

Health Related Quality of Life and its predictors among Postpartum Mother in Southeast Ethiopia: A Cross sectional study

Degefa Gomora (✉ degefag21@gmail.com)

Madda Walabu University

Chala Kene

Madda Walabu University

Ayinamaw Embiale

Madda Walabu University

Yohannes Tekalegn

Madda Walabu University

Girma Geta

Madda Walabu University

Kenbon Seyoum

Madda Walabu University

Girma Beressa

Madda Walabu University

Daniel Atlaw

Madda Walabu University

Biniyam Sahiledengle

Madda Walabu University

Fikreab Desta

Madda Walabu University

Neway Ejigu

Madda Walabu University

Usman Hussein

Madda Walabu University

Lillian Mwanri

Torrens University Australia

Research Article

Keywords: HRQOL (Health-related quality of life), postpartum women, Bale Zone, PPD (Postpartum Depression), FCV 19 (Fear of COVID-19)

Posted Date: September 12th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-2037336/v1>

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Abstract

Background: Impaired Health related quality of life (HRQOL) after women's childbirth affects women in a wide range of ways including limiting their daily activity, reducing self-care capacity, impairing childcare including effective breastfeeding and baby weaning, and increasing the cost of medical care, both for women and for their newborn babies. This study aimed to assess the HRQOL and its predictors among postpartum women in Southeast Ethiopia.

Methods: Between March and May 2022, an institutional-based cross-sectional study was conducted among a simply randomly selected sample of 794 postpartum women who were attending immunization services in public health facilities in Southeast Ethiopia. The pretested interviewer-administered structured, Short Form 36 (SF-36), validated questionnaire was used to collect data and to assess the HRQOL. Descriptive statistics were computed and the bivariable and multivariable logistic regression model was fitted to predictors of HRQOL. Odds ratio (OR), along with a 95% confidence interval (CI), were used to estimate the strength of the associations.

Results: The mean scores (mean \pm SD) of overall HRQOL, physical component summary (PCS) and mental component summary (MCS) of quality of life were 43.80 ± 27.88 , 45.39 ± 28.58 and 42.20 ± 28.15 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), giving birth to ≤ 3 deliveries (AOR = 1.81; 95% CI: 1.36 –2.65), having health facility admission history during the recent baby's pregnancy (AOR=1.62; 95% CI=1.08–2.44), having postpartum depression (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.

Conclusion: This study revealed that nearly half of the postpartum women had a lower HRQOL. Means of transport used, the number of total deliveries they had, admission history during the recent baby pregnancy, PPD and Fear of COVID 19 (FCV 19) showed a statistically significant association with the lower overall HRQOL. To improve the HRQOL among postpartum women in Ethiopia, programs should be implemented by applying appropriate strategies that address the identified factors.

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). It has been established that the HRQOL was a fundamental contributor to an exhaustive measure of health status in 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), (7), (8).

Changes that occur after childbirth affect women's HRQOL and have significant impacts on their overall well-being (9, 10),(11). Recently, HRQOL has attracted greater attention as it refers to a wider view of the

health status of women during their childbearing experience. It well recognized that even in uneventful pregnancies, during the reproductive and childbearing times, women undergo experiences that may change their capacity to conduct their usual activities, which may affect their overall HRQOL. The additional changes that occur in expectant mothers, during both the perinatal and the postpartum periods, may lead to significant increases in psychological health problems such as psychosis and depression (12).

A few studies have highlighted that the level of HRQOL in the postpartum women varies among different settings. Examples of these studies with respective HRQOL scores in brackets have included postpartum women from nations including Kuwait (mean score of 53.7), Iran (66.32 ± 13.7), Spain (71.94 ± 17.48), and Brazil (86.86 ± 10.6). (13-16). Additionally, even within the same nation, the HRQOL scores differ according to conditions within populations. For example, a study in Kuwait showed that the HRQOL overall mean score was (47.4 ± 10.3) among women with PPD and (59.2 ± 13.1) among women without PPD (15).

It has also been reported that sociodemographic factors may influence the HRQOL of populations. For example, a study conducted in Arba Minch town in Ethiopia showed that about (62.3%) of participants had a lower level of HRQOL, mean \pm SD 45.15 ± 8 , and the overall mean score of HRQOL was 45.15 ± 8.13 . Moreover, in this Ethiopian study, age group 17–24 years and no formal education were factors associated with 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). Another study reported that women older than 40, separated/divorced, or widowed, had significantly lower HRQOL scores compared to women who had completed upper secondary or had a university level education (20).

Most of the previous studies were conducted 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, most of the previous studies in Ethiopia, except the study done in Arba Mich town, were investigated the quality of life among pregnant mothers rather than postpartum women. The current study aimed to assess the level of HRQOL and its predictors among postpartum women in the Southeast Ethiopia.

Methods And Materials

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 centres. 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 men,662,691 females and total number of reproductive-age women 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 were excluded from the study.

Sample size determination

By using the single population proportion formula 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.

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. In addition, 5 urban health centers and 11 rural health centers were chosen at random from the 18 urban health centers and 37 rural health centers respectively. Based on the simple random technique, the total number of selected participants was proportionally drawn from each selected health facility based on the total number of postpartum mothers attending immunization clinics (Table 1).

Table 1 : Proportionally Allocated Sample Size for The Study Of HRQOL In Southeast Ethiopia

Health institution	Area	Average PPM who attends child immunization clinic in the past two months	Proportionally allocated sample size $n = (\text{Sample size}(794) * \text{PPM attending immunization clinic at each selected health institution}) / \text{Total}(1497)$
Dinsho HC	Urban	100	53
Agarfa HC	Urban	100	53
Gasara HC	Urban	101	54
Dambal Hc	Urban	98	52
Harawa Sinja HC	Urban	105	56
Homma HC	Rural	82	43
Qaso Manso HC	Rural	88	47
Hawo HC	Rural	91	48
Buluk HC	Rural	97	51
Wacho HC	Rural	76	40
Warre HC	Rural	87	46
Cirri HC	Rural	88	47
K/Golba HC	Rural	85	45
Birbirsa HC	Rural	69	37
M/burka HC	Rural	70	37
Mexi HC	Rural	50	27
Robe GH	Hospital	110	58
Total		1,497	794

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.

Data collection techniques and instrument

A pretested interviewer-administered structured questionnaire (Short-Form 36 (SF-36)), a widely validated tool and one of the most widely used HRQOL scales in the world was used to collect data. The SF-36 which is a multicultural scale and a widely validated in different languages tool, has been applied in different countries for the study of the maternal quality of life, including in Ethiopia (21),(20),(14),(17), (22).

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 (23, 24).

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, 22). Edinburgh postnatal depression scale (EPDS) which contains ten questions was used as the tool to assess patients at risk of postnatal depression (23). The EPDS indicates how the mother felt during the previous seven days. According to a validation study in Addis Ababa, respectively, EPDS generated the sensitivity and specificity of 78.9% and 75.3% (23, 25).

Data quality control

The MOS-SF-36 used for this study was prepared in English and translated to Afan Oromo, one of the local languages spoken in the study setting. The tool was checked by Afan Oromo 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.

Operational definitions

Scoring the SF 36-Item Health Survey is a two-step process. In the first step: a pre-coded numeric values (values on questionnaires) were recoded according to scoring guide for SF 36 tools. It is worthy noting that all items were scored so that a high score defined a more favorable health state. In addition, domain scores were calculated by summing up each item under each domain. Then each raw scale score was transformed from 0 to 100 (0–100 scale) by using the formula of transformed scale item which was scored in a 0 to 100 range, so that the lowest and highest possible scores were 0 and 100, respectively. Scores represented the percentage of the total possible score achieved. In the second step, items on the same scale were averaged together to create the 8 scale scores. Table 2 of the scoring guide for SF 36 tools lists the items averaged together to create each scale. Items that were left blank (missing data) were not taken into account when calculating the scale scores. Hence, scale scores represented the average of all items on the scale that the respondents answered (17, 22, 26)..

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) mean score is the arithmetic average of the transformed scores of physical functioning, role physical, bodily pain, and general health domains (22, 27).

Mental QOL (MSC) mean score is the arithmetic average of the transformed scores of social functioning, mental health; role emotional, and vitality domains (17, 22, 23).

Overall HRQOL mean score is the arithmetic average of the transformed score of the eight domains (23) (17, 23).

Higher HRQOL is when participants scored greater than or equal to the standardized mean value of 50 (22, 23).

Lower HRQOL is when participants scored less than the standardized mean value of 50 (22, 23).

Postpartum Partum depression: was assessed by using the Edinburgh Postnatal Depression Scale (EPDS). According to the EDPS, study participants who scored ≥ 13 are considered as having postpartum depression (23).

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 (28, 29).

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(30, 31). 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 computed from physical functioning, role physical, bodily pain, and general health domain transformed scores. The Mental QOL (MCS) mean was computed from social functioning, mental health, vitality, and the role emotional domain transformed score. The overall HRQOL mean was computed from the eight domains' transformed scores. Using the standardized mean score of 50, overall HRQOL, physical HRQOL, and mental HRQOL were dichotomized into higher and lower HRQOL. Generally, scoring SF 36 questionnaires was done by strictly following the guide for scoring SF 36.

Bivariable logistic regression analysis was used to examine the statistical association between the overall HRQOL and the predictors. Then variables with a *P*-value less than 0.25 in the bivariable logistic regression analysis were considered candidates for the multivariable logistic regression analysis. In the multivariable logistic regression model, variables with a *P*-value less than 0.05 were considered significantly associated with the outcome variable. The odds ratio (OR), along with a 95% confidence interval (CI), were used to estimate the strength of the associations. Multicollinearity was checked among all predictors. The Hosmer and Lemeshow's goodness-of-fit test were checked.

Results

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 2).

Table 2: 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[1]	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[2]	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[3]	19	2.4
Average monthly income	Below median	357	45.1
	Above median	435	54.9
Types of transport used	Walk.	213	26.9
	Public transport (bus, taxi)	436	55.1
	Private Vehicle	143	18.1
Time taken from home to reach health facility	1-30 minutes	536	67.7
	>30 minutes	256	32.3

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 while nearly fifty eight percent 57.5% (455) of the study participants had no fear of COVID 19 (Table 3).

Table 3: Obstetrics and postnatal Characteristics of postpartum women in Southeast Ethiopia, 2022 (N = 792)

Characteristics		Frequency(n)	Percent (%)
Total number of delivery you had	≤3	550	69.4
	>3	242	30.6
Total delivery at health institution(N=416)	<3	245	58.9
	≥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
	≥4	296	53.7
Admission history to health institution during pregnancy	Yes	143	18.1
	No	649	81.9
Duration since the delivery of last baby	≤ 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 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	338	42.7
	No PPD	454	57.3
Fear of COVID 19(FCV19)	Yes	337	42.6
	No	455	57.5

Health related quality of life among respondents

Nearly half (382) of the study participants had lower overall HRQOL, while respectively, about 48.7% (386) and 49.6% (396) of the participants had lower physical and mental HRQOL respectively. From the eight domains of HRQOL assessment, the highest mean score was found in the role emotional dimension with mean \pm SD of 49.33 ± 48.05 ; and the lowest mean \pm SD score was in the social functioning (SF), with 30.97 ± 21.65 mean \pm SD. Moreover, the physical component summary (PCS) mean \pm SD) score and the mental component summary (MCS) mean \pm SD score were 45.39 ± 28.58 and 42.20 ± 28.15), respectively (Table 4).

Table 4: Health Related Quality Of Life of Postpartum Mothers in Southeast Ethiopia, 2022 (N = 792)

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

Factors associated with overall HRQL of the respondents

In the binary logistic regression model, 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, number of 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 binary 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 ≤ 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 5).

Table 5: 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		
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	Normal delivery	179(46.9)	158(38.5)	1.41(1.06,1.87)	1.37(0.99,1.88)	0.051
	Caesarean 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[4]	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		
FCV 19[5]	Have FCV19	239(62.6)	216(52.7)	1.50(1.13, 1.99)	1.46(1.08,1.99)	0.015
	No FCV19	143(37.4)	194(47.3)	1	1	1

Discussion

The purpose of this study was to assess the level of health related quality of life (HRQOL) and its associated factors among postpartum women in southeastern Ethiopia. The HRQOL among postpartum women was assessed using the Medical Outcome Study Short-Form 36 (MOS SF-36), which is an Ethiopian adaptation of SF 36 validated tool. The study indicated that postpartum women had a lower overall quality of life, with a mean score of HRQOL of 43.80 ± 27.88 . This finding is comparable with a studies conducted in Ethiopia which had a mean score of 45.15 ± 8.13 (32), and Kuwait with a mean score of 53.7 (15), but was lower than studies conducted elsewhere including: Iran (Ilam province in the west of Iran) with mean score of 66.32 ± 13.7 (33), Spain with mean score of 71.94 ± 17.48 (34), Iran (Dezful City, Khuzestan province) with mean score of 68.38 ± 13.6 (35), and Brazil with mean score of 86.86 ± 10.6 (13).

While all these studies were conducted in postpartum women, the HRQOL seemed to differ. It is reasonable to allude that the differences in HRQOL might be due to the socioeconomic and other variations among study participants. While in the current study, the majority of the study participants had low socioeconomic status (from rural areas), the previous studies were conducted in areas of 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 (36), we hypothesize that a higher socioeconomic status favors a higher quality of life or physical health, mental health, social activities, public health, and vitality (36). Moreover, we recognize that other studies have also correlated socioeconomic status with the quality of life (37, 38), indicating that populations with higher social economic status have better quality of life.

Another difference in HRQOL between these studies might be due to differences in the study population, noting that in the current study we included women who gave birth in the last six months (postpartum mothers), whilst the study conducted in Spain included women who gave birth a year before the survey. For women who gave birth a year before the study, it is possible that the women would have recovered from the impact of childbirth, which may not be the case in our study population. It is also possible that the discrepancy between our study and the two studies (Brazil and Iran) could be due to a variation in the tool used to assess the quality of life. In the current study, we used the adaptation on SF-36 questionnaires, but studies conducted in Brazil and Iran used the World Health Organization Quality-of-life Assessment-Bref (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 (36).

This study also showed that post-partum mothers who walked as a means of transport to reach health facilities were 2.09 times more likely to have lower overall HRQOL when compared with women who were

private vehicle users. Moreover, postpartum mothers who used public transports were 2.6 times more likely to have lower overall 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 (36). The current study findings are therefore in support of others that have stated poor families tend to have poorer or lower quality of life (39).

On the other hand, postpartum mothers who gave birth to less than or equal to three deliveries were 1.81 times more likely to have lower overall HRQOL than those who gave birth to greater than three deliveries. This finding is in agreement with the study done somewhere else (40). 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) (41). 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 times more likely to have a lower overall 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 (42). 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 showed that postpartum mothers who had PPD were also 2.13 times more likely to have lower overall HRQOL than those who had no PPD. Similar findings were found in other studies in which PPD was negatively correlated with HRQOL (15, 43). Consistent with previous studies conducted in Nigeria (44), Carolina state, USA (45), and Iran (46),(42), 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 times more likely to have lower HRQOL than those who had no fear of COVID-19. The reason for this might be because the Covid-19 pandemics has disrupted life across the globe, and fear of it (especially during the early period of the pandemic) has also become a pandemic itself(48). Evidence exists that the pandemic has induced different disturbances including anxiety, stress, and depression that could disturb HRQOL in many aspects (49-54), supporting the findings observed in the current study.

Limitation of the study

The finding in this study must be interpreted by considering the following limitations. Firstly, due to the cross-sectional nature of the study, a cause-effect relationship cannot be established between the risk factors and HRQOL. Secondly, perceptions of mothers regarding services in health facility and/or health worker related factors that might affect the quality life among postpartum mothers were not assessed. To assess such type of factors qualitative study might be helpful. Additionally, this study did not address the quality of life based on time difference during postpartum period (Follow up cohort study might needed).

Conclusion

This study found that nearly half of the study participants had lower overall HRQOL, while fifty percent of the respondents had low mental HRQOL. Of the eight domains of HRQOL, social functioning (SF) was the most compromised component of quality of life. The mode of transportation used, the total number of deliveries, admission history during the most recent pregnancy, PPD, and FCV 19 had statistically significant associations with lower overall HRQOL. The study findings highlight the fact that the quality of life of postpartum women needs much attention. Evidence exists that vulnerability to depression increases during pregnancy and childbirth, which may partly be attributable to hormonal change, social factors such as lack of support, and economic deprivation for women in low-income countries (55-57). As such, 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 study the quality of life among postpartum mothers.

Abbreviations

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.

Declarations

Ethics approval and informed consent

Ethical clearance was obtained from MWU's Research and Development Directorate (RDD). Subsequently, a letter of permission was received from the management of the Bale Zone Health official. After explaining the objectives of the study in detail, written consent was obtained from each study participant by reading the informed consent format attached to the questionnaires. During data collection, the study participant had the right to refuse, stop, or withdraw from participation. Confidentiality of the data and their responses were guaranteed throughout the study period, and information was provided at the end of the interview in case of any misunderstanding.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests" in this section.

Funding

Not applicable

Authors' contributions

All authors have made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas. Have drafted or written, or substantially revised or critically reviewed the article. Have agreed on the journal to which the article be submitted. Reviewed and agreed on all versions of the article before submission, during revision, the final version accepted for publication, and any significant changes introduced at the proofing stage. Agree to take responsibility and be accountable for the contents of the article. All authors read and approved the final manuscript.

ACKNOWLEDGEMENT

We would like to express our gratitude to Madda Walabu University for creating the opportunity for us to conduct this research. We would also like to extend our heartfelt appreciation to the Bale Zone Health Office for providing important background data on the study area. Lastly, we would like to acknowledge the scholars whose work is used in this research paper work as references.

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