The Effects of Pregnancy and Childbirth on Women's Health-Related Quality of Life: A Scoping Review

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ABSTRACT

Context: Although pregnancy and childbearing are the most natural processes for women, it is accompanied by significant life changes for the mother, who needs to adjust to parenting. Hormonal variables cause these changes, resulting in physiological and emotional consequences. Although the changes that pregnant women experience are only transitory, they might affect their quality of life.

Aim: This scoping review highlight the effect of pregnancy and childbearing on women's health-related quality of life.

Methods: A scoping review was completed by searching data converging about pregnancy and childbirth's effects on women's health-related quality of life utilizing databases from 2015-2022 papers. The review was done via different database engines. The research selection procedure uses Mesh keywords to find the most relevant papers, and the PRISMA flowchart helped pick research papers. The search engines were picked from the Saudi digital library and Google Scholar. Three main themes and three subthemes were created in this scoping review. A total of 82 articles were initially retrieved. Twenty-four duplications were removed. Thirty-four articles that did not meet the aim were excluded. The remaining 26 were screened; the non-English, outdated articles, text articles, and more reasons were counted, so another ten articles were removed. So, 14 studies met the criteria and were eligible to be included in this review.

Results: revealed a correlation between delayed first birth and better health-related quality of life. It is highlighted that physical quality of life-related to maternal age, gestational age, BMI before 12 weeks of pregnancy, mother's education and work, and spouse's education (p<0.05). Psychological quality of life-related to gestational age, mother's education and occupation, and spouse's education. The main characteristics related to greater quality of life were mean maternal age, primiparity, early gestational age, the lack of social and economic issues, having family and friends, exercising, being happy to be pregnant, and being hopeful. Early second-trimester pregnant women had the best health-related quality of life drops in the third trimester. More than half of the participants in the reviewed studies had urinary incontinence as a main pelvic floor disorder. Mothers showed lower gray matter (GM) volumes and higher white matter (WM) volumes in empathy and reward networks. Those who gave birth vaginally reported the highest HRQoL, whereas those who underwent cesareans reported the lowest.

***Conclusion*:** The study elucidates the fluctuations in quality of life throughout pregnancy, showing its dependence on various demographic and health-related aspects. The nuanced variations and pathological features emerging during pregnancy encompass the impact of morning sickness, sleep patterns, and pelvic floor disorders. The influence of the mode of delivery on women's health-related quality of life emphasizes differences in pain, physical functioning, and mental health between those who undergo cesarean sections and those who have vaginal births. Collectively, these findings underscore the complexity of the maternal experience, calling for a holistic approach to healthcare that addresses the diverse challenges women face during this pivotal life stage.

Keywords: Pregnancy, childbirth, women's health-related quality of life

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1. Introduction

The World Health Organization (WHO) defines Quality of Life (QoL) as an individual's view of their place in life concerning their objectives, expectations, standards, and concerns in the context of the culture in which they live. For researchers, health providers, and the public, well-being and improving life quality have become a topic of interest. The idea of quality of life encompasses a variety of factors that are used to create various scales. However, these scales would be limited to some level because the notion of quality of life varies according to society *(Haraldstad et al., 2019).*

The fundamental indication that produces a subjective and objective evaluation of each human's existence is Quality of Life (QoL). Physical, psychological, social, and environmental aspects are used to describe health. The phrase "quality of life" has been widely utilized in women's health as a key metric for assessing primarily women's well-being. Inconsistent results, on the other hand, have revealed a wide range of findings for women's QoL from pregnancy through postpartum *(Haraldstad et al., 2019).*

Health-related quality of life (HRQoL) is a multifaceted term encompassing physical, psychological, and emotional well-being and patient autonomy. It may be applied to various medical disorders *(AlShehri, 2015).* Furthermore, HRQoL is frequently a term that refers to the health aspects of quality of life, generally considered to reflect the impact of disease and treatment on disability and daily functioning, as well as the impact of perceived health on an individual's ability to live a fulfilling life. HRQoL, on the other hand,

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measures the value attributed to the duration of life as impacted by sickness, injury, treatment, and policy, as well as impairments, functional states, and opportunities *(Haraldstad et al., 2019).*

Several validated quality-of-life assessment methods are available today to evaluate the degree of well-being in different health and welfare areas for different groups of people, including women's health-related quality of life, such as the SF-36, Euro-QoL, WHOQoL, and others *(Triviño-Juárez et al., 2017).*

In the women's health world, HRQoL became an essential metric in 1987 for assessing pregnant women's physical and psychological health to better understand their health. The EuroQoL Group's (EQ-5D-5L), a reliable instrument developed by the EuroQoL group, includes a descriptive section that includes a visual analog scale questionnaire part (EQ-VAS) and the evaluative part that measures health-related quality of life (HRQoL) using five dimensions mobility, self-care, usual activities, pain/discomfort, anxiety/depression *(Wu et al., 2021).* Many studies and articles in this scoping review involved some of these tools.

2. Significance of the study

Many women are inattentive to the long-term physical and mental health issues that might arise due to pregnancy, delivery, and puerperium. Hence are unprepared when they are confronted with such issues. As a result, their quality of life will be negatively impacted for an extended time. A mother's quality of life impacts her child's health and well-being, with long-term implications for the child's psychological development *(Tola et al., 2021).*

3. Aim of the study

This scoping review aimed to highlight the effect of pregnancy and childbearing on women's health-related quality of life by highlighting the physical and psychological changes and mediators associated with pregnancy and childbirth that possibly affect the health-related quality of women's lives during pregnancy and afterward.

3.1. Review Question

The PICOT question format is used to identify the research question. In pregnant or childbearing women, what are the effects of being pregnant and giving birth on their health-related quality of life?

Table (1): PICOT Question.

	The Content	*The PICOT Question*
P	Pregnant and childbearing women	In pregnant or childbearing women, what are the effects of being pregnant and giving birth on their health-related quality of life?
I	Not applicable	
C	Not applicable	
O	Health-related quality of life	
T	2015-2022	

4. Methodology

4.1. Research design

Scope reviews are a great method that helps determine how much information there is on a subject. They are conducted to locate and organize relevant research on a topic. They provide a high-level and more specific overview of the relevant literature and studies. A growing number of evidence synthesis methods include scoping reviews *(Munn et al., 2018).*

4.2. Search strategy

The researcher used a database search engine to look for studies on the effects of pregnancy and childbirth on women's health-related quality of life. The study selection process uses Mesh list-based keywords, the most compatible articles perusing regarding the topic. The PRISMA flowchart was used to set the process of selecting articles that were included in the study. The search engines were chosen from the Saudi digital library on the website of King Abdul-Aziz University, as well as Google Scholar, Research Gate, NCBI, ELSEVIER, SPRINGER, MEDLINE, and PUBMED are among them. The search terms used included pregnancy, the effect of pregnancy, childbirth, effects of childbirth, and women's health-related quality of life.

All articles included in the review were published. Europe 42.8% (6/14) are from Asia, 50% (7/14), and one article is from Africa. A sum of (14) studies were cross-sectional quantitative (9), cohort (2), experimental (1), (1) observational study, and (1) systematic review.

4.3. Study Inclusion and Exclusion Criteria

Studies carried out in the English language in health-related journals and the human field. Between 2015 and 2022, original quantitative studies and full-access studies were conducted. The population of interest mostly consists of primipara or multipara pregnant women in various trimesters and postpartum women. They range in age from 17 to 49. In addition, women with permanent changes in their lifestyle patterns and low quality of life due to one of their previous childbirths are included.

Studies conducted outside of the health-related journals, conducted in languages other than English, or published earlier than 2015, unpublished studies were excluded; the population of females who were severely ill or who have never had children or have experienced stillbirth was also excluded.

4.4. Study selection

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) was applied to classify the literature. PRISMA is a flow chart that consists of four phases, explained in Figure 1. Fourteen articles were included in the review. In the identification phase, 82 records were collected from the database. In the screening phase, 22 duplicated records were removed. Then, the total number of screened articles, after eliminating the duplicates, was 60. Thirty-four unsuitable records and quite different from the topic were excluded. The remaining 26 were screened, then

the non-English, outdated articles, some text articles, and more reasons counted twelve articles were uninvolved. So, finally, in the eligibility phase, 14 studies were the primary resource articles suitable for this topic, and they fell into the criteria that were eligible to be included.

4.5. Charting the data

The researcher looked at the article's title, abstract, and full text to decide if it was worth reading. All articles that met the criteria for inclusion were added.

The review matrix was used to show what the included studies were about and their main findings. This matrix gave an overview of the study, including its location, purpose, design, sample, tools, and results.

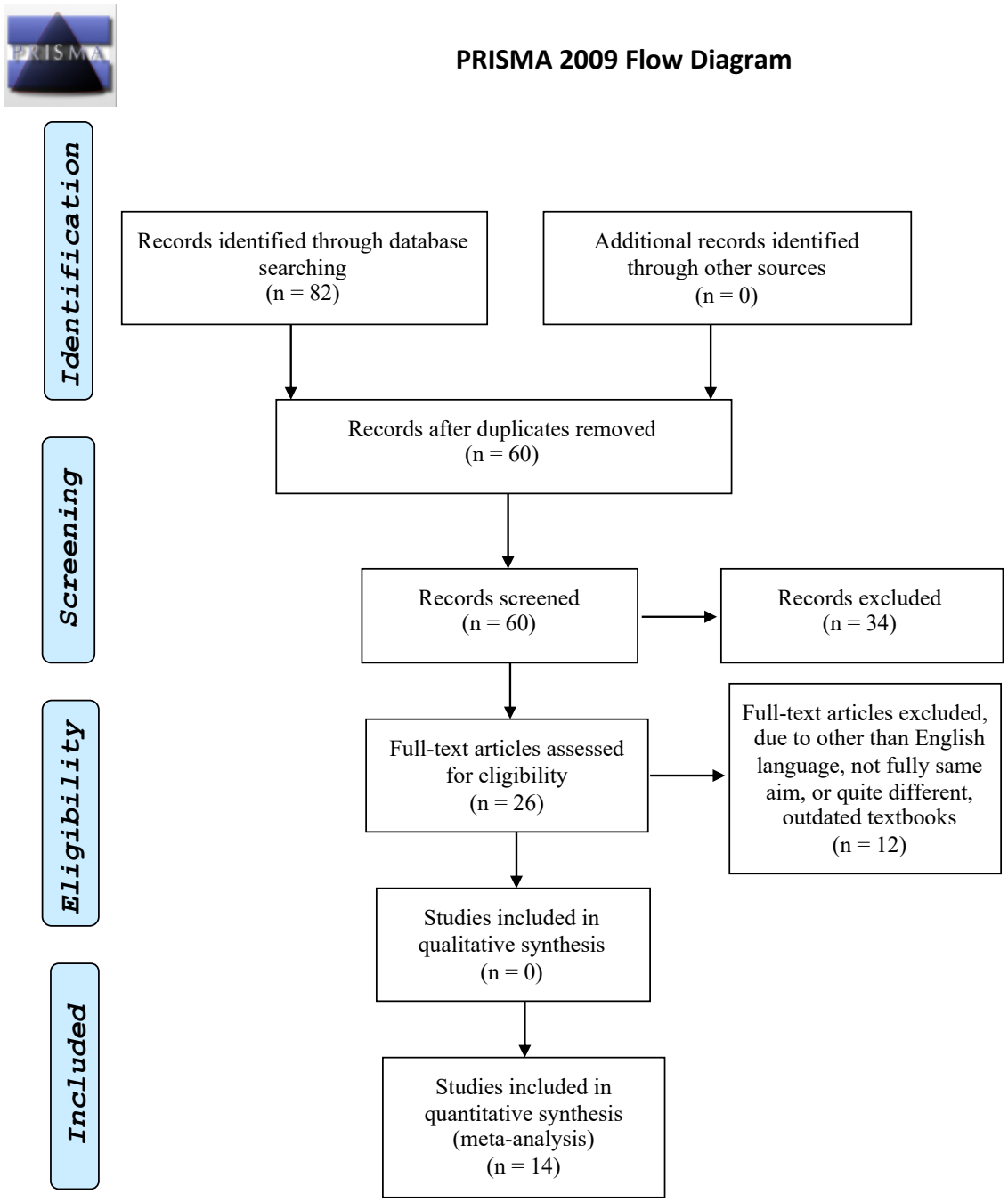

Figure (1): Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement *(Moher et al., 2009)*.

4.6. Quality Assessment

Table (2): Quality assessment conduction using the instrument of *Hawker et al. (2002).*

Author(s)	Title/ Abstract	Introduction	Methods	Sampling	Data analysis	Ethics/ Bias	Findings	Transferability & Generalizability	Implication & Usefulness	Total score
Wang et al. (2022)	4	4	4	4	4	4	4	4	4	36 Good
Wu et al. (2021)	4	4	4	4	4	4	4	4	4	36 Good
Laitinen et al. (2021)	4	4	4	4	4	3	4	4	3	34 Good
Tola et al. (2021)	4	4	4	4	4	3	4	3	4	34 Good
Estebsari et al. (2020)	4	4	4	4	4	4	4	4	4	36 Good
Moossdorff-Steinhauser et al. (2021)	4	4	4	4	4	4	4	2	4	34 Good
Zhang et al. (2019)	4	4	3	4	3	4	4	3	4	33 Good
Morin et al. (2019)	4	4	4	4	4	4	4	4	4	36 Good
Lagadec et al. (2018)	4	4	4	4	4	4	4	4	4	36 Good
Park and Choi (2018)	4	4	4	4	4	4	4	3	4	35 Good
Trivino et al. (2017)	4	4	4	4	4	4	4	4	4	36 Good
Petrou et al. (2017)	4	4	4	4	4	4	4	4	4	36 Good
Sut et al. (2016)	4	4	4	4	4	4	4	3	3	34 Good
AlSheri-et al. (2015)	4	4	4	4	4	4	4	4	4	36 Good

Table (3): Scoping review themes and subthemes.

Themes-subthemes	Author name/ publish year
Theme 1: Factors associated with women's health-related quality of life, physiological, and psychological fluctuations.	*Park and Choi, (2018); Estebsari et al. (2020); Lagadec et al. (2018); Tola et al. (2021).*
Theme 2: Variations and pathological features in women because of pregnancy and childbearing that make a difference in their health-related quality of life.	
Subtheme 1: Illness and sleep pattern changes during pregnancy.	*Wu et al. (2021), Morin et al. (2019); Latinen et al. (2021); Sut et al. (2016).*
Subtheme 2: Pelvic floor disorders result from pregnancy and childbirth.	*Wang et al., 2022; Moossdorff-Steinhauserv et al. (2021).*
Subtheme 3: Brain morphology and women's adaptation.	*Zhang et al. (2019).*
Theme 3: Mode of delivery effects on women's health-related quality of life.	*Petrou et al. (2017); AlShehri, et al. (2015), Trivino et al. (2017).*

5. Results

Thematic analysis by using the three categories presented in the table above. Based on the articles included in the review about the effect of pregnancy and childbirth on women's health-related quality of life, three themes have been extracted as follows:

Theme 1: Factors associated with women's health-related quality of life, physiological, and psychological fluctuations.

Theme 2: Variations and pathological features in women because of pregnancy and childbearing that make a difference in their health-related quality of life.

Subtheme 1: Illness and sleep pattern changes during pregnancy.

Subtheme 2: Pelvic floor disorders result from pregnancy and childbirth.

Subtheme 3: Brain morphology and women's adaptation.

Theme 3: Mode of delivery effects on women's health-related quality of life.

Theme 1: Factors associated with women's health-related quality of life/ physiological and psychological fluctuations.

Pregnancy and delivery are two of the most natural and important periods of a woman's life, during which her body undergoes physiological and anatomical changes as the fetus grows. Physical and mental illnesses that occur as a result of pregnancy or delivery have a significant impact on women's quality of life, especially after childbirth. Pregnant women's health-related quality of life fluctuates as the pregnancy progresses *(Haraldstad et al., 2019).*

A survey study in Korea showed a correlation between delayed first birth and better health-related quality of life.

HRQoL was increasing by 33.5%, attributable to declining parity. Early first births increased parity and mobility problems *(Park & Choi, 2018).*

Similarly, according to the findings in an Iranian cross-sectional study, enhancing mother and child health during and after pregnancy requires focusing on the physical and psychological quality of life of pregnant women and the demographic variables impacting it. Pregnant women's physical quality of life was 43.7±7.3, and psychological was 31.5±11.8. It is highlighted that physical quality of life-related to maternal age, gestational age, BMI before 12 weeks of pregnancy, mother's education and work, and spouse's education (p<0.05). Psychological quality of life was connected with gestational age, mother's education and occupation, and spouse's education (p<0.05) (*Estebsari et al., 2020).*

In one systematic review, while the physical quality of life declined throughout pregnancy, the mental quality remained steady and improved. The main characteristics related to greater quality of life were mean maternal age, primiparity, early gestational age, the lack of social and economic issues, having family and friends, exercising, being happy to be pregnant, and being hopeful. Medically assisted reproduction, complications before or during pregnancy, obesity, nausea and vomiting, epigastric pain, back pain, smoking in the months before conception, alcohol dependence, sleep difficulties, stress, anxiety, depression during pregnancy, and sexual or domestic violence were linked to a lower quality of life *(Lagadec et al., 2018).*

Sixty-two-point three percent of participants in cross-sectional research in Ethiopia reported worse health-related quality-of-life, 46.2% had lower physical health-related quality-of-life, and 79% had a lower mental health-related quality-of-life. Low mental HRQoL was also connected with postpartum depression and not receiving prenatal care among women aged 17–24 *(Tola et al., 2021).*

Theme 2: Variations and pathological features in women because of pregnancy and childbearing that make a difference in their health-related quality of life.

Subtheme 1: Illness and sleep pattern changes during pregnancy.

Regarding a morning illness, 70%–80% of pregnant women experience nausea and vomiting during pregnancy (NVP). Symptoms occur 2–4 weeks after conception, peak between 9 and 16 weeks, and resolve by 22 weeks. Ten percent of women experience symptoms till birth. Hyperemesis gravidarum (excessive vomiting) affects 0.3–2% of pregnant women, if neglected, can lead to maternal morbidity and bad delivery outcomes *(Bustos et al., 2016).*

According to another cross-sectional study, early second-trimester pregnant women had the best health-related quality of life. Due to physical and emotional changes, pregnant women's health-related quality of life drops in the third trimester. Pain and discomfort were the top worries (46%), while self-care was the least. Ten percent of first-trimester pregnant women reported at least one health-related concern *(Wu et al., 2021).*

It was reported in a prospective cohort study that, from month 4 to month 8, participants showed a significant drop in quality of life, with the drop being even more pronounced in pathological pregnancies *(Morin et al., 2019).*

In the Turku city, Finland, A study on serious pregnancy sickness, NVP causes sleep disruptions and lowers physical and mental health. Pregnancy Unique Quantification of Emesis Questionnaire (PUQE) found that NVP was moderate 52.3% of the time, mild 30%, severe 6.4%, and 11.3% have no NVP. Night awakenings 69.9% were the most common sleep disruption, followed by daytime tiredness 35.7%, early morning awakenings 12%, and trouble going to sleep 7.1% *(Laitinen et al., 2021).*

Pregnant women had a worse sleep and health-related quality of life than healthy controls and pregnant women's sleep and health-related quality of life deteriorated compared to healthy controls. The probability of poor sleep quality in pregnancy rose 2.11-fold in the second trimester and 1.86-fold in the third. Second and third-trimester scores declined from the first *(Sut et al., 2016).*

Subtheme 2: Pelvic floor disorders result from pregnancy and childbirth.

The term ‘pelvic floor disorders’ (PFDs) refers to stress urinary incontinence, overactive bladder syndrome, pelvic organ prolapse, and fecal incontinence. These disorders are prevalent in adult women. One of the current reviewed studies found that 52% of pregnant women experienced urine incontinence. Mild to moderate incontinence was a problem for most women. Multiple logistic regression identified five risk variables. Pregnancy-related urine incontinence was most strongly associated with preexisting urinary incontinence (OR=4.178, 95% CI=2.690–6.490), followed by a history of vaginal delivery, coffee use, childhood enuresis, and urinary tract infection. Health-related quality of life during pregnancy was significantly impacted by urinary incontinence. Only 14.8% of pregnant women who experienced urinary symptoms sought medical attention *(Wang et al., 2022).*

Furthermore, the study found that overall, 66.8% of pregnant women experience UI, increasing from 55.1% in the first trimester to 70.1% in the third. Almost 43% of respondents said they had UI once a week or less, 92.5% of women lost a modest amount, and 90% said it had a mild to moderate effect on their quality of life. In this study, only 13.1% of UI people sought professional help. Mainly, people did not get help because they wanted to avoid being a burden or assuming the UI problem would disappear independently. The scores, ICIQ-UI SF, ICIQ-LUTSQoL, and interference in daily life different scores of women who sought help were considerably higher than those who did not *(Moossdorff-Steinhauser et al., 2021).*

Subtheme 3: Brain morphology and women's adaptation.

The functional brain activity of mothers has been demonstrated to shift over time in the context of a response using functional neuroimaging, as per numerous studies. A comparative study between mothers and non-mothers to

check and document the elasticity of maternal brains. It has been found that mothers showed lower gray matter (GM) volumes and higher white matter (WM) volumes in empathy and reward networks (supplementary motor area, occipital, inferior parietal lobe, insula, striatum), decreased cortical thickness in the precentral gyrus, and increased gyrification index in the orbitofrontal cortex *(Zhang et al., 2019).*

Moreover, in the postpartum period, mothers showed changes in the gray matter (GM) and white matter (WM) volumes and cortical thickness of various regions associated with maternal networks (such as the superior and medial frontal gyrus, insula, limbic lobe, superior and middle temporal gyrus, and precentral gyrus). Maternal empathy was associated with changes in GM and WM volume. These findings provide neuroanatomical evidence for how mothers process emotional and sensory information after giving birth *(Zhang et al., 2019).*

Theme 3: Mode of delivery effects on women's health-related quality of life.

In a prospective English population-based study, women who had cesareans were more likely to have pain or discomfort 12 months after giving birth than those who had natural births (*Petrou et al., 2017).*

Women who had recently given birth scored higher on measures of physical functioning, role-physical health, vitality, role-emotional health, and mental health. Women who had recently given birth reported less physical pain than the control group. Those who gave birth vaginally reported the highest HRQoL, whereas those who underwent cesareans reported the lowest *(AlShehri et al., 2015).*

However, a longitudinal prospective study in Spain reported no difference in health-related quality of life by mode of birth at six weeks or six months postpartum for healthy primipara. Postpartum urine incontinence lowers the health-related quality of life at six weeks postpartum, regardless of delivery method. Health-related quality of life improved for all birth modes between six weeks and six months postpartum *(Triviño-Juárez, et al., 2017).*

6. Discussion

Many physiological and psychological adjustments must be made throughout pregnancy. These variations may affect the mother's and infant's health, well-being, and quality of life for pregnant women, even in the most straightforward pregnancies *(Park & Choi, 2018).* Well-being and quality of life are essential during all stages of life, including pregnancy. Pregnancy is one of a woman's most natural and significant times. Women's quality of life decreases with time due to physical symptoms such as nausea, vomiting, epigastric pain, reflux, shortness of breath, dizziness, back discomfort, and sleep disturbances *(Estebsari et al., 2020).*

Pregnancy and childbirth represent transformative periods in a woman's life, impacting both physiological and anatomical aspects as the fetus develops. The resulting physical and mental health challenges significantly affect postpartum quality of life. Various studies reveal that delayed first births correlate with improved health-related quality of life (HRQoL), emphasizing the inverse relationship between parity and quality of life. Factors influencing pregnant women's HRQoL include maternal age, primiparity, gestational age, social and economic support, exercise, and emotional well-being. Complications such as medical interventions, psychosocial issues, and mental health challenges during pregnancy are associated with lower quality of life. In Ethiopia, a cross-sectional study found a substantial percentage of participants reporting diminished health-related quality of life, particularly in mental health, with links to postpartum depression and inadequate prenatal care. These findings highlight the complex and varied experiences of health-related quality of life during pregnancy and postpartum, underscoring the importance of addressing both physical and psychological aspects.

In a study to assess the overall health-related quality of life (HRQoL) in women five years after the birth of their first child, the findings revealed a good overall HRQoL. Suboptimal scores were obtained for the three variables: Sleeping problems, emotional well-being – negative affect, family functioning, and sexual functioning *(Carlander et al., 2015). Alzboon and Vural (2019)* found that only parity significantly affected the QoL. High-parity women had lower QoL scores than low-parity women in a study to identify the effects of women's characteristics on their quality of life.

A systematic review of thirty-one studies conducted to evaluate research evidence on the determinants of antenatal mental health disorders among Iranian women revealed that a significant relationship between antenatal mental health risks and variables such as lack of social support, marital status, domestic violence, unintended pregnancy, and socioeconomic status *(Alipour et al., 2018).* Similarly, *Saridi et al. (2022)* revealed that 15.5% of pregnant women were at an increased risk of developing depression symptoms in a study aimed at assessing the quality of life in association with depression symptoms in pregnancy. In Moroccan study conducted by *Boutib et al. (2023)* reported that rural pregnant women had the worst HRQoL (EQ-5D index score = 0.57) compared to their urban peers.

There was a significant correlation in the women in the second trimester of pregnancy between the quality of life in the physical health domain and the intensity and type of physical activity *(Krzepota et al., 2018).* Similarly, a systematic review by *Boutib et al. (2022)* reported sociodemographic characteristics related to improved well-being (favorable economic status, social support). Similarly, better sleep quality and moderate physical exercise were linked to an increased QoL. Physical and psychological factors were associated with a lower QoL.

Ishaq et al. (2022) reported maternal quality of life predictors during physiological pregnancy. They reported a very good overall quality of life. Besides, reporting a significant association between age, education, occupation, income, marital status, and trimester. Education was reported as a positive predictor for QoL. On the other hand, trimester was reported as a negative predictor of QoL.

Various studies highlight the dynamic nature of pregnant women's health-related quality of life (HRQoL)

throughout different trimesters. According to a cross-sectional study, early second-trimester pregnant women experience the highest HRQoL, with a subsequent decline in the third trimester due to physical and emotional changes. Pain and discomfort are predominant concerns, affecting around half of the participants, while self-care is less concerned. Another prospective cohort study indicates a significant drop in HRQoL from the fourth to the eighth month of pregnancy, particularly pronounced in pathological pregnancies. Another study revealed that above half of the participants experienced moderate NVP, while night awakenings were the most common sleep disturbance. Additionally, pregnant women, when compared to healthy controls, exhibited worse sleep and HRQoL, with deterioration noted as pregnancy progressed, particularly in the second and third trimesters. These findings collectively underscore the fluctuating nature of HRQoL during pregnancy, influenced by physical discomfort, emotional changes, and the presence of pregnancy-related symptoms.

Although NVP is generally seen as a normal part of pregnancy, it can significantly affect a woman's quality of life during her pregnancy. Ten percent to thirty-five percent of patients with NVP also report increased sorrow, which can significantly impact work, household duties, parenting, and family connections *(Bustos et al., 2016).* Additionally, *Lacasse et al. (2008)* examined the influence of nausea and vomiting on health-related quality of life during pregnancy in prospective observational research. They observed that experiencing nausea and vomiting, as well as the severity of it, affects health-related quality of life. Also, more than half of pregnant women suffer back pain during pregnancy, and back discomfort reduces health-related quality of life, particularly in the third trimester.

Mindell et al. (2015) observed that nausea frequently prevented people from sleeping well. Besides, across all months of pregnancy, women experienced poor sleep quality (76%), insufficient nighttime sleep (38%), and significant daytime sleepiness (49%). All women reported frequent nighttime awakenings (100%), and most took daytime naps (78%). Symptoms of insomnia (57%), sleep-disordered breathing (19%), and restless legs syndrome (24%) were commonly endorsed, with no difference across the months of pregnancy for insomnia, sleep-disorder breathing, daytime sleepiness, or fatigue. In addition, high rates of pregnancy-related symptoms were found to disturb sleep, especially frequent urination (83%) and difficulty finding a comfortable sleep position (79%). *Ertmann et al. (2020)*, in a study that used a comprehensive sleep questionnaire, NVP was linked to difficulties maintaining sleep. In addition to a worse quality of life in all areas, women with more severe NVP also slept less well.

Similar findings were revealed in a systematic review of 32 articles concerning pathological pregnancies' quality of life. All the included studies reported a negative impact on pregnant women's quality of life. Obesity, low back and pelvic girdle pain, and hyperemesis gravidarum were the frequent pathologies during pregnancy *(Boutib et al., 2022).*

These findings matched with *Boutib et al. (2023)*, who reported that the HRQoL in pregnant women was significantly lower than in nonpregnant women, as the pregnancy reduced the EQ-VAS score. The pregnancy increased the problems with mobility and usual activities. Also, the pregnancy increased pain/discomfort and anxiety/depression. Likewise, women in the third trimester and nulliparous had the worst HRQoL.

The reviewed studies collectively emphasize the substantial impact of pregnancy on pelvic floor function and urinary incontinence (UI) among pregnant women. The studies highlighted alterations such as bladder neck lowering and pelvic organ descent during pregnancy, further accentuated by vaginal birth. The studies indicate the prevalence of urinary incontinence among more than half of the studied women. This UI significantly affected health-related quality of life.

In a narrative review, researchers assessed pregnancy's influence on pelvic floor function. Pregnancy causes bladder neck lowering, increased bladder neck movement, pelvic organ descent, decreased levator ani strength, and decreased urethral resistance. Vaginal birth accentuates these alterations *(Van Geelen et al., 2018).* More findings of research on the factors of pelvic floor disorders (PFDs), which include urine incontinence (UI), stress urinary incontinence (SUI), overactive bladder syndrome (OAB), pelvic organ prolapse (POP), and anal incontinence (AI), affect around 25–30 % of adult females. Large population-based epidemiological and cross-sectional observational studies have demonstrated the link between parity, childbirth, and PFDs *(Van Geelen et al., 2018).*

de Oliveira et al. (2013) reported a similar finding of 71% of pregnant women reported having had UI during the last four weeks of pregnancy. Incontinent women presented the International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF) median score of 11 (range 3- 21), considered a severe impact on quality of life.

Numerous studies utilizing functional neuroimaging have demonstrated a shift in the functional brain activity of mothers over time. *Zhang et al. (2019)* conducted a comparative study between mothers and non-mothers, revealing distinct neuroanatomical differences in maternal brains. Maternal empathy was linked to these differences. These neuroanatomical findings offer insights into the adaptive processes occurring in the maternal brain, providing evidence for how mothers process emotional and sensory information following childbirth.

Orchard et al. (2023) study revealed that across analyses, the study shows consistent disinhibition between cognitive and affective regions, suggesting more efficient, flexible, and responsive behavior, subserving cognitive performance, social cognition, and maternal caregiving. These results support the interpretation of these key regions as constituting a parental caregiving network. The nucleus accumbens, and the parahippocampal gyrus emerges as 'hub' regions of this network, highlighting the global importance of the affective limbic network for maternal caregiving, social cognition, and cognitive performance in the postpartum period.

The research group conducted a notable longitudinal study in 2017, tracking neuroanatomical MRI data of

primiparous women through three sessions: Before pregnancy, early postpartum, and two years after childbirth. Notable gray matter reductions in theory-of-mind regions were observed in first-time mothers *(Hoekzema et al., 2017).*

Five studies were reviewed by *Luders et al. (2022).* The five existing studies seem to indicate that pregnancy is accompanied by "negative" effects, such as decreases in brain size, striatal volume, gray matter tissue, cortical thickness, surface area, gyrification, sulcal depth and sulcal length, as well as increases in ventricular volume and sulcal width *(Carmona et al., 2019; Hoekzema et al., 2017, 2020; Martínez-García et al., 2021; Oatridge et al., 2002).*

The examined studies shed light on the multifaceted aspects of postpartum experiences and health-related quality of life (HRQoL) in women, emphasizing the influence of delivery methods. The studies reveal the positive association between vaginal birth and higher scores in physical functioning, vitality, and mental health suggests potential benefits for women who undergo this mode of delivery. However, the challenges associated with cesarean sections are evident in the reported lower HRQoL for women who experienced this delivery method. The findings from the longitudinal study in Spain provide a nuanced understanding, revealing no significant differences in HRQoL based on delivery mode at six weeks or six months postpartum for healthy primipara. Nonetheless, the impact of postpartum urine incontinence on lower HRQoL highlights the importance of addressing additional factors affecting well-being.

Similar findings were revealed by *Sadat et al. (2013),* who showed that physical HRQoL at two months after VD was better than CS significantly; there were significant differences in the physical functioning and role physical subscales. Furthermore, mental HRQoL at four months after VD was better than CS significantly; there were significant differences in the social function and emotional health subscales.

A systematic review and meta-analysis of 21 studies conducted by *Evans et al. (2022)*, including 19,879 women, found HRQoL scores were significantly higher for women after vaginal delivery in comparison to cesarean (emergency and elective combined), with the highest scores after assisted vaginal delivery. Physical functioning, physical role, vitality, and social functioning were significantly higher after vaginal delivery compared to a cesarean.

7. Conclusion

The comprehensive exploration of women's health-related quality of life during and after pregnancy has revealed multifaceted dynamics influenced by physiological and psychological factors. The first theme elucidates the fluctuations in quality of life throughout pregnancy, showing its dependence on various demographic and health-related aspects. The second theme delves into the nuanced variations and pathological features emerging during pregnancy, encompassing the impact of morning sickness, sleep patterns, and pelvic floor disorders. Finally, the third theme investigates the influence of the mode of delivery on women's health-related quality of life, emphasizing differences in pain, physical functioning, and mental health between those who undergo cesarean sections and those who have vaginal births. Collectively, these findings underscore the complexity of the maternal experience, calling for a holistic approach to healthcare that addresses the diverse challenges women face during this pivotal life stage.

8. Recommendations

Numerous factors influence one's quality of life. Without a shadow of a doubt, health is having a profound effect on standards everywhere. Quality of healthy life is a hot topic, and discussions typically begin with women's health. Women are a primary source of well-being if they receive the full necessary intervention, especially during crucial times. These feelings emerge during and after her pregnancy and childbirth.

The quality of women's health during these times is affected by several factors. Educating expectant mothers, their partners, and their children before, during, and after pregnancy is strongly encouraged. In reality, there should be no gaps in women's representation at all levels of decision-making and the provision of fully accessible facilities, expanded missions, necessary matters, policymaking, or any other aspect of support. It is clear from this review that relatively few global studies have focused on women's health status and quality of life.

More research and studies may be recommended after this review to better the pregnancy and childbirth experience and emphasize health-seeking behavior and the growth of female health-related quality of life. More attention must be paid to disseminating up-to-date information and organizing dedicated conferences to improve women's health-related quality of life.

Possible implication in the future: From a nursing perspective, nurses play a crucial role in promoting women's health, starting with prenatal and infant care. They should be actively engaged in the many future studies and research that aim to do so. This recommendation is especially true given the many academic articles which shed light on how women can contribute to a thriving community.

Exported changes in a woman's body and mind are the subject of this scoping review. Factors and extents that influence women's health-related quality of life, as well as an explanation of the most common mediators, are presented, along with a call to action for all nursing and midwifery colleagues and other multidisciplinary members to incorporate these ideas into their plans of health-related women empowerment and draw a strategical map to direct all the necessary efforts toward qualifying women to manage their lives, their health, and as wives or mothers, to become well deciders when it comes to pregnancy and motherhood.

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Matrix of scoping review extraction table

No.	Author (s)	Pub.	Country for study	Studydesign	Total sample	Types of participants	Outcome measures	Main findings
1	Wang et al.	2022	China	Cross-sectional study	1243 pregnant women	Full term pregnant women who age 18 years and above, singleton	- Self-designed questionnaire, - Urinary incontinence was measured with the International Consultation on Incontinence Module Questionnaire- - Urinary Incontinence Short Form (ICIQ-UI SF), - Individual interview.	- Pregnancy urinary incontinence was 52%. Five variables are linked to urine incontinence during pregnancy. Pregnancy help-seeking was disheartening. - Urinary incontinence and health-related quality of life in pregnant women need targeted treatments.
2	Wu et al.	2021	Regional University Hospital in Guangzhou, south China.	Cross-sectional study	908 pregnant women	Pregnant women during their antenatal care.	- EuroQoL Group's five-dimension five-level questionnaire (EQ-5D-5L)	- HRQoL was linked to gestational trimesters during pregnancy. - Early second-trimester pregnant women had the best health. Physical and emotional changes lower pregnant women's health-related quality of life in the third trimester. - Pain/discomfort was the top concern (46%), while self-care was the least. 10% of first-trimester pregnant women suffered health concerns.
3	Laitinen et al.	2021	Turku City, Finland	Cohort study	One thousand twenty-three pregnant women fell in the criteria and were involved in the study.	They are 30 years old and around 16 weeks of gestational age.	- The data of this study was based on a questionnaire survey conducted by sequential sampling of patients in antenatal clinics. - Pregnancy Unique Quantification of Emesis Questionnaire (PUQE). - Basic Nordic Sleep Questionnaire (BNSQ)	- NVP was moderate 52.3% of the time, then 30% and 6.4%. 11.3% had no NVP. Night awakenings accounted for 69.9% of sleep disturbances, followed by daytime tiredness (35.7%), early morning awakenings (12%), and trouble going asleep (7.1%).
4	Tola et al.	2021	Arba Minch town, Ethiopia	Community-based cross-sectional study	409 postpartum women	Postpartum women who live in Arba Minch town were selected via systematic sampling randomly.	- SF 36 tool was used to assess health-related quality of life.	- Study participants showed decreased HRQoL, 62.3%. 46.2% of research participants reported lower physical HRQoL, and 79% had lower mental HRQoL. - Low mental HRQoL was also connected with postpartum depression and not receiving prenatal care among women aged 17–24.

No.	Author(s)	Pub.	Country for study	Studydesign	Total sample	Types of participants	Outcome measures	Main findings
5	Moossdorff, Steinhauser et al.	2021	Maastricht, The Netherlands	Descriptive cross-sectional	407 pregnant women	Pregnant women aged 18 years and above with different parity and gestational age fill in the survey.	- Digital survey shared on social media. The survey includes demographic variables, - International Consultation on Incontinence Questionnaire-Urinary Incontinence - Short Form (ICIQ-UI SF), and ICIQ Lower. - Urinary Tract Symptoms, Quality of Life (ICIQ-LUTSqol), and questions on beliefs and help-seeking behavior	- The overall prevalence of UI is 66.8%, rising from 55.1% in the first trimester to 70.1% in the third. 43% of respondents reported UI once a week or less; 92% of women lost a minor amount; 90% reported slight to moderate quality of life impairment. - Only 13.1% sought UI help. Minimal hassle and the belief that UI would handle itself were causes for not seeking help.
6	Estebsari, et al.	2020	Iran	Cross-sectional descriptive-analytical study	Three hundred pregnant women were considered, but 259 were the sample selection. Random sampling technique.	Pregnant women who are in their second and third trimesters of pregnancy without any high-risk	- HRQoL questionnaires (SF-12v2).	- Pregnant women's physical quality of life was 43.7±7.3, and psychological was 31.5±11.8. Physical quality of life was connected with maternal age, gestational age, BMI before 12 weeks of pregnancy, mother's education and work, and spouse's education (p<0.05). Psychological quality of life was connected with gestational age, mother's education, occupation, and spouse's education (P<0.05).
7	Zhang et al.	2019	China	The Experiment consisted of 2 sessions.	35 primiparous and 26 non-mothers	The 35 primiparous healthy biological mothers in between 37-41 gestational weeks. The 26 participants are healthy non-mothers.	- Magnetic resonance imaging (MRI). - A questionnaire assessing empathy according to the interpersonal reactivity index.	- Many data show that mothers' brains are dynamically adaptable. - Mothers had reduced gray matter (GM) volumes and increased white matter (WM) volumes in empathy and reward networks (supplementary motor area, occipital, inferior parietal lobe, insula, and striatum), decreased cortical thickness in the precentral gyrus, and increased gyrification index in the orbitofrontal cortex. Mothers revealed longitudinal changes in the GM and WM volumes and cortical thickness of various regions (including the superior and medial frontal gyrus, insula, limbic lobe, superior and middle temporal gyrus, and precentral gyrus) related to maternal networks over the postpartum period. GM and WM volume alterations were linked to maternal empathy. - These results explain how postpartum moms interpret emotional and sensory information neuroanatomically.

No.	Author(s)	Pub.	Country for study	Studydesign	Total sample	Types of participants	Outcome measures	Main findings
8	Morin et al.	2019	Lyon, Toulouse France	Cohort-monocentric prospective	500 pregnant women.	Age was over 18 years old during the first antenatal visit before the end of the first trimester of pregnancy (<15 weeks)	- Electronic questionnaire - French version of the European EQ-5D-3L questionnaire.	- Between the fourth and eighth months, pathological pregnancies ($p< 0.001$) had a lower quality of life than physiological ones (0.08 points per month, P< 0.001 simple pathological, 0.12 points per month<0.001; complex pathological,0.11 points per month, P<0.001).In physiological pregnancies, perceived health was poorer in the ninth month than in the 3rd (10.5 points, (P< 0.001). Complex abnormal pregnancies (mean difference = 7.8 points, P = 0.058).
9	Lagadec et al.	2018	France	Systemic review	37 articles included	All observational studies (e.g., Cohort, cross-sectional, and case-control have been considered (no restriction in the starting date).	- Different health related quality of life questionnaires	- Physical QoL dropped throughout pregnancy, whereas mental QoL remained consistent and improved. - Mean maternal age, primiparity, early gestational age, the lack of social and economic problems, family and friends, physical exercise, feeling happy about pregnancy, and optimism were associated with greater QOL. - Medically assisted reproduction, complications before or during pregnancy, obesity, nausea and vomiting, epigastralgia, back pain, smoking in the months before conception, alcohol dependence, sleep difficulties, stress, anxiety, depression during pregnancy, and sexual or domestic violence were associated with lower QOL.
10	Park and Choi	2018	Korea	Cross-sectional	5146 various women	Age is 50 years and above.	- Korean National Health and Nutrition Examination Survey. - EuroQol five-dimension descriptive system (EQ-5D) consists of the following domains: mobility, self-care, usual activities, pain or discomfort, and anxiety or depression. - Self-reported questionnaire, face-to-face interview.	- Younger mothers had poorer HRQoL due to more births. - Findings show that women with early pregnancy and more deliveries require extra care to avoid HRQoL impairment. - HRQoL increased across quartiles of age at first childbirth (p=0.030). Across quartiles, self-care and anxiety/depression disorders rose. - Parity contributed to the link between age at first childbirth and HRQoL (B=0.352, p=0.003). Increasing HRQoL after late first childbirth was 33.5% due to decreasing parity. Early first births increased parity and mobility problems.

No.	Author(s)	Pub.	Country for study	Studydesign	Total sample	Types of participants	Outcome measures	Main findings
11	Trivino et al.	2017	Spain	Longitudinal observational prospective study	546 Women	Healthy Spanish-Speaking primipara aged 18-45yrs	Health-related quality of life (measured using the SF-36).	- At six weeks and six months postpartum, there were no health-related quality of life changes by delivery method. At the sixth week postpartum, regardless of the manner of birth, women with postpartum urinary incontinence reported worse health-related quality of life. Between the sixth week and sixth month postpartum, health-related quality of life improved for all types of births.
12	Petrou et al.	2017	England	Retrospective, population-based	2161 Mothers sample of all live births and stillbirths between 32+0 and 36+6 weeks.' Gestation whose families were residing in Nottingham.	The sample mothers who have live births or stillbirths between 32+0- and 36+6-weeks gestation whose families reside in Nottingham.	- Perinatal data extracted from the medical record. - Tool of EuroQol Five Dimensions (EQ-5D) measure with responses to the EQ-5D descriptive system converted into health utility scores.	- Significantly more cesarean-delivery women experienced moderate, severe, or great pain or discomfort at 12 months postpartum than vaginal-delivery women. Multivariable analyses using the Ordinary Least Squares estimator showed that cesarean delivery without maternal or fetal compromise was associated with a significant EQ-5D utility decrement compared to spontaneous vaginal delivery among all women (0.026; p=0.038) and mothers of term-born infants (0.062; p <0.001). This result was confirmed in models controlling for all maternal and baby variables (utility decrease of 0.061; p<0.001). Sensitivity tests varying the key exposure variable (method of delivery) and econometric technique corroborated the results.
13	Sun et al.,	2016	Turkey	Cross-sectional design	492 participants	Two hundred ninety-two pregnant women applied for a routine pregnancy follow-up visit to the Departments of Gynecology and Obstetrics. 200 nonpregnant healthy comparing control group selected by a random sampling method.	- Survey developed by the researcher. - Pittsburgh Sleep Quality Index (PSQI) for sleep quality - European Quality of Life–5 Dimensions (EQ-5D) scale to assess health-related quality of life.	- Pregnant women had lower PSQI and EQ-5D scores than controls (p=.017 and p=0.001). Only pregnant status affected PSQI scores (p =0.117; p=0.009). In the second trimester, the probability of poor sleep quality increased 2.11-fold (p=.048) and 1.86-fold (p=0.054). Second (p=.038) and third (p=0.001) trimester EQ-5D scores were lower than the first. Pregnant women had poorer sleep and health-related quality of life than healthy controls. Pregnant women's sleep and health-related quality of life deteriorate.
14	AlShehri et al.	2015	Saudi Arabia	A comparative cross-sectional study was performed over a period of nine months	150 postnatal women with normal delivery and cesarean section An equal number of the comparator group	Of Saudi women who were attending postpartum care, 75 of them had normal delivery, and the other 75 had cesarean sections. The comparative group of healthy volunteers was selected from the general population or the individuals or relatives accompanying women at different centers.	- Individual interviews using the SF36 survey by two groups.	- Physical functioning, role-physical, vitality, role-emotional, and mental health subscales were greater for delivered women. Delivered women reported less bodily pain than controls. Normal delivery women reported the greatest HRQoL scores, while cesarean-section women had the lowest.