



# Maternal sociodemographic characteristics and psychological distress: Factors affecting quality of life among pregnant and lactating women in Indonesia

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## Abstract

**Background:** A low quality of life during pregnancy and lactation can elevate the risk of psychological complications, adverse pregnancy outcomes, and developmental issues in children. Gaining insight into the factors that affect the quality of life for pregnant and lactating women is essential for healthcare providers to create effective interventions.

**Objectives:** This study aims to evaluate the quality of life among pregnant and lactating women and to identify the factors influencing it, including sociodemographic characteristics, obstetric factors, and levels of psychological distress.

**Methods:** This cross-sectional study was conducted online between February and March 2022, employing a chain referral sampling method to gather participants. A total of 409 women from Java (Indonesia) participated, comprising 249 pregnant women and 160 lactating women. The Depression Anxiety Stress Scale was employed to assess psychological distress, while the 36-item Short Form Health Survey measured quality of life. Data were analyzed using independent samples t-tests, one-way analysis of variance, and multiple linear regression.

**Results:** The mean quality of life scores did not show a significant difference between the two groups (pregnant:  $67.64 \pm 13.78$ ; lactating:  $67.20 \pm 15.38$ ;  $P=0.768$ ), indicating a generally good quality of life for both. Multiple linear regression revealed that for pregnant women, significant factors affecting quality of life included occupation ( $P<0.05$ ), depression ( $P<0.01$ ), and anxiety ( $P<0.01$ ). For lactating women, influential factors included ethnicity ( $P<0.05$ ), duration of breastfeeding ( $P<0.05$ ), as well as depression ( $P<0.01$ ), anxiety ( $P<0.01$ ), and stress ( $P<0.05$ ).

**Conclusion:** Both pregnant and lactating women reported a good quality of life; however, psychological distress, sociodemographic characteristics, and obstetric factors significantly influenced their overall well-being. It is crucial to address psychological distress through early screening and ongoing, comprehensive interventions.

**Keywords:** Quality of Life, Pregnant women, Lactating women, Sociodemographic factors, Psychological distress.

## Introduction

The journey from conception to delivery, along with the postpartum period, brings about significant anatomical and physiological changes in a woman's body that can profoundly affect her psychological and social well-being.<sup>[1]</sup> Difficulties in adapting to these changes during pregnancy can heighten the risk of complications, including major depression,<sup>[2]</sup> adverse pregnancy

outcomes,<sup>[3]</sup> disruptions in a child's neurocognitive development,<sup>[4]</sup> and a diminished quality of life (QOL).<sup>[5]</sup> For pregnant women (PW) and lactating women (LW), QOL encompasses their perceptions of this life stage, including their aspirations, concerns, and life goals within the framework of their cultural and personal values.<sup>[6]</sup>

Several factors influence the QOL of PW, such as maternal age, gestational age, income, parity, occupation,

marital status, substance use, pregnancy complications, physical discomfort, sleep disturbances, psychological conditions, and social support.<sup>[7,8]</sup> However, some studies have found no significant correlation between QOL and variables like age, marital status, occupation, or pregnancy complications.<sup>[9,10]</sup>

In contrast, the QOL of LW is shaped by factors including occupation, income, education,<sup>[6,11,12]</sup> maternal age,<sup>[5,12,13]</sup> ethnicity, marital intimacy,<sup>[12]</sup> adjustment to breastfeeding,<sup>[6,13]</sup> postpartum fatigue,<sup>[6]</sup> and psychological conditions such as depression and fear of childbirth.<sup>[5,6,11,13]</sup> Yet again, other research has failed to establish a connection between QOL and factors like age,<sup>[11]</sup> income, occupation,<sup>[12]</sup> education, or ethnic background among LW.<sup>[14]</sup> These inconsistencies highlight the need for further exploration into the determinants of QOL for both PW and LW.

A compromised QOL during pregnancy can lead to increased maternal stress levels, feelings of helplessness during childbirth, diminished bodily and social functioning, and reduced physical activity.<sup>[15]</sup> In the postpartum period, a lower QOL may result in greater self-care dependency, challenges in child care, premature cessation of breastfeeding, negative implications for the child's health, and potential long-term effects on the child's psychological development.<sup>[5,16]</sup> Thus, identifying the factors that influence QOL in this population is essential for taking proactive measures to address any emerging issues.<sup>[7,11]</sup>

Despite the importance of understanding these factors affecting QOL among PW and LW, there is a notable lack of data on this population in Indonesia. This study seeks to investigate whether maternal sociodemographic characteristics, obstetric status, and psychological distress impact the QOL of PW and LW in Indonesia.

## Objectives

This study aims to assess the QOL of PW and LW and identify the factors influencing it, including sociodemographic characteristics, obstetric factors, and perceived psychological distress.

## Methods

### Study design and participants

This cross-sectional study was conducted online from February to March 2022 to assess the QOL among women and identify the factors influencing it. Participants were required to meet two criteria: a) they must be women aged between 15 and 49 residing in six provinces on Java Island,

Indonesia, and b) they must be either currently pregnant or have been lactating within the last two years.<sup>[17]</sup>

To determine the sample size, we aimed for a statistical power of 0.90 and a confidence level of 0.95. Based on prior research, a correlation coefficient of at least 0.31 was deemed statistically significant. Using the sample size calculation formula [Formula 1], we established that each group needed a minimum of 105 participants. We employed chain referral sampling, and ultimately collected data from 249 PW and 160 LW after referrals had ceased.

$$n = \left[ \frac{Z_{\alpha} + Z_{\beta}}{c} \right]^2 + 3, \quad c = 0.5 \cdot \ln \left( \frac{1+r}{1-r} \right)$$

**Formula-1.** Sample Size Calculation

### Data collection instruments

In this study, QOL served as the dependent variable, while sociodemographic characteristics, obstetric factors, and psychological distress were treated as independent variables. The sociodemographic data included maternal age, ethnicity, family income, occupation, and education level. Obstetric factors encompassed parity, gestational age for PW, duration of breastfeeding for LW, gravida status, and body mass index (BMI). Psychological distress was defined as emotional suffering characterized by symptoms of stress, anxiety, and depression.

To measure psychological distress, we utilized the Depression Anxiety Stress Scale-21 (DASS-21). The QOL of PW and LW was evaluated using the Short Form-36 (SF-36).

The DASS-21 questionnaire assesses perceived levels of depression, anxiety, and stress among PW and LW. Each subscale consists of seven questions rated on a four-point scale: 0 (never), 1 (sometimes), 2 (often), and 3 (almost always). Total scores for each subscale range from 0 to 21, with higher scores indicating greater psychological distress.<sup>[18]</sup> The validity and reliability of the Indonesian version of DASS-21 were evaluated by Muttaqin and Ripa, who reported internal consistency reliabilities of 0.87 for depression, 0.81 for anxiety, and 0.82 for stress.<sup>[19]</sup>

QOL is measured across eight health domains, which are divided into physical and mental components. The physical component evaluates general health, physical functioning, pain experiences, and role limitations due to physical health issues. In contrast, the mental component assesses vitality, mental health, social functioning, and role limitations stemming from emotional challenges. Each question on the SF-36 is scored from 0 to 100 using a variable point scale. The overall score ranges from 0 to 100 and is calculated by averaging the scores from all questions; a higher score signifies better QOL. In this study, a mean score of 50 was established as the cutoff

point distinguishing between lower (weaker) and upper (better) health scores.<sup>[20]</sup> The Indonesian version of SF-36 was validated by Rachmawati et al.,<sup>[21]</sup> who found that the internal consistency reliability for each subscale ranged from 0.76 to 0.93 using Cronbach's alpha.

### Procedures

Data collection was conducted through chain referral sampling via a Google Form, which included participants' consent to participate, sociodemographic information, obstetric data, the DASS-21 scale, and the SF-36 questionnaire. The form was distributed through popular social media platforms such as WhatsApp, Instagram, and Facebook. This sampling method relies on participants referring others who have experienced similar circumstances. To enhance the representativeness of our sample, we employed a strategy known as multiple snowball sampling, which involved intentionally accessing various networks to reach a broader audience.<sup>[22]</sup> This approach was particularly beneficial during the COVID-19 pandemic, as pregnant and lactating women were classified as vulnerable populations, necessitating minimized physical contact.<sup>[22]</sup> Additionally, this method facilitated access to hard-to-reach individuals across six provinces on Java Island.

### Data analysis

Data analysis was performed using SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA). We examined differences in QOL using independent samples t-tests. To explore the relationships between QOL and influencing factors -such as sociodemographic characteristics, obstetric factors, and psychological distress- we utilized both independent samples t-tests and one-way ANOVA. Factors that showed significance at a threshold of  $\leq 0.10$  were considered potential influences and were included in a multivariate analysis employing the backward elimination method in multiple linear regression. The significance level for all tests was set at  $\alpha \leq 0.05$ .

### Ethical considerations

This study received approval from the Ethics Committee of The University of Alma Ata (code: KE/AA/II/10688/EC/2022). Before providing consent, participants were informed about the study's objectives, the confidentiality of their data, and their right to participate voluntarily or withdraw at any time.

### Results

This study included a total of 409 women, comprising 249 PW and 160 LW. As detailed in Table 1, the majority of participants in both groups were under 30 years of age, with mean ages of  $26.56 \pm 4.49$  for PW and  $27.02 \pm 4.43$  for

LW. Most participants identified as Javanese (84.8% of PW vs. 75.6% of LW), had completed secondary education or higher (92.8% of PW vs. 96.9% of LW), earned incomes above the minimum wage (61.4% of PW vs. 69.4% of LW), were employed (54.2% of PW vs. 53.2% of LW), and were primiparous (88% of PW vs. 68.8% of LW). A significant proportion of PW were in their first trimester of pregnancy (40.6%), while most LW reported breastfeeding for durations ranging from six weeks to six months (47.5%).

Both groups demonstrated low levels of psychological distress, with PW reporting a mean depression score of  $2.63 \pm 3.46$  compared to  $3.44 \pm 3.88$  for LW, anxiety scores of  $4.30 \pm 3.68$  for PW and  $4.13 \pm 3.69$  for LW, and stress scores of  $3.68 \pm 3.45$  for PW versus  $5.85 \pm 4.29$  for LW.

The overall mean QOL scores for PW and LW were  $67.64 \pm 13.78$  and  $67.20 \pm 15.38$ , respectively, with no significant difference between the two groups ( $P=0.768$ ). These scores indicate that women in both groups enjoyed a good quality of life. Notably, the physical component scores were lower than the mental component scores for both groups, with the "physical role" subcomponent receiving the lowest ratings, averaging  $55.12 \pm 33.10$  for PW and  $56.25 \pm 35.80$  for LW [Table 2].

Bivariate analyses revealed that depression, anxiety, and stress negatively impacted all components of QOL in both groups ( $P<0.001$ ). Additionally, occupation positively influenced the mental component of QOL in PW ( $P=0.044$ ), while the duration of breastfeeding had a positive effect on the physical component of QOL in LW ( $P<0.001$ ) [Table 3].

In multivariate analyses, after adjusting for relevant variables, being employed in the private sector was found to positively impact the physical component of QOL for PW, while anxiety and depression consistently exerted a negative influence across all ranges. This model accounted for 17% of the variability in QOL outcomes. Furthermore, the mental component of QOL was positively associated with employment in the private sector or as a civil servant among PW, although anxiety and depression again had detrimental effects across all levels. This model explained a greater percentage of variance (39%) [Table 4].

For LW, multivariate analysis indicated that breastfeeding durations between six weeks to six months and six months to two years positively affected the physical component of QOL, while factors such as ethnicity, anxiety, and stress negatively impacted it across all ranges. This model accounted for 33% of the variability in QOL outcomes. Conversely, the mental component of QOL was adversely affected by Sundanese ethnicity, depression, and anxiety, explaining 37% of the variability [Table 5].

**Table 1.** Sociodemographic factors, obstetric factors, and psychological distress among pregnant and lactating women

Variables	Pregnant women	Lactating women
	N=249 (%)	N=160 (%)
<b>Maternal Age</b> , year, mean (SD)	26.56 (4.49)	27.02 (4.43)
<b>Age group</b>		
17-25	119 (47.8)	72 (45.0)
26-35	119 (47.8)	81 (50.6)
>35	11 (4.4)	7 (4.4)
<b>Gravida</b>		
Primigravida	142 (57.0)	
Multigravida	107 (43.0)	
<b>Gestational age</b>		
Trimester 1	101 (40.6)	
Trimester 2	85 (34.1)	
Trimester 3	63 (25.3)	
<b>Parity</b>		
Primipara	219 (88.0)	110 (68.8)
Multipara	30 (12.0)	50 (31.2)
<b>Length of breastfeeding</b>		
0-6 weeks		43 (26.9)
>6 weeks-6 months		76 (47.5)
>6 months-2 years		41 (25.6)
<b>Body Mass Index (BMI)</b> , mean (SD)	23.97 (3.84)	22.97 (3.43)
Underweight	15 (6.0)	15 (9.4)
Healthy weight	145 (58.3)	97 (60.6)
Overweight	76 (30.5)	43 (26.9)
Obesity	13 (5.2)	5 (3.1)
<b>Self-reported ethnicity</b>		
Javanese	211 (84.8)	121 (75.6)
Sundanese	28 (11.2)	26 (16.3)
Madurese	1 (0.4)	1 (0.6)
Betawi	5 (2.0)	0
Not reported	4 (1.6)	12 (7.5)
<b>Monthly income (IDR)</b>		
Below the minimum wage	96 (38.6)	49 (30.6)
Above the minimum wage	153 (61.4)	111 (69.4)
<b>Occupation</b>		
Not employed	114 (45.8)	75 (46.9)
Entrepreneur	36 (14.5)	18 (11.2)
Private sector employee	71 (28.5)	52 (32.5)
Civil servant	28 (11.2)	15 (9.4)
<b>Educational status</b>		
University graduated	110 (44.2)	101 (63.1)
Senior school graduated	121 (48.6)	54 (33.8)
Junior school graduated	12 (4.8)	4 (2.5)
Elementary graduated	6 (2.4)	1 (0.6)
<b>Depression</b> , mean (SD)	2.63 (3.46)	3.44 (3.88)
Normal	197 (79.2)	116 (72.5)
Mild	23 (9.2)	13 (8.1)
Moderate	20 (8.0)	17 (10.6)
Severe	5 (2.0)	9 (5.6)

Extremely severe	4 (1.6)	5 (3.2)
<b>Anxiety</b> , mean (SD)	3.68 (3.45)	4.13 (3.69)
Normal	142 (57.0)	84 (52.5)
Mild	39 (15.7)	29 (18.0)
Moderate	39 (15.7)	22 (13.8)
Severe	13 (5.2)	10 (6.3)
Extremely severe	16 (6.4)	15 (9.4)
<b>Stress</b> , mean (SD)	4.30 (3.68)	5.85 (4.29)
Normal	207 (83.1)	116 (72.5)
Mild	25 (10.1)	14 (8.8)
Moderate	12 (4.8)	16 (10.0)
Severe	2 (0.8)	9 (5.6)
Extremely severe	3 (1.2)	5 (3.1)

IDR: Indonesian Rupiah

## Discussion

The QOL scores for PW and LW in this study were categorized as good. Notably, the lowest scores were recorded during the third trimester of pregnancy and six weeks postpartum, with QOL improving throughout the postpartum period. Although our study utilized a cross-sectional design involving different individuals for each group, these findings align with a previous cohort study that also identified the third trimester as a time of decreased QOL.<sup>[23]</sup> This final stage of pregnancy, particularly the ninth month, is often associated with heightened discomfort due to physical health issues, reduced vitality, and symptoms of depression.<sup>[1,23-25]</sup>

Our analysis revealed a strong and consistent association between symptoms of depression, stress, and anxiety with lower QOL in both PW and LW. This highlights the importance of mental health support during these critical periods.

We also identified maternal sociodemographic factors influencing QOL, particularly the impact of occupation on the well-being of PW. This finding is consistent with previous research indicating that women who are employed and work in supportive environments tend to enjoy greater social engagement, financial stability, and increased self-esteem, all of which contribute to an improved QOL.<sup>[6-8]</sup>

Interestingly, we found that ethnicity significantly affects the QOL of LW. This may be linked to the internalization of cultural principles throughout pregnancy and postpartum. In our study, 75% of LW identified as Javanese, who reported the highest QOL scores. Among Javanese women, partners and parents play vital roles as support systems during the postpartum period. This support encompasses not only practical assistance with childcare and household chores but also emotional backing such as empathy, attention, love, and trust.

Positive cultural practices prevalent among the Javanese during this time -such as traditional massages, consumption of herbal remedies like a blend of rice,

aromatic ginger, and palm sugar, along with maintaining good sleep patterns- help mothers relax and can enhance breast milk production and maternal self-efficacy.<sup>[26-29]</sup>

**Table 2.** Mean quality of life scores among pregnant and lactating women

Variables	Pregnant women, Mean (SD)	Lactating women, Mean (SD)	P value <sup>*</sup>
<b>Quality of life score</b>	67.64 (13.78)	67.20 (15.38)	0.77
<b>Physical component</b>	64.59 (14.69)	67.15 (16.73)	0.11
<b>Mental component</b>	70.69 (15.89)	67.25 (17.00)	0.04 <sup>a</sup>
<b>Physical functioning</b>	59.92 (26.28)	70.18 (26.52)	0.00 <sup>a</sup>
<b>Bodily pain</b>	74.20 (17.08)	72.80 (15.88)	0.34
<b>Role physical</b>	55.12 (33.10)	56.25 (35.80)	0.75
<b>General health</b>	69.12 (13.63)	69.38 (14.41)	0.86
<b>Vitality</b>	66.31 (17.51)	63.55 (17.07)	0.11
<b>Social functioning</b>	74.90 (18.07)	73.20 (18.00)	0.35
<b>Role emotional</b>	69.21 (32.77)	62.08 (35.18)	0.04 <sup>a</sup>
<b>Mental health</b>	72.34 (17.90)	70.15 (18.09)	0.23

<sup>\*</sup>P value of *t*-test, <sup>a</sup>statistically significant at P< 0.05

**Table 3.** Participants' quality of life based on sociodemographic and obstetric factors, as well as psychological distress

Variables	Pregnant women quality of life		Lactating women quality of life	
	Physical domain Mean (SD)	Mental domain Mean (SD)	Physical domain Mean (SD)	Mental domain Mean (SD)
<b>Maternal Age (year)</b>				
17-25	64.50 (14.48)	71.31 (15.05)	66.41 (15.88)	66.45 (16.95)
26-35	64.58 (14.98)	70.07 (16.85)	68.39 (17.21)	68.21 (17.02)
>35	65.74 (15.25)	70.72 (15.13)	60.41 (20.21)	64.35 (19.15)
<b>Gravida</b>				
Primigravida	64.93 (15.17)	71.34 (15.30)		
Multigravida	64.14 (14.09)	69.83 (16.68)		
<b>Gestational age</b>				
Trimester 1	65.25 (15.40)	69.77 (16.27)		
Trimester 2	64.91 (15.28)	72.25 (15.45)		
Trimester 3	63.10 (12.72)	70.07 (15.95)		
<b>Parity</b>				
Primipara	64.07 (14.74)	70.54 (15.83)	66.41 (16.54)	67.66 (16.94)
Multipara	68.36 (14.01)	71.81 (16.55)	68.69 (17.37)	66.34 (17.26)
<b>Length of breastfeeding</b>				
0-6 weeks			60.29 (16.57) *	62.18 (16.10) *
>6 weeks-6 months			67.02 (16.18)	67.98 (17.84)
>6 months-2 years			74.59 (15.06)	71.22 (15.32)
<b>Body Mass Index (BMI)</b>				
Underweight	64.84 (14.07)	69.85 (9.83)	67.09 (17.34)	65.75 (17.38)
Healthy weight	65.52 (15.32)	70.31 (16.97)	67.59 (16.42)	67.61 (17.02)
Overweight	63.59 (13.21)	71.10 (14.89)	65.02 (17.69)	65.42 (17.17)
Obesity	59.81 (16.74)	73.53 (15.92)	77.25 (11.98)	80.39 (10.86)
<b>Self-reported ethnicity</b>				
Javanese	65.38 (15.06)	71.63 (15.61)	66.93 (16.86) *	69.65 (16.56) *
Sundanese	60.09 (11.42)	65.42 (18.55)	60.05 (11.99)	62.30 (16.68)
Betawi	59.75 (16.75)	67.39 (9.16)	-	-
Not reported	61.41 (11.39)	60.19 (9.24)	54.64 (15.62)	54.03 (15.44)
<b>Monthly income (IDR)</b>				
Below the minimum wage	65.34 (14.40)	71.34 (14.52)	64.47 (15.88)	64.16 (17.04)
Above the minimum wage	64.12 (14.90)	70.28 (16.72)	68.34 (17.03)	68.61 (16.88)

Maternal sociodemographic characteristics and psychological distress				
<b>Occupation</b>				
Not employed	61.89 (13.96)	68.11 (16.86) *	64.86 (15.73)	64.59 (17.92)
Entrepreneur	67.16 (16.70)	70.12 (14.09)	62.64 (22.54)	66.68 (20.92)
Private sector employee	66.48 (13.31)	72.85 (13.28)	69.45 (15.36)	69.41 (13.95)
Civil servant	67.51 (16.99)	76.47 (18.44)	76.05 (15.38)	73.73 (15.62)
<b>Educational status</b>				
University graduated	66.06 (15.78)	71.93 (16.88)	68.71 (16.64) *	68.44 (16.33)
Senior school graduated	63.19 (14.19)	68.90 (14.66)	64.66 (16.40)	65.56 (17.79)
Junior school graduated	64.38 (10.81)	79.10 (10.88)	71.88 (7.86)	69.18 (16.75)
Elementary graduated	66.26 (9.60)	67.43 (24.53)	-	-
<b>Depression</b>				
Normal	67.01 (14.23) *	74.85 (13.27) *	70.47 (14.66) *	72.23 (14.32) *
Mild	56.71 (13.11)	58.82 (11.18)	68.75 (19.12)	64.44 (17.12)
Moderate	59.13 (10.34)	56.32 (12.93)	59.89 (16.52)	54.34 (13.17)
Severe	49.78 (8.85)	55.39 (19.60)	44.84 (12.18)	45.17 (11.40)
Extremely severe	36.60 (10.13)	25.17 (11.33)	50.88 (21.60)	42.68 (21.39)
P value	0.000* (F 9.80)	0.000* (F 29.14)	0.000* (F 8.50)	0.000* (F 15.64)
<b>Anxiety</b>				
Normal	69.85 (13.65) *	77.58 (13.17) *	74.56 (14.27) *	76.01 (13.15) *
Mild	60.89 (13.42)	68.07 (10.69)	63.71 (12.59)	62.11 (12.44)
Moderate	57.01 (12.91)	61.91 (10.53)	58.40 (15.14)	57.98 (16.25)
Severe	53.71 (9.32)	54.31 (16.16)	60.69 (15.61)	55.96 (18.27)
Extremely severe	54.04 (14.25)	50.26 (20.59)	49.46 (17.79)	49.26 (15.80)
P value	0.000* (F 13.97)	0.000* (F 28.88)	0.000* (F 13.90)	0.000* (F 19.21)
<b>Stress</b>				
Normal	66.21 (14.48) *	73.69 (13.84) *	72.18 (14.65) *	72.46 (14.55) *
Mild	59.88 (12.19)	59.64 (15.16)	58.49 (12.33)	60.53 (12.19)
Moderate	57.52 (10.53)	58.30 (13.72)	52.96 (12.33)	51.18 (13.45)
Severe	44.38 (0.88)	47.22 (15.51)	45.28 (18.75)	48.26 (18.25)
Extremely severe	34.21 (10.94)	21.47 (10.52)	59.50 (15.65)	50.69 (20.97)
P value	0.000* (F 6.68)	0.000* (F 19.42)	0.000* (F 13.99)	0.000* (F 14.53)

one-way ANOVA, \*statistically significant at  $p < 0.05$

**Table 4.** Multiple linear regression analysis of quality of life in pregnant women and influencing factors

QOL domain	Variables	Beta		95%CI	T	P Value	Adjusted R <sup>2</sup>	
		Non-standardized	Standardized					
Physical domain	<b>Occupation</b>							0.17
	Not employed	Reference	Reference					
	Entrepreneur	5.28	0.13	-0.21, 10.76	1.90	0.059		
	Private sector employee	4.59	0.14	0.26, 8.93	2.09	0.038 <sup>a</sup>		
	Civil servant	5.62	0.12	-0.43, 11.67	1.83	0.069		
	<b>Depression</b>							
	Normal	Reference	Reference					
	Mild	-10.30	-0.20	-16.26, -4.33	-3.40	0.001 <sup>a</sup>		
	Moderate	-7.88	-0.15	-14.24, -1.53	-2.44	0.015 <sup>a</sup>		
	Severe	-17.23	-0.17	-29.49, -4.96	-2.77	0.006 <sup>a</sup>		
	Extremely severe	-30.41	-0.26	-44.09, -16.74	-4.38	0.000 <sup>a</sup>		
	<b>Anxiety</b>							
	Normal	Reference	Reference					
Mild	-8.95	-0.22	-13.67, -4.24	-3.74	0.000 <sup>a</sup>			
Moderate	-12.84	-0.32	-17.65, -8.04	-5.26	0.000 <sup>a</sup>			
Severe	-16.14	-0.25	-23.77, -8.52	-4.17	0.000 <sup>a</sup>			
Extremely severe	-15.81	-0.26	-22.74, -8.87	-4.49	0.000 <sup>a</sup>			

Mental domain	Maternal Age (year)						0.39
		Reference	Reference				
	17-25	Reference	Reference				
	26-35	-1.24	-0.04	-5.31, 2.83	-0.60	0.550	
	>35	-0.59	-0.01	-10.49, 9.31	-0.12	0.906	
	<b>Occupation</b>						
	Not employed	Reference	Reference				
	Entrepreneur	2.00	0.04	-3.92, 7.93	0.67	0.506	
	Private sector employee	4.74	0.14	0.06, 9.42	1.99	0.047 <sup>a</sup>	
	Civil servant	8.36	0.17	1.83, 14.89	2.52	0.012 <sup>a</sup>	
	<b>Depression</b>						
	Normal	Reference	Reference				
	Mild	-16.03	-0.29	-21.75, -10.31	-5.52	0.000 <sup>a</sup>	
	Moderate	-18.53	-0.32	-24.62, -12.44	-5.99	0.000 <sup>a</sup>	
	Severe	-19.47	-0.17	-31.22, -7.71	-3.26	0.001 <sup>a</sup>	
	Extremely severe	-49.69	-0.39	-62.80, -36.58	-7.47	0.000 <sup>a</sup>	
	<b>Anxiety</b>						
	Normal	Reference	Reference				
	Mild	-9.52	-0.22	-14.17, -4.86	-4.03	0.000 <sup>a</sup>	
	Moderate	-15.68	-0.36	-20.42, -10.93	-6.50	0.000 <sup>a</sup>	
	Severe	-23.28	-0.33	-30.81, -15.74	-6.09	0.000 <sup>a</sup>	
	Extremely severe	-27.32	-0.42	-34.18, -20.47	-7.85	0.000 <sup>a</sup>	

<sup>a</sup> Statistically significant at P<0.05

**Table 5.** Multiple linear regression analysis of quality of life in lactating women and influencing factors

QOL domain	Variables	Beta		(95%CI)	t-test	P Value	Adjusted R <sup>2</sup>	
		Non-standardized	Standardized					
Physical domain	<b>Self-reported ethnicity</b>						0.33	
	Javanese	Reference	Reference					
	Sundanese	-9.88	-0.22	-16.74, -3.017	-2.84	0.005 <sup>a</sup>		
	Betawi	-	-	-	-	-		
	Not reported	-14.39	-0.24	-23.66, -5.13	-3.07	0.003 <sup>a</sup>		
	<b>Length of breastfeeding</b>							
	0-6 weeks	Reference	Reference					
	>6 weeks-6 months	6.730	0.20	0.70, 12.76	2.20	0.029 <sup>a</sup>		
	>6 months-2 years	14.301	0.37	7.40, 21.20	4.09	0.000 <sup>a</sup>		
	<b>Anxiety</b>							
	Normal	Reference	Reference					
	Mild	-10.85	-0.25	-17.04, -4.67	-3.47	0.001 <sup>a</sup>		
	Moderate	-16.16	-0.33	-23.04, -9.28	-4.64	0.000 <sup>a</sup>		
	Severe	-13.87	-0.20	-23.48, -4.26	-2.85	0.005 <sup>a</sup>		
	Extremely severe	-25.10	-0.44	-33.15, -17.05	-6.16	0.000 <sup>a</sup>		
	<b>Stress</b>							
	Normal	Reference	Reference					
	Mild	-13.70	-0.23	-21.87, -5.52	-3.31	0.001 <sup>a</sup>		
	Moderate	-19.23	-0.35	-26.93, -11.52	-4.93	0.000 <sup>a</sup>		
	Severe	-24.24	-0.35	-33.77, -14.72	-5.03	0.000 <sup>a</sup>		
Extremely severe	-15.78	-0.15	-30.47, -1.08	-2.12	0.036 <sup>a</sup>			
Mental domain	<b>Self-reported ethnicity</b>						0.37	
	Javanese	Reference	Reference					
	Sundanese	-7.35	-0.16	-14.38, -0.32	-2.06	0.041 <sup>a</sup>		
	Betawi	-	-	-	-	-		
	Not reported	-14.88	-0.24	-24.37, -5.38	-3.10	0.002 <sup>a</sup>		
	<b>Depression</b>							

	Reference	Reference			
Normal					
Mild	-7.79	-0.13	-16.19, 0.61	-1.83	0.069
Moderate	-17.88	-0.33	-25.34, -10.43	-4.74	0.000 <sup>a</sup>
Severe	-27.06	-0.37	-36.99, -17.13	-5.38	0.000 <sup>a</sup>
Extremely severe	-29.54	-0.30	-42.66, -16.43	-4.45	0.000 <sup>a</sup>
<b>Anxiety</b>					
Normal					
Mild	-13.90	-0.32	-19.89, -7.91	-4.58	0.000 <sup>a</sup>
Moderate	-18.03	-0.37	-24.69, -11.37	-5.35	0.000 <sup>a</sup>
Severe	-20.04	-0.29	-29.35, -10.74	-4.26	0.000 <sup>a</sup>
Extremely severe	-26.74	-0.46	-34.54, -18.95	-6.78	0.000 <sup>a</sup>

<sup>a</sup> Statistically significant at  $P < 0.05$

A study conducted in Saudi Arabia noted that it is culturally expected for new mothers to receive substantial social support, which facilitates their adjustment to motherhood.<sup>[13]</sup> The presence of supportive relationships is crucial for achieving both physical health and emotional well-being, aiding mothers in adapting to their new roles. The quality of these relationships directly correlates with higher QOL.<sup>[12,13,29,30]</sup>

Moreover, we found that longer breastfeeding durations positively influence the QOL of LW, supporting findings from earlier studies.<sup>[6,31]</sup> Mothers who exclusively breastfeed for up to four months postpartum report better QOL compared to those who stop breastfeeding after just one month. Discontinuation often arises from challenges such as concerns about milk supply, breast pain, difficulties with pumping, fatigue, and balancing household responsibilities with breastfeeding. Addressing these challenges could extend breastfeeding duration to six months or more, thereby improving QOL, enhancing mother-infant bonding, optimizing child growth and development, and potentially reducing the incidence of postpartum depression.<sup>[32]</sup>

Our evaluation of psychological distress factors revealed that the QOL for PW is significantly influenced by depression and anxiety. When PW experience psychological distress, it can lead to alterations in neuroendocrine and immunological functions, marked by increased cortisol levels.<sup>[33]</sup> These physiological changes can adversely affect women's physical health, social functioning,<sup>[34,35]</sup> and even heighten their risk of self-harm and suicidal thoughts.<sup>[23]</sup> Moreover, anxiety and depression are associated with an increased likelihood of low birth weight and premature births,<sup>[36]</sup> which can negatively impact maternal-fetal attachment.<sup>[37]</sup>

For LW, the effects of depression, anxiety, and stress on QOL are similarly well-documented.<sup>[5,6,11,13]</sup> Research indicates that postpartum depression can lead to various complications, including strained relationships with

partners, engagement in risky behaviors, suicidal ideation, disrupted sleep patterns, and health issues for infants, such as growth concerns, sleep disturbances, and developmental challenges. Additionally, these psychological distress factors can hinder mother-infant interactions, affecting bonding, role fulfillment, and breastfeeding success.<sup>[38,39]</sup> As psychological distress intensifies, the QOL for PW tends to decline.<sup>[33,35]</sup>

This study has several limitations. First, due to its cross-sectional design, we were unable to establish causal relationships or track trends in QOL among PW and LW over time. Second, we did not explore other potential factors influencing QOL, such as sleep disturbances, postpartum fatigue, marital intimacy, and social support.<sup>[6,7,13]</sup> Third, the sampling method employed may not have been the most appropriate for this population, particularly for PW and LW who are registered in a follow-up system. In future research, especially when contact restrictions are not in place (such as during the COVID-19 pandemic), more suitable sampling strategies should be implemented. Lastly, caution should be exercised when generalizing our findings, as this study did not include high-risk PW and was conducted via an online survey, potentially excluding women with limited internet access.

## Conclusions

Overall, the QOL of both PW and LW was classified as good. Factors affecting the QOL of PW included occupation, depression, and anxiety, while LW's QOL was influenced by ethnicity, breastfeeding duration, and psychological distress. All forms of psychological distress - depression, stress, and anxiety- were found to negatively impact maternal QOL. To address these issues, healthcare providers should prioritize managing maternal psychological distress through early screening, non-judgmental counseling, and ongoing interventions. Additionally, promoting exclusive breastfeeding during prenatal classes is essential for meeting infants' nutritional

needs and enhancing maternal QOL. It is also important to discuss cultural practices related to childbirth and postpartum care, including their benefits and potential risks. Given the study's limitations, further research utilizing a longitudinal design is warranted to better understand changes in QOL throughout pregnancy and into the postpartum period.

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### Competing interests

The authors declare that they have no competing interests.

### Abbreviations

Quality of life: QOL; Pregnant Women: PW; Lactating Women: LW; Body mass index: BMI; The depression anxiety stress scale 21: DASS-21; The Sort Form-36: SF-36; Indonesian Rupiah: IDR.

### Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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### Availability of data and materials

The data used in this study are available from the corresponding author on request.

### Ethics approval and consent to participate

This research received approval from the Ethics Committee of The University of Alma Ata (code: KE/AA/II/10688/EC/2022). Before obtaining consent, we ensured that participants were fully informed about the study's objectives, their confidentiality rights, and their ability to choose whether to participate or withdraw at any time

### Consent for publication

By submitting this document, the authors declare their

consent for the final accepted version of the manuscript to be considered for publication.

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