Research article

# Health related quality of life and its predictors among postpartum mother in Southeast Ethiopia: A cross-sectional study

Degefa Gomora [a,*], Chala Kene [a], Ayinamaw Embiale [a], Yohannes Tekalegn [b], Girma Geta [a], Kenbon Seyoum [a], Girma Beressa [b], Daniel Atlaw [c], Biniyam Sahiledengle [b], Fikreab Desta [b], Neway Ejigu [a], Usman Hussein [a], Lillian Mwanri [d]

[a] Madda Walabu University, Goba Referral Hospital, School of Health Sciences, department of Midwifery, Bale, Goba, Ethiopia
[b] Madda Walabu University, Goba Referral Hospital, School of Health Sciences, Department of Public Health, Bale, Goba, Ethiopia
[c] Madda Walabu University, Goba Referral Hospital, School of medicine, Department of Human Anatomy, Bale, Goba, Ethiopia
[d] Torrens University Australia, Adelaide Campus, South Australia, Australia

## ARTICLE INFO

## ABSTRACT

*Background:* Post-childbirth, woman's health-related quality of life (HRQOL) is significantly impacted, leading to decreased daily activity, reduced self-care, challenges with breastfeeding and baby weaning, and increased medical costs for both mother and newborn.This study aimed to assess the HRQOL and its predictors among postpartum women in Southeast Ethiopia.
*Methods:* A cross-sectional study was conducted in Southeast Ethiopia between March and May 2022, involving randomly selected sample of 794 postpartum women attending immunization services in public health facilities. Data was collected using a validated questionnaire, and descriptive statistics were computed. A bivariable and multivariable logistic regression model was fitted to predict HRQOL, with odds ratios and 95% confidence intervals used to estimate associations.
*Results:* The study revealed that the overall HRQOL, physical component summary, and mental component summary of quality of life had mean scores of 43.80 ± 27.88, 45.39 ± 28.58, and 42.20 ± 28.15(mean ± SD) respectively. Walking to the health facility (AOR = 2.09; 95% CI: (1.31,3.31); using public transport (AOR = 2.58; 95% CI = 1.69–3.93); having the fear of COVID-19 (AOR = 1.46; 95% CI = 1.08–1.99); having health facility admission history during the recent pregnancy (AOR = 1.62; 95% CI = 1.08–2.44); having postpartum depression (PPD) (AOR = 2.13; 95% CI = 1.57–2.89) were predictors of a lower level of overall HRQOL among postpartum women.
*Conclusion:* The study found that nearly half of postpartum women in Ethiopia have lower HRQOL, with factors such as transport use, recent baby's pregnancy admission history, and postpartum depression (PPD) significantly affecting their overall, physical, and mental HRQOL. Fear of COVID-19 was found to be significantly associated with lower overall and physical HRQO. The implementation of appropriate strategies addressing identified factors is crucial for enhancing the HRQOL among postpartum women in Ethiopia.

* Corresponding author.
*E-mail address:* degefag21@gmail.com (D. Gomora).

## 1. Introduction

The health-related quality of life (HRQOL) is a multidimensional concept that comprises health fields related to physical, psychological and social functioning [1,2] providing beyond a comprehensive measure of population health, life expectancy, causes of death and individuals' functioning capacity [3]. The HRQOL has been proven to be a crucial factor in assessing health status during the transition to motherhood, in addition to physical and social life, and it assesses the positive facets of people's life such as positive emotions and life fulfillment [4,5]. Postpartum-related morbidity has been reported in studies from several countries [6–8].

Post-childbirth changes significantly impact women's HRQOL and overall well-being [9–11]. HRQOL is a growing field that examines women's health during childbearing in wider view. It acknowledges that even during uneventful pregnancies, women may experience experiences that alter their ability to perform their daily activities, potentially impacting their overall HRQOL. Expectant mothers' additional changes during perinatal and postpartum periods may lead to increased psychological health problems like psychosis and depression [12].

Postpartum women's HRQOL scores vary across different settings, with varying scores in Kuwait (mean score of 53.7), Iran (66.32 ± 13.7),Spain (71.94 ± 17.48),and Brazil (86.86 ± 10.6) [13–16]. Even within the same nation, HRQOL scores differ based on conditions within populations. For instance, a Kuwait study found that HRQOL scores were (47.4 ± 10.3) among women with postpartum depression (PPD) and (59.2 ± 13.1) among those without PPD [15].

It has also been reported that Sociodemographic factors may influence the HRQOL of populations. A study in Arba Minch, Ethiopia, revealed that 62.3% of participants had lower HRQOL scores, with a mean score of 45.15 ± 8.13. Moreover, in this Ethiopian study, age group 17–24 years and no formal education were predictors of the lower overall HRQOL [17].

Additional factors including: married or living with a partner, registered students, 30–40 years of age, living without physical complaints, having at least an 8th-grade education, being Caucasian were predictors of having the best health related quality of life [18]. Huang and colleagues also found that husband's lower education level and male gender of the infant were significantly associated with poor quality of life [19]. A study found that women over 40, separated, divorced, or widowed had significantly lower HRQOL scores compared to those who completed upper secondary or had university education, indicating a significant disparity in HRQOL outcomes [20].

Most of the previous studies were done in developed countries, and it is well acknowledged that HRQOL is a concept that is affected by culture and social systems, indicating that the cultural differentials between developed and developing settings may have implications for HRQOL. As such, it is not justifiable to inform policy and strategy initiatives for developing settings, using evidence from studies conducted in developed countries. However, although there have been limited studies indicating the impact of postnatal discomfort and problems on women's HRQOL, their results have been inconsistent and not comprehensive.

Additionally, Previous studies in Ethiopia, were investigated the quality of life among pregnant mothers rather than postpartum women [21,22]. However,the study conducted at Arba Minch town assesed the quality of life among postpartum women in the town and did not considered the rural women, however this study considered the women from rural part of Ethiopia including those from agrarian and pastoralist parts where there is differences in cultures, life styles and other factors that might in turn affect quality of life. Therefore current study aimed to assess the level of HRQOL and its predictors among postpartum women in the Southeast Ethiopia.

## 2. Methods and materials

### 2.1. Study design, setting and populations

Between 10th March and 8th May 2022, institutional-based cross-sectional study was conducted in the health facilities in the Bale Zones, South East Ethiopia. The Bale zone is located in the Southeastern part of the Oromia Regional National State. The zone health facilities are categorized as hospitals or health centers. During the study period, the zone had five hospitals namely: (i) Goba Referral Hospital, (ii) Robe General Hospital, (iii) Delomena General Hospital, (iv) Madda Walabu Primary Hospital, and (v) Goro Primary Hospital. However, the last hospital (Goro Primary Hospital) was not fully functional during study period and was excluded from study. In addition, there were 18 urban health centers and 37 rural health centers within the zone.

According to the 2020/21 Bale zone health office report, the estimated total population of the Bale zone was 1,299,394 of which 636,703 were male,662,691 females and total number of reproductive-age female was 285,867(Unpublished Bale zone health report).

The estimated number of pregnant women in Bale zones was 44,179, and the total number of mothers on postnatal follow-up was 42,880. All postpartum mothers who were attending immunization at all health facilities in the Bale Zone were the source population. To be eligible, women were required to be: in the postpartum period or less than six months after delivery, aged ≥18 years, voluntarily willing to participate in the study, and living in Bale zone for at least six months. However, women with obstetric/neonatal complications related to the recent birth, diagnosed with postpartum depression, and mothers with disability (inability speak, in ability to hear) were excluded from the study.

### 2.2. Sample size determination

By using the single population proportion formula $n = \frac{(Z\frac{\alpha}{2})2\ P(1-P)}{d2}$ and considering P = 62.3% of postpartum mothers who had a low level of quality of life from the previous study in Arba Minch [17], d = 5%, design effect = 2, and non-response rate of 10%, the current study final sample size was 794.

## 2.3. Sampling techniques

The purpose was to have a representative sample of postpartum mothers who were attending child immunization clinic in Bale zone public health facility. Of the total public health facilities in Bale zones, at first step, public health facilities were categorized into hospitals and health centers. Of the four fully functional hospitals in the Bale zone, Robe General Hospital, Delomena General Hospital, and Madda Walabu Primary Hospital were providing child immunization services, and Madda Walabu University Goba Referral hospital was out of service. Since child immunization, service given at those hospitals was by similar guidelines, Robe General Hospital was included in the study site by lottery method. The study randomly selected 5 urban health centers and 11 rural health centers from 18 to 37 respectively, with the total number of selected participants proportionally drawn from each facility based on the total number
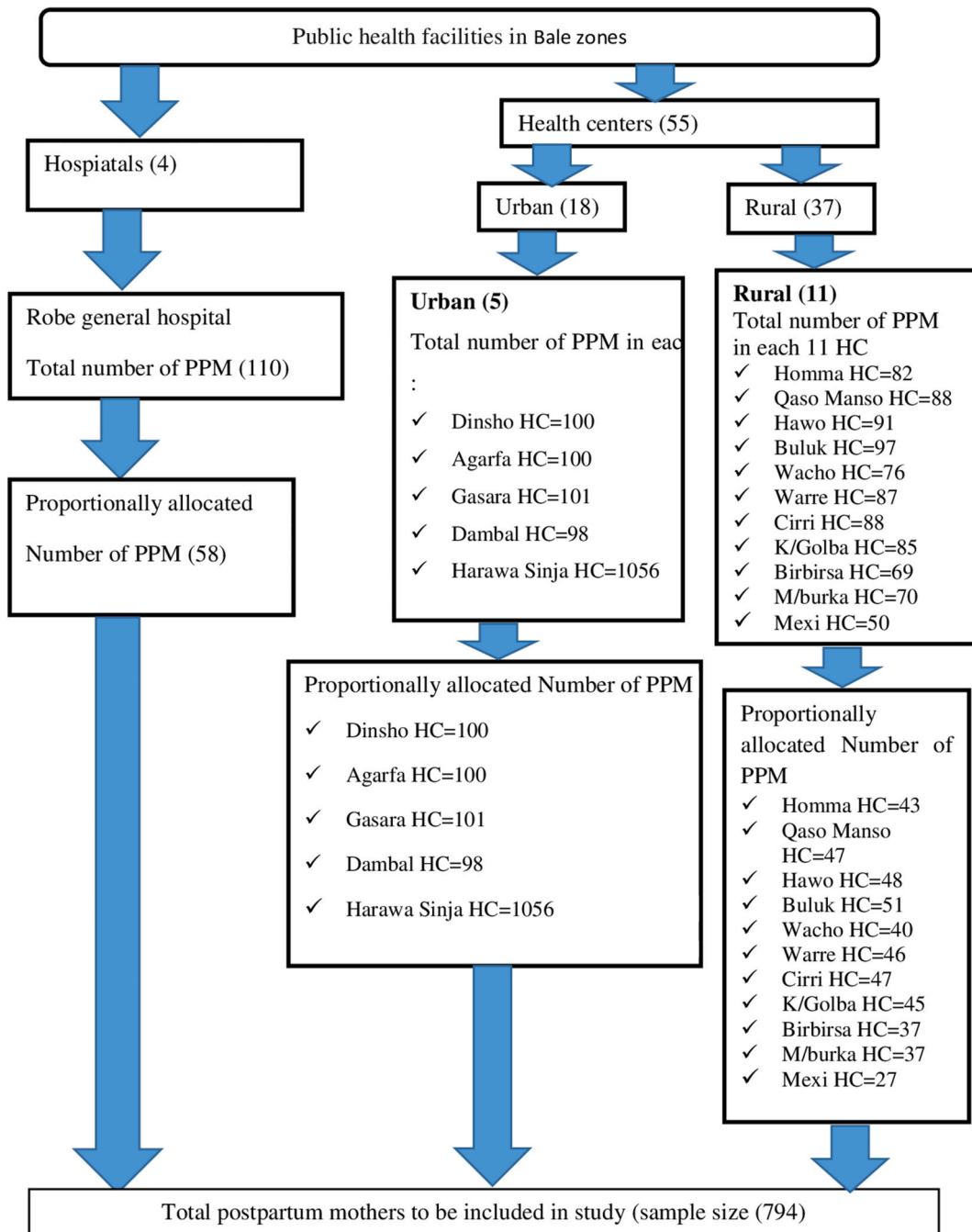


**Fig. 1.** Proportionally allocated sample size for the study of HRQOL in Southeast Ethiopia.

of postpartum mothers attending immunization clinics by using simple random sampling techniques and the created sampling frame from their children follow up registration (Fig. 1).

### 2.4. Study variables

Dependent variable: Health related Quality of life (HRQOL.

**Independent variables**: Includes; Sociodemographic, obstetrics related characteristics, postpartum depression related characteristics, and Fear of COVID 19 related characteristics.

**Operational definitions** The SF 36-Item Health Survey scoring process involves recoding pre-coded numeric values according to the scoring guide for SF 36 tools, with a high score indicating a more favorable health state, ensuring all items are scored accurately. Domain scores were calculated by summing up each item under each domain. Each raw scale score was transformed from 0 to 100 using a formula, resulting in the lowest and highest possible scores. Scores represented the percentage of the total possible score achieved. Items on the same scale were averaged together to create 8 scale scores. Items left blank (missing data) were not considered when calculating scale scores. Scale scores represented the average of all items on the scale that respondents answered [17,23,24].

**Health Related Quality of Life (HRQOL)** is the post-delivery maternal quality of life assessed by using an Ethiopian validated tool called the Medical Outcome Study Short-Form 36 (MOS SF-36). The MOS–SF–36 contains eight domains comprising two main categories namely, physical and mental HRQOL.

**Physical QOL (PCS):** The Physical QOL (PCS) mean score is calculated by taking the arithmetic mean of the converted values for physical functioning, role physical, bodily pain, and general health domains [23,25].

**Mental QOL (MSC):** The Mental QOL (MSC) mean score is the arithmetic mean of the converted scores for the social functioning, mental health, role emotions, and vitality domainn [17,23,26].

**The overall HRQOL mean score** is calculated by combining the arithmetic mean of transformed scores for each of the eight domains [17,26].

**Higher HRQOL** is when participants scored greater than or equal to the standardized mean value of 50 [23,26].

**Lower HRQOL** is when participants scored less than the standardized mean value of 50 [23,26].

**Postpartum depression**: The Edinburgh Postnatal Depression Scale (EPDS) was utilized to evaluate postpartum depression, with scores of 13 or higher indicating depression [26].

**Fear of COVID 19(FCV 19)**: was measured by validated 7 items five-likert scale ranges from strongly disagree to strongly agree. Scoring each item together, minimum score is 7 and maximum score is 35, Mean score is 7.5. If participants score greater than or equal to mean they classified as having FCV 19 and as has no FCV 19 if less than mean [27,28].

## 3. Data collection techniques and instrument

A pretested interviewer-administered structured questionnaire (Short-Form 36 (SF-36)), an internationally validated tool was used to collect data. The SF-36 which is a multicultural scale and internationally validated tool, has been applied in different countries for the study of the maternal quality of life, including in Ethiopia [14,17,20,23,29].

The SF-36 tool consists 36 questions categorized into eight-domain profile of scores and two component summaries including physical (PCS) and mental (MCS) health. The SF 36 as a multidimensional multi-item scale, assesses eight health conceptual domains with associated components as follows: (i) Physical functioning (PF)-10 items; (ii) role physical (RP)-5 items; (iii) general health (GH)-4 items; (iv) bodily pain (BP)-2 items; (v) social functioning (SF)-2 items; (vi) vitality (VT)-4 items; (vii) role emotional (RE)-3 items; and (viii) mental health (MH)-5 items. For each domain, a score ranging from 0 to 100 was assessed, with a higher score indicating better health [26,30].

The questionnaire has five parts: (i) socio-demographics, (ii) obstetrics-related characteristics, (iii) postpartum depression-related characteristics, (iv) quality-of-life-related characteristics, and (v) fear of COVID 19 (FCV 19) study scale. We used the Ethiopian version of validated tool, termed Medical Outcome Study Short Form 36 (MOS–SF–36), to study HRQOL. The current study tool was validated and translated for Ethiopia with Cronbach's alpha score of greater than 0.7 [17,23]. Edinburgh postnatal depression scale (EPDS) which contains ten questions was used as the tool to assess client at risk of postnatal depression [26]. The sensitivity and specificity of SF 36 is 92.6 and 73.2 % respectively while the EPDS indicates how the mother felt during the previous seven days. A validation study in Addis Ababa found that EPDS had a sensitivity and specificity of 78.9% and 75.3%, respectively [26,31].

## 4. Data quality control

The MOS–SF–36 used for this stud was prepared in English and translated to Afan Oromo and Amharic(local languages spoken in the study setting). The tool was checked by Afan Oromo and Amharic speaking English language expert, and was re-checked to ensure that it maintained its consistency. The pretesting of the tool was conducted to improve the clarity, understandability and simplicity of the messages before the actual data collection. Before the actual data collection, data collectors (who were selected from midwifery and/or nursing professionals) and supervisors were trained for two days on the objectives, method, sampling technique, ethical issues, data collection instrument and data collection procedures. All of questionnaires were checked for completeness and accuracy during and after data collection.

## 5. Data processing and analysis

The collected data were checked for completeness, coded and then entered into Epi Data 4.6.2.0. Then, data were exported to SPSS version 26 and cleaned before analysis. Descriptive statistics were calculated for the variables and the analysis was performed as per developer guides for scoring for SF-36 questionnaires [32,33]. First, pre-coded numeric values were recorded in which all items were scored so that a high score defines a more favorable health state. In addition, each item was scored on a 0 to 100 range, so that the lowest and highest possible scores are 0 and 100, respectively. Secondly, items on the same scale were averaged together to create the 8-scale scores. An item that was left blank (missing data) was not taken into account when calculating the scale scores. Hence, scale scores represented the average of all items on the scale that the respondent answered.

The Physical QOL (PCS) mean was determined by transforming scores from physical functioning, role physical, bodily pain, and general health domain Furthermore,the Mental QOL (MCS) mean was determined by transforming scores from social functioning, mental health, vitality, and the role emotional domain. The overall HRQOL mean was calculated using transformed scores from eight domains, with a standardized mean score of 50. HRQOL, physical, and mental were categorized into higher and lower levels, using the SF 36 questionnaire scoring guide.

The study utilized bivariable logistic regression analysis to analyze the association between HRQOL and predictors, with variables with a P-value below 0.25 being eligible for multivariable logistic regression analysis. The multivariable logistic regression model was used to identify variables significantly associated with the outcome variable, with P-values less than 0.05. The strength of associations was estimated using odds ratios and 95% confidence intervals, and multicollinearity was checked using Hosmer and Lemeshow's goodness-of-fit test.

**Table 1**
Socio-demographic and economic characteristics of postpartum women in Southeast Ethiopia, 2022 (N = 792).

| Characteristics | | Frequency (n) | Percent (%) |
|---|---|---|---|
| Age | 15–19 | 37 | 4.7 |
| | 20–24 | 221 | 27.9 |
| | 25–29 | 300 | 37.9 |
| | 30–34 | 148 | 18.7 |
| | ≥35 | 86 | 10.9 |
| Ethnicity | Oromo | 644 | 81.3 |
| | Amhara | 126 | 15.9 |
| | Others[a] | 22 | 2.8 |
| Residence | Rural | 415 | 52.4 |
| | Urban | 377 | 47.6 |
| Partner education | No formal education | 305 | 38.5 |
| | Primary education | 232 | 29.3 |
| | Secondary education | 185 | 23.4 |
| | College/university | 70 | 8.8 |
| Marital type | Live without partner[b] | 182 | 23.0 |
| | Live with partner | 610 | 77.0 |
| Partner education | No formal education | 200 | 25.3 |
| | Primary education | 232 | 29.3 |
| | Secondary education | 208 | 26.3 |
| | College/university | 152 | 19.2 |
| Mothers occupation | Housewife | 574 | 72.5 |
| | Merchant | 196 | 24.7 |
| | Employed | 22 | 2.8 |
| Partner occupation | Farmer | 230 | 29.0 |
| | Merchant | 288 | 36.4 |
| | Employed | 274 | 34.6 |
| | Non-government employee | 257 | 32.4 |
| | Labor worker | 17 | 2.1 |
| Religion | Muslim | 493 | 62.2 |
| | Orthodox | 170 | 21.5 |
| | Protestant | 110 | 13.9 |
| | Others[c] | 19 | 2.4 |
| Average monthly income | Below median | 357 | 45.1 |
| | Above median | 435 | 54.9 |
| Types of transport used | Walk. | 436 | 55.1 |
| | Public transport (bus, taxi) | 213 | 26.9 |
| | Private Vehicle | 143 | 18.1 |
| Time taken from home to reach health facility | 1–30 min | 536 | 67.7 |
| | >30 min | 256 | 32.3 |

[a] Wolyta, Kambata, Guraghe, Silte
[b] Divorced, widowed.
[c] Waqeffata, Adventist, Hawariyat, Johova

## 6. Results

### 6.1. Socio-demographic and economic characteristics of the respondents

Seven hundred ninety-two respondents were interviewed, a response rate of 99.75%. Nearly seventy three percent 72.5% (574) of respondents were homemakers, and 77% (610) of them lived with their partner. More than half (52.4%) (415) of the study participants lived in rural area (Table 1).

### 6.2. Obstetric history of the respondents

Nearly seventy percent 69.4% (550) of the respondents had up to three total deliveries. Of the total deliveries, 58.9% (245) gave birth in health institution. More than half (52.5%) (416) of the study participants were over three months post delivery of the current baby. More than half 57.3% (454) of the respondents had no postpartum depression. On the other hand, nearly fifty eight percent 57.5% (455) of the study participants had no fear of COVID 19 (Table 2).

### 6.3. Health related quality of life among respondents

Nearly half (382) of the study participants had lower overall HRQOL, moreover, about 48.7% (386) and 49.6% (396) of the participants had lower physical and mental HRQOL respectively. The HRQOL assessment revealed that the role emotional dimension had the highest mean score(mean $\pm$ SD) of 49.33 $\pm$ 48.05, while social functioning had the lowest score of 30.97 $\pm$ 21.65. The physical component summary and mental component summary scores were 45.39 $\pm$ 28.58 and 42.20 $\pm$ 28.15, respectively (Table 3).

### 6.4. Factors associated with overall HRQL of the respondents

In the bivariable logistic regression, variables with p-value less than 0.25 were selected as candidate variables for multivariable logistic regression analysis. Variables such as average monthly income, means of transport used, total number of deliveries they have until study period time, admission history to a health institution (HI) during recent pregnancy, mode of delivery of the recent baby, complications faced during the recent baby's delivery, postpartum depression (PPD), and fear of COVID-19 (FCV- 19s) were included in the bivariable logistic regression analysis.

In the multivariable logistic regression analysis, walking to the health facility [(AOR = 2.09; 95% CI: (1.31,3.31)], using public transport (AOR = 2.58; 95% CI = 1.69–3.93), giving birth to $\leq$ 3 deliveries (AOR = 1.81; 95% CI: 1.36–2.65), having admission history during a recent baby's pregnancy (AOR = 1.62; 95% CI = 1.08–2.44), having PPD (AOR = 2.13; 95% CI = 1.57–2.89), and having the fear of COVID-19 (AOR = 1.46; 95% CI = 1.08–1.99) were predictors of a lower level of HRQOL among postpartum women (Table 4).

**Table 2**
Obstetrics and postnatal Characteristics of postpartum women in Southeast Ethiopia, 2022 (N = 792).

| Characteristics | | Frequency(n) | Percent (%) |
|---|---|---|---|
| Total number of delivery you had | $\leq$3 | 242 | 30.6 |
| | >3 | 550 | 69.4 |
| Total delivery at health institution(N = 416) | <3 | 245 | 58.9 |
| | $\geq$3 | 171 | 41.1 |
| Place of delivery | Home | 376 | 47.5 |
| | Health facility | 416 | 52.5 |
| Planned pregnancy | Yes | 653 | 82.4 |
| | No | 139 | 17.6 |
| ANC follow up | Yes | 551 | 69.6 |
| | No | 241 | 30.4 |
| Number of ANC visits | <4 | 255 | 46.3 |
| | $\geq$4 | 296 | 53.7 |
| Admission history to health institution during pregnancy | No | 143 | 18.1 |
| | Yes | 649 | 81.9 |
| Duration since the delivery of last baby | $\leq$3 months | 376 | 47.5 |
| | >3 months | 416 | 52.5 |
| Mode of last delivery | Normal delivery | 455 | 57.4 |
| | Caesarean delivery | 337 | 42.6 |
| Have you experienced/faced any complications during your recent delivery? | Yes | 146 | 18.4 |
| | No | 646 | 81.6 |
| Had you get postnatal check-up within 6 months of your recent delivery? | Yes | 386 | 48.7 |
| | No | 406 | 51.3 |
| Postnatal depression(PPD) | Have PPD | 454 | 57.3 |
| | No PPD | 338 | 42.7 |
| Fear of COVID 19(FCV19) | Yes | 455 | 57.5 |
| | No | 337 | 42.6 |

**Table 3**

Health related quality of life of postpartum mothers in Southeast Ethiopia, 2022 (N = 792).

| Components | Mean ± SD | 95% Confidence Interval | |
| --- | --- | --- | --- |
| Physical functioning(PF) | 49.21 ± 46.22 | 45.98751 | 52.43573 |
| Role physical (RP) | 48.88 ± 48.67 | 45.18446 | 51.97463 |
| Role emotional (RE) | 49.33 ± 48.05 | 45.97502 | 52.67818 |
| Vitality (VT) | 43.53 ± 18.79 | 42.21798 | 44.8401 |
| Mental health (MH) | 44.99 ± 32.19 | 42.74451 | 47.23528 |
| Social functioning (SF) | 30.97 ± 21.65 | 29.45557 | 32.47625 |
| Bodily pain (BP) | 46.28 ± 12.24 | 45.42574 | 47.1336 |
| General health (GH) | 37.52 ± 25.03 | 35.77829 | 39.2707 |
| Physical Component Summary (PCS) | 45.39 ± 28.58 | 43.40543 | 47.39224 |
| Mental Component Summary (MCS) | 42.20 ± 28.15 | 40.23961 | 44.16611 |
| Overall HRQOL | 43.80 ± 27.88 | 41.85614 | 45.74555 |

**Table 4**

Bivariable and multivariable logistic regression analysis for factors associated with overall health-related quality-of-life among postpartum mothers Southeast Ethiopia, 2022 (N = 792).

| | | Overall HRQOL | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | Lower | Higher | | | |
| | | Count (%) | Count (%) | COR (95% CI) | AOR (95% CI) | P value |
| Average monthly income | Below median | 188(49.2) | 169(41.2) | 1 | 1 | |
| | Above median | 194(50.8) | 241(58.8) | 1.38(1.04,1.83) | 1.06(0.78,1.45) | 0.695 |
| Means of transport used | Walking | 255(62.2) | 181(47.7) | 2.21(1.42, 3.44) | 2.09(1.31,3.31) | 0.002 |
| | Public transport | 109(26.6) | 104(27.2) | 2.97(1.99, 4.43) | 2.58(1.69,3.93) | 0.001 |
| | Private vehicle | 46(11.2) | 97(25.4) | 1 | 1 | |
| Number of total delivery you had | ≤3 | 142(37.2) | 100(24.4) | 1.83(1.35,2.49) | 1.81(1.36,2.65) | 0.001 |
| | >3 | 240(62.8) | 310(75.6) | 1 | 1 | |
| Admission history to HI during recent baby's pregnancy | No | 85(22.3) | 58(14.1) | 1 | 1 | |
| | Yes | 297(77.7) | 352(85.9) | 1.74(1.20,2.51) | 1.62(1.08,2.44) | 0.020 |
| Mode of last baby's delivery | Caesarean delivery | 179(46.9) | 158(38.5) | 1.41(1.06,1.87) | 1.37(0.99,1.88) | 0.051 |
| | Normal delivery | 203(53.1) | 252(61.5) | 1 | 1 | 1 |
| Faced complications during recent baby's delivery | Yes | 86(22.5) | 60(14.6) | 1 | 1 | |
| | No | 296(77.5) | 350(85.4) | 1.69(1.18, 2.44) | 1.19(0.79,1.79) | 0.403 |
| PPD[a] | Have PPD | 258(67.5) | 196(47.8) | 2.27(1.70, 3.03) | 2.13(1.57,2.89) | 0.001 |
| | No PPD | 124(32.5) | 214(52.2) | 1 | 1 | |
| FCV 19[b] | Have FCV-19 | 239(62.6) | 216(52.7) | 1.50(1.13, 1.99) | 1.46(1.08,1.99) | 0.015 |
| | No FCV-19 | 143(37.4) | 194(47.3) | 1 | 1 | 1 |

[a] Post-Partum Depression.
[b] Fear of COVID 19.

### 6.5. Factors associated with physical health-related quality-of-life among the respondents

The study included the variable with p-values <0.25 and biologically plausible variables for bivariable logistic regression analysis, including variables such as average monthly income, means of transport, total deliveries until study period, admission history to health institutions during recent baby's pregnancy, mode of delivery, complications, postpartum depression (PPD), and fear of COVID-19s.

In multivariable analysis means of transport used, number of total delivery they had, mode of delivery of recent baby, PPD, and FCV- 19s were shows a statistically significant association with the lower Physical HRQOL. Postpartum mothers who use public transport for transportation are 2.3 times more likely to have lower Physical HRQOL compared to those who use private vehicles (AOR = 2.30; 95% CI = 1.44–3.75). On the other hand, Postpartum mothers who walk to reach health facilities are 2.7 times more likely to have lower Physical HRQOL than those who use private vehicles (AOR = 2.70; 95% CI = 1.77–4.12).

Postpartum mothers with less than or equal to three total deliveries are 1.91 times more likely to have lower physical health and well-being (HQOL) compared to those with more than three deliveries (AOR = 1.91; 95%CI: 1.37–2.67). Postpartum mothers who had admission history during the recent baby's pregnancy were 1.6 times more likely to have lower HQOL compared to those without an admission history (AOR = 1.55; 95% CI = 1.03–2.33).

Postpartum mothers who gave birth of the recent baby by cesarean section were 1.4 times more likely to have lower physical HRQOL than those who gave birth by normal vaginal delivery (AOR = 1.42; 95%CI: 1.04–1.94). Postpartum mother who had PPD were 1.94 times more likely to have lower physical HRQOL than those who have no PPD (AOR = 1.94; 95% CI = 1.43–2.64). Meanwhile postpartum mother who have fear of COVID 19 were 1.4 times more likely to have lower Physical HRQOL than those who have no fear of COVID 19 (AOR = 1.40; 95% CI = 1.03–1.90) (Table 5).

**Table 5**

Bivariable and multivariable analysis for factors associated with physical HRQOL among postpartum mothers in Bale zone, Ethiopia, 2022.

| | | Physical HRQOL | | | | |
|---|---|---|---|---|---|---|
| | | Lower | Higher | | | |
| | | Count (%) | Count (%) | COR (95% CI) | AOR (95% CI) | P value |
| Average monthly income | Below median | 190(49.2) | 167(41.1) | 1 | 1 | |
| | Above median | 196(50.8) | 239(58.9) | 1.39(1.05,1.84) | 1.09(0.79,1.48) | 0.594 |
| Means of transport used | Public transport | 103(26.7) | 110(27.1) | 2.40(1.54, 3.75) | 2.30(1.44,3.75) | 0.001 |
| | Waking | 184(47.7) | 252(62.1) | 3.08(2.06, 4.61) | 2.70(1.77,4.12) | 0.001 |
| | Private vehicle | 99(25.6) | 44(10.8) | 1 | 1 | |
| Number of total delivery you had | ≤3 | 143(37) | 99(24.4) | 1.83(1.34, 2.48) | 1.91(1.37,2.67) | 0.001 |
| | >3 | 243(63) | 307(75.6) | 1 | 1 | |
| Admitted to HI during recent baby's pregnancy | No | 85(22) | 58(14.3) | 1 | 1 | |
| | Yes | 301(78) | 348(85.7) | 1.69(1.17,2.45) | 1.55(1.03,2.33) | 0.035 |
| Mode of last baby's delivery | Caesarean delivery | 182(47.2) | 155(38.2) | 1.45(1.09, 1.92) | 1.42(1.04,1.94) | 0.030 |
| | Normal delivery | 204(52.8) | 251(61.8) | 1 | 1 | |
| Faced complications during delivery | Yes | 87(22.5) | 59(14.5) | 1 | 1 | |
| | No | 299(77.5) | 347(85.5) | 1.71(1.19,2.47) | 1.22(0.81,1.84) | 0.345 |
| PPD[a] | Have PPD | 257(66.6) | 197(48.5) | 2.11(1.59, 2.82) | 1.94(1.43,2.64) | 0.001 |
| | No PPD | 129(33.4) | 209(51.5) | 1 | 1 | |
| FCV19[b] | Have FCV-19 | 240(62.2) | 215(53) | 1.46(1.10, 1.94) | 1.40(1.03,1.90) | 0.031 |
| | No FCV-19 | 146(37.8) | 191(47) | 1 | 1 | |

[a] Postpartum depression.
[b] Fear of COVID 19.

## 6.6. Factors associated with mental health-related quality-of-life among the respondents

In bivariable logistic regression analysis variables average monthly income, means of transport used, number of total delivery they have until study period time, admission history to HI (health institution) during recent baby's pregnancy, mode of delivery of the recent baby, faced complications during recent baby's delivery, and PPD(Postpartum depression were included.

In multivariable analysis means of transport used, number of total delivery they had, admission history to HI (health institution) during recent baby's pregnancy,mode of delivery of recent baby, and PPD, were shows a statistically significant association with the lower mental HRQOL. Post-partum mothers who use public transport as means of transport to reach health facility were 1.98 times more likely to have lower mental HRQOL when compared with those who use private vehicle(AOR = 1.98; 95% CI = 1.25–3.14). Besides, postpartum mothers who walks to reach health facility were 2.5 times more likely to have lower mental HRQOL than those who use private vehicle (AOR = 2.52; 95% CI = 1.65–3.84).

Postpartum mothers who were admitted to health institution during recent babies' pregnancy were 1.9 times more likely to have lower mental HRQOL than those who were not admitted to health institution (AOR = 1.94; 95%CI: 1.29, 2.93). Postpartum mothers who gave birth of the recent baby by normal vaginal delivery were 1.45 times more likely to have lower Mental HRQOL than those who gave birth by cesarean section (AOR = 1.45; 95%CI: 1.06–1.99).

**Table 6**

Bivariable and multivariable analysis for factors associated with mental HRQOL among postpartum mothers in Bale zone, Ethiopia, 2022.

| Characteristics | | Mental HRQOL | | | | |
|---|---|---|---|---|---|---|
| | | Lower | Higher | | | |
| | | Count (%) | Count (%) | COR(95%CI) | AOR(95%CI) | P Value |
| Average monthly income | Below median | 192(48.9) | 165(41.4) | 1 | 1 | |
| | Above median | 201(51.1) | 234(58.6) | 1.36(1.02,1.79) | 1.11(0.82,1.50) | 0.504 |
| Means of transport used | Public transport | 105(26.3) | 108(27.5) | 2.05(1.32,3.19) | 1.98(1.25,3.14) | 0.004 |
| | Walk | 248(62.2) | 188(47.8) | 2.78(1.87,4.15) | 2.52(1.65,3.84) | 0.001 |
| | Private Vehicle | 46(11.5) | 97(24.7) | 1 | 1 | |
| Admitted to HI during recent baby's pregnancy | No | 92(23.4) | 51(12.8) | 1 | 1 | |
| | Yes | 301(76.6) | 348(87.2) | 2.09(1.43,3.04) | 1.94(1.29,2.93) | 0.002 |
| Mode of last delivery | Normal delivery | 208(52.9) | 247(61.9) | 1.45(1.09,1.92) | 1.45(1.06,1.99) | 0.019 |
| | Caesarean delivery | 185(47.1) | 152(38.1) | 1 | 1 | |
| Faced complications during your delivery | Yes | 91(23.2) | 55(13.8) | 1 | 1 | |
| | No | 302(76.8) | 344(86.2) | 1.89(1.30,2.73) | 1.27(0.84,1.91) | 0.263 |
| Number of total delivery you had) | >3 | 247(62.8) | 303(75.9) | 1.87(1.37,2.54) | 1.86(1.33,2.60) | 0.001 |
| | ≤3 | 146(37.2) | 96(24.1) | 1 | 1 | |
| PPD[a] | Have PPD | 129(32.8) | 209(52.4) | 2.25(1.69,3.00) | 2.08(1.53,2.82) | 0.001 |
| | No PPD | 264(67.2) | 190(47.6) | 1 | 1 | |

[a] Postpartum depression.

A postpartum mother those who gave birth of greater than three total delivery were 1.86 times more likely to have lower Mental HRQOL than those who gave birth of ≤3 total delivery (AOR = 1.86; 95%CI: 1.33–2.60). Postpartum mother who had PPD were 2.08 times more likely to have lower Mental HRQOL than those who have no PPD (AOR = 2.08; 95% CI = 1.53–2.82) (Table 6).

## 7. Discussion

The study aimed to evaluate the health-related quality of life (HRQOL) and its factors among postpartum women in southeastern Ethiopia using the Medical Outcome Study Short-Form 36 (MOS SF-36), which is an Ethiopian adaptation of SF 36 validated tool. In this study, the postpartum women reported a lower overall quality of life, with a mean score of 43.80 ± 27.88.

This finding is consistent with a studies done in Ethiopia which had a mean score of 45.15 ± 8.13 [17], Kuwait with a mean score of 53.7 [15], and study conducted Iran (Ilam province in the west of Iran) with mean score of 66.32 ± 13.7 [34]. However, lower than the studies conducted in elsewhere including: Spain with mean score of 71.94 ± 17.48 [35], Iran (Dezful City, Khuzestan province) with mean score of 68.38 ± 13.6 [36], and Brazil with mean score of 86.86 ± 10.6 [13].

It is reasonable to allude that the differences in HRQOL might be due to the socioeconomic and other variations among study participants. The majority of participants were from rural areas, while previous studies were conducted in areas with relatively higher socioeconomic status. For example, the study conducted in Ilam province, west Iran and Iran (Dezful City, Khuzestan province) drew participants who resided only in urban areas who may have had higher socioeconomic status. Consistent with the World Health Organisation (WHO) social determinants of health framework [37], we hypothesize that higher socioeconomic status leads to better physical, mental, social, public health, and vitality quality of life [37]. Moreover, we recognize that other studies have also correlated socioeconomic status with the quality of life [38,39], indicating that populations with higher social economic status have better quality of life.

The HRQOL differences between these studies may be due to differences in the study population, with the current study focusing on postpartum mothers, while the Spanish study included women who gave birth a year prior to the survey. The study's discrepancy may be due to differences in the tool used to assess quality of life between Brazil and Iran, as well as the fact that women who gave birth a year before the study may have recovered from the impact of childbirth.

The study utilized SF-36 questionnaires, while studies in Brazil and Iran utilized the WHOQoL-Bref tool. Additionally, the variation of findings between the current study and other studies conducted in Ethiopia could be due to the differences in the study areas whereby the previous studies were conducted in urban areas and the current study was conducted in both rural and urban areas, but the majority of participants were from rural areas. It is also reasonable to hypothesis that urban areas even in Ethiopia have a better socioeconomic status than in rural areas, which could translate to better health outcomes, noting that poverty and rurality are known significant social determinants of health [37].

This study also revealed that post-partum mothers who walked as a means of transport to reach health facilities were 2.09, 2.3 and 1.98 times more likely to have lower overall HRQOL, lower Physical HRQOL and lower mental HRQOL when compared with women who were private vehicle users. Moreover, postpartum mothers who used public transports were 2.6, 2.7 and 2.5 times more likely to have lower overall HRQOL, lower Physical HRQOL and lower mental HRQOL than private vehicle users. Again, this could be due to the effect of poor socioeconomic status, assuming that the private vehicles users were able to pay high cost of transport or they (or family) owned the vehicles, and recognizing the significance that the burden of poverty has on the quality of life [37]. The current study findings are therefore in support of others that have stated poor families tend to have poorer or lower quality of life [40].

On the other hand, postpartum mothers who gave birth to less than or equal to three deliveries were 1.81 and 1.86 times more likely to have lower overall HRQOL and lower Mental HRQOL than those who gave birth to greater than three deliveries. This finding is in inline with the study conducted somewhere else [41]. The possible explanation of why women with less number of children would have a lower HRQOL could be because primiparous women struggle with maternal identity and the demands of motherhood for the first time, resulting in more stress during postpartum than multiparous women (who would have had more than three total deliveries) [42]. However, this finding will need to be explored further, given that large families (with more than three children) would need more resources to meet their needs, and without further interventions or changed circumstance, mother with a large number of children could become more stressed under unmet family needs.

Postpartum mothers who had an admission history during a recent pregnancy were 1.6 and 1.9 times more likely to have a lower overall HRQOL and lower mental HRQOL score than those who had no admission history. This finding is consistent with the study conducted in Iran that reported an absence of history of disease in pregnancy to be associated with higher women's QOL [43]. However, this is not surprising because women, who would have been admitted to hospitals prenatally, could have been admitted due to conditions that would negatively affect their health, and which could be carried over postnatally, contributing to poor correlate of lower HRQOL during the postpartum period.

This study revealed that postpartum mothers who had postpartum depression were also 2.13, 1.94 and 2.08 times more likely to have lower overall HRQOL, lower Physical HRQOL and lower Mental HRQOL than those who had no postpartum depression. Other studies have shown a negative correlation between PPD and HRQOL [15,44]. Consistent with previous studies conducted in Nigeria [45], Carolina state, USA [46], and Iran [43,46], the current study found women with mental health to have poor HRQOL. The reason might be that depression harms mental health (negatively affecting the SF, MH; RE, and VT domains of quality of life); and depression by itself is known to affect women's ability to: function well, have good relationships with their child, have good interpersonal relationships, have good sleeping patterns, and good social engagement, thus lowering the overall and mental HRQOL [47].

In the meanwhile, postpartum mothers who had a fear of COVID-19 were 1.46 and 1.4 times more likely to have lower HRQOL and lower Physical HRQOL than those who had no fear of COVID-19. The reason for this might be because the Covid-19 pandemics, the

Covid-19 pandemic has disrupted global life, leading to fear and resulting in disturbances like anxiety, stress, and depression that could affect HRQOL in various aspects, as evidenced by the findings in the current study. This fear has become a pandemic itself, affecting various aspects of life [48,49–54].

Moreover, postpartum mothers who gave birth of the recent baby by cesarean section delivery were 1.4 times more likely to have lower physical HRQOL than those who gave birth by normal delivery. However, postpartum mothers who gave birth of the recent baby by normal vaginal delivery were 1.45 times more likely to have lower Mental HRQOL than those who gave birth by cesarean section. The reason why giving by cesarean section affects physical HRQOL than normal delivery and giving birth by normal delivery affects mental HRQOL than giving by cesarean section is not clearly studied in this study.

However, the reason might be due to the effect of anesthesia, cesarean scar and other cesarean section related factors that might reduce components of physical health like physical functioning, role physical, bodily pain, and general health domains. However, our study include those mothers who gave birth at home by normal vaginal delivery and in which they have not get care from health professional, psychological reassurance, and on components of mental health indices like, social functioning, mental health; role emotional, and vitality domains than those who gave birth by cesarean section (must conducted at health facilities by). The effects of mode of delivery on quality of life might need further study to know the causal and effects relation and their effects on quality of life, especially among postpartum mothers in Ethiopia.

### 7.1. Limitation of the study

The following strengths and limitations must be taken into account when interpreting the study's conclusions.Large sample sizes and globally recognized instruments were used in this investigation. However, the research included women from pastoralist and agrarian communities, which might have an impact on quality of life. The attitudes or perceptions of mothers about services in health facilities and/or characteristics related to health workers, as well as cultural and societal factors that may impact postpartum mothers' quality of life, were the study's limitations. We were unable to understand why, in this study, giving birth by normal delivery affected mental HRQOL more than giving birth by cesarean section and giving birth by normal delivery affected physical HRQOL more than both.

## 8. Conclusion

The study found that about half of participants had lower overall health related quality of life (HRQOL), and 50% had low mental HRQOL. Social functioning was the most compromised component of HRQOL. Factors such as mode of transportation, number of deliveries, admission history, and postpartum depression (PPD) were associated with lower HRQOL. Fear of COVID-19 was also linked to lower physical and overall HRQOL. Women who gave birth by cesarean section had lower physical HRQOL, while those by normal vaginal delivery had lower mental HRQOL.

The results of the study demonstrate how much attention is needed to improve the quality of life for postpartum mothers. Research indicates that women in low-income nations may be more vulnerable to depression during pregnancy and delivery due to hormonal changes, social variables including having supportive friends and family, and economic hardship (55–57). Policymakers, program planners, other concerned bodies and organizations should emphasize the need provide high care to postpartum mothers' social, mental, and physical quality of life given the vulnerability to depression of women in perinatal period especially postpartum period. Further studies on time series (types of postnatal periods) or follow-up studies might be needed to assess the quality of life among postpartum mothers. Qualitative study will be recommended for the exploration of perceptions of mothers regarding services in health facility and/or health worker related factors and cultural and social related factors.

### Ethics approval and informed consent

The study received ethical clearance from MWU's Research and Development Directorate (RDD/123/14), and permission from Bale Zone Health's management. Written consent was obtained from each participant, who had the right to refuse, stop, or withdraw from participation. Confidentiality of data and responses was guaranteed throughout the study, and information was provided at the end of the interview to avoid misunderstandings.

### Consent for publication

Not applicable.

### Data availability statement

Data will be made available on request.

### Funding

Not applicable.

## CRediT authorship contribution statement

**Degefa Gomora:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Chala Kene:** Writing – review & editing, Resources, Methodology, Investigation. **Ayinamaw Embiale:** Writing – review & editing, Resources, Methodology, Investigation. **Yohannes Tekalegn:** Writing – review & editing, Software, Resources, Methodology, Investigation. **Girma Geta:** Writing – review & editing, Resources, Methodology, Investigation. **Kenbon Seyoum:** Writing – review & editing, Software, Resources, Methodology, Investigation. **Girma Beressa:** Writing – review & editing, Visualization, Software, Resources, Methodology, Investigation. **Daniel Atlaw:** Writing – review & editing, Visualization, Software, Resources, Methodology, Investigation. **Biniyam Sahiledengle:** Writing – review & editing, Visualization, Validation, Software, Resources, Methodology, Investigation, Conceptualization. **Fikreab Desta:** Writing – review & editing, Software, Resources, Methodology, Investigation. **Neway Ejigu:** Writing – review & editing, Software, Resources, Methodology, Investigation, Data curation. **Usman Hussein:** Writing – review & editing, Resources, Methodology, Investigation. **Lillian Mwanri:** Writing – review & editing, Visualization, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgement

## Abbreviation and acronyms

| | |
|---|---|
| ANC | Ante Natal Care |
| BP | Bodily Pain |
| CS | Cesarean Section delivery |
| EPDS | Edinburgh Postnatal Depression Scale |
| GH | General Health |
| HF | Health Facility |
| HRQOL | Health Related Quality Of Life |
| MCS | Mental component score/mental health |
| MH | Mental Health |
| MOS SF 36 | Medical Outcome Study Short Form 36 |
| MWU | Madda Walabu University |
| PCS | Physical component score/physical health |
| PF | Physical Functioning |
| PPD | Post-Partum Depression |
| PPM | Post-Partum Mothers |
| QOL | Quality of Life |
| RE | Role Emotional |
| RP | Role Physical |
| SD | Standard Deviation |
| SF | Social Functioning |
| SF 36 | Short Form 36 |
| SPSS | Statistical Package for Social Science |
| VT | Vitality |
| WHO | World Health Organization |

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