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ASSESSMENT OF QUALITY OF LIFE AND ITS DETERMINANTS AMONG PREGNANT WOMEN: A HOSPITAL-BASED CROSS-SECTIONAL STUDY

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Abstract

Background: Pregnancy involves significant physical, psychological, and social changes that can affect maternal quality of life**.** This study aimed to assess the quality of life (QoL) among pregnant women in a hospital setting and identify its key determinants.

Methods: This hospital-based cross-sectional study was conducted among 150 pregnant women at a tertiary care hospital, SMCH, over two months, from March to April 2024, to assess their quality of life. A simple random sampling method was used to select the study participants. Quality of life was assessed using the EQ-5D-5L Questionnaire, and the EQ-Visual Analogue Scale (EQ-VAS) was employed to measure the participant's self-rated health on a vertical visual analogue scale. Statistical analysis was performed using SPSS version 14, utilizing descriptive statistics, t-tests, ANOVA, and multiple linear regression to identify key demographic and clinical factors influencing quality of life, with a p-value set at ≤0.05.

Results: The results indicate that both age and high-risk pregnancy significantly negatively impact the quality of life among pregnant women. Specifically, each additional year of age is associated with a decrease of 0.08 units in the EQ-5D-5L utility score (β = -0.08, 95% CI: -0.13 to -0.04, $p < 0.001$) and a decrease of 6.24 units in the EQ-VAS score (β = -6.24, 95% CI: -9.40 to -3.09, $p < 0.001$). Additionally, women with high-risk pregnancies had EQ-VAS scores 5.96 units lower than those with normal pregnancies (β = -5.96, 95% CI: -9.54 to -2.37, $p = 0.001$), highlighting the detrimental effect of high-risk pregnancies on quality of life.

Conclusion: older maternal age and high-risk pregnancies significantly reduce the quality of life among pregnant women, highlighting the need for targeted interventions to enhance their well-being and pregnancy outcomes. Future research employing longitudinal approaches could provide deeper insights into the dynamic nature of QoL during pregnancy.

INTRODUCTION

Pregnancy is a transformative period in a woman's life, marked by a range of physical, psychological, and social changes. These changes can significantly influence a woman's Quality of Life (QoL), affecting not only her well-being but also the health and development of the fetus.[1] WHO defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns."[2]

The QoL during pregnancy is multifaceted, encompassing aspects such as physical health, mental well-being, and social support. The assessment of QoL during pregnancy has gained increasing attention in recent years, as it provides valuable insights into the holistic health status of expectant mothers beyond traditional clinical measures. Understanding the factors that influence QoL during pregnancy is crucial for healthcare providers to offer comprehensive, patient-centered care and to identify women who may require additional support or interventions.[3]

Various tools have been developed to measure QoL, with the EuroQol five-dimensional (EQ-5D) questionnaire being one of the most widely used generic instruments. The EQ-5D-5L, an updated version of the original EQ-5D, offers improved sensitivity and discriminatory power. This instrument assesses five dimensions of health: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, each with five levels of severity. Additionally, it includes a visual analog scale (EQ-VAS) for self-rating overall health status.[4,5] The EQ-5D-5L has been validated for use in diverse populations, including pregnant women.[6] The uniqueness of this study lies in its focus on a comprehensive assessment of QoL using the EQ-5D-5L and EQ-VAS tools, which offer a detailed evaluation of health status across multiple dimensions.

Previous studies have identified sociodemographic factors such as age, high socioeconomic status, and education level; obstetric factors including gestational age, parity, and pregnancy-related complications; and psychosocial factors like social support, marital satisfaction, and mental health as key influencers of quality of life during pregnancy.[3,7-10.] Despite the growing recognition of the importance of maternal QoL, there is limited data on its determinants, particularly in socio-demographic and clinical contexts. This study seeks to address this gap by exploring the QoL among pregnant women attending a tertiary care center in a hospital setting. Understanding the factors associated with variations in QoL can provide valuable insights for healthcare providers and policymakers to tailor services and support systems, ultimately enhancing maternal and fetal health outcomes.

Unlike previous studies that may have focused on isolated aspects of maternal health, this research adopts a holistic approach by examining a diverse population within a tertiary care hospital. This study aimed to provide a detailed distribution of EQ-5D-5L levels and EQ-VAS measures, identifying key demographic and clinical determinants of quality of life. These findings will offer valuable insights into the specific needs and challenges faced by pregnant women, guiding the development of targeted interventions to enhance their well-being and pregnancy outcomes, and serving as a baseline for future research and policy-making.

Objectives:

Among the pregnant women visiting the antenatal clinic in a tertiary care centre,

1. To assess the distribution of EQ-5D-5L levels across dimensions.
2. To calculate the mean EQ-5D-5L utility scores and EQ-VAS scores.
3. To assess the factors associated with quality of life (US and VAS measures).

MATERIALS AND METHODS

This was a hospital-based cross-sectional study designed to assess the quality of life (QoL) among pregnant women at Integrated Clinic 6 of SMCH, a tertiary care hospital, over two months, from March to April 2024.

A total of 150 pregnant women were included, based on sample size calculations appropriate for the study's objectives and available resources. A simple random sampling was used to select the study participants, ensuring that each pregnant woman visiting the hospital had an equal chance of being included in the study. The quality of life was assessed using the EQ-5D-5L Questionnaire, a widely used instrument for evaluating health-related quality of life (HRQoL) in pregnant women. The EQ-5D-5L consists of a descriptive system that evaluates five key dimensions of health—mobility, self-care, usual activities, pain/discomfort, and anxiety/depression—each with five levels of severity (1 to 5), where 1 represents no problems and 5 represents extreme problems. Each participant's responses generate a five-digit health state code (e.g., 11234). The utility scores for each study participant were calculated using the Indian value set from the Devine study[11], where the highest health state, 11111, scored 1.000, and the lowest, 55555, scored -0.923. Additionally, participants rated their overall health on the EQ-Visual Analogue Scale (EQ-VAS), a scale ranging from 0 (worst imaginable health) to 100 (best imaginable health), providing a comprehensive assessment of their health status.

Study Procedure: Before the commencement of the study, ethical approval was obtained from the Institutional Review Board (IRB) of SMCH. Informed consent was obtained from all participants before their inclusion in the study, ensuring that they were aware of the study's purpose, procedures, potential risks, and benefits. All pregnant women visiting Integrated Clinic 6 of SMCH during the study period (March to April 2024) were approached for participation, and a simple random sampling method was employed for selection. Each selected woman was interviewed to collect demographic information (age, education, occupation, etc.) and relevant clinical data (gestational age, parity, medical history, etc.).Interviewers were administered with the EQ-5D-5L questionnaire and the responses were recorded on structured data sheets.

All data were anonymized to protect participant confidentiality. Each participant was assigned a unique identifier. All data were anonymized to protect participant confidentiality. Each participant was assigned a unique identifier. The results were analyzed and compiled into a comprehensive report, highlighting the key findings and implications for clinical practice. The findings were presented at relevant medical conferences.

Statistical Analysis: Analysis was done using IBM SPSS version 22. The EQ-5D-5L utility scores were summarized using mean and standard deviation (SD). Frequency Distribution of EQ-5D-5L Levels of the study participants across Dimensions was described using frequency (percentage). Independent t-tests and ANOVA were utilized to compare EQ-5D-5L utility scores across different independent variables, such as demographic and clinical factors. Multiple linear regression was conducted to identify factors associated with the quality of life (both utility scores and VAS measures) among pregnant women. This analysis helped to adjust for potential confounders and determine the relative influence of various determinants on QoL outcomes.

RESULTS

The mean (SD) of EQ-5D-5L utility scores and EQ-VAS scores were 0.87 (.15) and 72.9 (12.39) respectively.

Table 1: Frequency Distribution of EQ-5D-5L Levels of the study participants across Dimensions (N = 150)

EQ-5D-5L Dimensions	Mobility	Self-care	Usual Activities	Pain/ Discomfort	Anxiety/ Depression
No problem	88 (58.67)	132 (88)	97 (64.67)	82 (54.67)	73 (48.67)
Slight problem	31 (20.67)	16 (10.67)	24 (16)	46 (30.67)	47 (31.33)
Moderate problem	20 (13.33)	2 (1.33)	29 (19.33)	21 (14)	22 (14.67)
Severe problem	11 (7.33)	0	0	1 (0.67)	8 (5.33)
Extreme problem	0	0	0	0	0

Overall, the majority of participants reported no or slight problems across all dimensions, while moderate to severe problems were less frequent. Extreme problems were not reported in any dimension.

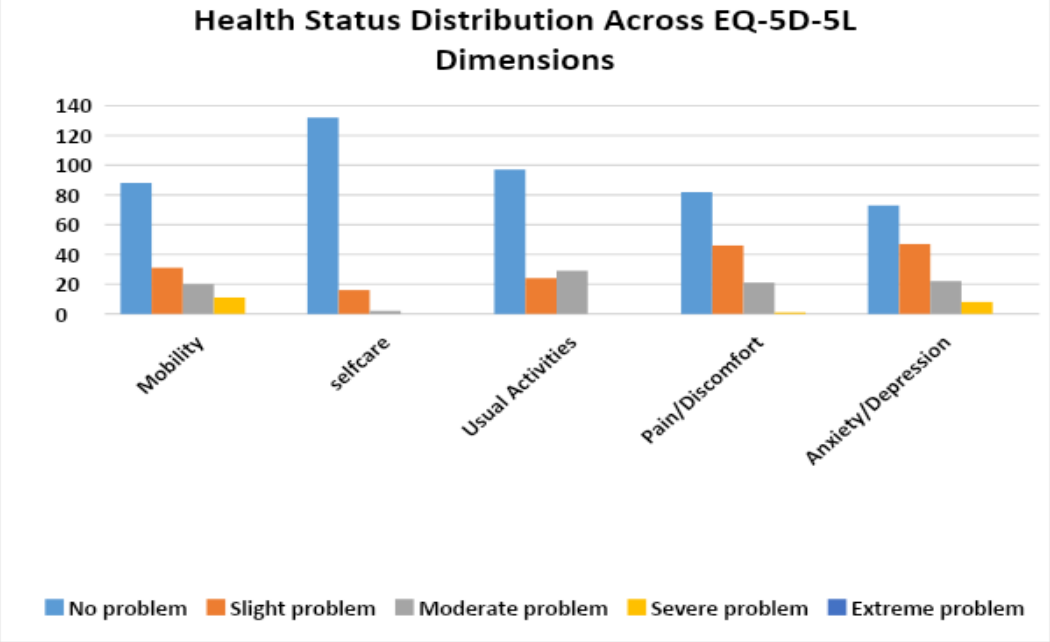

Figure 1: Frequency Distribution of EQ-5D-5L Levels of the study participants across Dimensions (N = 150)

Table 2: Mean EQ-5D-5L Utility scores among the study participants (N = 150)

Variables	Frequency n (%)	Mean EQ-5D-5L Utility Score Mean (SD)	p value
Age (years)			
19 – 24	55 (36.67)	0.92 (0.11)	**< 0.001**
25 - 29	68 (45.33)	0.89 (0.11)	
30 -34	24 (16)	0.76 (0.18)	
≥ 35	3 (2)	0.48 (0.22)	
Residence			
Rural	69 (46)	0.88 (0.16)	**0.30**
Urban	81 (54)	0.86 (0.13)	
Education			
No formal education/primary	20 (13.3)	0.89 (0.93)	**0.35**
High	13 (8.67)	0.88 (0.77)	
Higher secondary & above	56 (37.33)	0.88 (0.17)	
Graduate & above	61 (40.67)	0.84 (0.15)	
Occupation			
Housewife	93 (62)	0.89 (0.15)	**0.02**
Employed	57 (38)	0.83 (0.15)	
Per capita income			
< 10,000	103 (68.67)	0.88 (0.15)	**0.05**
11000-20000	25 (16.67)	0.88 (0.13)	
≥ 21000	22 (14.67)	0.80 (0.15)	
Gestational age			
1st trimester	19 (12.67)	0.94 (0.05)	

2nd trimester	31 (20.67)	0.86 (0.14)	**0.09**
3rd trimester	100 (66.67)	0.86 (0.16)	
Parity			
Primi	102 (68)	0.89 (0.13)	**0.02**
Multi	48 (32)	0.83 (0.17)	
High-risk pregnancy			
No	75 (50)	0.91 (0.12)	**0.0002**
Yes	75 (50)	0.83 (0.16)	
History of chronic illness			
No	131 (87.33)	0.88 (0.15)	**0.15**
Yes	19 (12.67)	0.83 (0.16)	

Table 3: Mean EQ-VAS scores among the study participants (N = 150)

Variables	**Frequency n (%)**	**Mean EQ-5D-5L Utility Score Mean (SD)**	**p value**
Age (years)			
19 – 24	55 (36.67)	76.90 (10.56)	**<0.001**
25 - 29	68 (45.33)	74.91 (10.78)	
30 -34	24 (16)	61.04 (11.22)	
≥ 35	3 (2)	53.33 (15.27)	
Residence			
Rural	69 (46)	73.8 (13.97)	0.37
Urban	81 (54)	72.14 (10.87)	
Education			
No formal education/primary	20 (13.3)	72.25 (12.72)	0.35
High	13 (8.67)	73.46 (4.74)	
Higher secondary & above	56 (37.33)	75.19 (14.33)	
Graduate & above	61 (40.67)	71.11(11.35)	
Occupation			
Housewife	93 (62)	74.74 (12.82)	**0.02**
Employed	57 (38)	70.14 (11.18)	
Per capita income			
< 10,000	103 (68.67)	73.45 (12.79)	0.39
11000-20000	25 (16.67)	74 (12.33)	
≥21000	22 (14.67)	69.68 (10.29)	
Gestational age			
1st trimester	19 (12.67)	78.95 (10.62)	**0.06**
2nd trimester	31 (20.67)	71 (11.86)	
3rd trimester	100 (66.67)	72.48 (12.63)	
Parity			
Primi	102 (68)	74.30 (12.27)	**0.06**
Multi	48 (32)	70.20 (12.28)	
High-risk pregnancy			
No	75 (50)	78.08 (10.95)	**<0.001**
Yes	75 (50)	67.90 (11.68)	
History of chronic illness			
No	131 (87.33)	73.48 (12.47)	0.20
Yes	19 (12.67)	69.63 (11.49)	

Multiple linear regression analysis was performed by selecting independent variables with p-values less than 0.2.

Table 4: Factors associated with Quality-of-life EQ-5D-5L Utility Score among the study participants (N = 150)

Variables	**β coefficient (95% CI)**	**p value**
Age	-0.08 (-0.13 – -0.04)	< **0.001**
Occupation	-0.03 (0.08 – 0.03)	0.108
Per capita income	-0.001 (-0.04 – 0.03)	0.92
Gestational age	-0.01 (-0.04 – 0.008)	0.19
Parity	0.04 (-0.02 – 0.10)	0.23
High-risk pregnancy	-0.02 (-0.06 – 0.01)	0.20

History of chronic illness	-0.04 (-0.11 – 0.03)	0.21

In the multiple linear regression analysis, a significant negative association was observed between age and quality of life. For each one-year increase, there was a decrease of 0.08 units in the quality-of-life score (β = -0.08, 95% CI: -0.13 to -0.04, p < 0.001).

Table 5: Factors associated with Quality-of-life EQ-VAS among the study participants (N = 150) (Multiple linear regression)

Variables	β coefficient (95% CI)	p value
Age	-6.24 (-9.40- -3.09)	< **0.001**
Occupation	-2.31 (-5.98- 1.36)	0.21
Gestational age	-0.47 (-3.02 – 2.07)	0.71
Parity	3.82 (-0.57 – 8.21)	0.09
High-risk pregnancy	-5.96 (-9.54 - -2.37)	**0.001**
History of chronic illness	-2.57 (-8.22– 3.07)	0.37

The multiple linear regression analysis revealed that older age and high-risk pregnancy are significantly associated with lower quality of life scores as measured by the EQ-VAS. For each one-year increase in age, there was a corresponding decrease of 6.24 units in EQ-VAS scores (β = -6.24, 95% CI: -9.40 to -3.09, p < 0.001). Participants with high-risk pregnancies had EQ-VAS scores 5.96 units lower than those with normal pregnancies (β = -5.96, 95% CI: -9.54 to -2.37, p = 0.001), indicating a significant disparity in quality or detrimental impact of high-risk pregnancy on quality of life between the two groups.

DISCUSSION

In this cross-sectional study, we found that the mean (SD) EQ-5D-5L utility score among pregnant women was 0.87 (0.15), indicating an overall good perceived quality of life (QoL). Similarly, the mean EQ-VAS score was 72.9 (12.4), reflecting a moderate self-assessment of health status. These findings suggest that most pregnant women maintain a relatively positive QoL despite the physical and emotional demands of pregnancy.Our findings align with those of Regan et al., who reported a median EQ-5D-5L utility score of 0.88 during pregnancy, with significant fluctuations across trimesters—showing a decline during the third trimester and recovery postpartum. This trend supports the idea that QoL during pregnancy is dynamic and closely linked to physiological changes and gestational age. Conversely, Boutib et al. in Morocco reported a lower mean EQ-5D utility score of 0.71 (0.24) among pregnant women, significantly lower than that of non-pregnant women ($p < 0.0001$). This contrast may be attributed to differences in healthcare accessibility, socioeconomic status, and cultural context.Our study's EQ-VAS score of 72.9 was notably lower than the 87.86 (9.16) reported by Wu et al., who found the highest VAS scores in the first trimester and a significant decline in later pregnancy ($p = 0.001$). This suggests that as pregnancy progresses, women may perceive their health less favorably, likely due to physical discomfort and fatigue, particularly in the third trimester. The difference between our findings and Wu et al.'s may be due to population-level differences in maternal health support, or the higher proportion of participants in their first trimester in that study.

The analysis of EQ-5D-5L dimensions in our cohort revealed that most participants experienced no or only slight problems. The most affected domains were pain/discomfort (30.67%) and anxiety/depression (31.33%), which are known to be common concerns during pregnancy. Moderate problems were most reported in usual activities (19.33%), and a small proportion experienced severe issues in mobility (7.33%). No participants reported extreme problems. A systematic review by Lagadec et al. similarly found that although pregnancy is associated with physical and emotional challenges, women generally report high QoL, particularly when supported by strong social and prenatal care networks.Further support comes from Boutib et al., who found that pregnancy significantly increased the absolute risk of problems in EQ-5D-5L dimensions, with a 27.3% increase in usual activities, 26.5% in pain/discomfort, and 12% in anxiety/depression—all statistically significant ($p < 0.05$). Compared to our data, where most issues remained mild to moderate, this suggests that our participants may have had better access to healthcare or stronger support systems.

Multiple regression analysis revealed two significant predictors of QoL: age and high-risk pregnancy. Each one-year increase in maternal age was associated with a 0.08-point decrease in the EQ-5D utility score (β = -0.08, 95% CI: -0.13 to -0.04, p < 0.001) and a 6.24-point decrease in EQ-VAS score (β = -6.24, 95% CI: -9.40 to -3.09, p < 0.001). These findings are consistent with international studies. For instance, Morin et al. found that QoL declines more steeply in high-risk pregnancies and among older women. Age-related factors such as increased risk of gestational diabetes, hypertension, and physical fatigue likely contribute to this decline. Interestingly, research also shows that while older women face more physical limitations, younger women (especially adolescents) often experience more emotional challenges, suggesting that both physical and psychological domains of QoL are influenced by age.

Participants with high-risk pregnancies in our study had significantly lower EQ-VAS scores, with a mean decrease of 5.96 units (β = -5.96, 95% CI: -9.54 to -2.37, p = 0.001), compared to those with normal pregnancies. These findings are supported by Pesavento et al., who reported that women with normal

pregnancies generally perceive their QoL more positively than those with complications. High-risk conditions, including preeclampsia, placenta previa, or fetal growth restriction, are known to impair both physical functioning and mental well-being.

Beyond clinical and demographic variables, psychosocial support may also play a critical but underexplored role in maternal QoL. A study in rural Karnataka, India, emphasized that social support, particularly from partners and family, helped mitigate the negative effects of high-risk pregnancies on mental and social domains of health. While our study did not assess social support directly, its potential impact should be acknowledged in future research.

Finally, our cross-sectional study design limits causal interpretations and the ability to explore changes in QoL across trimesters. Longitudinal studies, such as that of Regan et al., offer greater insight into how QoL evolves through pregnancy and into the postpartum period. Future research could explore trimester-specific factors, evaluate rural–urban disparities in greater depth, and include psychosocial variables such as perceived stress, support, and economic burden.

CONCLUSION

This study highlights that pregnant women, overall, report a relatively good quality of life, as reflected by high mean EQ-5D-5L utility and EQ-VAS scores. However, quality of life significantly varies with individual characteristics. Increasing maternal age and the presence of high-risk pregnancies were found to be strong negative predictors of both self-reported health status and utility scores. Notably, pain/discomfort and anxiety/depression were the most frequently reported problems among the five EQ-5D-5L dimensions. These findings underscore the importance of early identification and supportive interventions for at-risk groups—particularly older and high-risk pregnant women—to preserve and enhance their well-being during pregnancy. Future longitudinal and interventional studies are recommended to better understand the evolving quality of life throughout pregnancy and inform targeted maternal health strategies.

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