



Quality of Life and Gestational Diabetes Mellitus: A Review Study

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Abstract

Objectives: High-risk pregnancies can affect the quality of life (QOL) of pregnant women due to their complications. QOL involves different dimensions including physical, psychological, and social health of the individuals. Assessing the QOL, especially in mothers with gestational diabetes is important in planning for maternal and newborn care and understanding the need for care for policymakers and the health care association. Therefore, the present study aimed to review the effects of gestational diabetes on QOL during pregnancy.

Materials and Methods: In this study, articles indexed in several databases such as PubMed, Science Direct, Scopus, Google Scholar, SID, and Magiran were obtained among which, those related to the QOL of mothers with gestational diabetes were extracted and evaluated based on the aim of the study.

Results: The series of the reviewed studies included 10 articles on the physical, psychological, and social dimensions of the QOL of mothers with gestational diabetes. Most of the examined articles failed to find any significant change in the physical dimension of QOL of mothers with gestational diabetes. The psychological effects of gestational diabetes were diverse and less understandable, therefore, different studies obtained contradictory results in this regard. Three out of four studies examining the social dimension of QOL of women with gestational diabetes showed that mothers' QOL could be jeopardized by social dimension.

Conclusions: In general, the results revealed that gestational diabetes could affect various physical, psychological, and social dimensions of the QOL of mothers. In addition, adequate education should be provided for mothers with diabetes in order to reduce their fear, anxiety, and depression concerning gestational diabetes.

Keywords: Pregnancy, Gestational diabetes, Quality of life

Introduction

Gestational diabetes mellitus (GDM) is considered as the most common medical condition during pregnancy which begins or is diagnosed with different intensities of carbohydrate intolerance during pregnancy. This definition is used regardless of the use or the lack of insulin use for treatment (1,2). The prevalence of GDM is growing worldwide (3,4) and obesity and the increased age of mothers during pregnancy are among the factors involved in an increase in GDM prevalence (5). In a meta-analysis conducted in Iran, the prevalence of GDM was estimated at around 4.9% (6).

According to the World Health Organization, the quality of life (QOL) refers to a person's perception of their status in life given the culture and value system in which they live, along with the goals, expectations, criteria, and interests of the person of interest (7). In addition, physical, psychological, social, environmental, and personal beliefs affect QOL (8). Today, QOL investigation and registration have obtained great significance as an integrated concept with different dimensions in medical and nursing

interventions (8,9).

Women with high-risk pregnancies face problems in their personal, familial, and social life, which can adversely influence their QOL (10). GDM, as one of such problems, causes detrimental medical consequences for the pregnant mother, as well as the fetus and neonate (11). Further, it adversely affects the psychological health and well-being of pregnant mothers, leading to a reduction in the QOL of a pregnant woman's life (12).

Concerning the high and progressive prevalence of GDM and the importance of enhancing QOL of patients with GDM, the current study sought to investigate the impacts of GDM on the QOL of pregnant women.

Materials and Methods

As previously mentioned, this study assessed the effect of gestational diabetes on the QOL during pregnancy following the guideline of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (13). To fulfill the present study, English electronic sources including Medline (via PubMed), Scopus, Web of Science,

Received 14 September 2018, Accepted 10 February 2019, Available online 7 March 2019

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and Science Direct were systematically searched without any time constraints up to 2018. The keywords used to find the research articles included “gestational diabetes OR gestational hyperglycemia” combined using AND Boolean operator with “quality of life”. Furthermore, Persian databases such as SID and Magiran were searched using Persian keywords of gestational diabetes and QOL. Two researchers independently reviewed the titles and abstracts of the articles and then extracted and reviewed the full-text articles if the subject matter seemed to be relevant to the purpose of the present study. Finally, those articles that met the inclusion criteria were selected for investigation.

Inclusion Criteria

- All papers up to 2018 which were qualitative or quantitative;
- Persian and English papers published in domestic and foreign research-scientific journals;
- Papers that dealt with assessing the QOL of mothers of GDM.

Exclusion Criteria

The exclusion criteria were repeated papers, non-English or Persian papers, those with no well-specified method and sample size, papers which were only related to the QOL of women with diabetes without reporting any special information regarding the GDM subgroup, and finally, papers that measured the effect of GDM on the QOL in the years after pregnancy. The inclusion and

exclusion criteria of the papers were applied based on their title and abstract. Eventually, all the eligible papers were examined after removing the papers not qualifying the inclusion criteria.

Results

Surfing the search engines using suitable keywords, a total of 502 papers were obtained out of which 10 papers were considered suitable and examined accordingly. Figure 1 represents the extracted results. As the QOL in the mentioned studies are presented with respect to physical, psychological, and social dimensions, the results of studies of the QOL of mothers with GDM are summarized in three parts including the physical dimension of the QOL of mothers with GDM (Table 1), the psychological dimension of the QOL of mothers with GDM (Table 2), and the social dimension of the QOL of mothers with GDM (Table 3).

Kopec et al assessed the physical and psychological health of 205 mothers with GDM during weeks 27 and 36 of their pregnancy using demographic and the 36-item short-form health survey (SF-8) questionnaires. Between these two weeks, the scores related to the physical health of mothers decreased briefly and significantly while those of the psychological health in SF-8 demonstrated no change. In addition, the diabetes impact on daily life (e.g., work, school, family, and social life) questionnaire was completed, along with the SF-8 questionnaire. Based on the results, GDM had no influence on the mothers' work or school. However, the number of individuals who

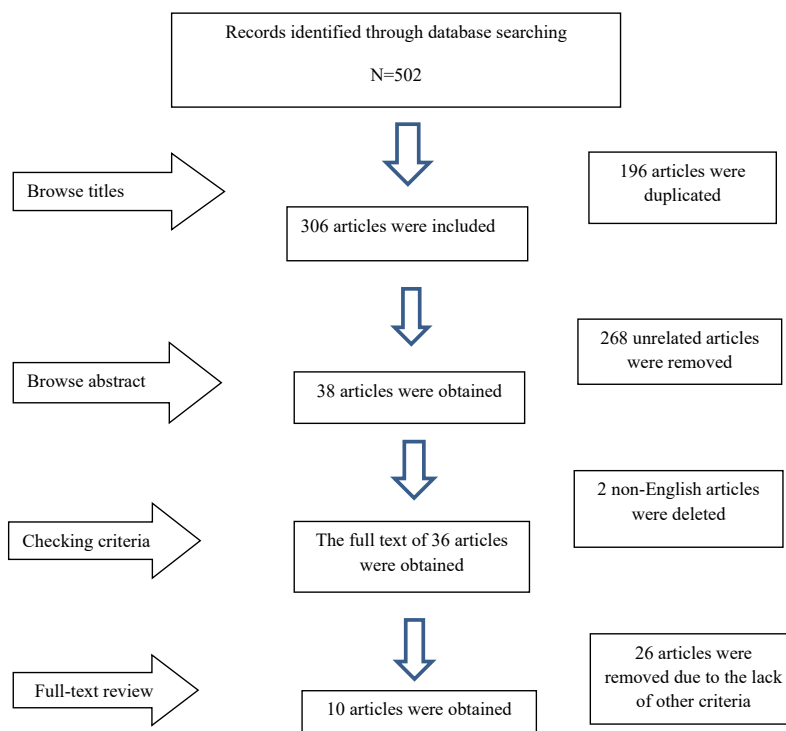


Figure 1. The Flowchart of the Course of Paper Selection.

Table 1. Characteristics of the Included Studies Respecting Assessing the Impact of GDM on Physical Dimension of the QOL

Authors/ Country/Year	Study Design	Participants	Dimension of QOL	Measure of QOL	Results
Kopec et al, Poland, 2015	Longitudinal study	205 pregnant women with GDM	Physical	SF-8	The physical health of mothers with GDM did not change in this study
Dalfrà et al, Italy, 2012	Observational study with control group	176 pregnant women with GDM, 30 pregnant women with T1DM, 39 healthy controls	Physical	SF-36	Physical health of mothers with GDM was better compared to healthy mothers
Trutnovsky et al, Australia, 2012	Prospective study	45 pregnant women with GDM	Physical	WHO-QOL	A significant decrease was observed in the mean scores of the physical dimension from the middle to the end of pregnancy
Halkoaho et al, Finland, 2010	Observational study with control group	77 women diagnosed with GDM, 54 healthy controls	Physical	15D HRQoL	The results of the study did not show a significant difference between the two groups
Mautner et al, Australia, 2009	Longitudinal study	18 women were affected by hypertensive disorders, 11 women were affected by GDM, 32 women were at the risk of preterm delivery, 29 healthy controls	Physical	WHO-QOL	Physical dimension of QOL of women with gestational diabetes was not significantly different from that of the control group
Kim et al, California, 2005	Cohort study	64 women with GDM, 48 healthy women	Physical	SF-36	There was no significant difference between physical activity scores between the two groups
Rumbold & Crowther, South Australia, 2002	Prospective study	21 with positive OGTT (GDM group), 124 with negative OGTT	Physical	SF-36	The mean score of SF-36 was similar between the two groups regarding the physical dimension after screening and in the next stages of pregnancy

Abbreviations. GDM: Gestational diabetes mellitus; QOL: Quality of life; T1DM: Type 1 diabetes mellitus; OGTT: Oral glucose tolerance test; SF-8: Eight-item short-form health survey; SF-36: Thirty-six-item short-form health survey; WHO-QOL: WHO-QOL-Bref questionnaire; HRQoL: Health-related quality of life.

reported that GDM affects their social life increased from 25% to 35% (14). Another study examined the QOL of 245 pregnant mothers (including 30 mothers with Type I diabetes, 176 with GDM, and 39 healthy mothers) in Italy by 36-Item Short-Form Health Survey questionnaire in the third trimester and post-delivery. Based on the results, the scores of the physical dimension were better in women with Type I diabetes and those with GDM compared to the control group during the third trimester. As regards the standardized psychological dimension scores, no difference was observed between the mothers in GDM and control groups (15). Similarly, Trutnovsky et al studied the QOL of mothers with GDM applying WHO-QOL-Bref questionnaire. The analysis of WHO-QOL-Bref indicated a significant reduction in the means of scores related to physical and social dimensions from the middle to the end of pregnancy. In addition to WHO-QOL-Bref questionnaire, a semi-structured interview was performed with mothers, the results of which showed a significant decline in the mean scores of psychological dimension from the middle to the end of pregnancy (16). Conversely, in a study in Finland on 100 mothers with GDM and 100 healthy mothers, the QOL was measured by a 15-dimension general QOL questionnaire. However, the results of the study represented no significant differences

between the dimensions of QOL including physical activity, discomfort, depression, and distress between the two groups (17). Further, a study conducted in Germany investigated the effect of adverse consequences of pregnancy including GDM on the QOL of 90 mothers (including 29 mothers in the control group) during and after pregnancy. All participants completed the WHO-QOL-Bref questionnaire which evaluated physical, psychological, social, environmental, and general health aspects 3 times (i.e., at the first visit, during pregnancy, and post-delivery). The results suggested that the physical dimension during 24-37 weeks diminished significantly compared to 3-4 months post-delivery for all mothers. However, no significant difference was observed between mothers with GDM and healthy mothers. Furthermore, the results demonstrated no significant difference between the healthy and GDM mothers regarding the scores of social dimension (18). Likewise, another study assessed the health conditions (e.g., physical performance, vitality, energy, and self-report health) of 64 women with GDM during a four-stage period using the SF-36 questionnaire and then their results were compared with those of 1233 healthy mothers. The results revealed that although the women with GDM were at a higher risk of self-report health reduction before pregnancy up to the

Table 2. Characteristics of the Included Studies Regarding Assessing the Impact of GDM on Psychological Dimension of the QOL

Authors/ Country/ Year	Study Design	Participants	Dimension of QOL	Measure of QOL	Results
Bien et al, Poland, 2016	Observational study without control group	114 pregnant women with GDM	Psychological	WHO-QOL	The average of psychological scores was worse than that of physical, social, and environmental dimensions
Kopec et al, Poland, 2015	Longitudinal study	205 pregnant women with GDM	Psychological	SF-8	The mental health of mothers with gestational diabetes demonstrated no change
Kutowska et al, Poland, 2012	Observational study without control group	100 pregnant women with GDM	Psychological		Half of the mothers had a worse mental state during the treatment compared to before the diagnosis of diabetes
Dalfrà et al, Italy, 2012	Observational study with control group	176 pregnant women with GDM, 30 pregnant women with T1DM, 39 healthy controls	Psychological	SF-36	In the psychological dimension, the QOL of the participants was not different
Lapolla et al, Italy, 2012	Observational study without control group	198 pregnant women with GDM	Psychological	Researcher's Inventory	Diagnosis of diabetes led to anxiety in Italian and immigrant women
Trutnovsky et al, Australia, 2012	Prospective study	45 pregnant women with GDM	Psychological	WHO-QOL	A significant decrease was observed in the mean of psychological dimension scores from the middle to the end of pregnancy
Halkoaho et al, Finland, 2010	Observational study with control group	77 women diagnosed with GDM, 54 healthy controls	Psychological	15D HRQoL	The results of the study showed no significant difference between the two groups in the psychological dimension of QOL
Mautner et al, Australia, 2009	Longitudinal study	18 women were affected by hypertensive disorders, 11 women were affected by GDM, 32 women were at the risk of preterm delivery, 29 healthy controls	Psychological	WHO-QOL	The psychological dimension of the QOL of women with GDM was not significantly different from that of the control group
Rumbold & Crowther, South Australia, 2002	Prospective study	21 with positive OGTT (GDM group), 124 with negative OGTT	Psychological	SF-36	The mean of SF-36 was similar between the two groups regarding the psychological dimension after screening and in the next stages of pregnancy

Abbreviation. GDM: Gestational diabetes mellitus; QOL: Quality of life; T1DM: Type 1 diabetes mellitus; OGTT: Oral glucose tolerance test; SF-8: Eight-item short-form health survey; SF-36: Thirty-six-item short-form health survey; WHO-QOL: WHO-QOL-Bref questionnaire; HRQoL: Health-related quality of life.

third trimester, they showed a similar reduction in all measurements of health conditions before pregnancy up to post-delivery compared to healthy individuals. Moreover, there was no significant difference between the physical performance scores between the 2 groups (19). Rumbold et al evaluated the QOL of pregnant women with positive GDM screening by SF-36 questionnaire which was designed for different stages of pregnancy (i.e., before screening the GDM, after the screening test, getting informed about the test results, and in the late third trimester). The mean SF-36 was similar in both groups after screening and during the subsequent stages of screening respecting physical and psychological areas. Based on the findings, women with positive screening and negative GDM diagnostic test had a poorer social performance compared to those with negative screening

due to emotional and physical problems (20). Additionally, Bien, using demographic and WHO-QOL questionnaires, studied 114 pregnant mothers with GDM hospitalized in the high-risk pregnancy ward and reported that the mean scores of the psychological dimension of mothers with GDM were lower compared to other dimensions (21). Similarly, Kutowska et al investigated the QOL of 100 women with GDM and the factors affecting their QOL. In most pregnancy mothers, the QOL score decreased by 2.5 scores on average after diagnosing and treating diabetes. In addition, women expressed their dominant psychological status and the sense of security, which worsened during the treatment as compared to the pre-diagnosis of GDM (22). Further, Lapolla et al studied the QOL of women with GDM and found that GDM diagnosis caused anxiety in Italian and immigrant women

Table 3. Characteristics of the Included Studies Regarding Assessing the Impact of GDM on Social Dimension of the QOL

Authors/ Country/ Year	Study Design	Participants	Dimension of QOL	Measure of QOL	Results
Kopec et al, Poland, 2015	Longitudinal study	205 pregnant women with GDM	Social	SF-8	The number of people who reported that pregnancy-induced diabetes affects their social lives after the diagnosis of gestational diabetes increased from 25% to 35%
Trutnovsky et al, Australia, 2012	Prospective study	45 pregnant women with GDM	Social	WHO-QOL	A significant decrease was observed in the mean social scores from the middle to the end of pregnancy
Mautner et al, Australia, 2009	Longitudinal study	18 women were affected by hypertensive disorders, 11 women were affected by GDM, 32 women were at the risk of preterm delivery, 29 healthy controls	Social	WHO-QOL	The social dimension of the QOL of women with GDM showed no significant difference as compared to the control group
Rumbold & Crowther, South Australia, 2002	Prospective study	21 with positive OGTT (GDM group), 124 with negative OGTT	Social	SF-36	Women with positive screening and negative diagnostic tests showed poorer social performance scores compared to women with negative screening

Abbreviations. GDM: Gestational diabetes mellitus; QOL: Quality of life; T1DM: Type 1 diabetes mellitus; OGTT: Oral glucose tolerance test; SF-8: Eight-item short-form health survey; SF-36: Thirty-six-item short-form health survey; WHO-QOL: WHO-QOL-Bref questionnaire; HRQoL: Health-related quality of life.

afflicted with this disease. The major feeling among these women was the fear of adverse consequences of the child (66%), followed by the concern over abnormalities in the neonate (29%). Furthermore, 52% of the Italian women were almost more optimistic, among whom the concern over neonatal consequences reduced as compared with the worries of immigrant women (23).

Discussion

In the current review study, the QOL of mothers with GDM was first examined concerning the physical, psychological, and social dimensions. The QOL is regarded as an objective and subjective concept based on personal perception and is affected by physical health, psychological status, and social relations (24). Moreover, it is a clinical concept which determines the individuals' assessment about their health conditions. This subjective assessment, as a psychological factor, can affect the medical consequences of GDM. Additionally, QOL encompasses various physical, psychological, and social health dimensions which can be measured during pregnancy. It is noteworthy that measuring the QOL, especially in mothers with GDM is crucial in planning for mother and neonatal care, as well as understanding the necessity of the existence of such care for policy-makers and healthcare associations (25).

Based on the findings of five out of seven papers, dealt with the physical dimension of QOL of women with GDM, no significant changes were found in the physical dimension of QOL of these mothers. Contrarily, in some studies, mothers with GDM had less physical activity (1, 3, 16). In the study by Tratnuski et al, the physical activity

of the affected mothers decreased during pregnancy (16). However, the above-mentioned study contained no control group and changes during pregnancy and the incidence of discomforts and problems of this period (e.g., nausea, vomiting, fatigue, pain, leg cramps, and the like) could have a considerable effect on the physical activities of pregnant women (25). Therefore, the decreased mean value of the physical dimension of the questionnaire may not be attributed only to GDM. In the study by Macvandi, investigating the QOL of pregnant mothers, the minimum acquired scores were observed in vitality and physical performance dimensions. In addition, the age of pregnancy was introduced as an influential factor in QOL such that an increase in the age of pregnancy led to a decrease in the score of physical dimension (26). However, the results of one study regarding the physical dimension of QOL of mothers with GDM represented the elevated scores of physical dimension as compared to healthy mothers (15) which may be due to the fact that mothers with GDM possibly care more about their health conditions compare to healthy mothers and strive harder to remain in good physical conditions for coping with GDM-associated problems. In the study by Morrison on the experience of Australian mothers with GDM, some participants viewed GDM as an opportunity for changing lifestyle (27). Further, in another study, gaining knowledge about GDM resulted in enhanced motivation and self-efficacy for changing lifestyle (e.g., physical activity and exercise) and the affected mothers modified their lifestyle in order to prevent diabetes in the future (28). On the other hand, the investigated studies may not be quite enough for discovering the difference between women

with or without GDM. For example, over 100 000 women are required to identify a significant difference respecting the changes in physical performance among women with or without GDM (19).

The majority of the examined papers of the present review study failed to find a significant change in the psychological dimension of QOL of mothers with GDM while only Trutnovsky et al (16), Bien (21), and Kutowska et al (22) reported a negative effect of GDM on the psychological dimension of mothers. Indeed, pregnancy is a stressful period for mothers, and high-risk pregnancy can intensify this stress (2). Furthermore, depression, worry, and anxiety are among the important psychological reactions of an individual who is diagnosed with new conditions including GDM (16). The fear and anxiety were among the themes which were extracted from the qualitative study by Morrison about the experience of women with GDM (27). Concern over their own and neonatal health was reported among the worries of mothers with GDM (29).

The psychological effects of GDM are diverse and less understandable, therefore, the results of studies in this regard are contradictory (16). This might be related to the fact that emotional effects during pregnancy are strongly associated with socio-demographic variables such as age, attitude toward pregnancy, and social support (30). Carolan indicated support by family, spouse, and acquaintances as the main factor for adapting to GDM and its self-management (31).

Moreover, the level of awareness and information about GDM and its consequences is considered as another effective factor on depression and anxiety levels of mothers with GDM. In studies in which GDM individuals were under care, those who received adequate information about GDM during pregnancy had less worry and anxiety, and the prevalence of depression was lower among these mothers. Even in mothers receiving insulin, the psychological results were similar to those with mothers who were controlled with diet when they found that better glucose control obtained by insulin can yield better pregnancy consequences (15). Mirfeizi et al, evaluating the effect of education on the QOL of pregnant women with GDM, found that the QOL enhanced in mothers who received an education (32). Additionally, effective and satisfactory communication between pregnant women with GDM and healthcare providers is regarded as another influential factor in the psychological health of GDM mothers (12). For instance, in the study by Lapolla et al, immigrant women with GDM probably failed to establish good communication with healthcare providers due to linguistic barriers, as well as cultural and religious differences, and therefore, experienced more worries during pregnancy (23). Thus, proposing a suitable treatment plan, establishing effective communication, and educating mothers with GDM can motivate and help

them feel the sense of security and improve their QOL.

Three out of four studies which focused on the social dimension of the QOL of women with GDM showed that their QOL can be jeopardized in the social dimension and women with high-risk pregnancy face various risks in their personal, family, and social life (33). Mothers with GDM feel that they are socially isolated and a very few numbers of people know about GDM, and this disease is unknown. Further, GDM is a stigma for some women and thus they are ashamed of expressing it (12,20). In a study, only 29% of women with GDM felt that their husband and other family members (e.g., sister, mother, and spouse family) helped them to cope with pregnancy problems and GDM (23). According to the report by Kopec et al, the level of support for mothers with GDM by friends decreased during pregnancy (14). Similarly, Pearson et al found that women believed that GDM resulted in damaged social relations, and the type of food and the time of its serving were not suitable for many of these individuals in social events. In these cases, some women concealed their disease and ate different types of food while some others unveiled their disease in order not to jeopardize themselves (34).

One of the reasons for the discrepancy in the results of the reviewed studies can be the fact that the QOL of women with GDM was measured by general questionnaires in these studies. Although these types of questionnaires can be valid and reliable, they may overlook important areas related to the unique experience of pregnancy or pregnancy-related conditions. In addition, these questionnaires may not be sensitive enough to measure the QOL of women with GDM. Their use may lead to distorted information possibly because they may neglect the unique views of pregnant women with or without complications (35). Thus, future studies are suggested to evaluate the QOL of mothers with GDM by using a specific QOL questionnaire allocated to these women.

Marchetti et al studied the QOL of mothers with GDM, while not examining the QOL dimensions in particular, and concluded that GDM worsened their QOL in general. The difference between the present study and that of Marchetti et al is that the present study searched different English and Persian databases. Considering the multi-dimensional nature of QOL and the effect of GDM on each of the dimensions of QOL, suitable interventions and measures can be implemented in order to enhance the QOL of the affected mothers. In the present study, the findings were expressed differently with a focus on the effect of GDM on various physical, psychological, and social dimensions of the QOL.

Healthcare providers and managers at different levels of healthcare organizations can benefit from the results of this study to enhance the QOL of mothers with GDM. These findings can be used in macro research and planning as well.

Conclusions

Overall, the results of the studies were contradictory regarding the physical, psychological, and social dimensions of the QOL of mothers with GDM. Generally, sparse studies addressed the QOL of mothers with GDM. Thus, further studies should be conducted in this regard. Further, specialized instruments should be used to assess the QOL of this group of mothers since understanding and evaluating different dimensions of the QOL of these mothers help healthcare providers to organize their activities aiming at enhancing and improving the health and QOL of GDM pregnant mother.

Conflict of Interests

There is no conflict of interest between authors and financial resources.

Ethical Issues

Not applicable.

Financial Support

This study is the result of a Phd thesis and was supported by Shahid Beheshti University, Tehran, Iran.

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