

# Differences in Health Related Quality of Life changes during Pregnancy based on Pregnancy Context: A prospective study

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## Research

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## Abstract

**Background** The significance of planned pregnancy is an accepted principle for improving the health of pregnant women; and quality of life, as one of the important indicators of women's health, is reduced in high-risk pregnancies. The aim of this research was to investigate the changes in the health related quality of life (HRQL) in low risk pregnancies in different groups based on pregnancy context.

**Methods** The present study was a longitudinal prospective study conducted on 250 pregnant women divided into three groups of women with planned pregnancy, unplanned/wanted pregnancy and unwanted pregnancy. Then, using WHOQOL-26 questionnaire, the quality of life of these women was measured in physical, psychological, social and environmental dimensions at the beginning of pregnancy as well as at the end of the first, second and third trimesters.

**Results** Based on the results, the mean score of environmental-HRQL in women with unwanted pregnancy was significantly lower than the other two groups. All dimensions on HRQL were influenced by time and group. However, changes in the physical, psychological and social dimensions of HRQL varied within the groups. Physical- HRQL changes were different within the groups. The intergroup effect on environmental dimension of quality of life changes was significant.

**Conclusion** It was observed in this study that HRQL in the women with unwanted pregnancy was lower than the women with planned pregnancy and those with unplanned /wanted pregnancy. Moreover, increase in gestational age would lower quality of life, but this decline had a similar pattern in different groups.

## Plain English Summery

The significance of planned pregnancy is an accepted principle for improving the health of pregnant women; and quality of life, as one of the important indicators of women's health, is reduced in high-risk pregnancies. The aim of this research was to investigate the changes in the health related quality of life (HRQL) in low risk pregnancies in different groups based on pregnancy context. This prospective study conducted on 250 pregnant women divided into three groups of women with planned pregnancy, unplanned/wanted pregnancy and unwanted pregnancy. Then, using WHOQOL-26 questionnaire, the quality of life of these women was measured in physical, psychological, social and environmental dimensions at the beginning of pregnancy as well as at the end of the first, second and third trimesters. Based on the results, the mean score of environmental-HRQL in women with unwanted pregnancy was significantly lower than the other two groups. All dimensions on HRQL were influenced by time and group. However, changes in the physical, psychological and social dimensions of HRQL varied within the groups. Physical- HRQL changes were different within the groups. The intergroup effect on environmental dimension of quality of life changes was significant. It was observed in this study that HRQL in the women with unwanted pregnancy was lower than the women with planned pregnancy and those with unplanned /wanted pregnancy. Moreover, increase in gestational age would lower quality of life, but this decline had a similar pattern in different groups.

## Introduction

Pregnancy is a complex period in women's lives. It is associated with significant physical and psychological changes that play an important role in balancing the functions of different systems in women's body with regard to the needs of the fetus. Although necessary for the survival of the fetus and the adaptation of the mother's body to new conditions, these changes make pregnant women vulnerable to physical and mental problems (RCOG). Additionally, these changes in various stages of pregnancy are associated with common complaints such as morning sickness, low back pain [1], movement restriction, Pelvic Girdle Pain [2] and sleep disorder [3]. Although these transient problems can be tolerated

by most pregnant women and do not seriously threaten their health, they reduce the quality of life of these women during pregnancy [4].

Quality of life is an important criterion in evaluating development indicators. While health is defined as complete physical, psychological, and social well-being, quality of life is a mental perception of health [5] affected by illnesses as well as physical [6] and mental [7]. High-risk and complicated pregnancies are among the factors affecting the decline of the HRQL in pregnant women [8]. Nonetheless, change in HRQL in uncomplicated pregnancies have received less attention. Moreover, due to the mental nature of quality of life, it can be influenced by different aspects of life. So that pregnancy complications such as hyperemesis have increased drastically after unwanted and unplanned pregnancies [9]. There are also studies reporting the low trend in HRQL following an unplanned pregnancy [10]. Although physical and psychological changes of pregnancy and the complications caused by them occur for most women, their impact on quality of life may be influenced by women's preparation and planning for pregnancy.

Planned pregnancy is one of the major goals of reproductive health whose desirability is an accepted principle in family planning as well as maternal and child health [11]. Denial of pregnancy following an unplanned pregnancy may reduce a person's psychological tolerance to pregnancy changes.

As the results of a qualitative study showed, couples defined planned pregnancy as adaptation to the conditions of having a child. Accordingly, family planning for childbearing provides the couples with the necessary readiness to accept pregnancy, and may reduce the negative effects of pregnancy on quality of life. However, it should be noted that even unplanned pregnancy can also be associated with pregnancy acceptance [12] and lessen the negative effects of unplanned pregnancy on the HRQL of pregnant women. In addition, the impact of unplanned and unwanted pregnancies on HRQL can be subject to the cultural beliefs and values governing different societies.

The impossibility of legal abortion because of religious values in some societies increases the likelihood of continuing unplanned and unwanted pregnancies. As such, understanding the changes in quality of life during unplanned and unwanted pregnancies seems to be essential in these societies. Accordingly, this study investigated change in HRQL of pregnant women in terms of Pregnancy context (PC).

## Method

This prospective longitudinal study, approved by the Ethics Committee of Isfahan University of Medical Sciences, was conducted between April 2017 and January 2018 in Isfahan-Iran. The study was conducted on 250 women with gestational age of 6–9 weeks who referred to ten Health Centers in Isfahan to start prenatal care. Inclusion criteria: aged between 18 to 35 years, no history of complications in previous pregnancies, no systemic disease in current pregnancy, and no known pre-pregnancy psychological disorder. Exclusion criteria were including twin or multiple pregnancy diagnosis and abortion in the first trimester, pregnancy complications such as preeclampsia and second trimester pregnancy bleeding, and stressful events such as death of relatives, economic bankruptcy and suchlike.

Samples were selected from health centers that were selected using simple random sampling. The research samples were selected by convenience sampling method; all eligible pregnant women were invited to participate in the study and, after obtaining informed consent, their demographic data were recorded.

To determine PC, intention and wantedness for pregnancy were asked about using interview and those who were pregnant with a pre-planned program were put into the planned pregnancy group, those who were pregnant without a predetermined program but wanted the baby, were put into the unplanned/wanted group and, finally, those who

became pregnant without a predetermined program and did not want the baby were placed in the unwanted pregnancy group [12].

The subjects' HRQL was measured using WHO Quality of Life-BREF (WHOQOL-26) at the time of admission (T1) and at 11–12 (T2), 24–25 (T3) and 33–35 weeks (T4) of pregnancy [4].

The validated WHOQOL-26 is a self-reported survey that consists of 26 questions regarding quality of life and is divided into four domains: physical, psychological, social, and environmental. HQOL is calculated using the mean of the total score and the scores of each domain [13].

Data analysis was performed using SPSS19 software. Statistical methods of two-way ANOVA, Chi-square, Mann-Whitney, Kruskal-Wallis, and linear mixed model analysis were used.

## Results

Of the 370 women invited to participate in the study, 300 accepted to take part in it. 29 pregnant women because of abortion and 19 others because of pregnancy complications such as preeclampsia, bleeding in the second trimester, and preterm labor pain were excluded from the study. Then, the data of 250 pregnant women aged between 18 and 35 years old were analyzed.

Among these women, 153 women (61.2%) had planned and wanted pregnancy, 72 women (28.8%) unplanned but wanted pregnancy, and 25 women (10%) had unwanted pregnancy.

Based on the results, the three groups were not different in terms of age, gravidity, employment status and monthly income. However, the frequency of under-diploma education level in the unwanted and unplanned pregnancy groups was higher than that of the planned pregnancy group. Moreover, HRQL score in the women with unwanted pregnancy was lower than the women with planned pregnancy and unplanned/ wanted pregnancy (Table 1).

Table 1  
The baseline characteristics of the subjects

	Mean (standard deviation) or Number (%)			Sig
Groups (based on pregnancy context)				
	Wanted/ Planned	Wanted /Unplanned	Unwanted	
<b>Number</b>	<b>153</b>	<b>72</b>	<b>25</b>	
Age	28.7 (3.9)	29.0 (4.6)	28.6 (3.7)	ns
Monthly income <sub>(R)</sub>	1498 × 10 <sup>4</sup> (589 × 10 <sup>4</sup> )	1567 × 10 <sup>4</sup> (617 × 10 <sup>4</sup> )	1435 × 10 <sup>4</sup> (610 × 10 <sup>4</sup> )	ns
Gravity				ns
Education (%)				.001
High school	13 (8.5)	8 (11.1)	3 (12.0)	
Diploma	69 (45.1)	23 (31.9)	13 (52.0)	
Academic	71 (46.4)	41 (56.9)	9 (36.0)	
Occupation (%)				ns
Home worker	228 (91.2)	144 (94.1)	63 (87.5)	
Employed	22 (8.8)	9 (5.9)	9 (12.5)	
Rials (R):Each dollar equal to 45000 Rials at the of data gendering time in this study				

The results showed that the HRQL of all pregnant women at the time of entering the study was negatively correlated with age (Beta = -0.12 CI 95%: -0.55 to -0.04; p < 0.05) and positively with monthly income (Beta = 0.23; CI 95%: 0.01 to 0.02; P < 0.001). The results were indicative of the effect of time on the total HRQL score and its different dimensions (Table 2). So that the HRQL score decreased during the first trimester of pregnancy, remained stable during the second trimester and, then, began to decrease again until the third trimester (Fig. 1). Comparison of the mean of total HRQL scores and its dimensions at 4 time periods revealed that at the beginning of pregnancy (Time1) the mean of total HRQL score and physical, psychological and environmental dimensions of the three groups were significantly different. During the second, third and fourth time periods, only the environmental dimension of quality of life differed significantly between the groups (Table 1).

Table 2  
Differences in the HRQL at the four assessing times (repeated measure analysis)

	Mean (standard deviation)			Time		Time/ Group				Time/ Education	
	1th Trimester	2th Trimester	3th Trimester	F <sup>a</sup>	Sig <sup>a</sup>	F <sup>a</sup>	Sig <sup>a</sup>	F <sup>b</sup>	Sig <sup>b</sup>	F <sup>a</sup>	Sig <sup>a</sup>
Total HRQL	91.8 (10.2)	83.2 (12.8)	61.51 (16.0)	379.7	< .0001	1.1	ns	1.1	ns	1.4	ns
Physical HRQL	27.0 (3.9)	23.9 (4.9)	24.1 (4.5)	32.2	< .0001	2.4	.02	.5	ns	.7	ns
Psychological HRQL	12.0 (1.5)	10.6 (2.1)	20.6 (3.6)	39.6	< .0001	1.2	ns	1.9	ns	1.8	ns
Social HRQL	22.9 (3.3)	20.3 (4.1)	11.0 (2.1)	36.8	< .0001	1.1	ns	.5	ns	2.3	ns
Environmental HRQL	29.8 (3.6)	28.3 (4.1)	28.6 (3.9)	12.8	< .0001	.2	ns	4.5	.01	2.0	ns
a: Results of the repeated measures analysis of variance (RMANOVA); HRQL: Health related Quality of Life											
a test of between subject effect											
b test of between subject effect											

Table 3  
The results of post hoc analysis

Groups		Environmental HRQL			
I	J	I-J	sig	CI 95%	
Wanted/ Planned	Wanted /Unplanned	1.4	.006	.4	2.4
	Unwanted	1.3	ns	-.2	2.8
Wanted /Unplanned	Unwanted	-.2	ns	-1.8	1.5

The results indicated the significant effect of group on HRQL changes in physical dimension. Therefore, women with unwanted pregnancies, at the start of pregnancy, had a lower physical HRQL score than the other two groups, but experienced less decrease than the other two groups (Fig. 2). Changes in total HRQL score and its score on physical, psychological and social dimensions were not different between the three groups. However, the level of environmental HRQL changes was different between the planned pregnancy group and the unplanned/wanted group. As such, the environmental HRQL in women of the planned pregnancy group was lower than that of the women with unplanned pregnancy during the first trimester. It then increased again by the second trimester and reduced its distance from the unplanned/wanted pregnancy group (Fig. 2). The effect of education level on changes in total HRQL score and its dimensions was not significant (Table 2).

## Discussion

This study aimed at investigating the change in HRQL during uncomplicated pregnancies with regard to PC. To this end, the quality of life changes were compared between three groups of pregnancy context; women with planned, unplanned/wanted and unplanned/unwanted pregnancies. The results showed that HRQL had a decreasing from the beginning of pregnancy to the third trimester. Although women with planned pregnancies have a higher quality of life with the onset of pregnancy, they experience similar changes compared to the other two groups.

Comparing the background characteristics of the groups, it was shown that the frequency of under-diploma education level in women with planned pregnancy was lower than the other two groups. This finding corroborates the results of other studies indicating that women's education is a determining factor in family planning [14, 15]. Nevertheless, unlike other studies [16–18], it was not a determining factor in quality of life. Additionally, contrary to the results of other studies [19, 20], the results of the present study demonstrated that economic status; number of pregnancies, and age were not related to planning for pregnancy.

Evaluation of change in HRQL over four periods of time confirmed the effect of time on the total quality of life score and its different dimensions. So that the HRQL score decreased during the first trimester, then, remained stable during the second trimester and, finally, began to decrease again after the second and during the third trimesters. This change was consistent with the situation of pregnant women during different pregnancy periods. Common problems in the 1th trimester, such as morning sickness [21], lead to lower HRQOL in this trimester.

In the 2th trimester, decrease in this sickness often results in fewer problems for women, explaining how quality of life does not change during the second trimester. Increased prevalence of pregnancy problems following an increase in abdominal enlargement, restriction of movement and sleep disorder during this period [22] is also associated with decreased quality of life. Decreased quality of life associated with the increase of gestational age has been reported previously [15], and the present study attempted to show that this change occurs even during uncomplicated pregnancies.

In line with the main objectives of this research, the results suggested that, from the outset of pregnancy, women in the unwanted pregnancy group reported lower quality of life compared to the other two groups; moreover, throughout the pregnancy, their quality of life in the environmental dimension was lower than the other two groups. Changes in overall quality of life and quality of life in physical, psychological and social dimensions followed the same pattern in all three groups. This finding suggests that, except for the environmental dimension of quality of life, other aspects are less affected by unwanted pregnancy during pregnancy; while this factor (unwanted pregnancy) has an ever-lasting impact on the environmental dimension of HRQL.

As previous studies have shown, unwanted and unplanned pregnancies can reduce quality of life in women [18]. Nonetheless, no difference was observed in the present study in the quality of life of the women with planned pregnancy and those with unplanned/wanted pregnancy. According to this finding, the wantedness of the pregnancy in the women of the study, even if not based on previous planning, does not have an adverse effect on the quality of life of these women. By contrast, unwanted pregnancy can reduce the quality of life of pregnant women.

Providing physical, psychological, social and environmental facilities is one of the conditions considered by people judging the timeliness of pregnancy. Put differently, a pregnancy is considered timely when it occurs in an appropriate condition. The environmental dimension of quality of life refers to the availability of environmental and supportive facilities [4] and, it should be noted, that differences between groups are expected at the beginning of pregnancy. But it was observed unexpectedly within the first trimester, that women with planned pregnancies experienced more decrease in the environmental dimension than women with unplanned/wanted pregnancies.

Decreased environmental quality of life during the second trimester for the women with planned and wanted pregnancies is maybe due to an incorrect estimation of conditions for planning the pregnancy. Furthermore, although perceived social support has not been measured in this study, decreased environmental quality of life in this women suggests that the available support systems have failed to decrease the problems of women during the first trimester.

One of the limitations of the present study, that needs to be taken into account in interpreting the results, is that poor pre-pregnancy quality of life can be a reason for women's unwillingness to become pregnant. Therefore, to identify the causal pathway between PC and quality of life, the pre-pregnancy quality of life of these women needs to be assessed. In addition, the low number of women with unwanted pregnancies is another limitation of the study that may affect the results of the study.

## Conclusion

The results of this study showed that the increase of gestational age can reduce the quality of life in uncomplicated pregnancies. It was also shown that based on PC there is a similar pattern of change in physical, psychological and social dimensions of quality of life in different groups of women. However, the environmental dimension of quality of life in women with unwanted pregnancies is lower than other groups and, hence, needs to be taken into account in planning pregnancy cares for these women.

## Abbreviations

HRQL

health related quality of life

WHOQOL

World Organization Health quality of life

PC

Pregnancy context

ANOVA

Analysis of variance

MANOVA

Multivariate analysis of variance

T1

Time 1

T2

Time 2

T3

Time 3

T4

Time 4

## Declarations

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

### **Competing interests**

The authors declare that they have no conflict of interest.

### **Authors' contributions**

AK: Project development, designing protocol, data collection supervising, Interpretation of study results, manuscript writing. AD: Data collection, acquisition of analysis,

### **Ethics approval and consent to participate**

All procedures performed in participants were in accordance with the ethical standards of the Ethics Committee of the Isfahan University of Medical Sciences. The Ethic approval given by Isfahan University of Medical Sciences. Informed written consent was obtained from all participants and their parents. Participants will be informed about the content, purpose, and procedure of the study.

### **Consent for publication**

Not applicable

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## Figures

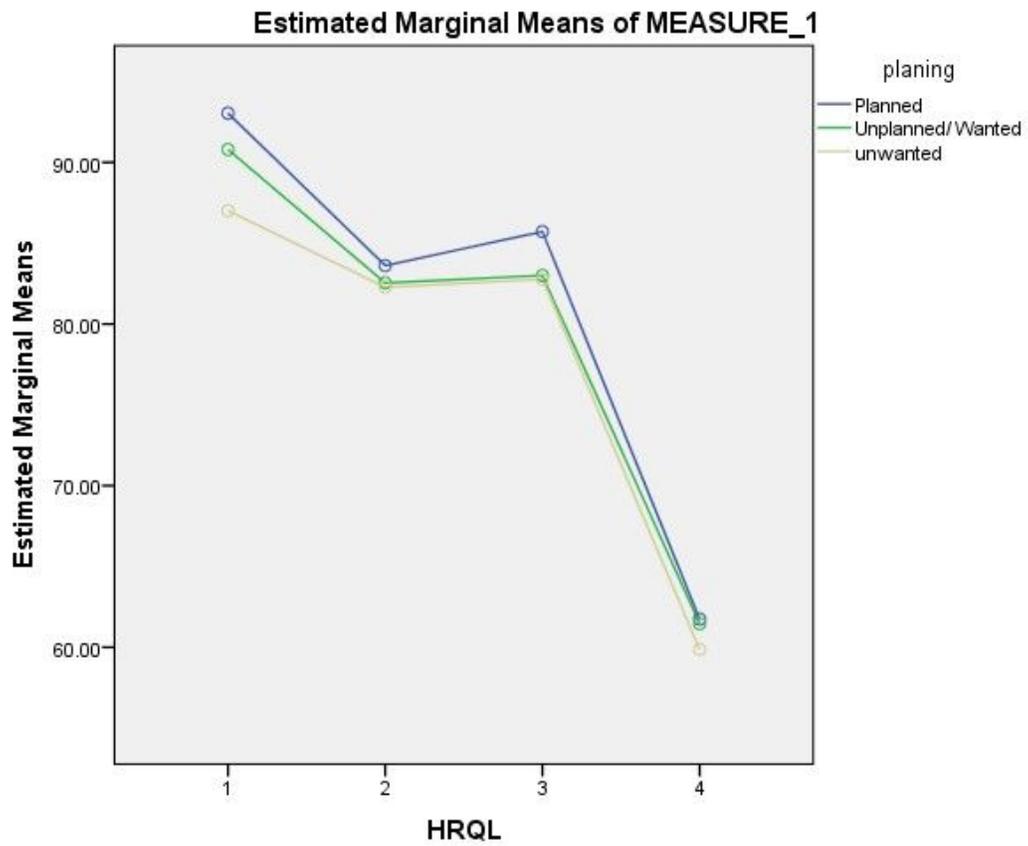
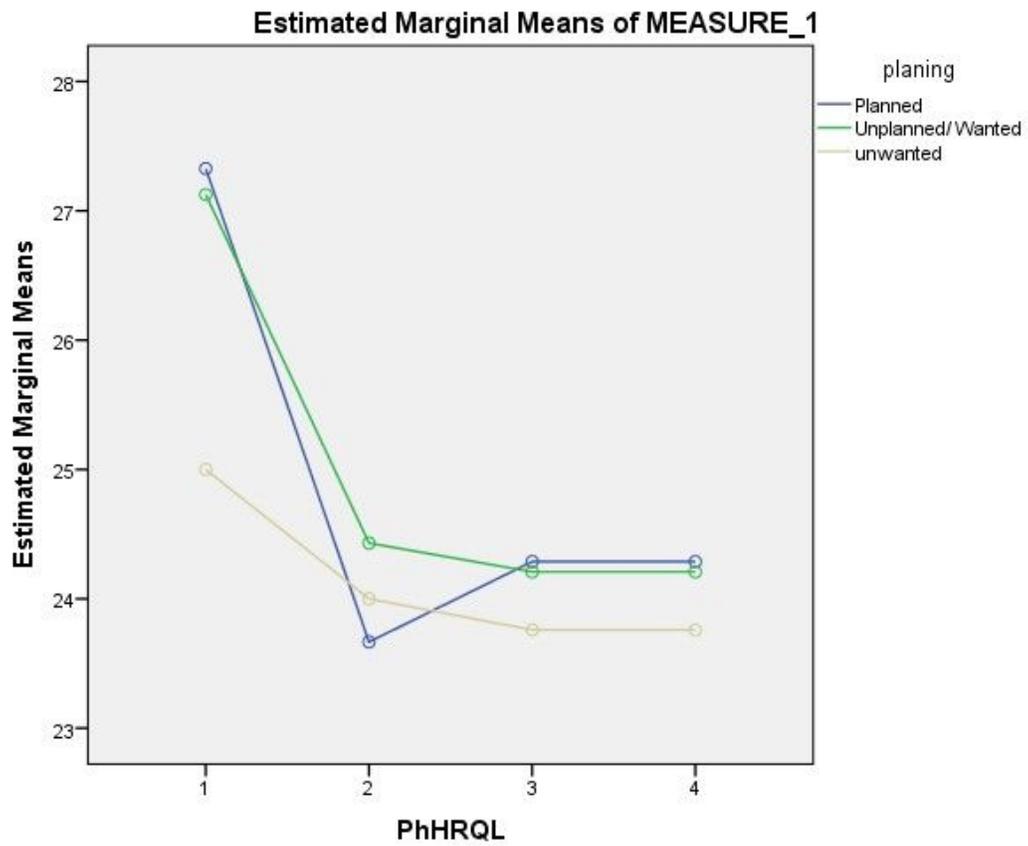


Figure 1

Differences in the total health related quality of life in four times



**Figure 2**

Differences in the physical health related quality of life in four times