

Family function, social support, postpartum depression, and maternal parenting practices: their impact on infant growth

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Abstract. The postpartum period presents challenges for mothers; requiring adaptation to new roles and family functions while emphasizing the importance of social support. This transition increases the risk of postpartum depression, affecting the mother's ability to care for her baby. During the first year of birth, a baby depends entirely on the mother to grow optimally. This research aimed to analyze the direct and indirect influence of family function, social support, and postpartum depression on infant growth. The study followed a cross-sectional design and involved 130 mothers of six-month-old babies as respondents in Bogor, selected through a random sampling, and was conducted from September to April 2024. The findings revealed that maternal health-nutrition parenting practices affect infant growth ($\beta = 0.320$). There was a negative correlation between social support and postpartum depression through family function ($\beta = -0.133$). The family function positively affected maternal parenting practices through postpartum depression ($\beta = 0.103$) and contributed to infant growth through postpartum depression ($\beta = 0.166$). The study emphasizes the significance of enhancing family function to reduce postpartum depression, enhance maternal parenting practices related to nutrition and healthcare, and support optimal infant growth while reducing the risk of stunting.

1 Introduction

Optimal child growth requires fulfilling the components of nurturing care, including good health, responsive parenting, early learning opportunities, and safety and security. However, 3.69% of children in Indonesia still receive inadequate care [1]. Many children experience neglect, child abuse, and insufficient nutrition. In fact, inadequate care, poor environmental and sanitation conditions, infectious diseases, and limited access to health services can place babies in critical situations, even causing death [2].

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In the first year of life, according to Neumann, babies tend to form attachment to their mother as the primary caregiver [3]. In accordance with Bowlby's opinion, the attachment of the mother-baby relationship from the beginning of birth is very important [4]. During this period, mothers face significant adjustments to accept the new role. This can cause stress, which is a significant disruptor. It can also lead to changes in the mother's parenting behavior [5], disturb the breastfeeding process, result in inadequate baby's nutritional requirements, unsuccessful exclusive breastfeeding, and delayed cognitive and emotional development of babies, increasing the risk of stunting [6,7]. Prolonged stress experienced by mothers after childbirth can develop into postpartum depression [8]. While mothers usually experience depression in the first six weeks after giving birth, and recover within six months, this condition can persist until the first or even second year postpartum [9].

Child quality is reflected in their growth and development dimensions [10]. Babies' growth is measured through an appropriate increase in body length, weight, and nutritional status [2]. According to Bronfenbrenner's ecological theory, child growth is related to five interconnected layers, with the closest being the microsystem, which includes the family [11]. The family is the main institution where children grow and develop. The family is a social system with roles, functions, and duties to ensure the system runs. One of the functions of the family is the reproductive function, which is related to ensuring and protecting pregnancy, birth, and breastfeeding with a happy and healthy baby [10].

Globally, the incidence of postpartum depression ranges from 11.7% to 20.4%. In contrast, research conducted in Bogor City found that 28% of mothers experience postpartum blues [12], with 1-5% of these cases potentially progressing to postpartum depression [13]. This condition will result in poor mother-baby attachment. Postpartum depression is influenced by the distribution of roles and tasks in the family and also by social support, particularly the husband's support [14]. In Indonesia, despite recognition of postpartum depression's negative impact on the quality of children as national assets, no comprehensive data on its prevalence exists. Cases are often identified only when the condition has progressed to severe depression or psychosis [15].

This study is particularly crucial in Bogor City, where the Indonesian Nutrition Status Survey 2022 revealed a 13.0% prevalence of underweight toddlers, 18.7% stunting, and a 5.1% obesity rate [16], along with 44.2% rate of exclusive breastfeeding [17]. This study offers a unique contribution to the field of infant growth research by exploring the impact of mother's mental health, caregiving practices, family functioning, and social support influence infant development. By highlighting these interconnected factors, it provides a broader perspective on optimizing infant growth, emphasizing the critical role of maternal well-being and family. This study analyzed postpartum depression, comprehensively involving variables such as family function, social support, and maternal parenting practices, dimensions of nutrition and health, and their influence on the baby's growth.

2 Materials and methods

This cross-sectional study was conducted in Bogor City, specifically in South Bogor, West Bogor, North Bogor, and Tanah Sareal Districts, from September 2023 to April 2024. The research was approved under ethical number 1079/IT3.KEPMSM-IPB/SK/2023. Using a simple random sampling technique, 130 mothers with six-month-old babies were selected as respondents. The sample size aligns with Ghazali & Kusumadewi recommendation, which suggests that for SEM analysis, a minimum sample size of 100 is required [18]. In SEM analysis, a sample size that is too large may lead to excessive sensitivity in the model, making it difficult to achieve an optimal goodness of fit. Therefore, it is recommended that sample size be 5-10 times the number of latent variables [19,20]. The independent variables in this study were family function, social support, postpartum depression, and maternal parenting

practices, while the dependent variable was infant growth, indicated by nutritional status. Inclusion criteria required the mother and baby to be living in an intact family unit. The exclusion criteria included illiterate mothers, those without an MCH (Maternal and Child Health) book, or the baby with congenital malformations. Primary data were collected directly from respondents through a structured questionnaire and direct measurement of baby weight and length.

The family function was measured using the Fungsi-Ga (Fungsi Keluarga) [19] questionnaire, social support was measured with the Multidimensional Scale of Perceived Social Support (MSPSS), and Postpartum depression was measured using the Edinburgh Postpartum Depression Scale (EPDS) [20]. Maternal parenting practices were measured through a health practices questionnaire [21] and feeding practices were assessed using the Feeding Practices and Structure Questionnaire [22]. The validity and reliability tests conducted in August 2023 confirmed that all instruments were valid. The Cronbach alpha values were 0.999 for Fungsi-Ga, 0.956 for MSPSS, 0.878 for EPDS, and 0.658 for maternal parenting practices. The infant growth was determined based on the nutritional status, body weight/age, length/age, and weight/ body length [2]. Data were analyzed using SEM-PLS (Structural Equation Model-Partial Least Squares).

3 Results and discussion

Most babies were born crying, received early breastfeeding initiation, were exclusively breastfed, and immunized. They grow according to their age, attained normal weight and length, and exhibited satisfactory nutritional status. Approximately 4.6% of these infants were born prematurely, 9.2% had a weight below the standard, and 7.7% were found to be stunted (See Table 1).

Table 1. Distribution of respondents based on family function, social support, postpartum depression, maternal priority practices, and infant growth (N=130)

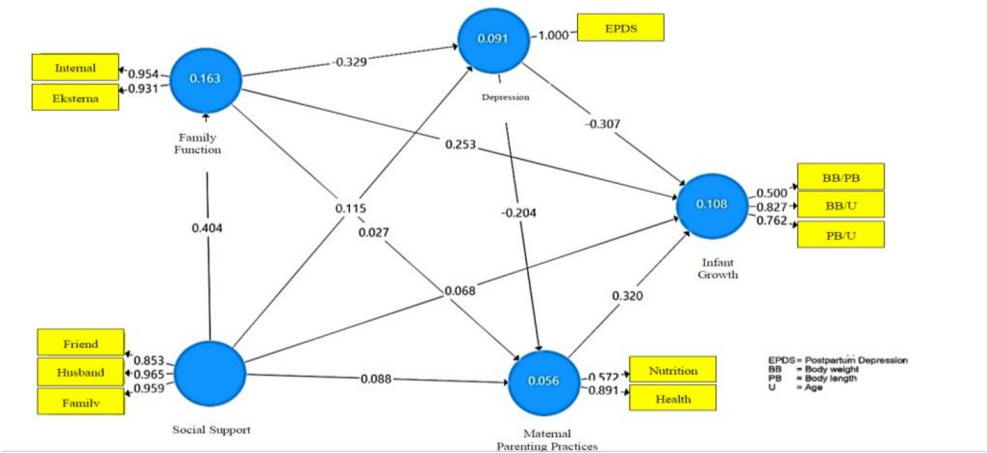
Category		Percentage
Family Function	Very Low	0.8
	Low	17.7
	Sufficient	26.2
	Hight	55.4
Min-Max (Mean±SD)		19-100(74±22.5)
Social Support	Very Low	2.3
	Low	7.7
	Sufficient	23.1
	Hight	66.9
Min-Max (Mean±SD)		14-100 (79.3±19.2)
Postpartum Depression	Depression	8.5
	Normal	91.5
Min-Max (Mean±SD)		0-14 (6.8±3.5)
Maternal Parenting Practices	Low	0.8
	Sufficient	12.3
	Hight	86.9
Min-Max (Mean±SD)		32-99 (86.2±9.6)
Weight/ Age (W/A)	Severely Underweight	6.9
	Underweight	0.8
	Overweight risk	0
	Normal	92.3
Weight/ Height (W/H)	Malnutrition	9.2
	Risk of Overnutrition	13.1

	Category	Percentage
Height/ Age (H/A)	Over Nutrition	1.5
	Good Nutrition	76.2
	Short (Stunted)	3.1
	Tall	0
	Normal	96.9
Weight (kg)	Min-Max (Mean±SD)	5.2-10 (7.5±0.95)
Height (cm)	Min-Max (Mean±SD)	60-71 (66.1±2.4)

Table 2. Direct, indirect and total effects between variables

Direction of Influence	Direct effect	Indirect effect	Total effect
Social support → Postpartum depression	-0.115	-0.133*	-0.018
Social support →family function	0.404*		0.404*
Social support → Maternal parenting practices	0.068	0.095	0.027
Social support → infant growth	0.088	0.014	0.102
Family function → Postpartum depression	-0.329*		-0.329*
Family function → Maternal parenting practices	0.027	0.166*	0.194*
Family function → infant growth	0.253	0.103*	0.151
Postpartum depression → Maternal parenting practices	-0.204*		-0.204*
Postpartum depression → infant growth	-0.307*	-0.004	-0.211*
Maternal parenting practices → infant growth	0.320*		0.320*

Note: *) Sig, ≤0,05 *, analyzed by SEM-PLS, confidence interval 95%. Direct effect: direct influence between variables. Indirect effect: the influence of a variable indirectly, through other variables. Total effect: the combined influence of direct and indirect effects.



Note: Latent variables meet the requirements for an AVE (Average Variance Extracted) > 0.5, composite reliability > 0.6, SRMSR (Standardized Root Mean Square Residual) < 0.08, and outer loading > 0.5, GoF (Goodness of Fit) 0.27.

Fig. 1. SEM measurement results

In Table 2, the path-coefficients are significant. Variables with significant correlation include social support to family function ($\beta = 0.404$), family function to postpartum depression ($\beta = -0.329$), postpartum depression to maternal parenting practices ($\beta = -0.204$), and infant growth ($\beta = -0.307$), and maternal parenting practices regarding infant growth ($\beta = 0.320$). Maternal parenting practices encompass health and nutritional care practices. These results align with previous research showing that nutritional status is positively correlated with nutritional care practices and children's eating habits [23]. In terms of indirect effect, a negative correlation was found between social support and postpartum depression through

family function. The family function positively affected maternal parenting practices through postpartum depression, and infant growth through postpartum depression.

Family functioning influences postpartum depression, acting as a buffer against depression during pregnancy [24], and indirectly influences infant growth [25]. Social support is the strongest predictor of parenting practices [24], influencing the success of specific nutritional interventions, pregnancy outcomes [26], parenting stress or depression, child development, coping, and baby-mother interactions. Postpartum depression is associated with delayed adaptation to the maternal role, inadequate nutritional provision, and negative parenting practices [27]. Stress triggers the release of adrenaline and cortisol, inhibiting oxytocin. This condition reduces breast milk production and breastfeeding intake, resulting in potential developmental and growth deficits and stunting. Maternal parenting practices on health and nutritional care dimension impact children's nutritional status, motor development, and children's nutritional status [25].

Stress experienced by postpartum mothers, when at manageable levels, can serve as a motivator to improve effective coping mechanisms [28]. According to Rubin's theory, by 10-14 days postpartum, mothers should enter the psychological adaptation phase of letting go, during which they can adapt and care for themselves and their baby. If this adaptation process fails, it may lead to postpartum depression [12].

The research results indicate that the factors directly influencing the baby's growth at 6 months postpartum are maternal parenting practices and postpartum depression. Parenting practices positively affect baby growth, meaning that better parenting practices lead to the better the baby's growth. The dimensions of maternal care practices in this research include health and nutrition practices within the growth model. Research shows that feeding practices are related to the incidence of stunting [29] and children's weight status [23].

This study shows that postpartum depression negatively affects baby growth, meaning that lower depression score in mothers is associated with the better the baby's growth. Based on Erikson's theory of psychosocial development, the first year of life is a critical period for babies to develop a sense of trust [4,30]. Babies depend on their mother as the primary caregiver for their growth and development. Bowlby stated that the early birth period is essential for creating a secure attachment. Mothers with postpartum depression will have insecure bonds, which increases the risk of impaired child development [31].

The results of this study also indicate an indirect effect, where depression in family function mediates the impact of postnatal depression on infant growth. Good family function and social support for postpartum mothers can increase feelings of personal competence and coping, increase mother-infant interaction, and reduce depression [32], thereby increasing the mother's role in stimulating care for the baby [33]. The better the family function, the lower the mothers' depression, and the better their parenting practices and the baby's growth and development. According to Nuriyanto's research, family function indirectly influences children's growth and development [25].

Some limitations of this study include the fact that the respondents were exclusively mothers, meaning the variables were measured solely from the mothers' perspectives. This introduces the potential of research bias, as socio-economic factors of the respondents cannot be controlled. To confirm the diagnosis of depression, a psychiatric specialist must carry out further examination, while a growth and development specialist must assess the infant's development. Additionally, when postpartum depression can persist up to 12-14 months postpartum, this study only measured in 6 months postpartum, due to time constraints.

4 Conclusion

The results of the SEM PLS influence test show that the infant growth model involving the variables of family function, social support, postpartum depression, and maternal parenting

practices is a good fit (Goodness of Fit 0.27). There were direct influences between social support ($\beta = -0.115$) and family function ($\beta = -0.329$) on postpartum depression; postpartum depression on maternal parenting practices ($\beta = -0.204$); and postpartum depression ($\beta = -0.307$) and maternal parenting practices ($\beta = 0.320$) on infant growth. These findings underscore the importance of implementing programs to raise awareness of postpartum depression and also increase mothers' knowledge and skills in providing optimal healthcare and nutrition to support infant growth and reduce the risk of stunting. The study emphasizes the significance of enhancing family function to reduce depression and enhance a baby's nutritional and healthcare parenting practices, ultimately promoting infant growth. This research provides an overview of various factors influencing infant growth, providing a foundation for policy development aimed at addressing nutritional issues and promoting healthy infant growth in Bogor city. Further research could adopt a longitudinal approach and include variables beyond those related to the mother. This would offer a more balanced and comprehensive perspective.

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