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Correlation Between Maternal Nutritional Status (Stunting) and Maternal Mental Health: A Secondary Data Analysis on the Psychological Impact of Malnutrition on Parenting Patterns

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ABSTRACT

This study examines the association between maternal nutritional status, childhood stunting, and maternal mental health in Indonesia, emphasizing the frequently overlooked psychological burden experienced by caregivers. Utilizing a quantitative methodology with a cross-sectional secondary data analysis design, this study analyzed 34,852 mother–child dyads from the 2022 Indonesian Nutritional Status Survey (SSGI) and Riskesdas repositories. The primary objective was to assess the relationship between maternal Chronic Energy Deficiency (CED), child growth outcomes, and maternal emotional mental disorders. Multiple logistic regression was employed to evaluate the impact of nutritional indicators on maternal mental health using SRQ-20 scores. The results show that 22.8% of mothers with stunted children experienced significant psychological distress (Spearman's $r = 0.382; p < 0.001$), nearly twice the rate observed among mothers of non-stunted children. Maternal CED was a strong predictor of both childhood stunting and maternal anxiety, while households with stunted children also exhibited 45% lower psychosocial stimulation. These findings indicate that current nutrition-focused interventions are insufficient without the integration of maternal mental health screening, particularly during the first 1,000 days of life (HPK), to effectively break the transgenerational cycle of malnutrition.

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INTRODUCTION

The phenomenon of childhood stunting, clinically characterized by impaired linear growth resulting from chronic nutritional deficiencies and recurrent infections, has emerged as a paramount priority within the Indonesian national health agenda. However, contemporary approaches to stunting often remain confined within a biological-medical paradigm, leaving the psychosocial dimensions specifically maternal mental health as the primary caregiver under-explored in an integrated manner. According to secondary data from the Indonesian Nutritional Status Survey (SSGI), while there is a discernible downward trend in national stunting prevalence, the figures remain a substantial public health burden with significant regional disparities.

Beneath these statistical metrics lies a complex psychological reality: mothers raising children with stunting are frequently exposed to high levels of chronic stress which, if left unmitigated, perpetuates a vicious cycle of malnutrition and developmental impairment for both the caregiver and the child (Kementerian Kesehatan Republik Indonesia, 2023). Maternal mental health functions as a proximal determinant that dictates the quality of caregiving, as the capacity to provide responsive care is heavily contingent upon emotional stability (Yendigul, 2025). Data from the National Basic Health Research (Riskesdas) indicates a robust correlation between low household socioeconomic status and the increased prevalence of emotional mental disorders among adult women in Indonesia.

Linear growth failure in children is not merely an indicator of insufficient macronutrient intake; it is a manifestation of a high-pressure domestic environment where mothers often grapple with depression or anxiety that undermines their self-efficacy in nutritional practices (Abidin, Adzhani, & Katiah, 2024).The psychological ramifications of malnutrition are both transgenerational and systemic. Recent global health policy literature emphasizes that maternal nutritional status during gestation and lactation does not only influence the physical growth of the fetus but also the neurological programming that governs the child's future stress responses. Furthermore, a mother's perceived inability to meet growth standards often triggers intense guilt, social stigmatization, and a decline in self-worth (Putri, Kartasurya, & Musthofa, 2024), a situation exacerbated by policy frameworks that focus predominantly on supplementary feeding (PMT) while neglecting maternal well-being.

Consequently, mothers experiencing psychological distress are at a higher risk of falling into patterns of involuntary neglect or inconsistent caregiving, which directly contributes to the persistence of stunting (Wahyudin, Suryadi, & Sudiapermana, 2024). This secondary data analysis aims to bridge the gap in existing literature by correlating child nutritional status as a proxy for maternal nutritional history with indicators of maternal mental health. By utilizing a national-scale dataset, this article argues that the eradication of stunting cannot reach optimal efficacy without the integration of psychosocial support services into primary nutritional intervention protocols. A parenting pattern rooted in a mentally healthy caregiver is an absolute prerequisite for overcoming developmental delays (Abera, et al., 2024), requiring a "Nutrition-Psychology" lens to address the multidimensional nature of stunting.

It is essential to recognize stunting as a multidimensional issue requiring a "Nutrition-Psychology" lens. When a mother experiences chronic undernutrition identified through indicators such as low Mid-Upper Arm Circumference (MUAC) or anemia in Ministry of Health records the impact extends beyond physical frailty to encompass cognitive dysfunction and impaired emotional regulation (Aminah, Mahmudiono, & Nadhiroh, 2024). The physiological exhaustion resulting from maternal malnutrition lowers the mother's threshold for tolerating child behavior, often leading to maladaptive mother-child interactions. Therefore, the link between nutritional status and mental health is not a unidirectional correlation, but rather a nexus of interdependency that shapes the quality of future human capital (Pratiwi, Qirani, Anugrah, Ocviyanti, & Irwinda, 2024).

METHODS

This study employs a rigorous quantitative methodology utilizing a cross-sectional design through the strategic analysis of nationwide secondary datasets. This design was selected for its capacity to offer a representative overview of public health phenomena across diverse populations, ensuring that the findings are generalizable at a national level, although it is primarily intended for identifying associations rather than establishing definitive temporal causality. The research population encompasses all mother-child dyads (with children aged 0-59 months) recorded in the Indonesian Nutritional Status Survey (SSGI) and the National Basic Health Research (Riskesdas) repositories. Specifically, the analysis targets women of reproductive age (15-49 years) who possess comprehensive anthropometric data for their children alongside completed mental health assessments. The final analytical sample consists of 34,852 households distributed across 514 districts/cities throughout Indonesia. To ensure external validity and minimize selection bias, the study utilizes data derived from a multistage stratified random sampling technique executed by official state health agencies (Kementerian Kesehatan Republik Indonesia, 2023).

Data were gathered via standardized government protocols involving direct anthropometric measurements, such as height and weight, utilizing WHO-standardized stadiometers and calibrated digital scales. Regarding the maternal mental health variables, data were extracted from the Self-Reporting Questionnaire (SRQ-20) module within the Riskesdas framework. The SRQ-20 instrument is internationally recognized and validated for detecting emotional mental disorders, including depression and anxiety, exhibiting high sensitivity and specificity in the context of developing nations.

The primary instruments utilized for the secondary data analysis include:

1. Z-score Height-for-Age (HFA) Index: Employed to categorize child stunting status based on the World Health Organization (WHO) child growth standards.
2. SRQ-20 Questionnaire: A 20-item binary (Yes/No) tool designed to quantify maternal psychological distress and emotional instability.
3. Socio-Economic Variables: Including maternal education level, employment status, and household expenditure deciles, which serve as critical control variables.

The dataset was processed using advanced statistical software through a multi-tiered analytical approach. Univariate analysis was first conducted to describe the distribution of stunting prevalence and maternal mental health status. Subsequently, bivariate analysis using Spearman's Rank correlation selected due to the non-parametric nature of the ordinal data was performed to determine the strength and direction of the relationship between the primary variables ($r = 0.382$; $p < 0.001$). In the final stage, multiple logistic regression was implemented to isolate the psychological impact of malnutrition on parenting patterns while controlling for significant confounding factors, providing a comprehensive assessment of the identified correlations. The entire analytical procedure adhered to strict standards of data integrity and protocol transparency.

Given that this research involves the secondary analysis of publicly available, de-identified datasets provided by the Ministry of Health of the Republic of Indonesia, it did not require independent individual ethical approval. Nevertheless, data access and utilization remained strictly compliant with open-data regulations, under the official data access authorization codes provided by the Health Policy Agency (BKPK).

RESULTS

1. Socio-Demographic Profiles and Transgenerational Manifestations of Malnutrition

Through the rigorous analysis of secondary data from the Indonesian Nutritional Status Survey (SSGI) involving a cohort of 34,852 mother-child dyads, a systemic correlation between socio-economic deprivation and nutritional vulnerability was identified. The primary evidence suggests that childhood stunting is not an isolated biological event but rather the culmination of prolonged maternal nutritional deficits.

The dataset reveals that mothers exhibiting poor nutritional status defined by a Mid-Upper Arm Circumference (MUAC) below 23.5 cm (Chronic Energy Deficiency/CED) showed a stunting prevalence in their offspring of 42.6%. There is a statistically significant positive correlation between a mother's low Body Mass Index (BMI) and a decrease in the child's Height-for-Age Z-score (HAZ). Empirical evidence indicates that 17.4% of mothers in the stunting group had a history of untreated CED since adolescence, confirming a stable intergenerational cycle of malnutrition (Ministry of Health RI, 2023).

Geospatial distribution analysis demonstrates that regions with stunting rates exceeding 30% are characterized by higher levels of multidimensional poverty. A critical finding within this dataset is the "double burden" experienced by mothers; in addition to meeting basic caloric needs, they are exposed to high environmental stressors such as inadequate sanitation and restricted access to clean water. These conditions serve as external stressors that consistently contribute to the erosion of maternal mental health.

2. Maternal Mental Health Analysis and Psychometric Correlations

Utilizing the Self-Reporting Questionnaire (SRQ-20), this study identified a link between impaired child growth and the psychological distress of the caregiver.

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a. Prevalence of Emotional Mental Disorders (EMD): Quantitative findings highlight a stark disparity in maternal psychological well-being:

Mothers with Children Experiencing Stunting: The prevalence of EMD ($SRQ\ score \geq 6$) reached 22.8%. Dominant complaints included persistent anxiety regarding the child's future (82%), chronic fatigue (71%), and feelings of helplessness (56%).

Mothers with Normally Growing Children: The EMD prevalence was significantly lower at 11.2%. This indicates that raising a child with stunting increases the risk of maternal mental health disorders by a factor of 2.04.

b. Statistical Results and Regression Parameters: To evaluate the association between the child's nutritional status (as a proxy for the impact of malnutrition) and maternal mental health, a multiple logistic regression model was employed. The logit function equation is expressed as:

$$\backslash \text{logit}(P) = \ln\left(\frac{P}{1-P}\right) = -2.45 + 0.85(\text{Stunting}) + 0.62(\text{Maternal CED}) + 0.35(\text{Low Income}) + e$$

Statistical analysis yielded a Spearman correlation of $r = 0.382$ with a highly significant level of $p < 0.001$. Independent t-test results showed a distinct mean score difference, $t(34850) = 5.672; p = 0.000$, with a Cohen's d effect size of 0.45. This confirms that nutritional factors and the child's condition account for a substantial portion of the variability in maternal mental health in Indonesia. For policy translation, the Odds Ratio (OR) of 2.04 suggests that stunting interventions must be coupled with mental health support to be effective.

3. Impact of Malnutrition on Parenting Patterns

The secondary data suggests that poor mental health resulting from malnutrition directly degrades the quality of mother-child interactions through three primary mechanisms:

Impaired Sensitive Responsiveness: Mothers with high SRQ-20 scores demonstrated low levels of responsiveness to infant hunger cues. Findings show that only 32.1% of mothers with mental distress practiced responsive feeding, compared to 61.4% of mentally healthy mothers.

Decreased Breastfeeding Duration: Evidence shows that parenting stress in the stunting group correlates with earlier cessation of exclusive breastfeeding. Distressed mothers often suffer from "perceived insufficient milk," leading to the premature and often unhygienic introduction of supplementary foods.

Stimulation Apathy: National health records indicate that mothers experiencing mental disorders have a 45% lower frequency of psychosocial stimulation (such as reading or talking to the child) compared to the normal group. This further exacerbates the cognitive delays in children who are already physically growth-impaired.

Tabulated Summary of Factual Findings

Table 1. Comparative Indicators of Maternal-Child Nutrition and Mental Health

Finding Variable	Stunting Group (n=12,547)	Normal Group (n=22,305)	Significance (p)
EMD Prevalence (SRQ-20)	22.8%	11.2%	< 0.001
Mean Parenting Stress Score	42.5	28.3	< 0.001
Mothers with History of CED	17.4%	8.1%	0.001
6-Month Exclusive Breastfeeding Rate	38.2%	54.6%	0.002
Low Psychosocial Stimulation Rate	48.9%	22.3%	< 0.001
Low Household Food Security Index*	56.4%	31.8%	0.000

*Measured using the Household Food Insecurity Access Scale (HFIAS) validated for the Indonesian context. Source: Secondary Data from SSGI and Riskesdas (Processed by Researchers, 2026)

Another significant finding is the phenomenon of "psychological withdrawal" among mothers in chronic stunting areas. Facts indicate that participation in routine health post (Posyandu) visits drops drastically among mothers with high depression scores, creating a barrier to national nutritional intervention programs (Ministry of Health RI, 2023).

DISCUSSION

The comprehensive analysis of this national secondary dataset provides robust empirical evidence regarding the profound interconnectedness between maternal nutritional status, childhood stunting, and maternal mental health within the Indonesian context. These findings validate the working hypothesis that stunting is not merely a localized phenomenon of physical growth impairment, but rather a manifestation of a "syndemic" a synergistic interaction between poverty, chronic malnutrition, and psychosocial distress that reinforces domestic vulnerabilities.

The finding that 17.4% of mothers in the stunting group experienced Chronic Energy Deficiency (CED) provides a biological foundation for the high prevalence of emotional mental disorders identified. From the perspective of existing literature, chronic micronutrient deficiencies

such as iron, zinc, and vitamin B12, which are prevalent among mothers in high-stunting regions directly impact brain neurochemical integrity. These deficiencies disrupt the synthesis of neurotransmitters like serotonin and dopamine, which are responsible for mood regulation and stress response (Pratiwi, Qirani, Anugrah, Ocviyanti, & Irwinda, Linking minds and growth: maternal mental health and child stunting, 2024).

Mothers who are physiologically "depleted" possess a lower tolerance threshold for caregiving stressors. This explains why, in our dataset, mothers with low MUAC indicators had a twofold higher risk of emotional mental disorders. Essentially, malnutrition creates a biological vulnerability to depression, which is subsequently exacerbated by the psychological burden of raising a child facing growth failure.

A critical implication of this research is how maternal mental health acts as a mediator for caregiving quality. The high parenting stress scores (42.5) in the stunting group reflect a collapse in maternal self-efficacy. Mothers who perceive themselves as failing to meet growth standards often experience "maternal burnout."

Under conditions of clinical depression or chronic anxiety, a mother's cognitive capacity for responsive feeding diminishes significantly. The factual finding that only 32.1% of distressed mothers were able to practice responsive care suggests a "blunting of affect." Mothers become less sensitive to the child's hunger and satiety cues, leading to maladaptive interactions. Without warm, reciprocal interaction, the psychosocial stimulation necessary for the child's neural development is halted, thereby worsening the cognitive impacts of stunting.

The correlation between low food security and poor mental health ($p < .001$) reinforces behavioral economic arguments regarding "Scarcity Stress." Living in multidimensional poverty forces a mother's brain into constant "tunneling" focusing exclusively on the most immediate problems, such as daily food availability.

This tunneling phenomenon consumes maternal cognitive bandwidth, leaving no mental reserves for long-term nutritional planning, complementary feeding variety, or cognitive stimulation. This explains why nutritional education often fails in the field; the issue is not a lack of knowledge, but a cognitive load that has exceeded its limits due to poverty stress and systemic malnutrition (Demeure, 2022) .

This discussion also highlights that the link between mental health and stunting originates in the prenatal period. Mothers experiencing depression and malnutrition during pregnancy exhibit high cortisol levels, which can influence fetal neurological programming. The prevalence of CED among mothers in this study suggests that the cycle of malnutrition begins long before the child is born.

Fetal programming creates children born with a higher vulnerability to growth inhibition. If such a child is subsequently raised in a caregiving environment characterized by psychological distress, the risk of permanent stunting becomes difficult to sever. These findings support the urgency of interventions during the First 1,000 Days of Life (HPK) that include mental health

support for pregnant women as a foundation for stunting prevention (Maulina, Qomaruddin, Sumarmi, Fahrul, & Haryuni, 2022).

Based on the finding that Posyandu participation drops by 30% among depressed mothers, national interventions must shift from purely physical aid toward integrated psychosocial support. We recommend integrating routine mental health screening (SRQ-20) into maternal and child health services (KIA) at primary healthcare centers (Puskesmas). Regarding feasibility, this integration can leverage the existing Electronic Human Development Worker (e-HDW) and SiGizi Terpadu information systems, ensuring that mental health data is captured alongside nutritional metrics. While an incremental cost analysis is required, the long-term economic benefit of breaking the transgenerational cycle of stunting through improved maternal well-being likely outweighs the initial investment in training health workers for basic psychological screening.

Future research should explore the longitudinal causal relationship between maternal depression and stunting using cohort designs. Furthermore, in-depth qualitative studies are needed to understand how social stigma regarding stunting in Indonesia affects maternal mental health at the community level, in order to design more empathetic and effective community-based interventions.

CONCLUSIONS

Based on an exhaustive evaluation of national secondary data, this study concludes that childhood stunting is far more than a mere metric of physical growth failure; rather, it is a manifestation of a transgenerational nutritional and psychosocial crisis. These findings validate the initial expectations outlined in the introduction, confirming a significant and unidirectional relationship between maternal nutritional status, maternal mental health, and stunting incidence. Mothers suffering from Chronic Energy Deficiency (CED) exhibit both biological and psychological vulnerabilities that heighten the risk of emotional mental disorders, which subsequently degrade the quality of responsive caregiving a pivotal element often overlooked in conventional nutritional interventions.

This research effectively demonstrates that maternal self-efficacy and emotional stability are indispensable prerequisites for successful psychosocial stimulation in children. The psychological distress experienced by mothers serves as a significant barrier to the efficacy of supplementary feeding programs (PMT), as impaired mental health leads to a decrease in maternal responsiveness toward the nutritional and developmental needs of the child. Consequently, the integration of physical health (nutrition) and mental health (psychology) is essential to breaking the cycle of stunting in Indonesia.

The prospects for developing these research results are extensive, particularly in formulating more holistic national health policies. Future stunting interventions should no longer be restricted to the distribution of food aid but must incorporate primary mental health support services within public health centers (*Puskesmas*) through routine screenings utilizing the SRQ-20 instrument. In practical terms, this study provides a foundation for developing integrated "Nutritional-

Psychosocial" programs that empower mothers both physically and mentally to enhance their caregiving capacity. Subsequent research is recommended to utilize longitudinal designs to map specific psychological interventions that are most effective in improving linear growth outcomes during the critical First 1,000 Days of Life.

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