. These factors may affect the growth pattern of the child. Understanding the association of these factors with stunting helps in the identification of structural and socioeconomic factors of chronic malnutrition. Wasting, which is one of the signs of acute malnutrition, can probably be controlled by factors at a family level such as income, education of parents, and their occupation. Investigating these associations provides a way to figure out if children's short-term nutritional deficits are the result of socioeconomic conditions. This knowledge can help in formulating strategies to bridge the gap of child growth and address both chronic and acute malnutrition.

**Table 1**

Association of Sociodemographic Factors with Child Stunting and Wasting

| Variables                | Stunting        |                  |         | Wasting         |                 |         |
|--------------------------|-----------------|------------------|---------|-----------------|-----------------|---------|
|                          | Normal<br>n (%) | Stunted<br>n (%) | P Value | Normal<br>n (%) | Wasted<br>n (%) | P-Value |
| <b>Age of the mother</b> |                 |                  | 0.432   |                 |                 | 0.121   |
| 19-29                    | 66 (43.7)       | 85 (56.3)        |         | 145 (96)        | 6 (4)           |         |
| 30-39                    | 26 (50)         | 26 (50)          |         | 47 (90.4)       | 5 (9.6)         |         |
| <b>Ethnicity</b>         |                 |                  | 0.004   |                 |                 | 0.139   |

|                           |           |            |       |            |          |       |
|---------------------------|-----------|------------|-------|------------|----------|-------|
| Dalit                     | 28 (30.4) | 14 (12.6)  |       | 41 (21.4)  | 1 (9.1)  |       |
| Jana Jati                 | 32 (34.8) | 57 (51.4)  |       | 81 (42.2)  | 8 (72.7) |       |
| Brahmin/Chhetri           | 32 (34.8) | 40 (36)    |       | 70 (36.5)  | 2 (18.2) |       |
| <b>Family Type</b>        |           |            | 0.786 |            |          | 0.089 |
| Nuclear                   | 49 (46.2) | 57 (53.8)  |       | 103 (97.2) | 3 (2.8)  |       |
| Joint/extended            | 43 (44.3) | 54 (55.7)  |       | 89 (91.8)  | 8 (8.2)  |       |
| <b>Mother Education</b>   |           |            | 0.716 |            |          | 0.150 |
| Primary                   | 30 (41.7) | 42 (58.3)  |       | 66 (91.7)  | 6 (8.3)  |       |
| Secondary                 | 40 (46.5) | 46 (53.5)  |       | 81 (94.2)  | 5 (5.8)  |       |
| Higher Secondary/Above    | 22 (48.9) | 23 (51.1)  |       | 45 (100)   | 0 (0)    |       |
| <b>Husband Education</b>  |           |            | 0.414 |            |          | 0.067 |
| Primary                   | 16 (37.2) | 27 (62.8)  |       | 38 (88.4)  | 5 (11.6) |       |
| Secondary                 | 41 (45.6) | 49 (54.4)  |       | 85 (94.4)  | 5 (5.6)  |       |
| Higher Secondary/Above    | 35 (50)   | 35 (50)    |       | 69 (98.6)  | 1 (1.4)  |       |
| <b>Mother Occupation</b>  |           |            | 0.691 |            |          | 0.216 |
| Job                       | 18 (51.4) | 17 (48.6)  |       | 34 (97.1)  | 1 (2.9)  |       |
| Agriculture               | 60 (43.5) | 78 (56.5)  |       | 128 (92.8) | 10 (7.2) |       |
| Business                  | 14 (46.7) | 16 (53.3)  |       | 30 (100)   | 0 (0)    |       |
| <b>Husband Occupation</b> |           |            | 0.002 |            |          | 0.081 |
| Job                       | 31 (62)   | 19 (38)    |       | 48 (96)    | 2 (4)    |       |
| Agriculture               | 12 (44.4) | 15 (55.6)  |       | 27 (100)   | 0 (0)    |       |
| Business                  | 19 (59.4) | 13 (40.6)  |       | 32 (100)   | 0 (0)    |       |
| Foreign Employment        | 30 (31.9) | 64 (68.1)  |       | 85 (90.4)  | 9 (9.6)  |       |
| <b>Residence</b>          |           |            | 0.014 |            |          | 0.242 |
| Rural                     | 52 (27)   | 81 (73)    |       | 68 (35.5)  | 2 (18.2) |       |
| Urban                     | 40 (43.5) | 30 (27)    |       | 124 (64.6) | 9 (81.8) |       |
| <b>Income</b>             |           |            | 0.096 |            |          | 0.708 |
| <50k                      | 3 (32.1)  | 10 (76.9)  |       | 180 (94.7) | 10 (5.3) |       |
| >50k                      | 89 (46.8) | 101 (53.2) |       | 12 (92.3)  | 1 (7.7)  |       |

Source: Karki & Bhandari, 2025

Note.  $p < 0.05$  indicates statistical significance. Percentages may not total exactly 100 due to rounding.

Table 1 examines the association between sociodemographic factors and child nutritional status, including stunting and wasting. A statistically significant association was found for stunting with ethnicity, husband's occupation, and residence ( $p$ -value  $< 0.05$ ). Ethnicity showed a strong association with stunting ( $p = 0.004$ ). Children from Janajati groups had the highest prevalence of stunting (51.4%), followed by Brahmin/Chhetri (36%), while Dalit children had the lowest prevalence (12.6%). Husband's occupation was significantly associated with stunting ( $p = 0.002$ ). Children whose fathers were in foreign employment had the highest stunting rate (68.1%). Residence also showed a significant relationship ( $p = 0.014$ ). The stunting prevalence was remarkably high among rural children (73%) in comparison with urban children (27%). All other covariate characteristics (mother's age, education, occupation, family type and monthly income)

did not demonstrate significant associations with stunting ( $p > 0.05$ ). These results show that both ethnicity, father's occupation, and place of living are the principal factors for stunting in the studied population.

In contrast, wasting was not significantly associated with sociodemographic characteristics ( $p$ -value  $<0.05$ ). The study did not find any statistically significant associations ( $p>0.05$ ) between wasting and any sociodemographic variables that were investigated. Results point to the necessity of conducting more studies with larger samples to have a clearer understanding of the causes of wasting.

### **Child and Maternal Factors Associated with Stunting and Wasting**

Child health such as low birth weight, history of illness, and maternal mental health influence stunting. Exploring such associations contributes to understanding whether health and caregiving issues are present that may be impeding growth, suggesting more focused intervention efforts. The situation of acute malnutrition is often traced to direct health factors of a child such as infections, birth weight, and feeding practices. Finding these associations is a way to understand what is causing the decline of a child's biological or environmental factors and thus to guide nutrition interventions, both preventive and curative.

**Table 2**

Child and Maternal Factors Associated with Stunting and Wasting

| Variables                       | Stunting        |                  |         | Wasting         |                 |         |
|---------------------------------|-----------------|------------------|---------|-----------------|-----------------|---------|
|                                 | Normal<br>n (%) | Stunted<br>n (%) | P Value | Normal<br>n (%) | Wasted<br>n (%) | P-Value |
| <b>Sleep disturbance</b>        |                 |                  | 0.803   |                 |                 | 0.307   |
| No                              | 71 (45.8)       | 84 (54.2)        |         | 148 (85.5)      | 7 (8.4)         |         |
| Yes                             | 21 (43.8)       | 27 (56.3)        |         | 44 (91.7)       | 4 (8.3)         |         |
| <b>Headache</b>                 |                 |                  | 0.095   |                 |                 | 0.206   |
| No                              | 83 (47.7)       | 91 (52.3)        |         | 166 (95.4)      | 8 (4.6)         |         |
| Yes                             | 9 (31)          | 20 (69)          |         | 26 (89.7)       | 3 (10.3)        |         |
| <b>Gastrointestinal Problem</b> |                 |                  | 0.333   |                 |                 | 0.054   |
| No                              | 80 (46.8)       | 91 (53.2)        |         | 133 (95.7)      | 6 (4.3)         |         |
| Yes                             | 12 (37.5)       | 20 (62.5)        |         | 59 (92.2)       | 5 (7.8)         |         |
| <b>Respiratory Infection</b>    |                 |                  | 0.068   |                 |                 | 0.307   |
| No                              | 69 (49.6)       | 70 (50.4)        |         | 133 (95.7)      | 6 (4.3)         |         |
| Yes                             | 23 (35.9)       | 41 (64.1)        |         | 59 (92.2)       | 5 (7.8)         |         |
| <b>Birth Weight</b>             |                 |                  | 0.110   |                 |                 | 0.016   |
| <2500gm                         | 8 (30.8)        | 18 (69.2)        |         | 22 (84.6)       | 4 (15.4)        |         |
| >2500gm                         | 84 (47.5)       | 93 (52.5)        |         | 170 (96)        | 7 (4)           |         |
| <b>CMD</b>                      |                 |                  |         |                 |                 | 0.699   |
| SRQ $\leq$ 7 (Good)             | 62 (50.8)       | 60 (49.2)        | 0.053   | 116 (95.1)      | 6 (4.9)         |         |
| SRQ $\geq$ 8 (Poor)             | 30 (37)         | 51 (63)          |         | 76 (93.8)       | 5 (6.2)         |         |

Source: Karki & Bhandari, 2025

*Note.* CMD = Common Mental Disorder; SRQ = Self-Reporting Questionnaire.  $p < 0.05$  indicates statistical significance. Percentages may not total exactly 100 due to rounding.

Table 2 illustrates the relationship of different health features of children to the prevalence of stunting (height-for-age). In general, no statistically significant relationships ( $p > 0.05$ ) were identified between stunting and the considered child health factors. Nevertheless, a few variables showed the trend of getting close to the statistical significance. The association of the stunted rates was stronger with the headache group (69%) compared to the no-headache group (52.3%) children, as reflected by the  $p$ -value of 0.095. The pattern of the association was also clear for respiratory infections, with 64.1 percent of infected children being stunted compared to 50.4 percent among non-infected ones ( $p = 0.068$ ). The comparison of low birth weight ( $<2500\text{g}$ ) children to normal birth weight children revealed that the former had a more considerable percentage of stunting (69.2%) than the latter (52.5%), however, there was no statistical significance ( $p = 0.110$ ) found. One of the major factors that showed a near borderline association with maternal mental health measured by SRQ was common mental disorder (CMD) ( $p = 0.053$ ). The proportion of stunted children whose mothers had poor mental health ( $\text{SRQ} \geq 8$ ) was 63%, while the stunting rate of children whose mothers had good mental health was only 49.2%. However, the odds for these variables have not attained significant levels statistically, the interactions that have been noticed signal probable links between the occurrence of diseases in children, getting born with a low weight, the mental health of the mother, and the condition of being stunted. Such data indicate that substantially more cases might be necessary to make these connections clear.

Very low birth weight ( $<2500\text{g}$ ) is the only factor that is significantly correlated with wasting ( $p=0.016$ ). Infants born with a low-birth-weight experience almost four times the prevalence of wasting (15.4%) in comparison to a normal birth weight (4%). These results position birth weight as the main factor leading to acute malnutrition in this population. At the same time, it also suggests that common childhood diseases may become a source of malnutrition but cannot independently determine the risk of wasting. The findings highlight the necessity of solving the problem of low birth weight through interventions in the prenatal period if acute malnutrition is to be prevented.

#### **Association Between Sociodemographic Factors and Weight for Age (Underweight)**

Underweight is an indicator of overall malnutrition. It is likely to be influenced by household factors such as the mother's occupation, family income, and place of living. Knowledge of these connections aids in focusing the socioeconomic environments that lead to the occurrence of nutritional deficiencies in children.

**Table 3**

Association Between Sociodemographic Factors and Underweight

| Variables                 | Normal n (%) | Underweight n (%) | P-Value |
|---------------------------|--------------|-------------------|---------|
| <b>Age of the mother</b>  |              |                   |         |
| 19-29                     | 141 (93.4)   | 10 (6.6)          | 0.793   |
| 30-39                     | 48 (92.3)    | 4 (7.7)           |         |
| <b>Ethnicity</b>          |              |                   | 0.052   |
| Dalit                     | 42 (22.2)    | 0 (0.00)          |         |
| Jana Jati                 | 79 (41.8)    | 10 (71.4)         |         |
| Baramin/Chhetri           | 68 (36)      | 4 (28.6)          |         |
| <b>Family Type</b>        |              |                   | 0.467   |
| Nuclear                   | 100 (94.3)   | 6 (5.7)           |         |
| Joint/Extended            | 89 (91.8)    | 8 (8.2)           |         |
| <b>Mother Education</b>   |              |                   | 0.297   |
| Primary                   | 65 (90.3)    | 7 (9.7)           |         |
| Secondary                 | 80 (93)      | 6 (7)             |         |
| Higher Secondary/Above    | 44 (97.8)    | 1 (2.2)           |         |
| <b>Husband Education</b>  |              |                   | 0.256   |
| Primary                   | 39 (90.7)    | 4 (9.3)           |         |
| Secondary                 | 82 (91.9)    | 8 (8.9)           |         |
| Higher Secondary/Above    | 68 (97.1)    | 2 (2.9)           |         |
| <b>Mother Occupation</b>  |              |                   | 0.029   |
| Job                       | 35 (100)     | 0 (0)             |         |
| Agriculture               | 124 (89.9)   | 14 (10.1)         |         |
| Business                  | 30 (100)     | 0 (0)             |         |
| <b>Husband Occupation</b> |              |                   | 0.166   |
| Job                       | 48 (96)      | 2 (4)             |         |
| Agriculture               | 25 (92.6)    | 2 (7.4)           |         |
| Business                  | 32 (100)     | 0 (0)             |         |
| Foreign Employment        | 84 (89.4)    | 10 (10.6)         |         |
| <b>Residence</b>          |              |                   | 0.026   |
| Rural                     | 69 (35.5)    | 1 (7.1)           |         |
| Urban                     | 120 (63.5)   | 13 (92.9)         |         |
| <b>Income</b>             |              |                   | 0.310   |
| <50k                      | 13 (100)     | 0 (0.0)           |         |
| >50k                      | 176 (92.6)   | 14 (7.4)          |         |

Source: Karki &amp; Bhandari, 2025

Note.  $p < 0.05$  indicates statistical significance.

Table 3 details the relationship of the children's sociodemographic factors to their underweight status. Two variables were found to have their statistically significant associations with children being underweight ( $p < 0.05$ ), i.e., maternal occupation and residence. Among these, maternal occupation had a very significant association with underweight ( $p = 0.029$ ). Kids of moms that were in farming showed the most significant percentage of underweight status (10.1%), while

children of formal-job or business mothers showed zero cases of underweight. In addition, residence was a factor that had significant changes in children with underweight ( $p = 0.026$ ). Although there were a lot of respondents from rural areas, most of the children with underweight were living in urban areas, contributing to 92.9% of the cases. Besides, ethnicity had a near association that was close to statistically significant, ( $p = 0.052$ ), where the Jana Jati children constituted 71.4 percent of the underweight cases, while no underweight children were reported among Dalit groups. In fact, the better the educational level of parents, the lower was the prevalence of underweight, which was a protective trend though not statistically significant. These results indicate that maternal agricultural work and urban living may be the two major factors leading to children underweight in this community.

#### **Child and Maternal Factors Associated with Weight for Age (Underweight)**

Diseases of the child such as infections, low birth weight, and poor mental health of the mother may affect a child's underweight condition. Finding out the relationships between these factors will help to understand which of the two - health problems or care-giving challenges are the main causes of insufficient weight gain.

**Table 4**  
Association Between Child and Maternal Factors and Underweight

| Variables                       | Underweight  |                   | P-value |
|---------------------------------|--------------|-------------------|---------|
|                                 | Normal n (%) | Underweight n (%) |         |
| <b>Sleep Disturbance</b>        | Normal       | Underweight       | p value |
| No                              | 147 (94.8)   | 8 (5.2)           | 0.080   |
| Yes                             | 42 (87.5)    | 6 (12.5)          |         |
| <b>Headache</b>                 |              |                   | 0.018   |
| No                              | 165 (94.8)   | 9 (5.2)           |         |
| Yes                             | 24 (82.8)    | 5 (17.2)          |         |
| <b>Gastrointestinal Problem</b> |              |                   | 0.034   |
| No                              | 162 (94.7)   | 9 (5.3)           |         |
| Yes                             | 27(84.4)     | 5 (15.6)          |         |
| <b>Respiratory Infection</b>    |              |                   | 0.006   |
| No                              | 134 (96.4)   | 5 (3.6)           |         |
| Yes                             | 55 (85.9)    | 9 (14.1)          |         |
| <b>Birth Weight</b>             |              |                   | 0.000   |
| <2500gm                         | 20 (76.9)    | 6 (23.1)          |         |
| >2500gm                         | 169(95.5)    | 8 (4.5)           |         |
| SRQ $\geq 8$ (Poor)             | 70 (86.4)    | 11 (13.6)         |         |

Source: Karki & Bhandari, 2025

Note. CMD = Common Mental Disorder; SRQ = Self-Reporting Questionnaire.  $p < 0.05$  indicates statistical significance. Percentages may not total exactly 100 due to rounding.

Table 4 illustrates a number of significant ( $p < 0.05$ ) correlations between child health factors and the underweight condition. The most potent indicator was low birth weight (<2500g), whereby

infants who were affected had a 23.1 percent underweight prevalence compared to 4.5 percent in normal birth weight infants ( $p<0.001$ ). Maternal common mental disorders (CMD) have also significantly increased the risk (13.6% underweight vs 2.5% in non-CMD mothers,  $p = 0.02$ ). Besides that, children with current health problems have also been found to be at high risk. For example, respiratory infections (14.1% vs 3.6%,  $p=0.006$ ), gastrointestinal problems (15.6% vs 5.3%,  $p=0.034$ ), and headaches (17.2% vs 5.2%,  $p=0.018$ ). The presence of a child under six months in the family almost made the underweight risk three times higher (28.6% vs 7.4%,  $p=0.035$ ). Those results emphasize that biological factors (birth weight), current illnesses and maternal mental health are the main determinants of the underweight condition, therefore the suggestion of interventions should be to solve the medical as well as psychosocial aspects of malnourished children.

### Bivariate Analysis

Bivariate analysis looks at the strength of the relationships between main variables and nutritional outcomes. It is instrumental in figuring out the factors such as sociodemographic, child-related, or health-related, that are most strongly linked to stunting, wasting, or underweight. The present analysis serves as an initial source of insights to be explored further in multivariate modeling and targeted intervention planning.

**Table 5**  
Bivariate Analysis of Associated Factor and Nutritional Status of Children

| Variables                      | Stunting                |         | Underweight             |         | Wasting                 |         |
|--------------------------------|-------------------------|---------|-------------------------|---------|-------------------------|---------|
|                                | COR (95%)               | P-Value | COR (95%)               | P-Value | COR (95%)               | P-Value |
| <b>Ethnicity</b>               |                         |         |                         |         |                         |         |
| Dalit                          | 1.191<br>(0.583-2.434)  | 0.631   | 2.152<br>(0.646-7.173)  | 0.212   | 3.457<br>(0.710-16.819) | 0.124   |
| Jana Jati                      | 0.501<br>(0.198-1.270)  | 0.145   | 0.000<br>(0.00-0.00)    | 0.998   | 0.854<br>(0.075-9.708)  | 0.899   |
| Brahmin/Chhetri                | ref                     |         | Ref                     |         | ref                     |         |
| <b>Husband Occupation</b>      |                         |         |                         |         |                         |         |
| Job                            | 0.409<br>(0.175-0.953)  | 0.038   | 0.350<br>(0.074-1.664)  | 0.187   | 0.394<br>(0.082-1.896)  | 0.717   |
| Agriculture                    | 0.656<br>(0.262-1.641)  | 0.367   | 0.672<br>(0.138-3.271)  | 0.622   | 0.000<br>(0.0-0.0)      | 0.998   |
| Business                       | 0.452<br>(0.177-1.1641) | 0.096   | 0.00<br>(0.000-0.00)    | 0.998   | 0.000<br>(0.0-0.0)      | 0.998   |
| Foreign Employment             | ref                     |         | Ref                     |         | ref                     |         |
| <b>Residence</b>               |                         |         |                         |         |                         |         |
| Rural                          | 1.074<br>(0.512-2.251)  | 0.851   | 7.352<br>(0.897-60.252) | 0.063   | 2.468<br>(0.518-11.749) | 0.257   |
| Urban                          | ref                     |         | Ref                     |         | ref                     |         |
| <b>Total Children</b>          |                         |         |                         |         |                         |         |
| Less than two                  | ref                     |         | Ref                     |         | ref                     |         |
| More than two                  | 1.350<br>(0.569-3.202)  | 0.496   | 0.984<br>(0.262-3.695)  | 0.982   | 0.798<br>(0.165-3.814)  | 0.773   |
| <b>Total Infant&lt;6 Month</b> |                         |         |                         |         |                         |         |
| No                             | ref                     |         | Ref                     |         | ref                     |         |

|                                    |                         |       |                         |       |                         |       |
|------------------------------------|-------------------------|-------|-------------------------|-------|-------------------------|-------|
| One                                | 9.837<br>(2.197-44.045) | 0.003 | 3.579<br>(1.023-12.526) | 0.046 | 1.810<br>(0.366-8.943)  | 0.467 |
| <b>Total School Going Children</b> |                         |       |                         |       |                         |       |
| Less than two                      | ref                     |       | Ref                     |       | ref                     |       |
| More than two                      | 2.933<br>(0.667-12.909) | 0.155 | 0.962<br>(0.117-7.896)  | 0.971 | 1.271<br>(0.152-10.660) | 0.825 |
| <b>Headache</b>                    |                         |       |                         |       |                         |       |
| Yes                                | 0.493<br>(0.213-1.144)  | 0.100 | 0.466<br>(0.111-1.956)  | 0.297 | 0.418<br>(0.104-1.677)  | 0.218 |
| No                                 | ref                     |       | Ref                     |       | ref                     |       |
| <b>Respiratory Infection</b>       |                         |       |                         |       |                         |       |
| Yes                                | 0.569<br>(0.309-1.047)  | 0.70  | 0.303<br>(0.082-1.123)  | 0.074 | 0.532<br>(0.156-1.814)  | 0.313 |
| No                                 | ref                     |       | Ref                     |       | ref                     |       |
| <b>Birth Weight</b>                |                         |       |                         |       |                         |       |
| <2500gm                            | 2.032<br>(0.840-4.917)  | 0.116 | 6.337<br>(1.996-20.126) | 0.002 | 4.416<br>(1.196-16.304) | 0.026 |
| >2500gm                            | ref                     |       | Ref                     |       | ref                     |       |
| <b>CMD</b>                         |                         |       |                         |       |                         |       |
| Good                               | ref                     |       | Ref                     |       | ref                     |       |
| Poor                               | 1.757<br>(0.990-3.118)  | 0.054 | 6.233<br>(1.681-23.109) | 0.006 | 1.272<br>(0.375-4.315)  | 0.7   |

Source: Karki & Bhandari, 2025

Note. COR = Crude Odds Ratio; CI = Confidence Interval; CMD = Common Mental Disorder. Ref = Reference category.  $p < 0.05$  indicates statistical significance.

Job holder's children were more likely to have less stunting than foreign employment COR (0.409, 95% CI (0.175-0.953). Having infant (<6month) likely to stunting than no infant (COR=9.837, 95% CI (2.197-44.045). Similarly having infant (<6month) likely were around 4 times more underweight than no infant (COR=3.579, 95% CI (1.023-12.526). The children below less than 2500gm were 6 times likely to have underweight than more than 2500gm birth weight. Similarly, those mothers who had the cases of common mental disorder were 6 times more likely to have underweight their children than non-cases of common mental disorder; COR=6.233, 95% CI (1.681-23.109). Lastly, the children below less than 2500gm were 4 times more likely to have wasting than 2500gm birth weight (COR=4.416, 95% CI (1.196-16.304).

### Discussion

The present study identified a high prevalence of common mental disorders among mothers, with almost 40 percent reporting mental health issues. This result is similar with the previous study conducted in in Ethiopia (39.4%) but lower than the rate reported in Bangladesh (49%) (Tesfaye et al., 2010). This is similar to what is found in lower- and middle-income regions of the world, and particularly the maternal common mental disorders associated with socio economic stressors, caregiving responsibilities, and having little or no access to mental health support (Surkan et al., 2011; WHO, 2014). Maternal CMD has been associated with an increased risk of child stunting and underweight in several studies conducted in countries like Bangladesh and Vietnam (Nguyen, et. al. 2014). This study found that undernutrition among children was chronic, as evidenced by

stunting. It is the most common form of undernutrition from which more than half of the children suffered. This pattern aligns with the 2024 Joint Child Malnutrition Estimates by UNICEF, WHO, and the World Bank. It is reported that approximately 150.2 million children under the age of five around 23.2% were stunted globally, reflecting the ongoing challenge of chronic undernutrition across regions (UNICEF, WHO, & World Bank, 2025).

The stunting prevalence among children regarding relative ethnicity, the father's occupation, and living in rural areas, all point to obvious inequalities in the population. It has been documented in other studies from around the world which show that chronic undernutrition is a clear byproduct of socioeconomic disadvantage (Black et al, 2013). Maternal CMD most likely accounted in children of mothers with poor mental health. Children of mothers diagnosed with CMD, however, showed a greater prevalence of stunting, despite CMD not being statistically significant in CMD-related stunting, which follows previous findings where the caregiver's depression negatively impacts the child's growth due to the caregiver's psychosocial inadequacy in child feeding and caregiving processes (Rahman et al., 2004; Surkan et al., 2011). It was also considerably lower and both under wasting and low birth weight of the child were the only significant association, reinforcing the previous evidence that acute malnutrition is most correlated with maternal prenatal and perinatal characteristics, not with socioeconomic conditions of the community where the child was born. Prior studies focused on the fact that maternal nutrition and antenatal care is fundamental to low birth weight and subsequent wasting (Victora, et al., 2010).

In 2024, 42.8 million children under five were globally wasted (6.6%), which also depicts the ongoing child malnutrition problem in the world (UNICEF, WHO & World Bank, 2025). In this study, maternal occupation, place of residence, childhood sickness, low birth weight, and maternal CMD showed significant underweight. The findings of this study showed a strong association between maternal CMD and children underweight, have supported previous studies showing poor mental health of mothers that increases risk in children in undernutrition through poor feeding, less health seeking efforts, and not being emotionally present (Patel, et al., 2004; Atif, et al., 2015).

Overall, the findings support existing global evidence that child undernutrition is the result of a complex interaction between biological, sociodemographic, and psychosocial factors. In line with WHO and UNICEF recommendations, the study highlights the necessity of integrated maternal mental health and nutrition interventions to improve child growth and development outcomes.

### **Conclusion**

This research indicates an essential link concerning the mental health status of mothers in relation to the health and nutrition of children under five years in Lamkichuha Municipality, Kailali. Mental health issues pertaining to mothers are highly prevalent with over 40 percent of the sampled mothers having common mental disorders (CMD). The nutrition situation of children in the study area was found to be very poor in that over 50 percent of children were stunted, 7 percent were underweighted, and 5 percent were wasted. This showed both chronic and acute malnutrition. The research results show that CMD of mothers are strongly correlated with underweight children; while stunting and wasting were a result of a mixture of issues. These issues include low birth weight, having an infant less than 6 months, occupation of the parents, and the health status of the child in question, who suffered from diarrhea and respiratory infections. The strong link that low

birth weight has with wasting and underweight, reflects the need to promote care intervention prior to birth. Stunting and underweight were also associated with some of the socio demographic factors like ethnicity, parental occupation, and place of residence which demonstrates that there are underlying structural and socio-economic factors that impact the child's nutrition. Overall, the research indicates a need for integrated intervention programs that take into account the mental health of mothers and nutrition of the children in a holistic way. Psychosocial health of mothers, malnutrition and socioeconomic factors are integrated.

## References

Alom, J., Quddus, M. & Islam, M. A. (2012). *Nutritional status of under-five children in Bangladesh: a multilevel analysis.* <https://pubmed.ncbi.nlm.nih.gov/22716955/>

Atif, N., Lovell, K., & Rahman, A. (2015). *Maternal mental health: The missing "m" in the global maternal and child health agenda.* *Seminars in Perinatology*, 39(5), 345–352. <https://doi.org/10.1053/j.semperi.2015.06.007>

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427–451. <https://pubmed.ncbi.nlm.nih.gov/23746772/>

Harpham, T., Huttly, S., De Silva, M. J., & Abramsky, T. (2005). Maternal mental health and child nutritional status in four developing countries. *Journal of Epidemiology & Community Health*, 59(12), 1060–1064. [https://pmc.ncbi.nlm.nih.gov/articles/PMC1732980/?utm\\_source=chatgpt.com](https://pmc.ncbi.nlm.nih.gov/articles/PMC1732980/?utm_source=chatgpt.com)

Karki, L. S., & Bhandari, T. B. (2025). *Association of maternal mental health and child nutritional status: A study in Lamkichuha Municipality of Kailali* (Mini research report). Research Management Cell, Far-Western University, Tikapur Multiple Campus, Kailali, Nepal. <https://tikapur.fwu.edu.np/assets/uploads/downloads/download-1756459785-sms.pdf>

Khan, A.M. (2014) *Association of Maternal Mental Health with Child Nutritional Status* <https://www.researchgate.net/publication/366580573>

Lamichhane, S. (2016). *Factors associated with post-partum depression among mothers attending Janaki Medical College and Teaching Hospital*, Dhanusha, Janakpur. [https://opac.nhrc.gov.np/bib/2528?utm\\_source=chatgpt.com](https://opac.nhrc.gov.np/bib/2528?utm_source=chatgpt.com)

Lancet (2013). *Executive Summary of The Lancet Maternal and Child Nutrition Series.* [https://thousanddays.org/wp-content/uploads/Lancet-2013-Executive-summary.pdf?utm\\_source=chatgpt.com](https://thousanddays.org/wp-content/uploads/Lancet-2013-Executive-summary.pdf?utm_source=chatgpt.com)

Ministry of Health and Population (2022). *Nepal Demographic and Health Survey, 2022.* [https://dhsprogram.com/pubs/pdf/FR379/FR379.pdf?utm\\_source=chatgpt.com](https://dhsprogram.com/pubs/pdf/FR379/FR379.pdf?utm_source=chatgpt.com)

Nasreen, H. E., Kabir, Z. N., Forsell, Y., & Edhborg, M. (2007). *Maternal depressive symptoms and infant growth in rural Bangladesh.* *Social Psychiatry and Psychiatric Epidemiology*, [https://pmc.ncbi.nlm.nih.gov/articles/PMC2714399/?utm\\_source=chatgpt.com](https://pmc.ncbi.nlm.nih.gov/articles/PMC2714399/?utm_source=chatgpt.com)

Nguyen, P. H., Saha, K. K., Ali, D., Menon, P., Manohar, S., Mai, L. T., Rawat, R., & Ruel, M. T. (2014). Maternal mental health is associated with child undernutrition and illness in

Bangladesh, Vietnam and Ethiopia. *Public Health Nutrition*. [https://pmc.ncbi.nlm.nih.gov/articles/PMC10282455/?utm\\_source=chatgpt.com](https://pmc.ncbi.nlm.nih.gov/articles/PMC10282455/?utm_source=chatgpt.com)

Rahman, A., Iqbal, Z., Bunn, J., Lovel, H., & Harrington, R. (2004). Impact of maternal depression on infant nutritional status and illness: A cohort study. [https://jamanetwork.com/journals/jamapsychiatry/fullarticle/482059?utm\\_source=chatgpt.com](https://jamanetwork.com/journals/jamapsychiatry/fullarticle/482059?utm_source=chatgpt.com)

Rahman, M. M., Abe, S. K., Kanda, M., Narita, S., Bilano, V., Ota, E., & Mori, R. (2018). Maternal anemia and risk of adverse birth and health outcomes in low- and middle-income countries: Systematic review and meta-analysis. [https://kclpure.kcl.ac.uk/portal/en/publications/maternal-anemia-and-risk-of-adverse-birth-and-health-outcomes-in-/?utm\\_source=chatgpt.com](https://kclpure.kcl.ac.uk/portal/en/publications/maternal-anemia-and-risk-of-adverse-birth-and-health-outcomes-in-/?utm_source=chatgpt.com)

Regmee, J., Shrestha, S., & Khanal, S. (2015). Nutritional status and associated factors among children under five years of age in Nepal. *Journal of Nepal Health Research Council*, 13(30), 123–129.

Singh, A. S., & Masuku, M. B. (2014). *Sampling techniques & determination of sample size in applied statistics research: An overview*. Department of AEM, Faculty of Agriculture, University of Swaziland. [https://ijecm.co.uk/wp-content/uploads/2014/11/21131.pdf?utm\\_source=chatgpt.com](https://ijecm.co.uk/wp-content/uploads/2014/11/21131.pdf?utm_source=chatgpt.com)

Stewart, C. P., Iannotti, L., Dewey, K. G., Michaelsen, K. F., & Onyango, A. W. (2013). Contextualising complementary feeding in a broader framework for stunting prevention. *Maternal & Child Nutrition*, 9(S2), 27–45. <https://pubmed.ncbi.nlm.nih.gov/24074316/>

Surkan, P. J., Kennedy, C. E., Hurley, K. M., & Black, M. M. (2011). *Maternal depression and early childhood growth in developing countries: systematic review and meta-analysis*. Bulletin of the World Health Organization, 89(8), 607-615. doi:10.2471/BLT.11.088187 <https://pubmed.ncbi.nlm.nih.gov/21836759/>

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). *The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation*. *Health and Quality of Life Outcomes*, 5, 63. <https://doi.org/10.1186/1477-7525-5-63>

Tesfaye, M., Hanlon, C., Wondimagegn, D., & Alem, A. (2010). Detecting postnatal common mental disorders in Addis Ababa, Ethiopia: Validation of the Edinburgh Postnatal Depression Scale and the Self-Reporting Questionnaire. *BMC Psychiatry*, 10, 248. <https://doi.org/10.1186/1471-244X-10-248>.

United Nations Children's Fund. (2023). *The state of the world's children 2023*. UNICEF. [https://www.unicef.org/reports/state-worlds-children-2023?utm\\_source=chatgpt.com](https://www.unicef.org/reports/state-worlds-children-2023?utm_source=chatgpt.com)

UNICEF. (Annual Report 2023). [https://www.unicef.org/media/157491/file/UNICEF%20Annual%20report%202023%20EN.pdf?utm\\_source=chatgpt.com](https://www.unicef.org/media/157491/file/UNICEF%20Annual%20report%202023%20EN.pdf?utm_source=chatgpt.com)

UNICEF, WHO, & World Bank. (2025). *Joint Child Malnutrition Estimates 2025 edition: Levels and trends in child malnutrition*. [https://www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-child-malnutrition-estimates/latest-estimates?utm\\_source=chatgpt.com](https://www.who.int/teams/nutrition-and-food-safety/monitoring-nutritional-status-and-food-safety-and-events/joint-child-malnutrition-estimates/latest-estimates?utm_source=chatgpt.com)

Victora, C. G., de Onis, M., Hallal, P. C., Blössner, M., & Shrimpton, R. (2010). *Worldwide timing of growth faltering: Revisiting implications for interventions*. Pediatrics, 125(3), e473–e480. <https://doi.org/10.1542/peds.2009-1519>

WHO (1994). *A user's guide to the Self-Reporting Questionnaire (SRQ)*. Geneva: WHO. <https://iris.who.int/items/b4fe7cc6-e87d-4b3c-800f-82d977e331ca>

WHO. (2006). *WHO child growth standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development*. [https://www.who.int/publications/i/item/924154693X?utm\\_source=chatgpt.com](https://www.who.int/publications/i/item/924154693X?utm_source=chatgpt.com)

WHO. (2008). Maternal mental health and child health and development in low- and middle-income countries. <https://iris.who.int/server/api/core/bitstreams/f0545909-15a4-494b-a73b-45f1204eb5cc/content>

WHO. (2009). *WHO child growth standards and the identification of severe acute malnutrition in infants and children*. [https://www.who.int/publications/i/item/9789241598163?utm\\_source=chatgpt.com](https://www.who.int/publications/i/item/9789241598163?utm_source=chatgpt.com)

WHO. (2014). *Global nutrition targets 2025: Policy brief series*. [https://www.who.int/publications/i/item/WHO-NMH-NHD-14.2?utm\\_source=chatgpt.com](https://www.who.int/publications/i/item/WHO-NMH-NHD-14.2?utm_source=chatgpt.com)

WHO. (2023). [https://www.who.int/teams/mental-health-and-substance-use/promotion-prevention/maternal-mental-health?utm\\_source=chatgpt.com](https://www.who.int/teams/mental-health-and-substance-use/promotion-prevention/maternal-mental-health?utm_source=chatgpt.com)