Predictors of Fathers' Worry about High Risk Pregnances of their Wives: A Path Analysis

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Abstract

Background: Recognizing the predictors of fathers' worries about maternal health, maternity, pregnancy, infant health and personal-familial issues is the first step in counseling them. The present study aimed to determine the predictors of fathers' worries about high-risk pregnancies of their wife.

Methods: This cross sectional study was conducted on 294 eligible fathers from four health centers and a hospital in Gorgan, Iran. Data collection tools included a checklist of demographic and midwifery characteristics, the psychological symptoms checklist (SCL-25), mothers' and fathers' worry questionnaire, and a social-familial support scale. Data were analyzed by SPSS and LISREL 8.8 full version.

Results: According to the results of path analysis, the mothers' worry (B= 0.31, p=4.78) among the related variables in both paths, had the highest positive association to the fathers' worry. The maternal mental health indirectly had the most positive association (B=0.12, p=3/48) and duration of marriage indirectly had the most negative association with fathers' worry (B=-0.22, p=-3.14). In a direct path, the fathers' mental health was positively related to the fathers' worry (B=0.3, p=0.000).

Conclusion: Mothers' worry, fathers' mental health, duration of marriage, and maternal mental health had the highest association with fathers' worry. The father's worry was both directly and indirectly related to the mother's worry through association with maternal mental health. According to the findings, it is important to pay attention to supportive and counseling programs for fathers.

Key Words: High-risk pregnancy; Men, Predictors, Worry.

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1- INTRODUCTION

Pregnancy is an exciting period in human life. This period is accompanied with intense emotions such as joy, excitement, confusion and concern (1, 2). Numerous studies have been recently conducted on psychological changes in women due to the high number of admissions and hospitalizations (3), so that providing services for mothers is a priority in mental health services in pregnancy, so that less attention has been paid to the psychological changes due to compliance with paternal role (4). Changing the role of husband to father is stressful (5). The tensions and worries may be intensified in high-risk pregnancies (1, 2).

The psychological effects of a high-risk pregnancy not only influence the woman, but also her husband (6). The high-risk pregnancies endanger the health or life of the mother or her fetus by diseases related to pregnancy or independent of it (7). The prevalence of these pregnancies is still high in developing countries (8). Its prevalence has also been reported in different regions of Iran. For instance, its prevalence was 52% in a study by Soleimanizadeh et al. in Bam (2004), 39.8% in a study by Azizi et al. (2015) in Sonqor, and 63.5% by Kashani et al. in Gorgan (9-11).

Due to an increase in morbidity and mortality in high-risk pregnancies, they are associated with higher stress and anxiety (12). Worries about maternal health, maternity, pregnancy, infant health, and personal-familial issues are among the fathers' worries in these pregnancies (13). Worries about the partner's intolerance of pain, the possibility of high-risk interventions, and traumatic delivery, feelings of helplessness, and lack of information about the delivery process are other causes of fathers' worries (14). This poses a challenge to their ability to cope with these new conditions; however, there are not enough services to support the fathers in different societies (15). Fathers are also more likely to hide their emotions; thus have more difficulties in dealing with their worries.

Therefore, men's health should not be neglected. It is necessary to pay attention to fathers' worries in accepting the parental role and understand their needs (16). Several factors have been known as risk factors affecting the fathers' psychological disorders and cognitive worries, including social support (17), mother' worries (18), maternal mental health and Mother's age (19), father's age (20), income (19, 21), duration of marriage (13), number of pregnancies (19), gestational age (22), number of hospitalizations (19), number of classes (23), body mass index, and father's mental health (13). There is a lack of information about the fathers' psychological changes, especially anxiety and factors that increase anxiety in their transition to the paternal stage. On this basis, preventive counseling for fathers, who are prone to mental disorders during pregnancy and postpartum, strengthens the successful transition to paternal role (19). Results of studies on the Iranian fathers' performance show their good participation during pregnancy (24). Worry is an emotional response of individuals; and expression of emotions such as fathers' worries is different in different cultures. Investigating the Iranian fathers' worries about high-risk pregnancies and determining the predictors of their worries are the first steps in counseling them for a successful transition to paternal role. Therefore, the present study was conducted to investigate the predictors of the fathers' anxiety about high-risk pregnancies of their wife.

2- MATERIAL AND METHODS

The present cross-sectional study based on path analysis was conducted in four health centers and a hospital in Gorgan city, North of Iran, during 2017-2018. The necessary sample size was estimated to be 260 based on 20 samples per variable (25), and considering the existence of 13 variables in the initial predictive model (social support, mother's worry, maternal mental health, mother's age, father's age, income, duration of marriage, number of pregnancies, gestational age, number of classes, body mass index, and paternal mental health), finally 294 samples were selected according to 15% sample loss. Cluster random sampling was performed in four health centers and a hospital in Gorgan, so that mothers with high-risk pregnancies and then their husbands with the inclusion criteria were invited to attend the study.

2-1. Inclusion criteria

Informed consent; no current or previous substance abuse and mental illness in the fathers according to their statement; Sampling was performed with adherence to diversity of each trimester of pregnancy.

2-2. Data collection method

The data was collected by the use of two questionnaires, including men's worry about high-risk pregnancy questionnaire (13), and mothers' worry questionnaire (26), and two checklists including the demographics and midwife (self-made questionnaire (, Symptom Checklist 25 (SCL-25) for mothers and fathers (27) , and a social-familial support scale (28).

Demographic characteristics and mental health of the mothers and mothers' concerns and family-scale social support questionnaires were completed by mothers in high-risk pregnancies ward or in health centers. The Fathers' Concern and Fathers' Mental Health questionnaire was completed by the fathers. A number of them were completed by the fathers who were in the high-risk pregnancy ward as a patient companion or came to visit their spouses, and a number of fathers completed the questionnaire in health centers, while accompanying their spouses or came to the health centers by phone call. And for some fathers who could not attend the health centers questionnaires were given to wives to be completed at home. Literate parents completed the questionnaire themselves, and for those who could not, the questionnaires were read and marked by the midwives. The completion time was about 45 minutes to an hour for each sample. A questionnaire on the demographic characteristics and concerns of the fathers in high-risk pregnancies has been developed by the researcher.

2-2-1. The Questionnaire of Men's Worry about High-risk Pregnancy (MWHPQ)

The questionnaire includes 25 items and 4 main categories, including the pregnancy and childbirth, infant health, maternal health, and personal-familial issues. Marital issues, financial issues and worries about not doing paternal duty, restrictions on daily activities, and social communication are subscales of personal and familial fields. The questionnaire was designed in Iran with acceptable reliability and validity (13).

The face, content and construct validity were also approved. The majority of indices related to the compliance and goodness of fit were at acceptable levels. The analysis of the questionnaire confirmed its reliability with the Cronbach's alpha coefficient of 0.91, and internal consistency of 0.91 using the Intraclass correlation coefficient (ICC). The level of worry ranged from zero to 4 in each item. Higher total scores indicated higher worry (13).

2-2-2. The Mothers' prenatal distress questionnaire

This questionnaire is a Persian translation of the scale developed by Alderdice and Lynn in 2011 (29). It has 25 items in 6 sub-categories, including maternal health, infant health, maternal interest in the child, childbirth and motherhood experience, personal-familial and personal-job issues. The questionnaire is based on a 5-point Likert scale with the minimum score of zero and the maximum of 100. Despite the lack of cut-off point for the questionnaire, its score indicates how much a pregnant woman is worried, and in which areas. The questionnaire is estimated to have acceptable validity and reliability indices in the Iranian society. The total test-retest coefficient of the whole questionnaire was 0.74, and Cronbach's alpha 0.78; and the face, content, criterion, and construct validity were acceptable (26).

2-2-3. Checklist of the demographic and midwifery characteristics

This researcher-made checklist consists of 40 questions about the couple's personal characteristics, midwifery characteristics, and counseling services. Midwifery characteristics include gestational age, history of problematic pregnancies, planning for pregnancy, regular visits for care, and participating classes during pregnancy.

2-2-4. Checklist of the parents' mental health

This checklist is derived from the Symptom Checklist 90 (SCL-90) designed by Limin and Currie in 1973 for indicating the psychological aspects of physical and mental patients. The questionnaire was revised by Derogatis et al. (1984), and its final form was prepared by the name of The Symptom Checklist 90 Revised (SCL-90-R) (30). Its validity and reliability were evaluated by Najjarian et al. (2001), in Iran, indicating that the SCL-25 had a very high correlation (0.95) with the main scale in the Iranian society despite the reduction of 65 out of 90 items, and was a valid and reliable scale for measuring general psychological damage. Each item of the questionnaire consisted of a 5-point scale of worry. The scores of the 25 items were added together in order to get the total score ranging from 0 to 100 (27). The cut-off point was 2.5 for each subscale, and 1.3 for the total index (31). The more the mean score of the questionnaire, the more mental health disorders of the respondent.

2-2-5. The questionnaire of perceived social support

This scale, developed by Mary Procidano and Kennet Heller (32) contains 20 items related to experiences, perceptions and feelings that most people sometimes have in their relationships with their family. Each item can have three answers: Yes, No, I do not know. The alpha Cronbach coefficients of the scale are from 0.88 to 0.91. The test has a good concurrent validity. The total score range is from zero to 20; and a high score indicates higher social-familial support one receives (28).

2-3. Data Analysis

The path analysis tests a theoretical model, leading to an experimental model by performing a statistical analysis on the data related to that model. Path analysis, in addition to direct effects, shows the indirect effects of each of the independent variables and their magnitude on the dependent variable. Therefore, it is natural that causal relationships of the variables in the experimental model are always different from those in the theoretical model. The theoretical model for determining predictors of fathers' worry about their wifes' high-risk pregnancies is as follows (33). Based on the review, the variables that were identified in the studies as the variables related to the fathers' concern were selected and a conceptual model was drawn based on the review (**Fig. 1**).

The data were analyzed using the path analysis method by the help of LISREL

8.8 full version. Central and dispersion indices were used to describe the observations; and the path analysis was used to identify the most important indices; and the significance level was considered to be less than 0.05. The most common goodness-of-fit indices were examined to confirm the final model. The indices and their acceptable values included the Root Mean Square Error of Approximation (RMSEA) (Good <0.08), Normed fit index (NFI) (>0.9), Comparative fit index (CFI) (>0.9), Goodness of fit (GFI) (>0.9), and Chi-square per degree of freedom (CMIN/df) (3<).
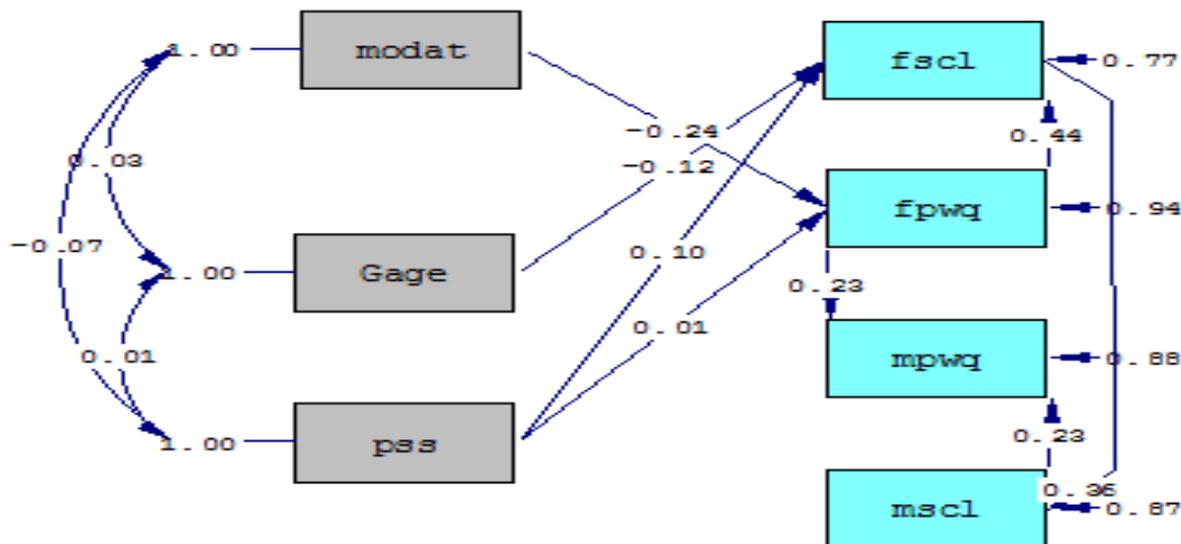
mpwq = Mother's Worry ،mscl = Mother's mental health ،fscl= father's mental health
pss = Social support ،modat = Duration of marriage ،G.age = Gestational age

Fig 1: Path diagram showing the relationship among father's Worry and Mother's Worry, Mother's mental health, father's mental health, Social support, Duration of marriage, and Gestational age.

3- RESULTS

Based on the research results, the mothers aged 14-45 years had a mean±standard deviation of 28.58±6.85, the fathers aged 20-65 had a mean±standard deviation of 32.84±6.9, and the mean marriage duration was 7.06±5.93 years old. The majority of mothers and fathers had high school degrees (35% and 37% respectively), and the majority of fathers were self-employed (50.3%). The study also indicated that 96 fathers (25.6%), and 119 mothers (31.7%) had mental health disorders. The mothers' worry scores ranged from zero to 104. The mean score of mother's worry was 34.57, indicating that the mothers had worry levels lower than the average. Furthermore, the mean score of the mother's perceived social support was equal to 14.45, and was higher than the average of 10 (the total score of the scale could range from 0 to 20). **Table 1** presents the frequency and percentage of a number of demographic and midwifery variables among the couples with high-risk pregnancies.

According to the results of the path analysis, among different variables in both paths, the mother's worry (B= 0.31) had

the highest positive correlation to the father's worry. This factor was both directly and indirectly related to the father's worry through the maternal mental health.

Table-1: Frequency and percentage of a number of variables among couples with high-risk pregnancies in health centers and hospitals of Gorgan in 2016

Variable	Group	Number (%)
Economic status	Enough	212 (72.1)
	More than enough	15 (5.1)
	Less than enough	64 (21.8)
Adequate income for care	Yes	155 (52.7)
	No	134 (45.6)
Pre-planning for pregnancy	Yes	194 (66)
	No	93 (31.6)
	First pregnancy	5
Attending a pregnancy class	Yes	44 (15)
	No	243 (82.7)
Dimensions of fathers' worry in high-risk pregnancies	Maternity pregnancy	2.7235 ± 0.90855 , P=0.00[3]
	Infant health	2.6222 ± 1.05707 , P=0.000
	Maternal health	2.77430 ± 0.99526 , P=0.00
	Personal-familial	2.2170 ± 1.17162 , P=0.001
	Total worry	$2.5842\pm.69845$, P=0.000

1 = F (%)　　　2 = Mean ± SD　　　3 = T-TEST

Among the variables, which were associated with worry from only an indirect path, the mother's mental health variable had the highest positive correlation (B = 0.12), and the duration of marriage had the highest negative correlation with father's worry (B= -0.22). In a direct way, the paternal mental health was positively related to the father's worry (B= 0.3) (**Table 2**).

Table-2: Direct effect of each variable on fathers' worry about the high risk pregnancy of their Wife.

variable	Direct effect	Indirect effect	Total effect	t-value
fpwq	0.26	0.05	.31	4.78
fscl	-	0.12	0.12	3.48
mscl	0.3	-	0.3	4.10
pss	-	0.03	0.03	0.68
modat	-	-0.22	-0.22	-3.14
Gage	-	-0.03	-0.03	-1.91

mpwq = Mother's Worry, mscl = Mother's mental health, fpwq = Father's worry pss= Social support, modat = Duration of marriage, G.age = Gestational age

The maternal mental health was related to the father's worry through the paternal mental health. The duration of marriage was also negatively related to the father's worry through the mother's worry. Social support was positively related to fathers' worry in two paths. In the first path, social support was indirectly related to the

father's worry through association with the mother's worry. In the second path, social protection decreased the fathers' worry by improving the maternal mental health. Gestational age was indirectly and negatively related to fathers' worry. In other words, as the gestational age increases, fathers become less worried. Gestational age was related to father's worry through association with maternal mental health and mothers' worry.

Therefore, increasing the gestational age decreased the fathers' worry by improving maternal mental health and reducing the mother's worry (**Fig. 1**). Results of model fit indices indicated the desirability, high fit of model, and rationality of adjusted relationships of the variables based on the conceptual model. Accordingly, the fitted model was not significantly different from the conceptual model (**Table 3**).

Table-3: Goodness of fit Characteristics in the path analysis model

X^2	df	X^2/df	CFI	GFI	NFI	RMSEA
13.65	10	1.36	0.98	0.99	0.94	0.03

Abbreviation: CMIN/df = Chi-square/degrees of freedom ratio, RMSEA = Root Mean Square Error of Approximation, NFI = Normed Fit Index, CFI = Comparative Fit Index, GFI= Goodness of Fit Index.

4- DISCUSSION

The present study was conducted to investigate the predictors of the fathers' worry about high-risk pregnancy of their wife. High-risk pregnancy can affect both of the spouses as a joint product of the couple and their supportive roles for each other. During this period, fathers are less supported, but mothers usually receive greater support. On this basis, there is a public vulnerability for men (34). Despite the fact that being aware of the fathers' experiences and worries during pregnancy is a key step in promoting their mental health (35), there are very few studies on fathers' worry, especially about the high-risk pregnancy and its relevant factors (36).

The most important advantage of the path analysis method compared to other methods such as the regression analysis is that the regression analysis is only able to identify the effect of each independent variable on the dependent variable, but the path analysis method not only clarifies the direct effects, but is also able to identify the indirect effects of each independent variable on the dependent variable. On the other hand, the degree of false relationships between variables can be found in the path analysis (37).

According to the results of path analysis, the mother's worry had the highest positive association to the father's worry among the related variables in both paths. The factor was both directly and indirectly related to the mother's worry through association to maternal mental health. Among variables, which were associated with paternal worry only through an indirect path, the maternal mental health had the highest positive association; and the duration of marriage had the highest negative association with the father's worry. In an indirect path, social support had a positive relationship and gestational age had a negative relationship with the fathers' worry. In a direct path, the paternal mental health was positively related to the father's worry and the maternal mental health was indirectly related to the father's worry through the paternal mental health.

In other words, the less the mother's worry, the less the father's worry; and the more

desirable the mother's mental health causes better paternal mental health and less fathers worry.

Hajikhani et al. (2018) found that higher worrying levels of pregnant mothers make their mental health more impaired (13). Based on the findings of Hajikhani et al. in 2020, the pregnant mothers' mental health disorder also impaired their spouse's mental health (38). A study in Australia found that the fathers, who experienced more worry during pregnancy, received less psychological support from their wife and had higher mental disorders (39). Therefore, the mother's concern during pregnancy leads to impaired maternal mental health. The mothers with mental health disorders, on the one hand, lose the psychologically supportive role for their husbands leading to the husbands' higher worry, and on the other hand, the mothers' mental health disorder has a direct effect on her husbands' mental health disorder.

In a study by Koh et al. (2017) in China on factors associated with mental health disorders among fathers during and after pregnancy, it was found that psychosocial factors (marital conflict, low self-esteem, work and family conflict, and poor social support), and maternal factors (maternal medical problems, and maternal depression and anxiety) were strong predictors of anxiety and depression in fathers (19).

4-1. Limitation

The strengths of the present study include the focus on fathers who are less taken into consideration in routine care during pregnancy, especially high-risk pregnancies. A limitation of this study was the use of questionnaires and self-reporting.

5- CONCLUSION

According to findings, mothers' worry, fathers' mental health, and maternal mental health had the highest association with fathers' worry. On this basis, it is important to pay attention to supportive and counseling programs for fathers.

Requiring the fathers to participate in childbirth preparation classes and trying to keep them informed about the delivery process, the mother's physiological changes, and fetal growth would reduce the father's worry. Special attention to high-risk pregnant mothers and counseling and reassuring them about their capabilities and the existence of comprehensive support can promote their mental health during pregnancy, which leads to better acceptance of the situation. Therefore, it is better to pay special attention to the mental health programs in high-risk pregnancies, because improving the mental health of the mothers also leads to improving the mental health of the fathers. So, health care professionals and midwives should be specifically trained in the diagnosis and management of anxiety and worry. The awareness of health care providers and midwives increases their sensitivity to the psychological needs of the expectant fathers.

6- ETHICAL CONSIDERATIONS

7- ACKNOWLEDGEMENTS

8- ABBREVIATION

mpwq = Mother's Worry

mscl = Mother's mental health

fscl = father's mental health

pss = Social support

modat = Duration of marriage

G.age = Gestational age

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