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Health-related Quality of Life (HRQOL) among Women with and without Medical Problems during Last Pregnancy and its Association with Postnatal Depressive Symptoms and Adverse Pregnancy Outcome

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Abstract

Background There is an increasing interest in measuring quality of life in clinical settings and in clinical trials. None of the commonly used quality of life (QOL) instrument had been validated for use postnatally.

Objectives To assess the psychometric properties of the 26-item of World Health Organization Quality of Life –BREF WHOQOL-BREF among women following childbirth and to identify women with postnatal depression by using Edinburgh Postnatal Depression Scale EPDS.

Methods Cross sectional study was carried out during the period from the 1st of December 2013 to 31st March 2014 in Baghdad, Iraq. A total number of 558 women were asked within first 48 hours after delivery to complete a questionnaire form which contains three elements (maternal socio-demographic and obstetrical variables, the WHOQOL-BREF which was developed by the WHO and EPDS).

Result The study showed that the prevalence of postnatal depressive symptoms among 558 mothers was 33.5%. Most pregnant women included in study had fair QOL scores on all domains at late pregnancy. Thus, the study concluded that women who experienced medical diseases such as hypertension, diabetes and other diseases had a lower HRQOL at late pregnancy than those who were apparently healthy. Also, woman with newborns complications' (respiratory distress, low birth weight and other complications) had been experienced significant declines in psychological health.

Conclusion The WHOQOL-BREF is well-accepted instrument in this sample and may be used in postnatal clinical settings or for assessing intervention effects in research studies.

Key words Quality of life, postnatal depression, adverse pregnancy outcome.

List of abbreviation: APH = Antepartum hemorrhage, CS = Cesarean section, GDM = Gestational diabetes, NVD = Normal vaginal delivery, PIH = preeclampsia, PNDS = Postnatal depressive symptoms, QOL = Quality of life, DM = diabetes mellitus, WHO = world health organization, WHOQOL –BREF = world health organization Quality of life –BREF.

Introduction

The Constitution of the World Health Organization (WHO) defines health as "A state of complete physical, mental, and social well-being and not merely the absence of disease". It follows that the measurement of health and the effects of health care must include not only an indication of changes in the frequency and severity of diseases but also an estimation of well-being and this can be assessed by measuring the improvement in the quality of life related to health care [1].

Health related quality of life (HRQOL), on the other hand, includes domains (aspects) of life that improve when a treatment option is successful. A clinically significant change in HRQOL is indicated by a decline in a domain that

leads a physician or health care provider to alter a medication or medical treatment. HRQOL domains minimally include physical state, mental health or emotional well-being. These domains represent typical outcomes in medical and social science research [2,3].

Pregnancy is a specific condition that is not a disease or a normal state of woman's health. There are specific organ and hormonal changes that affect bodily functions during pregnancy and often the overall well-being and sometimes mental well-being of pregnant women. It results in changes to a pregnant woman's quality of life [4,5].

In chronic conditions such as hypertension and diabetes, HRQOL is an especially important outcome, given their life long nature and the need for daily self-management [6].

Hypertension has been shown to be associated with negative outcomes in HRQOL, especially in the domain of subjectively perceived general health, although its impact on HRQOL is usually less adverse than that of other chronic diseases [6].

HRQOL has been found to be poorer in diabetic participants than in the general population, especially in the domains of self-perceived physical health, while findings on domains of psychosocial functioning vary between studies [7].

The term depression describes a spectrum of mood disturbance ranging from mild to severe and from transient to persistent. Depressive symptoms are continuously distributed in any population but are judged to be of clinical significance when they interfere with normal activities and persist for at least two weeks, in which case a diagnosis of a depressive illness or disorder may be made. The diagnosis depends on the presence of two cardinal symptoms of persistent and pervasive low moodand loss of interest or pleasure in usual activities [8].

In the 1st trimester, a woman may have increased emotional liability, which may be exacerbated by nausea, breast tenderness and other physical changes typical of early pregnancy. As pregnancy progresses, further bodily changes, alteration in sexual interests and anxieties about the delivery may all contribute to mood change [9].

Late pregnancy may be associated with social withdrawal and increased absorption and preoccupations with preparations for delivery and caring for the baby [9].

The goal of the study is to assess the psychometric properties of the 26-item WHOQOL-BREF among women with and without medical problems in last pregnancy and to identify the association between HRQOL and postnatal depressive symptoms and adverse pregnancy outcomes.

Method

A cross sectional study was carried out during the period from the 1st of December 2013 to 31st March 2014 in two teaching hospitals in Baghdad Al-Karkh (Al-Imamain Al-Kadhimain Medical City and Al-Yarmouk Teaching Hospital). This study was endorsed by the Institute Review Board of the College of Medicine, Al-Nahrain University. A sequential sample was obtained, which include 558 womenadmitted for delivery in both hospitals during the study period. All women were interviewed within first 48 hours after delivery, all of them had term labor (37 weeks or more) delivered by normal vaginal delivery (NVD) or caesarian section (CS).

Women included in this study were either apparently healthy or with medical problems during last pregnancy like gestational diabetes mellitus (GDM), essential hypertension, preeclampsia (PIH) and other diseases. Women with antepartum hemorrhage (APP), multiple pregnancy and previous history of psychological disorder or non-cooperative women were excluded from this study.

Mothers who meet the inclusion criteria were interviewed by the researcher using a structured questionnaire form which is constructed for this study. To fill the questionnaire form, each mother was interviewed after signing a consent form that declared her voluntary agreement to participate in this study. The nature and objectives of the study was explained and

assurance regarding confidentiality was confirmed.

Pilot study was carried out on six women who had delivered at the Al-Imamain Al-Kadhimain Medical City to test the feasibility of the questionnaire, estimate the time needed to fill it and to identify some terms and words used by public and understood by Iraqi mothers.

The questionnaire form consists of three sections:

The first section

It includes questions related to maternal variables: socio-demographic, obstetrical, antenatal care, medical problems at last pregnancy and maternal and newborns' complications.

The second section

The world health organization quality of life WHOQOL-BREF was developed by the WHOQOL Group, in 15 international field centers [10]. It is self-report questionnaire using the same local language of the mother, it contains 26 items, and each item represents one facet. The facets are defined as those aspects of life that are considered to have contributed to a person's quality of life and represent what she think about her life in the last four weeks [10].

Among the 26 items, 24 of them make up the 4 domains of physical health (7 items), psychological health (6 items), social relationships (3 items), and environment (8 items). The other 2 items measure overall quality of life and general health [10] and scored from 1-5 while questions 3, 4 and 26 were reversed according to the guidelines for the world health organization Quality of life –BREF WHOQOL-BREF [11].

The scores of items within each domain are used to calculate domain scores. The score in each domain (subscale) is calculated by adding up the scores of the corresponding items. The overall QOL score is the summation of all four subscale score plus another two global item scores [12]. The QOL score is then used to classify the quality of life as bad, fair or good as presented in table 1 [13].

Table 1. Subscale and overall quality of life scoring criteria

Subscale	Good	Fair	Bad
Physical domain	27-35	17-26	7-16
Psychological domain	23-30	15-22	6-14
Social domain	12-15	8-11	3-7
Environmental domain	30-40	19-29	8-18
Overall	96-130	61-95	26-60

The internal consistency, discriminant validity and correlation matrix of the WHOQOL –BREF of the questionnaire were checked. Internal consistency was determined by calculating Cronbach's Alpha for each of the four domains, with an acceptable value set at > 0.70 [14].

Correlation between the individual items of the WHOQOL-BREF and the four domains was assessed using a 2-tailed Pearson correlation coefficient, we accepted a moderate correlation between ($r \geq 0.45$ to $r < 0.70$) [15,16].

The third section

Edinburgh Postnatal Depression Scale (EPDS) had been used to identify mothers with postnatal depressive symptoms. The mother is asked to check the response that comes closest to how she has been feeling in the previous 7 days [17]. It includes 10 questions; Mothers who score ≥ 12 are likely to be suffering from a depressive illness [17].

Statistical analysis:

Data of the study had been analysed using available statistical computer program of statistical package for social sciences (SPSS-16). Mean scores of each domain of QOL had been calculated. For discriminate validity we used *t*-tests to examine the ability of the WHOQOLBREF to detect differences between groups. The groups were those scoring ≥12 on the EPDS (PND

group) and those scoring < 12 on the same instrument (the non-PND Group). Also Chi-square test had been used for the assessment of the association between two categorical variables and student *t*-test for continuous data had been used to test the significance differences of two means and ANOVA for testing the difference among three means and above. An association or difference had considered statistically significant if the probability value (*P* value) is less or equal to 0.05 [(18)].

Results

The highest proportion of women studied aged between 20-24 years (31.7%), about two thirds of the study sample were from urban area (78.3%). Similar proportions of women and their husbands have finished primary school (53.2% and 49.5% respectively). Majority of women were housewives (93.2%), while 64.9% of their husbands were workers. The family type of 64.9% of women was extended, the rest had nuclear families.

Regarding obstetrical history, about 66% of women studied had parity range of 2-5, history of previous abortion was found in 150 women (26.9%), and the rate of women who were delivered by caesarean section was 76.9%. Women who had antenatal care (4 visits) during last pregnancy constituted 79%. The rate of women had unintended last pregnancy was 60.6%. More than half of Mothers were without medical problems during last pregnancy (52.2%), while those with hypertension, diabetes, and other diseases during pregnancy were 18.5%, 7% and 22.6% respectively.

The homogeneity between items on each of the sub-scales was measuredwith the alpha coefficient for each domain of the WHOQOL-BREF exceeding 0.70 as presented in Table 2. The only exception was in the Environmental and social domains where the alpha coefficient was 0.586 and 0.455 respectively.

Table 2. Domain score distribution statistics

Quality of life domain	Minimum	Maximum	Mean±SD	Cronbach's Alpha
Physical domain	12	29	21.54±3.68	0.808
Psychological domain	13	29	21.88±3.62	0.729
Social Relationships	5	13	8.99±2.00	0.455
Environment	15	32	26.82±3.19	0.586

The domain structure of the WHOQOL-BREF was found to be valid in this sample of mothers. There was moderate to high correlation between individual items and the domain structure to which the items were originally assigned. Except for question 8, 13, and 14 which was equal to 0.25, 0.29, and 0.38 respectively as presented in table 3.

Table 4 shows the ability of the WHOQOL-BREF to clearly discriminate between known groups. Women scoring < 12 on the EPDS scored higher than those scoring above 12 in all domains and these differences were statistically significant. Discriminant validity was strongest in the psychological domain.

The study showed that the prevalence of postnatal depressive symptoms among mothers was 33.5%. A significant association was found between postnatal depressive symptoms and some variables such as occupation of mothers, family type, parity, mode of delivery, health status of mothers and newborns' complicationsas presented in table 5.

Most pregnant women included in study had fair QOL scores on all domains at late pregnancy. The overall QOL show that most of the mothers fairly well, with 17.4 % had good score, 82.4 % had fair score and 0.2 % had poor score. For physical activity domain 11.1 % had poor score, for psychological domain 0.7 % had poor score, for social domain 22.4 % had poor score and environmental domains 1.6 % had poor score as presented in table 6.

Table 3. Correlation matrix for the four domains of the WHOQOL-BREF*

WHOQOL-BREF items	Physical health	Psychological health	Social health	Environmental health
Physical health Pain(3)	0.74	0.35	0.27	0.18
Dependence of medical aids (4)	0.56	0.20	0.17	0.03
Energy (10)	0.83	0.42	0.30	0.20
Mobility (15)	0.59	0.19	0.20	0.11
Sleep and rest (16)	0.48	0.27	0.25	0.11
Activity of daily living (17)	0.85	0.41	0.32	0.18
Work capacity (18)	0.80	0.37	0.26	0.16
Psychological health Enjoyment of life (5)	0.28	0.82	0.42	0.30
Personal belief (6)	0.26	0.83	0.44	0.31
Concentration (7)	0.21	0.52	0.22	0.12
Bodily image (11)	0.18	0.49	0.13	0.16
Self- esteem (19)	0.74	0.47	0.29	0.30
Negative feeling (26)	0.26	0.77	0.43	0.20
Social relationships - personal relationship (20)	0.30	0.46	0.75	0.18
Sexual activity (21)	0.33	0.31	0.70	0.15
Social support (22)	0.11	0.23	0.62	0.23
Environmental health Security (8)	0.15	0.24	0.11	0.25
Physical environment (9)	0.12	0.23	0.20	0.73
Financial support (12)	0.16	0.20	0.15	0.62
Accessibility of information (13)	0.11	0.13	0.13	0.29
Leisure activity (14)	0.12	0.13	0.19	0.38
Home environment (23)	0.11	0.21	0.19	0.72
Health care accessibility (24)	0.10	0.14	0.13	0.45
Transport (25)	0.14	0.20	0.19	0.49

*Correlation of ≥0.45 was considered satisfactory

Table 4. Mean scores of four domains of WHOQOL-BREF of women with and without PNDS

Domain	Non PNDS	PNDS	*P* value
Physical domain	22.21±3.614	20.19±3.485	<0.01
Psychological domain	23.69±2.847	18.23±2.400	<0.01
Social Relationships	9.62±2.009	7.89±1.814	<0.01
Environment	27.57±2.865	25.32±3.301	<0.01

Women who experienced medical diseases such as hypertension, DM and other diseases had a lower health-related quality of life at late pregnancy compared to those who were apparently healthy at physical, psychological and social health (Table 7). In addition, woman with newborns complications' (respiratory distress, low birth weight and other complications) had been experienced significant declines in psychological health as presented in table 8.

Table 5. Postnatal depressive symptoms in relation to socio-demographic variables and pregnancy outcomes

Variables		Non –PNDS N = 371 (%)	PNDS N = 187 (%)	Total N = 558 (%)	Chi-square	*P* value
Age (year)	≤ 19	50 (72.5)	19 (27.5)	69 (100)	5.448	>0.05
	20-24	122 (68.9)	55 (31.1)	177 (100)		
	25-29	89 (69)	40 (31)	129 (100)		
	30-34	51 (58.6)	36 (41.4)	87 (100)		
	>35	59 (61.5)	37 (38.5)	96 (100)		
Residency	Urban	292 (66.8)	145 (33.2)	437 (100)	0.100	>0.05
	Rural	79 (65.3)	42 (34.7)	121 (100)		
Occupation of mother	Housewife	338 (65)	182 (35)	520 (100)	9.737	<0.05
	Employed	27 (93.1)	2 (6.2)	29 (100)		
	Others	6 (66.7)	3 (33.3)	9 (100)		
Education of mother	Illiterate	55 (71.4)	22 (28.6)	77 (100)	7.340	>0.05
	Primary or less	186 (62.6)	111 (37.4)	297 (100)		
	Secondary school	86 (66.7)	43 (33.3)	129 (100)		
	College or higher	44 (80)	11 (20)	55 (100)		
Type of family	Nuclear	111 (56.6)	85 (43.4)	196 (100)	13.168	<0.05
	Extended	260 (71.8)	102 (28.2)	362 (100)		
newborns' complications	Yes	95 (58.6)	97 (41.4)	162 (100)	6.306	<0.05
	No	276 (69.7)	120 (30.3)	396 (100)		
Types of newborns' complications	None	276 (69.7)	120 (30.3)	396 (100)	23.139	<0.05
	Low birth weight	37 (62.7)	22 (37.3)	59 (100)		
	Respiratory distress	38 (52.8)	34 (47.2)	72 (100)		
	Neonatal jaundice	16 (94.1)	1 (5.9)	17 (100)		
	Others	4 (28.6)	10 (71.40)	14 (100)		

Table 6. Quality of life (QOL) and subscale QOL scores of mothers

Quality of life domain	Quality of life level		
	Good	Fair	Poor
Physical domain	35 (6.3%)	461 (82.6%)	62 (11.1%)
Psychological domain	251 (45%)	303 (54.3%)	4 (0.7%)
Social Relationships	89 (15.9%)	344 (61.6%)	125 (22.4%)
Environment	123 (22%)	426 (76.3%)	9 (1.6%)
Overall Quality	97 (17.4%)	460 (82.4%)	1 (0.2%)

Table 7. Score domains of WHOQOL-BREF according to health status of mothers

Health status of mothers		Healthy	HT	DM	others	ANOVA test	*P* value
Domain	Physical	22.53±3.432	20.65±3.353	20.08±4.061	20.44±3.738	F=16.026	0.000
	Psychological	22.48±3.598	21.22±3.608	21.26±3.891	21.21±3.890	F =5.735	0.001
	Social	9.27±1.982	8.72±1.864	9.21±2.262	8.50±1.963	F =5.306	0.001
	Environmental	26.88±3.191	26.83±3.001	26.95±3.260	26.63±3.329	F =0.193	0.901

HT = hypertension, DM = DM

Table 8. Score domains of WHOQOL-BREF according to newborns' complications

Newborns' complications		None	Low birth weight	Respiratory Distress	Jaundice	Others	ANOVA test	*P* value
Domain	Physical	21.76±3.639	21.27±3.800	20.68±3.845	20.76±3.327	21.86±3.325	F=1.632	0.165
	Psychological	22.09±3.569	21.93±3.800	20.992±3.519	22.35±3.499	19.64±4.011	F=2.875	0.02
	Social	9.05±2.013	8.56±2.011	8.89±1.903	9.35±2.499	9.07±1.269	F=0.974	0.421
	Environmental	26.91±3.132	26.66±3.911	26.08±3.001	27.88±2.497	27.36±2.706	F=1.658	0.158

The mean score of QOL in all domains was inversely related to increasing age of the mothers, there was statistically significant difference in both physical and environmental domains. The mean score of QOL in all domains was inversely related to increasing parity of the mothers and increasing of depression score, there was statistically significant difference in all domains as presented in table 9.

Table 8. Age, parity, and depressive scores of women among the domains of WHOQOL- BREF

Variables	Physical domain			Psychological domain			Social Relationships			Environment		
	Good	Fair	poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Age (years) Mean±SD	25.20 6.512	26.61 6.867	29.29 6.867	26.56 6.868	26.99 6.530	29.75 4.787	26.46 6.784	26.56 6.514	27.78 6.983	25.65 6.757	27.05 6.603	31.56 6.187
P value	<0.05			>0.05			>0.05			<0.05		
Parity Mean±SD	2.26 1.578	2.83 1.745	3.45 1.762	2.63 1.711	3.05 1.773	3.25 1.258	2.52 1.989	2.82 1.623	3.23 1.863	2.18 1.349	3.03 1.808	4.33 1.118
P value	<0.05			<0.05			<0.05			<0.05		
Depression score Mean±SD	5.80 3.962	8.83 4.499	11.18 5.309	5.14 2.830	11.88 3.442	18.50 3.416	4.47 3.170	8.94 4.299	11.95 4.105	6.11 3.955	9.61 4.535	13.44 5.270
P value	<0.05			<0.05			<0.05			<0.05		

Discussion

The studies in other countries such as Iran, Kuwait and Malawi had noted problems with internal consistency of the social relationships domain [16,19,20] and also the WHOQOL-BREF field trial reported a Cronbach's alpha less than 0.7 in this domain [10]. This can be attributed to the small number of questions (3 items) in this domain. In addition, this domain does not appear very homogenous at least in the Iraqi culture, since it inquires about sexual life and social supports, which are relatively different concepts in Iraqi culture.

In this study, the alpha coefficient for environmental domain was less than 0.70, this can be attributed mainly to dissatisfaction with security and health care accessibility. This could be attributed to the fact that Iraqi population was exposed to wide spread violence in last years.

The domain structure of the WHOQOL-BREF was found to be valid in this sample of mothers. There was moderate to high correlation between individual items and the domain structure to which the items were originally assigned. Except for question 8 (security), 13 (accessibility of information) and 14 (Leisure activity) which was equal to 0.25, 0.29, and 0.38 respectively.

A study done in Malawi found that all 27 items were correlated to the domain to which they are assigned, with all correlations greater than, or equal to 0.60 [20]. This value was higher than study done in Iran, which was equal to 0.40 [16].

In the WHO 23-country report [10], it was noted that in 7 of 24 centers, the items on pain and the need for medical treatment were generally problematic in item-total correlations in the physical domain. In addition, poor item-total correlation (<0.30) was noted for negative feelings in one center.

In terms of discriminant validity the WHOQOL-BREF performed particularly well. On average, in each of the domains, women in the non-PND group had higher scores than those with EPDS scores over 12. And this is similar to study done in Australia, Kuwait and also the WHOQOL-BREF field trial [10,19,21].

It was also interesting to note the sensitivity of the instrument in terms of the strength of difference between the PND group and the non-PND group for each of the domains. The WHOQOL Group suggests that discriminant validity is best demonstrated in the physical domain [10]; however, in this study, the psychological domain showed the greatest difference between groups and this similar to that found in Australia [21].

In this study, the indicator used to determine postnatal depressive symptoms was EPDS with a cut-off score of ≥ 12 for depressive symptoms. In the prevalence of postnatal depressive symptoms among 558 mothers was 33.5%. This is approximately similar to study done in Bahrain, which found that prevalence of PND was 37.1% [22].

This result was in disagreement with that reported in Erbil, Lebanon and Karachi with overall prevalence of PPD; 28.4%, 21% and 52.21% respectively [23,24,25].

In this study, women who experienced hypertension had a lower health-related quality of life at late pregnancy than those who were apparently healthy. This finding is similar to other study done in Canada, which showed women experience lower HRQOL during pregnancy, particularly in the physical domain [26].

Another study was done in San Francisco also showed women with PIH more often reported a significant decline in HRQOL and an increase in depressive symptoms from pre-pregnancy to postpartum compared with unaffected women [27].

This decline in health related quality of life was mainly due to most pregnant women with gestational hypertension ended their pregnancy with cesarean section.

In this study, women who experienced diabetes had a lower health-related quality of life at late pregnancy than those who were apparently healthy. This finding is similar to that of a study done in Italy, which showed that pregnancy is associated with a perception of poor general health in women with both type 1 DM and GDM. After delivery, significantly worse depressive symptoms were documented in both groups, while a generally worse physical and psychological well-being was only identified in women with type 1 DM [28].

On the other hand, this result disagreed with that from San Francisco, which showed that women with GDM were not experience significant declines in health status compared to unaffected women [27].

This could be explained by a sense of control over the disease is an important factor influencing the mood of patients, their functioning and their health. The adaptation to the disease affects the way it is perceived by the patient. Women suffering from gestational diabetes, as the disease affecting their lives, have problems to come to introduce the changes needed to treat, such as adjustments to the new dietary recommendations, measurement of blood glucose, frequent medical checks and treatment with insulin constitute most difficulties to these patients [29].

In this study, a woman with newborn complications (respiratory distress, low birth weight and other complications) experience significant decline in health status of psychological domain compared to women

without these complications. Other domains did not show significant declines in health status of mothers with newborns complications' compared to women without these complications.

This finding is similar to study done in Taiwan that showed the pregnant women who had a very low score on mental health had a higher risk of giving birth prematurely than did women who had higher scores and mothers with poor mental health can predict low birth weight [30].

In conclusion, the WHOQOL-BREF is well-accepted instrument in this sample and may be used in postnatal clinical settings or for assessing intervention effects in research studies.

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Author contributions

Dr. Najlaa did the data collection, analysis and writing and Dr. Maysaloun made the conception and design, interpretation, and revision of the manuscript.

Conflict of interest

None.

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