



ORIGINAL ARTICLE

Medicine Science 2020;9(3):549-55

Evaluation of factors influencing quality of life in the third trimester of pregnancy: A cross-sectional study

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Received 05 March 2020; Accepted 10 April 2020

Available online 19.05.2020 with doi: [10.5455/medscience.2020.09.9235](https://doi.org/10.5455/medscience.2020.09.9235)

Abstract

Quality of life in pregnancy plays a key role in maternal healthcare. This study sought to determine the effects of sociodemographic characteristics, maternal risk factors and pregnancy complaints on pregnant women's quality of life. This descriptive study assessed the quality of life of 327 pregnant women using the short form of the World Health Organization's Quality of Life Assessment in conjunction with a questionnaire about sociodemographic and obstetric characteristics. Results were statistically analyzed using Independent Samples t-tests, Kruskal Wallis Variance Analysis, the Mann-Whitney U test and multiple regression analysis. Physical symptoms of pregnancy, such as fatigue, constipation, dizziness and frequent urination, decreased women's physical quality of life. Caesarean deliveries, higher spousal education levels and fewer children were significantly correlated with a higher environmental quality of life. Poor social quality of life was correlated with a history of mental illness and lower education levels ($p < 0.05$). Physical symptoms of pregnancy, as well as sociodemographic characteristics, negatively affected pregnant women's quality of life. These findings can be useful in assessing the long-term effects of quality of life with the goal of improving maternal, foetal and newborn health.

Keywords: Pregnancy, obstetric features, pregnancy complaints, quality of life

Introduction

Pregnancy encompasses significant physical and emotional changes, and pregnant women's quality of life is highly related to their physical, social and psychological health [1]. The World Health Organization (WHO) defines quality of life as 'individuals' 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. It is a broad ranging concept affected in a complex way by the persons' physical health, psychological state, level of independence, social relationships and their relationship to salient features of their environment [2]. Many studies have shown that quality of life and its determinants affect both physical and mental health during pregnancy, as well as pregnancy outcomes, including in pregnancies without medical complications. Research has also shown that physical functioning, which is a component of quality of life, is reduced during pregnancy [3,4]. Use of assisted reproduction techniques, low physical activity levels,

depression, obesity and various obstetric and physical and environmental factors have also been correlated with poor quality of life [1,3,5].

However, most studies about quality of life during pregnancy have focused on high-risk pregnancies or specific physical symptoms of pregnancy [6], such as nausea, vomiting, lower back pain, respiratory distress, frequent urination, melasma and insomnia, which have been found to decrease quality of life [5]. Quality of life has also been shown to be even more significantly affected if health problems (e.g. hypertension, gestational diabetes, preeclampsia, preterm delivery, emergency delivery) develop during pregnancy, delivery or immediately thereafter [7]. Very little research has explored the effects of routine obstetric factors on pregnant women's quality of life [8] but identifying obstetric risk factors correlated with decreased quality of life during pregnancy is important for planning antenatal care and monitoring maternal and neonatal outcomes [9,10]. Cultural differences may also affect perceptions of physical space and quality of life during pregnancy [8]. Other socioeconomic factors, such as being married, being a primipara, working outside the home, early gestational age, lower maternal age, higher maternal education, having friends and family and lacking financial problems have also been associated with increased maternal quality of life during pregnancy [11].

Insufficient attention has been given to Turkish women's quality of

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life during pregnancy and its associations with physical pregnancy symptoms and other quality of life risk factors. The present study therefore investigated a wide range of potential quality of life risk factors during pregnancy, including the relationship between physical pregnancy symptoms and maternal quality of life. Potential risk factors during both the pre-pregnancy and pregnancy periods were also analyzed, including sociodemographic characteristics, obstetric history and medical history. The findings may also help identify cultural differences within Turkish society.

Materials and Methods

Participants

This descriptive study was conducted at a public institution. All pregnant women who attended the antenatal clinic at Balıkesir Atatürk State Hospital (the largest public antenatal clinic in the city of Balıkesir) in 2016 were invited to participate in an analytical study. The inclusion criteria were pregnant women ≥ 28 gestational weeks who were literate and had no communication disabilities. No other sample selections were applied. Of the 513 women who met these criteria, 327 agreed to participate and were included; 106 refused consent, 52 could not be reached for follow-up and 28 were excluded due to missing data.

Research Questionnaires

Participants were asked to complete two questionnaires during face-to-face interviews. All interviews were held in an interview room after participants' medical examinations were completed or while they were waiting for tests. It took about 15 minutes to complete the questionnaires.

The first questionnaire gathered descriptive information using a form that was developed for this study based on a review of the literature. It consisted of 49 questions, including personal information, family history, habits, medical history, obstetric history and current gestational history, as well as sociodemographic variables (age, marital status, educational status, social security and working status) and health status (chronic disease, infectious disease, sexually transmitted infection, psychiatric illness, substance abuse, surgery and current drug use). The obstetric variables assessed by this questionnaire included use of any family planning methods prior to pregnancy; number of previous pregnancies; number of previous births; number of living children; previous stillbirths; previous births with anomalies; previous delivery of infants weighing less than 2,500 g or more than 4,500 g; previous hospitalisations due to pre-eclampsia or eclampsia; incidence and causes of infant or child death; premature or postmature births; previous multiple pregnancies; previous miscarriages; experience of any health complications during pregnancy (e.g. bleeding, preeclampsia, eclampsia, gestational diabetes, thrombosis, embolism) or labour (e.g. early separation of placenta; placenta previa; breech, transverse or other presentation anomalies; prolonged labour; third degree perineal tears or massive bleeding; removal of the placenta by hand); previous experience of any postpartum complications (e.g. sepsis, bleeding, depression, breast abs); previous modes of delivery and previous complications of live births (e.g. newborns with Hydrops Fetalis, chromosomal anomalies, malformations, intrauterine growth restrictions, low birth weights or macrosomia or newborns who

required resuscitation or other treatments).

The second questionnaire consisted of the WHO's short-form Quality of Life scale (WHOQOL-BREF), which enables intercultural comparisons assessing individuals' well-being and quality of life [12]. The original scale consists of 26 items and the Turkish version consists of 27 items. The Cronbach's α coefficient of the four dimensions, namely, physical health, psychological health, social relationships, environmental health, and interference were 0.83, 0.66, 0.53 and 0.73 respectively [13]. The scale is comprised of two general sections about general perceptions of quality of life and perceptions of health status, as well as four subscales that evaluate physical health, psychological health, social relationships and environmental health. The questions are close-ended and are scored with a five-point Likert scale, where a higher score indicates a better quality of life [12, 13]. Participants in the present study were asked to answer each question based on their experiences of the previous 15 days. The Cronbach alpha value, which is used to indicate internal consistency, was 0.84 on the physical health subscale, 0.78 on the psychological health subscale, 0.70 on the social relationship's subscale and 0.89 on the environmental health subscale in the present study.

Statistical Analysis

The relationships between the subscales of the WHOQOL-BREF and sociodemographic characteristics, pregnancy symptoms, pregnancy risk factors and obstetric characteristics were evaluated by Independent Samples t-tests, Mann-Whitney U tests. The relationship between body-mass index (BMI) and the subscales of the WHOQOL-BREF was assessed by Kruskal Wallis Variance Analysis. Bonferroni correction was used as a post hoc test. Multiple regression analysis was used to investigate the effects of independent variables on the WHOQOL-BREF subscales; the Type I error (Alpha error) level was set at 0.05. All statistical analyses were performed using SPSS 20.0. Descriptive data are presented as numbers, standard deviation, percentages and mean values.

Results

Mean participant age was 26.46 ± 5.28 (range: 16–44). Regarding education levels, 26.9% of participants had only a primary school education, while 21.7% were university graduates; 18.2% had spouses with only a primary school education, while 21.1% were university graduates. Approximately half (49.5%) of the women had BMI scores in the normal range prior to pregnancy, while 26.9% were pre-obese and 11.0% were obese. In addition, 8.6% indicated that they currently smoked tobacco products. Chronic diseases (gestational diabetes, asthma, hypothyroidism, epilepsy, cardiovascular diseases) were found in 5.8% of participants, while 3.1% had one or more infectious diseases (Brucella, urinary tract infections, rubella). Nearly half (46.8%) were primipara. Among those who were experiencing a multiparous pregnancy (63.2%), 15.6% had experienced a miscarriage, 5.2% had experienced a stillbirth, 3.2% had a history of premature or low-weight births, 11.3% had experienced problems during their previous pregnancies, 1.9% had experienced complications during their previous pregnancies and 45.4% had delivered by Caesarean section. No significant relationships was found among participants' number of previous pregnancies, previous use of family planning methods,

history of chronic infectious diseases, history of gynaecological surgery, history of problems during or after previous births, smoking during pregnancy, age, BMI or physical pregnancy symptoms (heartburn, leg cramps, shortness of breath, colostrum release, excessive saliva, pica, nausea or vomiting). Table 1 shows participants' mean quality of life scores across the four subscales; the social relationships and psychological health subscales had the highest mean scores (14.56±2.54 and 14.54±2.11, respectively), while physical health had the lowest mean score (13.65±2.24).

The correlations between participants' WHOQOL-BREF subscale scores and various obstetric characteristics and risk factors are shown in Table 2; significance for all results is reported as $p < 0.05$. Mean physical quality of life scores were significantly higher in participants who did not report problems during pregnancy or who had delivered previous pregnancies via Caesarean section. Mean environmental quality of life scores were significantly higher in women without a history of mental illness, who had delivered previous pregnancies via Caesarean section, who had two or more children, who were high school graduates or whose spouses were highly educated. Mean social quality of life scores were significantly higher in participants without a history of mental illness, who were high school graduates or who had delivered previous pregnancies via Caesarean section. Mean psychological quality of life scores were significantly higher in participants who did not have a history of mental illness or who had delivered previous pregnancies via Caesarean section.

Table 1. Quality of life mean scores

WHOQOL-BREF TR subscale	Mean±SD
Social subscale	14.56±2.54
Psychological subscale	14.54±2.11
Physical subscale	13.65±2.24
Environmental subscale	14.28±2.06

Table 2. Relationship between WHOQOL-BREF TR mean scores and obstetric characteristics and risk factors

Obstetric characteristics and risk factors	Number (%)	WHOQOL-BREF subscales, mean±SD				
		Physical	Psychological	Social	Environmental	
Problems during pregnancy	Yes	37 (11.3)	13.63±2.24	14.56±2.14	14.14±2.875	14.23±2.230
	No	290 (88.7)	15.28±2.26	14.35±1.928	14.61±2.49	14.29±2.046
	<i>p-value</i>		0.013	NS	NS	NS
	<i>t</i>		2.42	0.69	1.03	0.24
Number of pregnancy	Primiparous pregnancies	153(46.8)	13.83±2.11	14.49±2.062.58	14.71±2.48	14.35±2.06
	Multiparous pregnancies	174(63.2)	13.49±2.34	14.59±2.17	14.42±2.58	14.22±2.072
	<i>p-value</i>		NS	NS	NS	NS
	<i>t</i>		1.50	-0.73	0.66	0.89
Mode of Birth	Vaginal deliveries	94(54.6)	13.16±2.41	14.19±2.05	14.18±2.541	13.80±1.92
	Caesarean deliveries	78(45.4)	14.88±2.27	15.12±2.13	14.76±2.54	14.67±2.19
	<i>p-value</i>		0.047	0.004	0.013	0.007
	<i>t</i>		-1.99	-2.95	2.43	2.98
Education status	Highly educated**	71 (21.7)	13.94±2.08	14.85±1.96	15.15±2.10	15.30±1.69
	Poorly educated	256 (78.3)	13.57±2.81	14.45±2.15	14.39±2.62	14.01±2.07
	<i>p-value</i>		NS	NS	0.012	<0.0001
	<i>t</i>		-0.19	-1.21	-2.53	-5.62
Educational status of spouse	Highly educated** spouse	69(21.1)	14.03±2.11	14.89±2.08	15.01±2.23	15.16±2.01
	Poorly educated spouse	258(78.9)	13.55±2.69	14.45±2.12	14.43±2.60	14.05±2.02
	<i>p-value</i>		NS	NS	NS	<0.0001
	<i>t</i>		-0.59	-1.40	-1.16	-4.34
History of psychiatric illness	Yes	321(98.2)	13.68±2.22	14.58±2.09	14.61±2.518	14.31±2.067
	No	6(1.8)	12.19±2.92	11.77±2.72	11.77±2.72	12.51±1.471
	<i>p-value*</i>		NS	0.015	0.016	0.020
	<i>t</i>		-1.36	2.17	2.39	2.42
Number of children	1 child	140(75.6)	13.64±12.95	14.69 ±2.24	14.50±2.44	14.43±1.99
	2 or more children	32(24.4)	12.95±2.56	14.34±1.92	14.03±2.90	13.49±2.20
	<i>p-value</i>		NS	NS	NS	0.016
	<i>t</i>		1.24	0.95	1.03	2.88

NS: Not significant. All p-values derived using Independent Samples t-test except where otherwise indicated. * indicates that data were analyzed using a Mann-Whitney U test. ** University education is accepted

The correlations between participants' WHOQOL-BREF subscale scores and pregnancy-related physical symptoms are shown in Table 3. Mean physical quality of life scores were significantly lower in participants who reported fatigue, constipation, frequent urination, dizziness, varicosity or sensitivity in their breasts. Mean psychological quality of life scores were significantly lower in participants who reported skin changes and varicosity complaints, while mean environmental quality of life scores were significantly lower only in participants who reported skin changes and mean social quality of life scores were not significantly related to any reported pregnancy symptoms.

Furthermore, as shown in Table 4, fatigue ($\beta = 0.13$, $p = 0.013$), dizziness ($\beta = 0.14$, $p = 0.009$), constipation ($\beta = 0.12$, $p = 0.019$) and frequent urination ($\beta = 0.12$, $p = 0.026$) were significant predictors of physical quality of life scores, while varicosity ($\beta = -0.11$, $p = 0.049$) was a significant predictor of psychological quality of life scores. High education status ($\beta = 0.12$, $p = 0.02$) and a history of mental illness ($\beta = -0.14$, $p = 0.007$) were significant predictors of psychological quality of life scores, while high spousal education ($\beta = 0.22$, $p = 0.011$), number of children ($\beta = -0.188$, $p = 0.009$) and history of Caesarean deliveries ($\beta = 0.111$, $p = 0.036$) were significant predictors of environmental quality of life scores.

Table 3. Correlations between WHOQOL-BREF TR scores and pregnancy symptoms

Pregnancy symptoms	Number (%)		WHOQOL-BREF subscales, mean±SD			
			Physical	Psychological	Social	Environmental
Fatigue	Yes	249(76.1)	13.44±2.10	14.45±1.95	14.20±2.06	14.56±2.48
	No	78(23.9)	14.32±2.52	14.88±2.57	14.55±2.07	14.58±2.72
		<i>p-value</i>	0.002	NS	NS	NS
		<i>t</i>	-2.34	-0.65	-0.05	-1.14
Constipation	Yes	100(30.6)	13.22±2.11	14.55±1.87	14.46±2.72	14.25±1.94
	No	227(69.4)	13.83±2.26	14.54±2.22	14.60±2.45	14.29±2.12
		<i>p-value</i>	0.025	NS	NS	NS
		<i>t</i>	2.31	0.79	-0.47	0.08
Frequent urination	Yes	282(86.2)	13.52±2.25	14.54±2.14	14.22±2.09	14.49±2.61
	No	45(13.8)	14.57±1.95	14.65±1.98	14.71±1.83	15.10±1.90
		<i>p-value</i>	0.004	NS	NS	NS
		<i>t</i>	-2.25	-0.85	-1.46	-1.19
Dizziness	Yes	108(33.0)	13.06±2.24	14.27±2.20	14.25±2.89	14.39±2.16
	No	219(67.0)	13.96±2.19	14.69±2.06	14.72±2.33	14.23±2.02
		<i>p-value</i>	0.001	NS	NS	NS
		<i>t</i>	-3.86	-0.79	0.88	-1.26
Varicosity	Yes	84(25.7)	13.19±2.42	14.15±2.08	14.36±2.31	13.91±2.04
	No	243(74.3)	13.82±2.16	14.70±2.11	14.63±2.62	14.42±2.07
		<i>p-value</i>	0.027	0.039	NS	NS
		<i>t</i>	-2.08	-2.24	-1.31	-1.84
Skin changes	Yes	118(36.1)	13.38±2.28	14.23±2.03	14.20±2.54	13.90±2.01
	No	209(63.9)	13.81±2.20	14.52±2.14	14.76±2.50	14.49±2.07
		<i>p-value</i>	NS	NS	NS	0.013
		<i>t</i>	-0.35	-1.81	-1.92	-2.51
Sensitivity in breasts	Yes	179(54.7)	13.38±2.19	14.56±2.15	14.32±2.59	14.39±2.10
	No	148(45.3)	14.00±2.27	14.51±2.09	14.86±2.43	14.14±2.03
		<i>p-value</i>	0.014	NS	NS	NS
		<i>t</i>	-2.67	1.12	-1.92	1.14

NS: Not significant. All *p-values* derived using Independent Samples t-test except where otherwise indicated

Table 4. Multiple regression model analysis of the variables found to correlate with WHOQOL-BREF TR subscale scores

Variables	b	β	p
Physical subscale			
Problems during pregnancy	-0.212	-0.30	0.58
Mode of Birth	-0.071	-0.026	0.634
Fatigue	0.711	0.136	0.013
Constipation	0.243	0.126	0.019
Frequent urination	0.801	0.121	0.026
Dizziness	0.685	0.144	0.009
Varicosity	0.393	0.077	0.16
Sensitivity in breasts	0.444	0.098	0.073
R=0.33	R ² =0.11	Durbin-Watson= 1.77 (p< 0.001)	
Psychological subscale			
Varicosity	0.529	0.11	0.05
Mode of Birth	0.263	0.100	0.071
R=0.152	R ² =0.025	Durbin-Watson= 1.930 (p< 0.0001)	
Social subscale			
Education status	0.758	0.123	0.026
Mode of Birth	0.056	0.018	0.747
History of psychiatric illness	-2.809	-0.149	0.007
R=0.193	R ² =0.037	Durbin-Watson= 1.773 (p< 0.0001)	
Environmental subscale			
Education status	0.490	0.084	0.346
Educational status of spouse	1.289	0.229	0.011
Number of children	-0.910	-0.188	0.009
History of psychiatric illness	-1.669	-0.121	0.09
Mode of Birth	0.575	0.152	0.036
Skin changes	0.251	0.111	0.125
R=0.421	R ² =0.177	Durbin-Watson= 1.78 (p< 0.0001)	

Discussion

This study explored the relationships between women's pregnancy symptoms, obstetric characteristics and other potential risk factors and their reported quality of life during their third pregnancy trimester. The study sought to determine which physiological symptoms and other risk factors were correlated with poor obstetric outcomes and maternal quality of life scores. The results indicated that typical physical symptoms of pregnancy (fatigue, constipation, dizziness and frequent urination) were correlated with physical quality of life scores, while three sociodemographic characteristics (history of Caesarean deliveries, high spousal education levels and number of children) were correlated with environmental quality of life scores. A history of mental illness and maternal education levels were correlated with social quality of life scores.

Previous studies have found that women who experienced pregnancy complications (e.g. preeclampsia, eclampsia, gestational diabetes, thrombosis, embolism) reported lower qualities of life than other pregnant women [1,3]. Although multivariate analyses in the present analysis failed to

substantiate these findings, previous research has shown both that lower quality of life during pregnancy increases the likelihood of experiencing pregnancy complications and other health problems during pregnancy[3] and that physical quality of life decreases as a consequence of health complications during pregnancy. Quality of life during pregnancy is therefore both a determinant and a consequence of a woman's health status and her healthcare. In addition, Couto et al. found that pregnant women's quality of life was significantly lower if they had experienced a negative result from a previous pregnancy [14].

Previous studies have also found that women who delivered vaginally had a higher quality of life than those who delivered by Caesarean section [15,16]. However, univariate analysis in the present study found the opposite to be true: women who delivered vaginally had significantly lower quality of life

scores across all four subscales than women who delivered by Caesarean section. Multiple regression analysis in the present study also confirmed a significant correlation between higher environmental quality of life scores and Caesarean deliveries. Our results are consistent with a study by Safarinejad, which found that quality of life was higher among women who had elective Caesarean deliveries than among women who delivered vaginally [17]. Fobelets et al. also reported higher quality of life scores among women who experienced an elective Caesarean delivery compared to an emergency Caesarean delivery [18]. Our results here are likely since the Caesarean birth rate in Turkey has increased rapidly over the last 15 years [19] and is now extremely high; approximately half (45.4%) of the multiparous women in our study had previously delivered by Caesarean section. Fears of vaginal delivery, perceptions of greater security for babies delivered by Caesarean section, impatience to deliver and other personal preferences likely increase elective Caesarean deliveries among women with higher incomes and education. Since these two sociodemographic variables were found to be independently correlated with higher environmental quality of life, this could help explain the additional correlation with Caesarean deliveries. However, additional research is needed to understand the immediate and long-term effects of Caesarean deliveries on women's quality of life [15].

Other environmental quality of life findings in this study also likely reflect women's socioeconomic status due to the inclusion of occupation, income and social security data in this metric [20]. For example, increased socioeconomic status is correlated with fewer children [21], likely explaining our finding that women with only one child reported a higher environmental quality of life than women who had two or more children. Similarly, the literature suggests that women with a higher level of education have a better quality of life [3]. Although multiple regression analysis in the present study did not corroborate this finding, it did find a significant correlation between a woman's environmental quality of life and her spouse's education level,

which may reflect a similar sociodemographic relationship.

Univariate analysis in the present study found that mental illness was significantly correlated with lower psychological, social and environmental life quality scores, although multivariate analysis only found a significant correlation with social quality of life scores. These findings are broadly consistent with the literature, which has found that depressive symptoms negatively affect pregnant women's quality of life [3,8,22-24].

Even though pregnancy is a physiological event, its symptoms affect women in many different ways, especially during the first and third trimesters. In the present study, mean physical quality of life scores were lower in participants who reported pregnancy-related fatigue, constipation, frequent urination, dizziness, varicosity or sensitivity in their breasts. However, multivariate analysis identified a significant relationship only between physical quality of life and fatigue, dizziness, constipation and frequent urination. These results are broadly consistent with a study by Chang et al., which found physical quality of life scores declined in early and late pregnancy, which are when pregnancy symptoms typically peak [1]. Similarly, a study conducted by Mortazavi et al. found that physical quality of life scores was significantly lower during pregnancy than postpartum [25], while another study concluded that pregnancy causes dissatisfaction about physical quality of life due to the associated pain, discomfort, nausea, vomiting and fatigue [26]. The present study also found that fatigue negatively affects psychological quality of life, likely because fatigue encompasses not only physical fatigue but also mental fatigue and decreased concentration and motivation [3,27].

In addition, we found that mean environmental quality of life scores were lower for participants who reported changes in their skin; however, this correlation was not substantiated in multivariate analysis. Yamaguchi et al. likewise found no significant difference in quality of life between pregnancies with and without stria gravidarum (one of the pregnancy-related changes of skin) [28]. Skin changes in pregnancy are temporary and minor complaints that are thought to have no effect on other quality of life subscales. However, environmental quality of life may be affected by aesthetic concerns, and this could explain why it might be affected by skin changes during pregnancy.

An important limitation of this study is its potential respondent bias, since the data were collected via questionnaires. Another limitation is that this study was performed in a provincial hospital with a relatively small population that was not representative of wider Turkish society. Additional studies may identify cultural differences regarding perceptions of pregnancy and quality of life.

Conclusion

In conclusion, physical symptoms of pregnancy, including fatigue, constipation, dizziness and frequent urination, were significantly correlated with study participants' physical quality of life scores. Caesarean deliveries, high spousal education levels and fewer children were significantly associated with higher environmental quality of life scores, while social quality of life scores were higher in highly educated women and in

women without any history of mental illness. These findings can be used to assess the long-term health effects of quality of life and to improve maternal, foetal and newborn health.

Conflict of interests

The authors declare that they have no conflict of interest.

Financial Disclosure

All authors declare no financial support.

Ethical approval

Official research permission was obtained from the Balikesir University Faculty of Medicine Clinical Research Ethics Committee (reference number: 2014-82) and from the Balikesir Provincial Health Directorate. We obtained informed consent from each participant.

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