Prevalence of Postpartum Depression, Link to Primiparity and Associated Factors Among First-Time Mothers in Georgia

Ana Kurtanidze,[1] Ekaterine Mikautadze,[1] Mariam Oniani,[1] Valerian Prangishvili,[1] Avtandil Purtskhvanidze[2]

ABSTRACT

Background: Postpartum depression (PPD) is a complex disorder involving physical, emotional, and behavioral changes, making motherhood one of the most horrible experiences in a female's life. First-time mothers, who struggle more adjusting themselves to the role of mother, are at higher risk of developing postpartum depression compared to multipara females.

Objectives: The current study aimed to examine the risk factors and significant correlations of postpartum depression among first-time mothers in Georgia, compare PPD rates between primiparas and multiparas, and calculate the prevalence of PPD.

Methods: The article is based on a cross-sectional study conducted as an online survey. A linear regression analysis investigated the dependence between potential risk factors and PPD among first-time mothers. The variables were examined individually to identify their significance for a 95% confidence interval. In addition, a chi-squared test was used to compare the rates of PPD between first-time mothers and multigravida females.

Results: The prevalence was 49.6%, and the rates of PPD were significantly higher in first-time mothers (54.9%) than in multipara females (16.9%). Significant predictors of PPD in primiparas included advanced age (95% CI: 0.28 - 0.46), physiologic mode of delivery (95% CI: 0.85 - 3.59), higher economic status (95% CI: 1.84 - 3.25), and lack of family support (95% CI: -2.74 - -0.54). Obstetric pain, newborn health problems, education level, and employment were not correlated with increased risks of PPD.

Conclusions: Overall, this research study aims to address the lack of information on PPD in the Georgian population and provide a better understanding of the prevalence and associated factors of PPD among first-time mothers in Georgia. By identifying the prevalence and risk factors for PPD in this population, it will be possible to develop effective interventions and support systems to help mitigate the impact of PPD on first-time mothers in Georgia.

Keywords: Multiparas; online survey; postpartum depression; primiparas.

INTRODUCTION

The postpartum period is a challenging phase for the majority of females, frequently complicated by depressive disorders of varying severity, from mild transient baby blues to postpartum psychosis.[1] Postpartum depression (PPD) is a complex mental health condition characterized by a range of physical, emotional, and behavioral changes. This condition adversely affects mother-infant interaction and attachment and significantly impacts the mothers and their newborns.[2] As per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), PPD is a form of major depression that typically begins within four weeks after delivery, usually within one week.[3] In most cases, symptoms resolve spontaneously within weeks, but sometimes they can persist for several months or even years or lead to recurrent depression.[4-6] If left untreated, PPD may develop into a severe chronic depressive disorder and, in the worst cases, even lead to suicide.[7,8] Despite its serious consequences, PPD is mainly underdiagnosed, making it a significant health issue among childbearing females.[9] Early detection diagnosis and

effective treatment are crucial and must be considered a mandatory component of postpartum care.[9] The rates of PPD are increasing over time, with the prevalence reaching up to 60% in some countries.[10] The number of affected females varies widely between nations.[11] The prevalence is lower in developed countries, ranging from 6-13 %, compared to relatively low- and middle-income countries, where the mean number reaches 20%.[12-14]

Numerous sociodemographic, obstetric, and newborn-related factors are thought to influence the development of PPD, including family support, education level, economic status, maternal age, infant health problems, etc.[15,16] A study conducted in Sweden in 2006-2007 has established that the most common correlations of PPD in first-time mothers without a previous psychiatric history included anxiety proneness, delivery mode, obstetric pain, and any complications of the newborn's health.[17] A cohort study carried out in Iran in 2009 found that lack of social support, low maternal parental self-efficacy, and marital dissatisfaction were strong predictors of PPD.[18] Several

studies have shown that first-time mothers who have problems adapting themselves to the mother's role are more likely to suffer from PPD since they have lower maternal confidence and experience more anxiousness compared to multipara females.[15] For instance, a Japanese cohort study suggested that the rates of PPD were more than two times higher in first-time mothers compared to females who had given birth two or more times.[18]

Despite the well-studied nature of PPD worldwide, more data on the Georgian population is needed. The present study aimed to determine the estimated prevalence of PPD among Georgian females, to compare the rates of PPD between primiparas and multiparas, and to gain further insight into specific risk factors and correlations associated with this condition in first-time mothers.

METHODS

This article is based on a cross-sectional pilot study that aimed to determine the prevalence of PPD among Georgian females and compare the rates of PPD between primiparas and multiparas. The third specific aim was to examine the risk factors and significant correlations of PPD among first-time mothers.

Data collection

The study was conducted as an online survey; the questionnaire was posted on the social network Facebook in multiple groups dedicated to mothers and their experiences with pregnancy and childbirth. The study's inclusion criteria were first-time mothers and multigravida females aged 18 to 50. The sample size included females who had recently given birth or were pregnant when filling out the questionnaire, later classed as "Current Subjects," and those who had previously given birth, later classed as "Past Subjects." Females with previous mental health issues, either previous postpartum depression or any other psychiatric illness, were not eligible to participate since the history of mental illness, especially of depression or PPD, is established to be the strongest predictor.[17]

The questionnaire used in the study consisted of two sections. The first section included the questions from the Edinburgh Postnatal Depression Scale (EPDS).[19] The EPDS is a compassionate clinical screening tool widely used for assessing PPD, consisting of 10 questions. It has a maximum of thirty points, and a score of 12 or greater indicates a high likelihood of depression. The second section of the questionnaire contained questions regarding the potential risk factors and correlations of postpartum depression, including age, delivery mode, obstetric pain, newborn health problems, economic and living conditions, education level, employment, and family support. The structured questionnaire also contained a question about the number of births and the time of the last delivery. In addition, every subject was asked whether or not they had had an episode of depression in the past or any other psychiatric illness. Subjects with positive answers to the latter were excluded automatically. After collecting the data, the EPDS scores of every participant were calculated. Subjects included in the sample size were divided into four groups: first-time mothers with PPD, first-time mothers without PPD, multipara mothers with PPD, and multipara mothers without PPD.

Statistical analysis

The data was transferred to MS Excel, and prevalence was calculated. A linear regression analysis investigated the dependence between potential risk factors and PPD among first-time mothers. A correlation was identified between the dependent (EPDS score) and the independent (age, delivery mode, obstetric pain, newborn health problems, economic and living conditions, education level, employment, and family support) variables. The variables were examined individually to identify their significance for a 95% confidence interval. In addition, a chi-squared test was used in R programming to compare the rates of PPD between first-time mothers and multigravida females.

RESULTS

Out of 648 responses received in the survey, 87 participants with a history of psychiatric disorder were excluded from the study, narrowing the sample size to 561. The subjects included in the sample size were divided into four groups (Tab.1): A. First-time mothers with PPD: 201 (35.8%); B. First-time mothers without PPD: 165 (29.4%); C. Multipara mothers with PPD: 33 (5.9%); D. Multipara mothers without PPD: 162 (28.9%).

TABLE 1. Study population (Sample size: 561)

Group	N (%)
Group A: First-time mothers with PPD	15 (28.85)
Group B: First-time mothers without PPD	37 (71.15)
Group C: Multipara mothers with PPD	45.82 (13.46)
Group D: Multipara mothers without PPD	47 (90.38)

Abbreviations: PPD, postpartum depression

In addition, one exclusive group of females, Group X ("Current Subjects"), was isolated in order to calculate the prevalence of PPD in the Georgian population (Tab.2). This group included participants currently experiencing the postpartum period, 133 subjects in total (subjects from this group were included in the four major subgroups, Group A-D, as well). Group X was also divided into four subgroups: Xa. First-time mothers with PPD: 58 (43.6%); Xb. First-time mothers without PPD: 54 (40.6%); Xc. Multipara mothers with PPD: 8 (6.0%); Xd. Multipara mothers without PPD: 13 (9.8%).

TABLE 2. Group X of "current subjects" (Total number: 133)

Subgroup	N (%)
Subgroup a: First-time mothers with PPD	58 (43.6%)
Subgroup b: First-time mothers without PPD	54 (40.6%)
Subgroup c: Multipara mothers with PPD	8 (6.0%)
Subgroup d: Multipara mothers without PPD	13 (9.8%)

Abbreviations: PPD, postpartum depression

Distribution of all subjects is given in Figure 1.

FIGURE 1. Distribution of all subjects by presence/absence of PPD
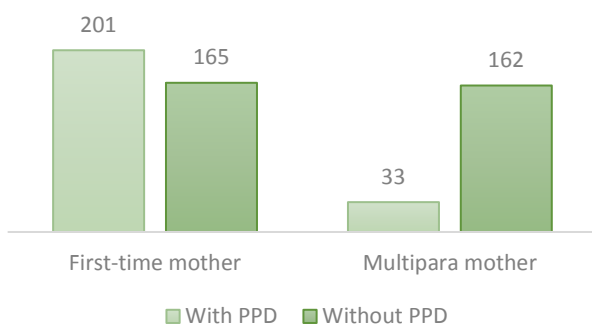
Abbreviations: PPD, postpartum depression

Prevalence of PPD
The data from Group X was used to calculate the prevalence of postpartum depression in the Georgian population. Out of 133 subjects, 66 (49.60%) had EPDS scores greater than 12, implying that the prevalence of PPD in Georgia is 49.60% (Fig.2).

FIGURE 2. Prevalence of PPD (%)
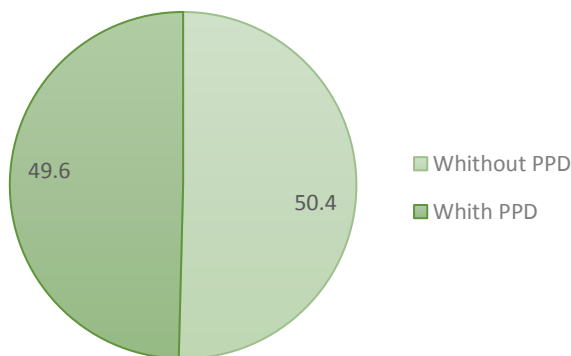
Abbreviations: PPD, postpartum depression

PPD rates in first-time mothers and multipara females
PPD rates in first-time and multipara mothers were compared across the entire sample size (using groups A-D).

The total number of first-time mothers was 366 (Group A and B), with 201 subjects (54.9%) having an EPDS score of greater than 12 (Group A). The total number of multipara mothers was 195 (Group C and D), with 33 subjects (16.9%) having an EPDS score of greater than 12 (Group C). According to these findings, the rates of PPD were significantly higher in first-time mothers (54.9%) than in multipara females (16.9%) (Fig.3). The chi-squared test proved the alternative hypothesis with a p-value of <0.001 (< 2.2E-16), implying that PPD is more common in first-time mothers compared to multigravida females.

TABLE 3. PPD rates (%) in first-time mothers (A) and multipara mothers (B)
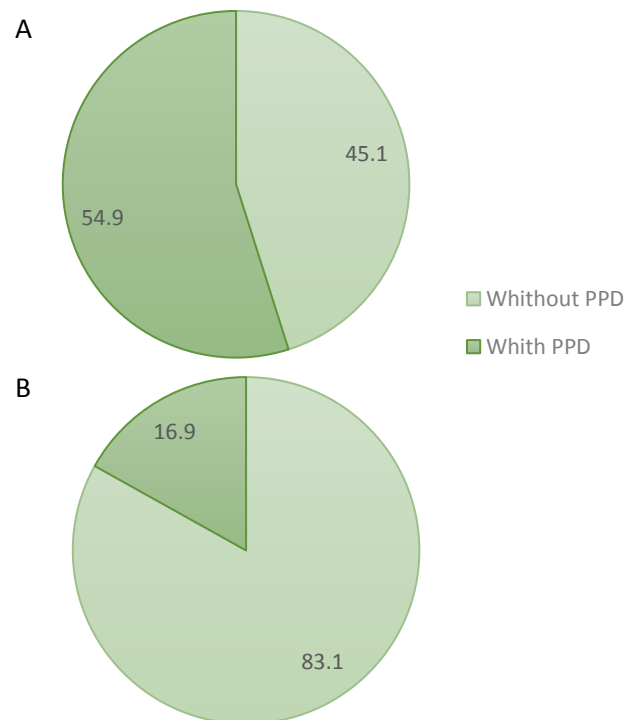
Abbreviations: PPD, postpartum depression

Potential risk factors among first-time mothers with PPD
Table 3 describes the distribution of potential risk factors in first-time mothers with PPD. Since the study aimed to determine the correlation of potential risk factors to postpartum depression among first-time mothers precisely, only responses from group A (201 subjects in total) were used for this part of the study. The mean EPDS score for first-time mothers with PPD was 18.04 ± 3.8, and the mean age at delivery was 25.7 ± 5.0. Out of 201 subjects, 131 (65.2%) gave birth with a physiologic mode of delivery, 61 (30.3%) subjects had C-sections, and nine subjects (4.5%) were pregnant with their first child at that time (i.e., delivery mode unknown). Out of 201 subjects, 55 (27.4%) experienced severe obstetric pain at the time of delivery,

and newborns of 33 subjects (16.4%) had health problems shortly after birth.

TABLE 3. Distribution of risk-factors of postpartum depression in first-time mothers (Total number: 201; Mean EPDS score and mean age of first-time mothers with PPD: 18.04 ± 3.8 and 25.7 ± 5.0, respectively)

Risk-factors	N (%)
Delivery mode	
Physiologic	131 (65.2)
C-section	61 (30.3)
Unknown (pregnant on first)	9 (4.5)
Obstetric pain	55 (27.4)
Newborn health problems	33 (16.4)
Economic/living conditions	
Excellent	31 (15.4)
Good	75 (37.3)
Satisfactory	88 (43.8)
Non-satisfactory	6 (3.0)
Bad	1 (0.5)
Education level	
Completed university	176 (87.6)
Completed high school	25 (12.4)
Did not complete school	0 (0)
Employment	
Employed	147 (73.1)
Unemployed	54 (26.9)
Family support	
Strong	130 (64.7)
Poor	55 (27.4)
No support	16 (7.9)

In terms of economic and living conditions, 31 subjects (15.4%) reported excellent conditions, 75 (37.3%) reported having good conditions, 88 (43.8%) reported satisfactory, 6 (3.0%) reported non-satisfactory, and 1 (0.5%) reported extremely bad conditions. 176 subjects (87.6%) completed high school and university, while the remaining 25 (12.4%) completed high school only. No subjects completed, only lower/upper secondary without completing high school. 147 subjects (73.1%) were employed at delivery time, and 54 subjects (26.9%) were unemployed. In terms of family support in the postpartum period, 130 subjects (64.7%) received strong support from their family members, 55 subjects (27.4%) were poorly supported, and 16 subjects (7.9%) received no help at all.

Table 4 describes the results of linear regression analysis.

TABLE 4. Correlation of Edinburgh Postnatal Depression Scale (EPDS) score of first-time mothers with postpartum depression to potential risk factors using linear regression analysis.[a]

Variables	Coefficient (SE)	P-value	95% (CI)
Age	0.37 (0.05)	< 0.001[b]	0.28-0.46
Delivery mode	2.22 (0.69)	0.002	0.85-3.59
Obstetric pain	0.42 (0.78)	0.593	-1.12-1.95
Newborn health problem	1.40 (0.86)	0.106	-0.30-3.10
Economic/living conditions	2.54 (0.36)	< 0.001[c]	1.84-3.25
Education level	0.06 (1.04)	0.956	-1.99-2.11
Employment	-0.29 (0.77)	0.704	-1.82-1.23
Family support	-1.64 (0.56)	0.004	-2.74-0.54

[a] Adjusted R squared = 0.94;
[b] 4.19354E-13;
[c] 2.08031E-11.

Four of the eight variables were statistically significant with a p-value of less than 0.05, including age, delivery mode, economic and living conditions, and family support. Age had a positive coefficient (0.37, SE=0.05), indicating that increased age was correlated to increased EPDS score: increasing age by one year increased the risk of PPD by 0.37 (95% CI: 0.28 - 0.46), with the p-value of <0.001 (4.19354E-13). The delivery mode also had a positive coefficient (2.22, SE=0.69), indicating that the physiologic mode of delivery increased the risk of PPD by 2.22 (95% CI: 0.85 - 3.59), with the p-value of 0.002 (in the linear regression, the physiologic mode was assigned 1 point, and C-section was assigned 0 points, meaning that increased point, or positive coefficient, is associated with physiologic mode of delivery, while decreased point, or negative coefficient, is associated with C-section). Another variable, economic/living conditions, had a positive coefficient (2.54, SE=0.36), indicating that better economic and living conditions increase the risk of PPD by 2.54 (95% CI: 1.84 - 3.25), with the p-value of < 0.001 (2.08031E-11). Finally, family support had a negative coefficient (-1.64, SE=0.56), indicating that strong family support decreases the risk of PPD by 1.64 (95% CI: -2.74 - -0.54), with the p-value of 0.004 (meaning that poor family support increases the risk of PPD). The variables that were not statistically significant include obstetric pain, newborn health problems, education level, and employment, with p-values of 0.593, 0.106, 0.956, and 0.704, respectively.

DISCUSSION

The findings mentioned above point to a considerably high prevalence of PPD among Georgian females. Additionally, significantly higher rates of PPD were identified in primiparas compared to multiparas, and major predictors of PPD among first-time mothers were highlighted. Specifically, advanced maternal age, physiologic delivery mode, high

economic status, and strong family support were among the most consistent predictors of depressive symptoms.

Except for a few contrasting and rather unexpected results, most of the findings in this cross-sectional analysis support previous studies. It should be highlighted that this pilot study only explores the individuals based on their responses to an online questionnaire. In contrast, the majority of studies to which the results of the current study are compared are longitudinal designs, mostly cohort, involving clinical interviews and prolonged observational periods. The contrasting findings could be attributed to the latter.

The overall prevalence of PPD (49.6%) among study subjects turned out to be significantly higher compared to the prevalence in numerous other countries. In the Western world, rates of PPD range from 10-15%.[12,21] Studies that were conducted in Delhi and adjacent states of northern India, Egypt, and Uganda showed that the prevalence was 15.8%,[21] 17.9%,[22] and 16.3%,[23] respectively. Similar studies were done in Lebanon, Cameroon, and Nigeria, establishing that the prevalence was 21%,[24] 23.4%,[25] and 23%,[26] respectively. However, numerous epidemiological studies have confirmed that PPD is becoming increasingly common than previously thought, and the prevalence varies significantly between nations.[27] The reported prevalence of PPD is established to be significantly high in Guyana, Costa Rica, Italy, Chile, South Africa, Korea, and Taiwan, ranging from 34-57.0%.[28]

A systematic review of all papers reporting PPD prevalence using the Edinburgh Postnatal Depression Scale[28] has established that the prevalence is lower in developed countries[12] compared to relatively low- and middle-income countries.[13] Given that Georgia is a developing country, this could be one of the reasons why the prevalence in the present study was so high. Since the current study was conducted as an online survey, using a questionnaire posted on the social network, there is a possibility that females who experienced symptoms of PPD were more engaged with this issue and responded to the questionnaire more actively.

The current study also sought to demonstrate that first-time mothers are at higher risk of developing postpartum depression compared to multipara females since they struggle more to adjust to the role of mother, have lower maternal confidence, and, as a result, experience more anxiety and depression after giving birth. As the results showed, the rates of PPD were significantly higher among first-time mothers compared to multigravida females. The prevalence was 54.9% in first-time mothers and 16.9% in multiparas. A similar difference was identified in the prospective cohort study conducted in 2020 among Japanese women, which established that prevalence was 15.2% and 6.7% in primiparas and multiparas, respectively.[18]

Determining the correlation of potential risk factors to postpartum depression among first-time mothers was another purpose of the present study. The results showed that four of the eight characteristics, including age, delivery mode, economic and living conditions, and family support, were linked to PPD in primiparas. Increased age was significantly associated with elevated EPDS scores, consistent with a substantial number of data suggesting that women giving birth at an advanced age have a higher risk of developing depression.[29-31] According to a cross-sectional study conducted in Canada in 2007-2008, the prevalence of depression in females who had recently delivered was significantly higher in women aged 40 to 44 years compared to those aged 30 to 35 years.[32] This increased risk has been linked to several reasons, such as the idea that older women experience more difficulty adjusting to the role of mother.[33]

Furthermore, they are more likely to develop obstetric complications, which could be another contributing factor to a higher risk of PPD.[34] The current study showed a positive association between the physiologic mode of delivery and increasing risks of PPD. This finding is consistent with a cohort study conducted in Uppsala, Sweden, which established that Caesarean section, compared to physiologic delivery, was associated with fewer depressive symptoms at 6 six weeks postpartum.[17] A possible interpretation of this phenomenon is that females who deliver via C-sections may receive more significant support from their immediate environment and, therefore, are less likely to develop depressive symptoms.[17] However, a prospective observational study conducted in Pittsburgh, Pennsylvania, did not find a relationship between delivery mode and PPD scores.[35] Thus, the evidence presented in the literature contradicts this finding. The current study showed a positive association between the level of economic and living conditions and depression as well, implying that better conditions are associated with an increased risk of PPD. This was an unexpected result since the study anticipated revealing that low economic status and poor living conditions are associated with increased depressive symptoms. Numerous studies have established that low income is associated with an increased risk of depression in postpartum females.[36] For instance, results of a descriptive study conducted in Northern California showed that low socioeconomic status was associated with increased depressive symptoms in late pregnancy at 2 and 3 months postpartum.[37] A possible explanation for the unexpected finding of the current study could be the limited access to the questionnaire for those with significantly poor conditions. Since the study was conducted as an online survey and required access to the internet, cell phones, computers, etc., which might not have been available to females with very low economic status, the questionnaire was probably less accessible to them. In the present study, increased family support was statistically associated with a

reduced risk of PPD. Although a prospective cohort study conducted in Iran in 2016 did not find this association,[15] there is evidence that postpartum care, particularly peer support, could be beneficial for women who are at high risk for PPD, leading to a statistically significant drop in their EPDS scores.[38] A prospective cohort study further strengthened this conclusion carried out in China, which established that a lack of postnatal family support, especially from the husband, is a significant risk factor for PPD.[39]

The results of the current study did not reveal a connection between the level of education and PPD, which is consistent with findings from several other surveys.[24,40] However, some other studies established a lower education level as one of the contributing factors to PPD.[41-43] It should be noted that the education level of the participants in the current study has only been determined based on their responses to a questionnaire that asked if they had completed high school or university. The educational activities increase the likelihood that their responses were not truly indicative of their level of education. This study failed to find an association between newborn health problems and an increased risk of PPD as well.

In contrast, an institution-based cross-sectional study conducted in Ethiopia in 2018 revealed that having a hospitalized child postpartum was associated with PPD. Females who had a current hospitalized child were nearly three times more likely to experience depression compared to women with healthy newborns.[44] Another study found that newborn health problems, such as colic, jaundice, and feeding problems, were moderate predictors of PPD.[17] The results of the present study could be attributed to the fact that, in the latter, women were asked whether their newborns had any general health concerns without specifying whether the baby had been hospitalized. Therefore, there is a possibility that their newborns' health problems were minimal, not having an impact on their mental health. The current study found no association between employment and postpartum depression either, contrary to prospective cohort studies carried out in Switzerland and Japan, which revealed that pregnant employed women had a lower risk of PPD compared to pregnant who were unemployed.[45,46] Unemployment may lead to lowered self-esteem, financial instability, and decreased social standing, all of which are potential sources of mental stress;[47] however, there are numerous factors, such as family support, that could have improved the mental health of the unemployed participants of the current study, producing contrasting results.

In contrast to the other studies that suggested a positive relationship between labor pain and postpartum depression,[48-50] in the current study, obstetric pain was not associated with an increased risk of PPD. The fact that women in the present study were not directly observed while giving birth may have contributed to this result since

their pain level was only evaluated based on the questionnaire responses they provided. Hence, there is a possibility that their answers did not accurately reflect their actual level of pain.

The primary strength of the study is a large sample size of 648 participants, which is a significantly high number in proportion to the Georgian population of fewer than four million. Conducting the study as an online survey is highly time-consuming and cost-effective. It is also minimally time-consuming for the study participants since filling out the questionnaire takes 5-10 minutes. Additionally, this gives the study another advantage of anonymity, which yields more truthful responses and produces more accurate data for the current study. However, conducting research through online questionnaires poses a high risk of bias, as subjects were not observed while filling out the questionnaires, increasing the potential for more subjective and inadequate answers. Another limitation is that the mental health status of the females with previous psychiatric illnesses, the primary exclusion criteria of the study, was not verified directly using official documents; the participants were marked as having a history of psychiatric disease solely based on their responses. Another weakness of this design that could significantly increase the risk of bias is that the females who gave birth several years ago could have had altered versions of their past mental health recollections and trouble documenting their actual experiences of the postpartum period.

Furthermore, the current study findings cannot be generalized to the entire population since the subjects included only a specific group of females who were members of specific Facebook groups. The most efficient way to reduce the risk of bias from the online survey design would be to conduct a clinical study with face-to-face interviews and long-term monitoring. Gathering more information through clinical interviews would ultimately lead to more valuable data in correlation with the current study and result in a better understanding of this issue. Still, it would not be an absolute solution for eliminating the subjectivity of the respondents as there is no ultimate strategy to measure honesty levels in study participants.

To the authors' best knowledge, the data regarding PPD is limited in the Georgian population. Hence, this study offers valuable insight into this critical mental health condition that needs serious attention and treatment. It will help increase awareness among society and healthcare providers who work directly on this condition. The findings of this research have important implications for providing care and support for Georgian females by helping identify the areas that require improvement. Furthermore, it could inform future studies in this area.

CONCLUSIONS

The present study sought to investigate the prevalence of postpartum depression (PPD) among Georgian females and identify specific risk factors associated with the condition among first-time mothers. Results indicate that the prevalence of PPD was significantly high, with a notably higher incidence observed among first-time mothers compared to multipara females. Factors found to be associated with PPD included advanced maternal age, physiologic delivery mode, high economic status, and lack of family support. These findings emphasize the importance of raising knowledge of these predictors among females and their close environment in order to promote maternal mental health postpartum.

AUTHOR AFFILIATION

1 American M.D. Program, Tbilisi State Medical University, Tbilisi, Georgia;
2 Financial risk consultant, KPMG Georgia, Tbilisi, Georgia.

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