

Research Article

Maternal Depression and Associated Factors Among South Sudanese Refugee Mothers in Gambella's Tierkidi Refugee Camp: A Cross-Sectional Study

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Abstract

Background: Maternal depression stands out as the prevailing psychiatric condition during pregnancy, with its detrimental impacts posing significant consequences for both the mother and the fetus. Nearly a quarter of women will encounter depression at some stage in their lives, with the majority experiencing it during their childbearing years. Refugee women face elevated susceptibility to mental health disorders, with rates surpassing those of host populations. **Objective:** The objective of this study is to determine the prevalence of maternal depression and the associated factors with it among South Sudanese refugee women living in the Gambella region, in the Tierkidi refugee camp in Ethiopia in 2023. **Method:** A community-based cross-sectional study conducted within the Gambella region's Tierkidi refugee camp in Ethiopia involved 452 randomly selected participants who were pregnant and had given birth within the past 12 months. Data collection utilized a pretested structured questionnaire administered through interviews. Data coding and entry were performed using Epi-Info version 7.2, with subsequent analysis conducted in SPSS version 23. Descriptive statistics and logistic regression were employed to identify associations between the outcome variable and explanatory variables. The strength of association was assessed using odds ratios at a 95% confidence interval, and associations were deemed significant at a p-value of less than 0.05. **Results:** In this study, the prevalence of maternal depression was found to be 31.5% (95% CI: 27.4-37.8). Significant associations were observed between maternal depression and unmarried marital status (AOR = 13.39, 95% CI: 3.11-57.7), unplanned pregnancy (AOR = 6.76, 95% CI: 2.13-21.4), intimate partner violence (AOR = 5.4, 95% CI: 2.32-12.4), number of pregnancies (AOR = 4.85, 95% CI: 2.56-9.17), and history of abortion (AOR = 3.97, 95% CI: 1.07-14.7). **Conclusion:** The study revealed a high prevalence of maternal depression among pregnant mothers with infants less than 12 months old. Factors such as being unmarried, experiencing unplanned pregnancy, having a history of abortion, a higher number of pregnancies, lack of social support, and a history of intimate partner violence were found to be significantly associated with maternal depression.

Keywords

Maternal Depression, Gambella, Tierkidi Refugee Camp

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1. Introduction

Maternal depression encompasses a spectrum of depressive episodes, varying in severity from mild to severe, occurring either during the antenatal period or within twelve months following childbirth [1]. The antepartum and postpartum periods bring about distinct challenges, encompassing both physical and psychological changes, which women may find challenging to navigate. These changes include alterations in physical appearance, potential shifts in interpersonal relationships, physical and emotional discomfort, and the anticipation of assuming the new role of motherhood. Together, these factors characterize the postpartum period as a significant yet transformative experience [2, 3].

There is ongoing debate regarding whether maternal depression exhibits phenomenological distinctions from depression occurring at other stages of a woman's life [4]. From an epidemiological perspective, major disease classification systems distinguish maternal depression from other types of depressive disorders solely based on its onset during the perinatal period [5].

The significant effects of maternal depression, compounded by escalating global migration patterns and pronounced disparities in mental health care, underscore migrant women's maternal mental health as a critical global health concern. Despite the distinct challenges associated with forced displacement, migrant women are disproportionately susceptible to inadequate social support, violence, poverty, adverse health conditions, and discrimination compared to non-migrants [4, 6].

Even with accessible and cost-effective treatment options, maternal depression frequently goes unnoticed and untreated, particularly in resource-limited environments. The repercussions of untreated maternal depression can be severe and far-reaching, impacting not only women but also their partners and children. Migrant women, facing numerous stressors linked to displacement, may be particularly susceptible to developing maternal depression. Untreated maternal depression has been linked to several adverse effects [1, 5, 6].

While a significant portion of migrants worldwide come from low- and middle-income countries (LMICs) and relocate to similar environments, relatively little is understood about migrant women who settle in LMICs. These women often experience less social and cultural isolation, as they reside in closer proximity to or migrate alongside family members. However, migrant women resettling in LMICs are prone to enduring inadequate living conditions, heightened socioeconomic disparities, and limited access to post-migration health and social services compared to those settling in high-income countries [1, 6, 7]. Within LMICs, maternal depression has a direct correlation with adverse child outcomes, including low birth weight, stunting, deficient attachments, and impaired social development [1, 8].

Epidemiological research has highlighted various factors

associated with an elevated risk of maternal depression, including younger age, unplanned pregnancy, marital status characterized by being unmarried, inadequate family support, insufficient spouse support, a history of psychiatric disorders, experiencing violence during pregnancy, low socioeconomic status, exposure to stressful life events, first-time pregnancy, inadequate follow-up of antenatal care, pregnancy-related complications, prior operative delivery, intimate partner abuse, and food insecurity [7, 8].

Consequently, it is crucial to comprehend the factors such as demographics, access to healthcare, and perceptions of mental health that influence the refugee women populations resettled in the Gambella region, Ethiopia specifically within the Turkide refugee camp. This understanding holds significant importance in devising innovative strategies and approaches to mitigate the issue. Moreover, it is essential to discern the efficacy of existing interventions and identify areas requiring further action.

2. Method and Materials

A community-based cross-sectional study was conducted in August 2023 among pregnant women who had given birth in the past 12 months and resided in the Tierkidi refugee camp in Gambella, Ethiopia. Situated on the western border of South Sudan, Gambella has seen a significant influx of refugees over the past two decades, as reported by the UNHCR in 2019. Among these refugees, many reside in five camps: Kule, Pugnido, Jewi, Nguenyiel, and Tierkidi, along with a smaller population living in local settlements within the region. The study specifically targeted South Sudanese refugee mothers residing in Gambella's Tierkidi refugee camp, which was selected by a lottery method.

The study included pregnant women aged between 18 and 49 years old, as well as women who had given birth within the past 12 months, provided they were South Sudanese refugees residing in the Gambella Tierkidi refugee camp during the study period. Individuals previously diagnosed with depression, anxiety, or any other mental illnesses were excluded from the study.

The sample size was calculated using the single population proportion formula, taking into account a 95% confidence interval (with $Z_{1-\alpha/2} = 1.96$), an estimated proportion of mental depression among mothers ($P = 44\%$) [9], a 5% degree of precision, and a 5% non-response rate, the final sample size was determined to be 452. The sampling frame was obtained from GOAL-Ethiopia, a non-governmental organization involved in the Infant and Young Child Feeding program in the Tierkidi refugee camp. This organization was selected due to its direct access to the target mothers. Participants were selected from the sampling frame using a simple random sampling technique.

Structured questionnaires were employed for data collec-

tion through interviews. These questionnaires were crafted by adapting information from various literature sources and similar studies [10, 8, 11]. The questionnaire consists of four sections covering socio-demographic, psychosocial, behavioural, and obstetrical/general health factors. Data collection involved eight female midwives and two psychologists, all fluent in the local (Neur) language, who underwent intensive two-day training. A pre-test on 5% of the sample size (n=23) was conducted to validate the questionnaire before full-scale data collection.

The measurement of the outcome variable for maternal depression was conducted using a standardized checklist adapted from the Patient Health Questionnaire (PHQ-9) [12].

This questionnaire comprises nine questions, each providing four possible responses. Each response is assigned a score from zero to three, indicating the severity of symptoms. The total score on the scale ranges from 0 to 27, with different score ranges representing varying levels of depression severity: mild depression (scores 5 to 9), moderate depression (scores 10 to 14), moderately severe depression (scores 14 to 19), and severe depression (scores >20).

In our study, we defined depression across the spectrum from mild to severe using this scale. Thus, we applied a cut-off point of five to nine on the PHQ-9 scale to identify depression among antenatal women.

The collected data were entered into Epi-Info 7.2 and were subsequently exported to SPSS (version 28) for thorough cleaning and analysis. Descriptive analysis, encompassing frequency, percentage, mean, and median, was employed to characterize the variables involved in the study.

Bivariate and multivariable logistic regression analyses were also conducted to investigate the relationship between the explanatory variables and the outcome variable, (maternal depression). Among the explanatory variables, certain variables exhibited a p-value < 0.25 in bivariate analysis and were thus included in the multivariable logistic regression analysis.

Assumptions essential for logistic regression, such as assessing multicollinearity between the explanatory variables through correlation coefficient, VIF, and tolerance, were thoroughly examined. The Hosmer–Lemeshow goodness-of-fit model was employed to evaluate multivariate fitness, yielding a result of 0.46.

In the multivariate analysis, the Adjusted Odds Ratio (AOR) with a 95% Confidence Interval (CI) and a p-value less than 0.05 were considered indicative of a statistically significant association.

3. Results

3.1. Socio-Demographic Characteristics

Out of the total estimated sample size (n = 452), 446 participants (98.6%) consented to participate in the interview.

The majority of participants (55.6%, n = 248) fell within the age range of 15–24 years, with a mean age distribution of 24.2 ± 5 years. A large proportion of participants were married (94.6%, n = 422) and identified as Protestant in religion (88.6%, n = 395). Both mothers and their spouses had a considerable level of formal education, with rates of 58.3% (n = 260) and 72.0% (n = 321), respectively. On average, participants had been residing in the camp for 2.5 ± 1 year. The majority (95.7%, n = 427) relied on support from UNHCR cash distribution/transfer as their source of income. Regarding pre-existing medical conditions, nearly all participants (97.1%, n = 433) reported not having any, while only a small percentage (0.9%, n = 4) were not taking any medication (see *Table 1*).

Table 1. Socio-demographic characteristics of participants Tierkidi refugee camp, Gambella, Ethiopia 2023.

| Variables | Frequency (n=446) | Percent (%) |
|----------------------------------|-------------------|-------------|
| Age | | |
| 15-24 | 248 | 55.6 |
| 25- 34 | 185 | 41.5 |
| >35 | 13 | 2.9 |
| Marital status | | |
| Married | 422 | 94.6 |
| Single | 24 | 5.4 |
| Religion | | |
| Protestant | 395 | 88.6 |
| Other* | 51 | 11.4 |
| Educational status of the mother | | |
| Informal education | 186 | 41.7 |
| Formal education | 260 | 58.3 |
| Spouse's Educational status | | |
| Informal education | 125 | 28.0 |
| Formal education | 321 | 72.0 |
| Length of stay in the camp | | |
| <1 year | 123 | 27.6 |
| 2- 4 years | 237 | 53.1 |
| 4-6 years | 63 | 14.1 |
| > 7 years | 23 | 5.2 |
| Source of income | | |
| UNHCR monthly cash support | 427 | 95.7 |
| UNHCR and other | 19 | 4.6 |

| Variables | Frequency (n=446) | Percent (%) |
|---------------------------------|-------------------|-------------|
| Pre-existing medical illness | | |
| Yes | 13 | 2.9 |
| No | 433 | 97.1 |
| Currently taking any medication | | |
| Yes | 4 | 0.9 |
| No | 442 | 99.1 |

Other*= Catholic, Muslim

3.2. Maternal Depression

The study found that 141 out of 446 South Sudanese refugee women, representing 31.6% of the sample, showed signs of depression.

3.3. Substance Use

Just over a quarter (71.6%) of the respondents reported consuming alcohol, with 23.3% drinking one glass per week. In terms of cigarette smoking, only 1.4% of the interviewed participants reported smoking cigarettes. The study participants were queried regarding the development of other types of health-damaging behaviour. Consequently, a very small proportion (2.0%) had developed other substance addictions (see Table 2).

Table 2. History of substance use among participants Tierkidi refugee camp, Gambella, Ethiopia 2023.

| Variable characteristics | Frequency (n = 446) | Percent (%) |
|--------------------------------------|---------------------|-------------|
| Alcohol | | |
| Yes | 127 | 28.4 |
| No | 319 | 71.6 |
| Alcohol consumption/period (n = 127) | | |
| 1 Glass/week | 30 | 23.3 |
| Rarely | 97 | 76.7 |
| Cigarette Smoking | | |
| Yes | 6 | 1.4 |
| No | 440 | 98.6 |
| Other type of substance addiction | | |
| Yes | 9 | 2.0 |
| No | 437 | 98.0 |

3.4. Obstetric Characteristics

The study revealed that only a small proportion (5.0%) of participants had a history of abortion, with 85% (n=19) experiencing abortion once. About 82% (n=410) of the respondents reported that their pregnancy or child was planned.

Approximately 13% (n=58) of the study participants were primiparous, while roughly 39.7% (n=177) were multiparous, and about 47.3% (n=211) were grand multipara. On average, women had 3.5 pregnancies, with the minimum being one and the maximum reaching nine. Regarding the mode of delivery for the participants' most recent birth, almost all (96.6%, n=431) delivered vaginally (see Table 3).

Table 3. Obstetric characteristics among participants Tierkidi refugee camp, Gambella, Ethiopia 2023.

| Variable characteristics | Frequency (n = 446) | Percent (%) |
|--------------------------|---------------------|-------------|
| Abortion history | | |
| Yes | 22 | 5 |

| Variable characteristics | Frequency (n = 446) | Percent (%) |
|------------------------------------|---------------------|-------------|
| No | 424 | 95 |
| Number of abortion history (n= 22) | | |
| One | 19 | 86 |
| Two | 3 | 14 |
| Pattern of Pregnancy | | |
| Planned | 410 | 91.9 |
| Unplanned | 36 | 8.1 |
| Number of pregnancy | | |
| Primiparous | 58 | 13.0 |
| Multiparous | 177 | 39.7 |
| Grand multipara | 211 | 47.3 |
| Mode of delivery | | |
| Vaginally | 431 | 96.6 |
| Caesarean section | 15 | 3.4 |

3.5. Social Support

Concerning the social support system during pregnancy and the post-partum period, the majority, 66% (n=294) of South Sudanese refugee mothers, reported that their mothers supported them during these times. Additionally, approximately 68% (n=303) of the participants perceived having strong social support, while 28% (n=125) reported having an average level, and the remaining 4% (n=18) perceived having lower social support.

Experience of violence from an intimate partner

Among the mothers who participated in the study, 24.9% (n=111) reported experiencing intimate partner violence in the refugee camp. The majority of these cases (78%, n=87) involved partners exhibiting controlling behaviour, while emotional, physical, and sexual violence accounted for 18%, 3%, and 1% respectively.

Factors associated with maternal depression.

In bivariate logistic regression analysis, factors such as marital status, pregnancy pattern, number of pregnancies, history of abortion, intimate partner violence, and social support were found to be associated with maternal depression.

Unmarried pregnant women were five times more likely to experience maternal depression [COR & (95% CI) = 5.8, (2.47, 13.71)] compared to their married counterparts. Additionally, unplanned pregnancy was significantly associated with a six fold increase in the likelihood of maternal depression [COR & (95% CI) = 6.67, (3.24-13.70)] compared to planned pregnancy.

Furthermore, the risk of developing maternal depression

increased with the number of pregnancies, including primiparous [COR & (95% CI) = 2.64, (1.523, 4.59)], multiparous [COR & (95% CI) = 4.53, (2.214, 9.28)], and grand multipara [COR & (95% CI) = 4.77, (1.252, 18.2)].

Other variables associated with maternal depression in this study included a history of abortion [COR & (95% CI) = 4.94, (2.05, 11.89)], social support [COR & (95% CI) = 4.53, (2.214, 9.28)], and intimate partner violence [COR & (95% CI) = 4.94; (2.05, 11.89)].

Following adjustment for potential confounding variables, five variables; marital status, pregnancy pattern, number of pregnancies, history of abortion, and intimate partner violence were showed statistically significant associations with maternal depression.

In this finding, unmarried individuals were 13 times more prone [AOR & (95%CI) = 13.39; (3.11, 57.7)] to experience maternal depression compared to their married counterparts. The risk of developing maternal depression also increased by fivefold among women who experienced violence compared to their counterparts [AOR & (95%CI) = 5.4; (2.32, 12.4)]. Similarly, the odds of developing depression increased fourfold for women with multiple pregnancies compared to those with only one pregnancy [AOR & (95%CI) = 4.85(2.56, 9.17)].

Furthermore, unplanned pregnancy increased the odds of developing depression seven fold compared to planned pregnancies [AOR & (95%CI) = 6.76 (2.13, 21.4)]. Similarly, pregnant women with a history of abortion were four times more likely to develop maternal depression compared to those without such history [AOR & (95%CI) = 3.97; (1.07-14.7)] (see Table 4).

Table 4. Factors associated to maternal depression among participants Tierkidi refugee camp, Gambella, Ethiopia 2023.

| Variables | Maternal depression | | COR (95%CI) | AOR (95%CI) |
|---------------------------|---------------------|------------|-------------------|------------------|
| | Yes | Not | | |
| Marital status | | | | |
| Unmarried | 15 (13.8) | 9 (2.7) | 5.8 (2.47,13.71) | 13,39 (3.1,57.7) |
| Married | 94 (86.2) | 328 (97.3) | 1 | 1 |
| Pattern of Pregnancy | | | | |
| Planned | 86 (78.9) | 324 (96.1) | 1 | 1 |
| Unplanned | 23 (21.1) | 13 (3.9) | 6.67 (3.24,13.70) | 6.76 (2.13,21.4) |
| Number of pregnancies | | | | |
| multiparous | 42 (38.5) | 135 (40.1) | 4.53 (2.214,9.28) | 1 |
| Primiparous | 9 (8.3) | 49 (14.5) | 2.64 (1.523,4.59) | |
| Grand multipara | 58 (53.2) | 153 (45.4) | 4.77 (1.252,18.2) | 4.85 (2.56,9.17) |
| Abortion history | | | | |
| Yes | 13 (11.9) | 9 (2.7) | 4.94 (2.05,11.89) | 3.97 (1.07,14.7) |
| No | 96 (88.1) | 328 (97.3) | 1 | 1 |
| Intimate partner violence | | | | |
| Yes | 63 (57.8) | 48 (14.2) | 8.25 (5.06,13.43) | 5.4 (2.32,12.4) |
| No | 46 (42.2) | 289 (85.8) | 1 | 1 |
| Social support | | | | |
| Yes | 90 (82.6) | 322 (95.6) | 1 | 1 |
| No | 19 (17.4) | 15 (4.4) | 4.53 (2.214,9.28) | 1.34 (.37,4.88) |

Significance: $p < 0.05$; 1= reference category; AOR= Adjusted Odds Ratio, COR=Crude Odds Ratio

4. Discussion

In this study, the magnitude of maternal depression was found to be 31.5% (95% C.I: 27.4, 37.8), which is almost similar to the research conducted in Bale Goba [13]. However, the findings of this study were higher compared to meta-analyses and systemic reviews conducted in high-income countries [7, 8, 14]. Conversely, the prevalence of maternal depression in this study was lower compared to studies conducted in Bangladesh (54.6%) [15], Syria (50%) [9], Thailand Myanmar (58.3%) [16], Trinidad (88%) [11], Shimelba refugee camp (44%) [17], and systemic reviews conducted in low- and middle-income countries [1, 18, 19]. This difference might be attributed to variations in the screening tools used, cutoff points for screening, socio-demographic factors, year of study, and sample sizes utilized.

In this study, unmarried marital status was found to be

significantly associated with maternal depression, a similar finding to that reported in different studies [8, 20, 21]. This association could be attributed to feelings of loneliness and lower self-confidence or self-esteem.

In this study, pregnant women who did not plan their current pregnancy were more likely to experience maternal depression compared to those who had planned their pregnancy. This finding is consistent with other studies [21, 20]. This correlation can be attributed to the fact that pregnancy requires physical, psychological, and financial preparation. The absence of such preparation and support for these factors can exacerbate the physical, psychological, and hormonal changes associated with pregnancy, potentially leading to adverse outcomes for the child.

Similarly, a history of abortion was identified as a significant predictor factor which was associated with maternal depression. This finding is consistent with a systemic reviews and meta-analyses report from high, medium, and low-income countries [8, 22]. This association could be attributed to the

psychological consequences of abortion, which range from grief and fear of recurrence to decreased self-esteem and anxiety.

Intimate partner violence was identified as another explanatory variable significantly associated with maternal depression. Experiencing violence was associated with a fivefold increase in the risk of developing maternal depression compared to women who did not experience violence [Adjusted Odds Ratio (AOR) & (95% Confidence Interval) = 5.4; (2.32, 12.4)]. This finding is consistent with studies from Canada [23], Turkey [24], meta-analysis and systemic reviews [18, 20, 21, 25]. This could be attributed to reduced access to medical care and underreporting of violence.

Another explanatory variable significantly associated with maternal depression in this study was the number of pregnancies. The odds of developing depression increased fourfold for women with multiple pregnancies compared to those with only one pregnancy [AOR & (95%CI) = 4.85(2.56, 9.17)]. The findings suggest that a higher history of pregnancies may lead to more unplanned pregnancies, resulting in larger family sizes. This increase in family size could potentially contribute to heightened levels of maternal depression among affected mothers.

It is important to recognize the inherent limitations of this study. The limitations include its failure to assess factors such as food insecurity and the hormonal/genetic factors experienced by women during the perinatal period, which could significantly influence perinatal depression. Additionally, due to its cross-sectional study design, it is unable to establish cause-effect relationships. Longitudinal prospective research is necessary to comprehensively understand the nature of these factors in maternal depression.

5. Conclusion

The study conducted among South Sudanese pregnant mothers with infants under 12 months old in Gambella region, in the Tierkidi refugee camp Ethiopia, revealed a significant prevalence of maternal depression. It identified significant associations between maternal depression and several factors: unmarried marital status, experiencing unplanned pregnancies, a history of abortion, a higher number of pregnancies, and a history of intimate partner violence. These findings emphasize the intricate interplay of social, reproductive, and interpersonal factors that contribute to maternal mental health challenges in refugee settings. They underscore the necessity for tailored interventions and support services for vulnerable populations in such contexts.

Abbreviations

| | |
|------|---|
| ARRA | Administration for Refugee and Returnee Affairs |
| AOR | Adjusted Odd Ratio |

| | |
|--------|---|
| CI | Confidence Interval |
| COR | Crude Odds Ratio |
| ILO | International Labour Office |
| ICN | International Council of Nurses |
| LMICs | Low- and Middle-Income Countries |
| OR | Odd Ratio |
| SPSS | Statistical Package for Social Science Software |
| SSA | Sub-Saharan Africa |
| UNHCR | United Nation Higher commissioner for refugee |
| WHO | World health Organization |
| Y12HMC | Yekatit 12 Hospital Medical College. |

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Ethics Approval and Consent to Participate

This study followed the principles outlined in the Helsinki Declaration concerning research involving human subjects. Ethical clearance was obtained from the Institutional Review Board of Yekatit 12 Hospital Medical College (Ref. No: Y12HMC/416/02/24). Before participation, participants were provided with a comprehensive explanation of the study's objectives, and individual informed consent was obtained. Data collection facilitators underwent rigorous training to ensure the confidentiality of participant information. Furthermore, participants were informed of their rights, including the option to decline participation or withdraw from the study at any time.

Author Contributions

Each author made substantial contributions to the conception of the idea, data collection, analysis, and interpretation. They all participated in drafting, revising, or critically reviewing the article and gave final approval for the version to be published. Additionally, they reached a consensus on the journal for submission of the article and agreed to be accountable for all aspects of the work.

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Data Availability Statement

Upon request, the data can be provided by contacting the corresponding author.

Conflicts of Interest

The authors declare no conflicts of interest.

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