

Araştırma Makalesi/Research Article

Effect of Physical Activity and Depression on Quality of Life in Pregnant Women During COVID-19 Pandemic: A Path Analysis

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COVID-19 Pandemi Sürecinde Gebelerde Fiziksel Aktive ve Depresyonun Yaşam Kalitesi Üzerine Etkisi: Bir Path Analizi

ABSTRACT

Objectives: The purpose of this study was to determine the effects of physical activity and depression on quality of life in pregnant women during the COVID-19 pandemic.

Methods: A cross-sectional design was conducted with 127 women who filled International Physical Activity Questionnaire – Short Form, Beck Depression Scale, World Health Organization Quality of Life Scale - Short Form (Turkish Version) and the Individual Identification Form were recruited from Gynaecology and Obstetrics outpatient clinics were conducted between May and September 2021.

Results: The results showed that the direct effect of depression on the environment, physical health and general health sub-dimensions of the World Health Organization Quality of Life Scale-Short Form was negative direction and significant ($p<.05$).

Conclusion: The study revealed that the quality of life of women who experienced depressive symptoms during pregnancy decreased during the pandemic process. According to the path analysis performed, physical activity has no direct effect on quality of life.

Keywords: COVID-19 outbreak, Depression, Physical activity, Pregnant woman, Quality of life, Women Health

ÖZ

Amaç: Bu çalışmanın amacı, COVID-19 pandemisi sürecinde gebe kadınlarda fiziksel aktivite ve depresyonun yaşam kalitesi üzerindeki etkilerini belirlemektir.

Metod: Kesitsel olarak tasarlanan bu çalışma, Kadın Hastalıkları ve Doğum polikliniğine başvuran 127 gebe kadın ile Mayıs- Eylül 2021 tarihleri arasında gerçekleştirildi. Veriler, Uluslararası Fiziksel Aktivite Anketi – Kısa Form, Beck Depresyon Ölçeği, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği – Kısa Form (Türkçe Versiyon) ve anket formu ile toplandı.

Bulgular: Sonuçlar, depresyonun Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği-Kısa Formu'nun çevre, fiziksel sağlık ve genel sağlık alt boyutları üzerindeki doğrudan etkisinin negatif yönde ve anlamlı olduğunu göstermiştir ($p<.05$). Gerçekleştirilen path analizine göre fiziksel aktivitenin yaşam kalitesi üzerinde doğrudan etkisi yoktur.

Sonuçlar: Bu çalışmada, gebelik döneminde depresif belirtiler yaşayan gebe kadınların pandemi sürecinde yaşam kalitelerinin azaldığı belirlendi.

Anahtar Kelimeler: COVID-19 salgını, Fiziksel aktivite, Depresyon, Gebe Kadın, Kadın Sağlığı, Yaşam kalitesi,

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EXTENDED ABSTRACT

Amaç: Pandemi sürecinde gebelerde yetersiz fiziksel aktivite ve artan depresif belirtilerin yaşam kalitesi üzerindeki olumsuz etkileri, anne ve yenidoğan sağlığı yani toplum sağlığı açısından giderek devam eden bir sorun olabilir. Bu çalışmanın amacı, COVID-19 salgını sırasında gebe kadınlarda fiziksel aktivite ve depresyonun yaşam kalitesi üzerine etkilerini belirlemektir.

Yöntem: Kesitsel tipteki çalışma Mayıs-Eylül 2021 tarihleri arasında kadın doğum polikliniğine başvuran ve Uluslararası Fiziksel Aktivite Anketi - Kısa Form, Beck Depresyon Ölçeği, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği - Kısa Formu (Türkçe) dolduran 127 kadın ile gerçekleştirildi. Makalenin hazırlanmasında Epidemiyolojide Gözlemsel Çalışmaların Raporlanmasının Güçlendirilmesi (STROBE) kontrol listesi kullanıldı. Gebe kadınlarda fiziksel aktivite ve depresyonun yaşam kalitesi üzerine etkilerini belirlemek amacıyla path analizi yaklaşımı kullanıldı.

Bulgular: Sonuçlar, depresyonun Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği-Kısa Formu'nun çevre, fiziksel sağlık ve genel sağlık alt boyutları üzerindeki doğrudan etkisinin negatif yönlü ve anlamlı olduğunu gösterdi ($p<.05$). **Gerçekleştirilen path analizine göre fiziksel aktivitenin yaşam kalitesi üzerinde doğrudan etkisi yoktur.**

Sonuç: Araştırma, gebelikte depresif belirtiler yaşayan kadınların pandemi sürecinde yaşam kalitesinin düştüğünü ortaya çıkardı. Sağlık profesyonellerinin, COVID-19 salgınında doğum öncesi bakım almaya gelen gebelerde depresyon ve yaşam kalitesi düzeylerini mutlaka sorgulaması gerekmektedir. Pandemi sürecinde depresyonun önlenmesine yönelik müdahaleler (sosyal destek sistemlerinin güçlendirilmesi ve çevrimiçi bireysel görüşmeler vb.) gebelerin yaşam kalitesini artırabilir.

INTRODUCTION

The coronavirus disease (COVID-19) was declared a global health emergency by the WHO due to its rapid spread and occurrence of deaths all over the world after its first appearance in Wuhan province of China in December 2019 (Biviá-Roig et al., 2020). At the time of writing this paper, the number of people infected with SARS-CoV-2 was 352,796,704 with 5,600,434 resulting deaths (WHO, 2022). COVID-19 spreads via droplets, coughing and by contacting the nose and eyes with

hands that have touched contaminated surfaces (Turkish Republic Ministry of Health, 2021). Its common symptoms include fever, coughing, muscle and joint pains, diarrhoea, headache, leucopenia, and thrombocytopenia. Two thirds of pregnant women with COVID-19 are asymptomatic and most of those who are symptomatic experience only mild symptoms similar to those of cold or flu (RCOG, 2021). However, there are reports of pneumonia, influenza, gestational hypertension, preeclampsia, fever, coughing, sore throat, weakness, shortness of breath, foetal distress, and early membrane rupture in pregnant women with COVID-19 (Li et al., 2020). Strict measures used to control the spread of the disease such as social distancing and isolation have considerably changed the daily routines of the entire population including pregnant women. Pregnant women have been left under stress during this pandemic due to the restrictions, problems in having access to prenatal care because of the congestion in hospitals, and the risk of contracting the disease (Kajdy et al., 2020).

The life style of a pregnant woman has substantial effects on the mother's health and fetal development (Biviá-Roig et al., 2020). Studies have found that although physical activity (PA) during pregnancy was not effective in controlling weight, it decreased the risk of gestational diabetes and hypertension, alleviated lumbar pain and depression symptoms, and improved mental health and quality of life (QoL) (ACOG, 2015). Despite limited evidence from randomized clinical trials, observational studies have shown that exercising during pregnancy has favourable impacts on GDM, caesarean-operative vaginal delivery rates, and postpartum recovery time (Büyükbayrak, 2016; Montoya Arizabaleta et al., 2010). The prevalence of antenatal and postnatal depression is also lower and QoL higher in exercising pregnant women (Montoya Arizabaleta et al., 2010; Robledo-Colonia et al., 2012). The American College of Obstetricians and Gynaecologists (ACOG) recommends at least 30 minutes of moderate activity or taking 8000 steps daily to women without a complicated pregnancy provided that they avoid contact sports such as football and basketball, and activities in a supine position (ACOG, 2015). Due to isolation caused by COVID-19 Pandemic, however, pregnant women have not been able to go to a gymnasium or swimming pool to perform their physical activities (Hori et al., 2021).

The coronavirus disease (COVID-19) pandemic has been reported to make pregnant women prone to **depression** as is the case in the general population (Wang et al., 2020). The COVID-19 pandemic is not only a public health crisis but also a social, demographic and economic crisis and has a negative psychosocial effect on everyone including pregnant women (Güler ve ark., 2021). Gestational depression is the most common psychiatric disorder with serious adverse effects on both the mother's and the baby's health (Alderdice et al., 2013). Studies have reported increased rates of anxiety and depression in pregnant women during the Covid-19 pandemic (Ayaz ve ark., 2020; Fan et al., 2021; Lebel et al., 2020). The higher rates of symptoms found in the studies were associated with the greater concern about the threat posed by COVID-19 to the lives of the mother and the baby, the inability to receive necessary prenatal care, the tension in the relationship with the partner, and the social isolation due to the COVID-19 pandemic (Alderdice et al., 2013). Depression is reported to increase gestational and delivery complications, cause preterm birth, low birth weight and intrauterine development retardation, and negatively affect the health of the newborn (Alderdice et al., 2013; Ayaz ve ark., 2020). Ensuring that pregnant women have a good QoL is important for their pregnancy outcomes (Lagadec et al., 2018). A number of previous studies have shown that pregnant women had a considerably lower QoL during the COVID-19 pandemic compared to non-pregnant women and the general public (Alaya et al., 2021; Mirzaei et al., 2021). There is no study in the literature exploring the effects of PA and depression on QoL in pregnant women during the COVID-19 pandemic. For this reason, the researchers in this study aimed to determine the effects of PA and depression on QoL in pregnant women during the COVID-19 pandemic.

METHODS

Design

This descriptive cross-sectional study was conducted with pregnant women who presented to the Healthcare Practices and Research Centre, Gynaecology and Obstetrics outpatient clinics of a university hospital in Turkey during the partial lockdown period of COVID-19 pandemic. A G*Power analysis was carried out to determine the number of pregnant women to be included in the study and to make a power estimation for the study

(Faul et al., 2009). Our calculations based on the two-way hypothesis test, taking "0.25" as the H_1 R^2 value, "0" as the H_2 R^2 value, .05 as the error margin, 90% as the power, and 4 predictor variables for a multiple linear regression showed that at least 63 pregnant women should be included in the study. Therefore, the goal was to work with more than 63 pregnant women in this research (n = 127). Included in the study were women aged 19 years and over who were graduates of at least primary school, who were in their gestational week 5-38, who had a healthy fetus, had no chronic disease, had a spontaneous pregnancy, who were able to understand and speak Turkish, and who agreed to take part in the study. The exclusion criteria were risky pregnancy (multiple pregnancy, preeclampsia, gestational diabetes, etc.) and having been diagnosed with a psychological illness (depressive personality disorders, depression, generalized anxiety disorder, etc.). Some demographic variables relating to the pregnant women are shown in Table 1. The STrengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist was used preparing the manuscript.

Data Collection

The study data were collected between May 2021 and September 2021 using the Individual Identification Form, International Physical Activity Questionnaire – (Short) [IPAQ-SF], Beck Depression Scale (BDS), and World Health Organization Quality of Life Scale -Short Form Turkish Version [WHOQOL-BREF (TR)].

Individual Identification Form

Developed by the investigators in line with the literature, the Individual Identification Form consists of 18 questions in total, 9 questions on socio-demographic characteristics (age, education, employment, income, place of longest living, duration of marriage, household, smoking, trusted person) and 9 questions on obstetric characteristics (number of pregnancies, number of deliveries, number of abortions, number of curettages, number of live births, mode of delivery, gestational week, wanted or unwanted pregnancy, thoughts about the changes the baby will bring to their life) (Kajdy et al., 2020; Montoya Arizabaleta et al., 2010; Mirzaei et al., 2021; Kazemi et al., 2016).

International Physical Activity Questionnaire – Short Form (IPAQ-SF)

The “level of PA”, which is an independent variable in this study, was measured using the International Physical Activity Questionnaire – Short Form that was developed by Craig et al. and adapted to Turkish and tested for validity and reliability by Öztürk (Craig et al., 2003; Öztürk, 2005). When interpreting the questionnaire, the standard IPAQ procedures were followed and then the number of days was multiplied by the number of hours reported for each component to find the metabolic equivalent (MET) scores. Based on total MET scores, the activity categories (inactive, active and very active) were determined. Those not found active or very active were rated as inactive. The questionnaire has 4 sub factors. The questionnaire has four subfactors: vigorous physical activity, moderate physical activity, walking activity and sitting activity (Craig et al., 2003). For this reason, the total score of each sub factor was taken and 4 predictor variables were included in the regression analysis.

World Health Organization Quality of Life Scale-Short Form (WHOQOL-BREF-TR)

One of the dependent variables of the study was quality of life. The QoL of pregnant women was assessed using the Brief Form of the World Health Organization Measuring Quality of Life-WHOQOL that was developed by the WHO and tested for validity and reliability in Turkish by Eser et al. (1999). The scale has 2 versions, a long (WHOQOL-100) and a short (WHOQOL-27) version. The scale consists of 5 sub factors, general health, physical health, psychological, social relationships and environment. The 26 questions in the scale measure physical, mental, social and environmental well-being. In its Turkish version (Question 27 is a national question), the Environment domain score is named as environment-TR. This means that the environment-TR domain score is used in place of the environment score. Since each domain represents QoL within that domain, independent of other domains, the domain scores range between 4 and 20. Higher scores indicate improved QoL (Eser ve ark., 1999).

Beck Depression Inventory (BDI)

Another dependent variable of the study is the level of depression in pregnant women. Developed by Beck and adapted to Turkish by Hisli, the Beck Depression Inventory was used to assess depression levels of pregnant women. The goal of the inventory is to reveal the severity of depressive symptoms rather than diagnosing depression. The

inventory can be administered to adolescents older than 15 years and to adults. It consists of 21 items. Each item has a 4-category answer set, “0”, “1”, “2” and “3”. The lowest score obtainable from the inventory is “0” and the highest “63”. The data to be obtained from the inventory may be used as continuous data, that is, as scores and also as segment scores to categorize individuals. The most frequently used segment scores are 0 to 9 for minimal depression, 10 to 16 for mild depression, 17 to 29 for moderate depression, and 30 to 63 for severe depression (Beck et al., 1961; Hisli, 1989). In the study carried out to adapt the inventory to Turkish, the cut-off score was set at 17.²⁹ A score of 17 and above obtained from the inventory identifies, with an accuracy of 90%, a depressive symptom that needs to be treated (Beck et al., 1961).

Pregnant women who volunteered to participate in the study were taken to a room right next to the outpatient clinic and suitable for data collection. At the beginning of the data collection process, participants were given an informed consent document to review and sign. After signing the verbal consent and informed consent document, the author was asked to fill in the data collection forms. Questionnaire forms were filled by pregnant women based on their own self-reports. It took approximately 20 minutes to fill out the questionnaires for pregnant women.

Data Analysis

The data obtained were transferred to the JAMOVİ program. The reason for choosing this software was because it is free software. When analysing the data, a path analysis was performed. Path analysis is an approach to model explanatory relationships between the variables being studied. The defining feature of path analysis models is the absence of hidden variables. Path analysis models are special forms of structural equation models. The path model designed included continuous variables such as depression, duration of marriage, pregnancy week and perceived QoL as well as categorical variables such as job and employment status, and activity status. Since the variables in the model were categorical and there was no expectation of a normal distribution, the estimations were made by the “Asymptotic Distribution Free” method (Raykov ve Marcoulides, 2006).

Ethical Considerations

This study was conducted in accordance with the guidelines in the Declaration of Helsinki. An ethics committee (Çanakkale Onsekiz Mart University Clinical Research Ethics Committee) approval was obtained from the Clinical Research Ethics Committee of a university. (06.05.2021-05-35). Informed consent was obtained from all participants.

RESULTS

The distribution of active and inactive pregnant women included in the study by some of their

demographic and obstetric characteristics is presented in Table 1. 54.3% of the pregnant women participating in the study had a college or lower education level, 63.8% worked, 48.0% lived in the town, 81.1% lived with their husband and/or children, 57.5% never smoked. It was determined that 52.8% of the participants had their first pregnancy, 71.7% had never given birth, 73.2% had no curettages, 93.7% had never had a abortus, 70.1% had no living children, 50.0% did not know how the previous pregnancy ended (Table 1).

Table 1 Demographic data of active and inactive pregnant women (n = 127).

Variables	Inactive pregnant	Active pregnant	Total
	n (%)	n (%)	n (%)
Education level	High school and below	25 (35.2)	58 (45.7)
	Collage and above	23 (41.1)	69 (54.3)
Employment status	No	17 (23.9)	46 (36.2)
	Yes	27 (48.2)	81 (63.8)
Place of Living	Village	6 (8.5)	15 (11.8)
	Town	29 (40.8)	61 (48.0)
	City	36 (50.7)	51 (40.2)
Household	Husband and/or children	59 (83.1)	103 (81.1)
	Husband's parents	12 (16.9)	24 (18.9)
Smoking	Occasionally	6 (8.5)	13 (10.2)
	Quit	13 (18.3)	41 (32.3)
	Never smoked	52 (73.2)	73 (57.5)
Number of pregnancies	1	37 (52.1)	67 (52.8)
	2	25 (35.2)	43 (33.9)
	3 and over	9 (12.7)	17 (13.4)
Number of deliveries	0	46 (64.8)	91 (71.7)
	1 and over	25 (35.2)	36 (28.3)
Number of miscarriages	0	56 (78.9)	93 (73.2)
	1 and over	15 (21.1)	34 (26.8)
Number of abortions	0	67 (94.4)	119 (93.7)
	1 and over	4 (5.6)	8 (6.3)
Number of living children	0	45 (63.4)	89 (70.1)
	1 and over	26 (36.6)	38 (29.9)
Outcome of previous pregnancy	Caesarean birth	14 (19.7)	16 (12.6)
	Normal birth	11 (15.5)	19 (15.0)
	Abortus	12 (16.9)	28 (22.0)
	Unknown	34 (47.9)	64 (50.4)
Total	56 (100)	71 (100)	127 (100)

Table 2 Comparison of depression levels in pregnant women in various variables (n = 127)

Variables	n	Depression				Direction of Significant Difference in Groups	
		Mean (SD)	Median (Min.-Max.)	U or K-W test	p value		
Education	High school and below	58	7.78 (3.72)	7 (3-18)	1276.5	<.0001	Collage and Higher<High school and below
	Collage and Higher	69	5.72 (3.37)	5 (0-22)			
Employment	No	46	8.33 (4.86)	7 (0-22)	1234.5	<.0001	Yes<No
	Yes	81	5.72 (2.32)	5 (1-13)			
Place of Living	Village	15	7.47 (3.58)	6 (3-17)	15.634	<.0001	City<Town City<Village
	Town	61	7.64 (4.07)	7 (1-22)			
	City	51	5.25 (2.66)	5 (0-14)			
Household	Husband and/or children	103	6.45 (3.58)	5 (0-22)	941.5	.068	
	Husband's parents	24	7.58 (3.99)	8 (1-18)			
Smoking	Occasionally	13	6.31 (4.73)	5 (0-16)	0.866	.649	
	Quit	41	7.05 (4.09)	6 (1-22)			
	Never smoked	73	6.51 (3.22)	6 (3-17)			
Number of pregnancies	1	67	6.73 (3.16)	6 (3-18)	3.069	.216	
	2	43	6.12 (3.48)	5 (1-17)			
	3 and over	17	7.76 (5.56)	7 (0-22)			
Number of deliveries	0	91	6.65 (3.27)	6 (1-18)	1535.5	.581	
	1 and over	36	6.69 (4.57)	5.5 (0-22)			
Number of miscarriages	0	93	6.33 (3.26)	5 (0-18)	1338	.183	
	1 and over	34	7.56 (4.54)	6 (1-22)			
Number of abortions	0	119	6.81 (3.66)	6 (1-22)	349	.204	
	1 and over	8	4.5 (3.16)	5.5 (0-8)			
Number of living children	0	89	6.66 (3.32)	6 (1-18)	1592.5	.744	
	1 and over	38	6.76 (4.48)	6 (0-22)			
Outcome of previous pregnancy	Caesarean	16	6.5 (3.72)	5 (3-17)	0.826	.843	
	Normal birth	19	7.16 (5.39)	7 (0-22)			
	Low	28	6.25 (3.39)	6 (1-15)			
	Unknown	64	6.73 (3.19)	6 (3-18)			
Total		127					

Abbreviations: K-W test, Kruskal-Wallis test; SD, standart deviation; U test, Mann-Whitney U test.

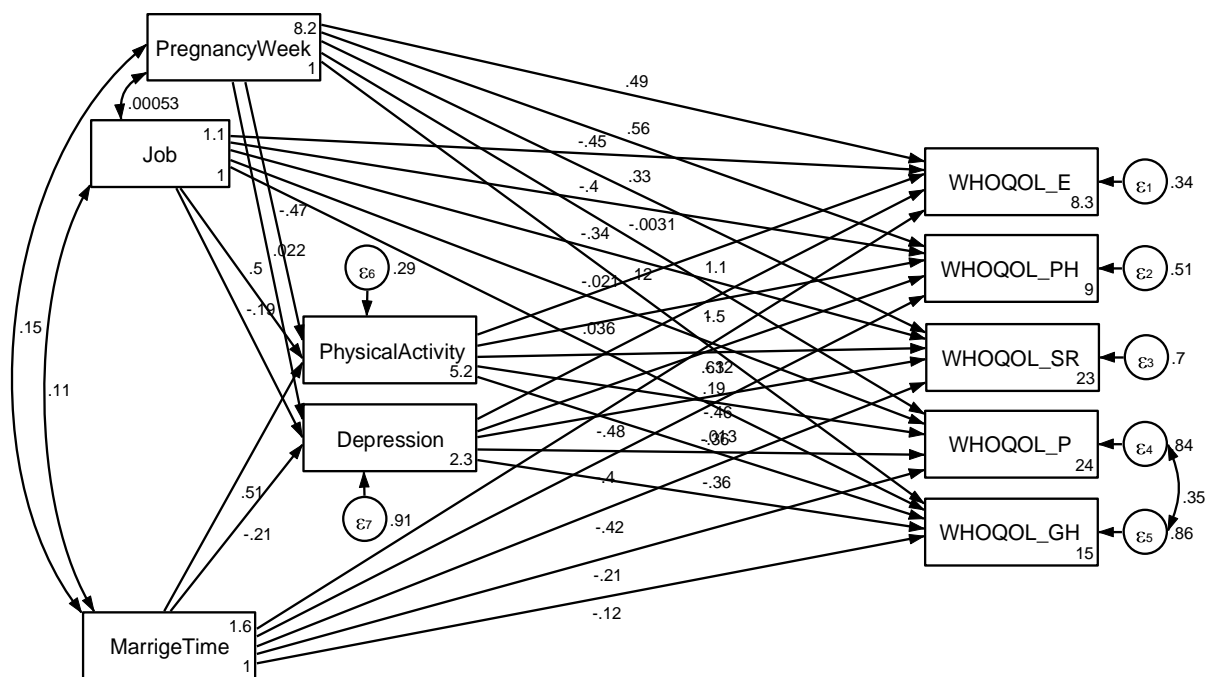
Table 3 Comparison of quality-of-life levels in pregnant women in various variables (n = 127)

Variables	n	QoL				Direction of Significant Difference in Groups	
		Mean (SD)	Median (Min.-Max.)	U or K-W test	p value		
Education	High school and below	58	89.5 (5.46)	91 (75-101)	1130	<.0001	High school and below<Collage and Higher
	Collage and Higher	69	93.25 (3.78)	93 (85-105)			
Employment	No	46	89.39 (6.42)	90 (75-105)	1180	<.0001	No<Yes
	Yes	81	92.75 (3.39)	93 (82-101)			
Place of Living	Village	15	88.87 (7.69)	91 (75-101)	22.896	<.0001	Town<City Village<City
	Town	61	90.23 (4.65)	91 (76-105)			
	City	51	93.88 (3.13)	94 (88-101)			
Household	Husband and/or children	103	92.34 (4.51)	93 (77-105)	609.5	<.0001	Husband's parents<Husband and/or children
	Husband's parents	24	88.08 (5.43)	90.5 (75-95)			
Smoking	Occasionally	13	90.46 (4.84)	92 (78-95)	1.546	.462	
	Quit	41	91.2 (5.32)	92 (76-105)			
	Never smoked	73	91.92 (4.81)	93 (75-101)			
Number of pregnancies	1	67	91.01 (5.01)	91 (75-101)	3.866	.145	
	2	43	92.65 (4.35)	93 (79-101)			
	3 and over	17	90.76 (5.99)	92 (77-105)			
Number of deliveries	0	91	91.16 (4.72)	91 (75-101)	1302	.071	
	1 and over	36	92.47 (5.49)	92.5 (77-105)			
Number of miscarriages	0	93	91.63 (4.95)	92 (75-101)	1404.5	.335	
	1 and over	34	91.26 (5.07)	92 (77-105)			
Number of abortions	0	119	91.54 (5.06)	92 (75-105)	460	.873	
	1 and over	8	91.5 (3.51)	92.5 (86-95)			
Number of living children	0	89	91.1 (4.82)	91 (75-101)	1318	.071	
	1 and over	38	92.45 (5.35)	92.5 (77-105)			
Outcome of previous pregnancy	Caesarean	16	93 (4.68)	94 (79-98)	4.775	.189	
	Normal birth	19	92.53 (5.83)	92 (77-105)			
	Low	28	91.43 (4.07)	92 (82-101)			
	Unknown	64	90.92 (5.11)	91 (75-101)			
Total		127					

According to the comparison analyses made, the education level of the woman made a difference in the depression level ($p < .05$). Women with higher education levels are less depressed than those with low levels of education. There was a difference in the level of depression whether the woman had a job or not ($p < .05$). Unemployed women have higher levels of depression than those with a job. The place of residence of the woman created a difference in the level of depression ($p < .05$). The depression level of women living in cities is lower than those living in villages and towns (Table 2). In addition, according to the comparison analysis, educational status of women made a difference in their quality of life ($p < .05$). Women with higher education levels have a higher quality of life than those with lower education levels. There was a difference in the quality of life whether the woman had a job or not ($p < .05$). The quality of life of unemployed women is lower than that of employed women.

The place of residence of the woman created a differentiation in the quality of life ($p < .05$). The quality of life of women living in cities is higher than those living in villages and towns. The quality of life that the woman lived with at home created a differentiation ($p < .05$). The quality of life of women living with their husbands and children is higher than those living with their spouse's family (Table 3).

The effects of the employment status, pregnancy week, duration of marriage, PA, and depression variables on QoL were modelled. Additionally, the effects of pregnancy week, employment status and duration of marriage on QoL through the mediator variables activity and depression were modelled. The analysis method enabling analysis of both direct and indirect (through mediator variables) effects is the regression-based Path analysis (Kline, 2011; Streiner, 2005). The Path analysis model used is shown in Figure 1.



WHOQOL_E: World Health Organization Measuring Quality of Life Environment Sub Factors
WHOQOL_PH: World Health Organization Measuring Quality of Life Physical Health Sub Factors
WHOQOL_SR: World Health Organization Measuring Quality of Life Social Relations Sub Factors
WHOQOL_P: World Health Organization Measuring Quality of Life Psychology Sub Factors
WHOQOL_GH: World Health Organization Measuring Quality of Life General Health Sub Factors

Table 4 Regression predictions in the model

	Coefficient	Standard error	Z	p value	
Direct effect	Activity → WHOQOL_E	11.30	8.32	1.36	.174
	Depression → WHOQOL_E	-0.34	0.13	-2.62	.009
	Pregnancy Week → WHOQOL_E	0.29	0.26	1.13	.258
	Job → WHOQOL_E	-1.65	4.15	-0.40	.691
	Marriage Time → WHOQOL_E	-0.38	0.36	-1.05	.294
	Activity → WHOQOL_PH	6.87	4.10	1.68	.094
	Depression → WHOQOL_PH	-0.14	0.04	-3.67	< .0001
	Pregnancy Week → WHOQOL_PH	0.22	0.14	1.54	.124
	Job → WHOQOL_PH	-0.26	0.63	-0.42	.678
	Marriage Time → WHOQOL_PH	-0.07	0.06	-1.22	.223
	Activity → WHOQOL_SR	1.33	1.11	1.19	.233
	Depression → WHOQOL_SR	-0.07	0.04	-1.65	.098
	Pregnancy Week → WHOQOL_SR	0.04	0.03	1.26	.208
	Job → WHOQOL_SR	-0.26	0.63	-0.42	.678
	Marriage Time → WHOQOL_SR	-0.07	0.06	-1.22	.223
	Activity → WHOQOL_P	0.85	1.61	0.53	.595
	Depression → WHOQOL_P	-0.10	0.06	-1.85	.064
	Pregnancy Week → WHOQOL_P	-0.00	0.06	-0.01	.989
	Job → WHOQOL_P	-0.03	0.36	-0.09	.928
	Marriage Time → WHOQOL_P	-0.07	0.07	-0.99	.323
	Activity → WHOQOL_GH	0.03	0.32	0.10	.923
	Depression → WHOQOL_GH	-0.06	0.02	-2.72	.007
	Pregnancy Week → WHOQOL_GH	0.02	0.01	1.51	.130
	Job → WHOQOL_GH	0.03	0.12	0.26	.798
	Marriage Time → WHOQOL_GH	-0.02	0.02	-1.15	.250
	Pregnancy Week → Activity	-0.03	0.01	-2.54	.011
	Job → Activity	0.18	0.33	0.53	.597
	Marriage Time → Activity	0.04	0.02	2.39	.017
	Pregnancy Week → Depression	0.02	0.06	0.26	.794
	Job → Depression	-1.01	2.06	-0.49	.625
Marriage Time → Depression	-0.25	0.11	-2.19	.028	
Indirect effect	Pregnancy Week → Activity or Depression → WHOQOL_E	-0.31	0.25	-1.25	.213
	Job → Activity or Depression → WHOQOL_E	2.33	5.41	0.43	.677
	Marriage Time → Activity or Depression → WHOQOL_E	0.53	0.34	1.57	.117
	Pregnancy Week → Activity or Depression → WHOQOL_PH	-0.19	0.14	-1.37	.169
	Job → Activity or Depression → WHOQOL_PH	1.35	2.92	0.46	.643
	Marriage Time → Activity or Depression → WHOQOL_E	0.31	0.17	1.78	.076
	Pregnancy Week → Activity or Depression → WHOQOL_SR	-0.04	0.04	-1.18	.240
	Job → Activity or Depression → WHOQOL_SR	0.30	0.72	0.42	.674
	Marriage Time → Activity or Depression → WHOQOL_SR	0.07	0.05	1.51	.130
	Pregnancy Week → Activity or Depression → WHOQOL_P	-0.03	0.04	-0.57	.571
	Job → Activity or Depression → WHOQOL_P	0.26	0.66	0.38	.701
	Marriage Time → Activity or Depression → WHOQOL_P	0.06	0.07	0.87	.382
	Pregnancy Week → Activity or Depression → WHOQOL_GH	-0.01	0.01	-0.21	.832
	Job → Activity or Depression → WHOQOL_GH	0.06	0.15	0.43	.665
	Marriage Time → Activity or Depression → WHOQOL_GH	0.02	0.02	0.94	.350

Abbreviations: WHOQOL_E, environment; WHOQOL_PH, physical health; WHOQOL_SR, social relationships; WHOQOL_P, psychological; WHOQOL_GH, general health.

The goodness of fit index values of the Path analysis used were found to be 4.26 for the division of chi-square (X^2) by degree of freedom, 0.056 for the Root Mean Square Error of Approximation (RMSEA), 0.971 for the Comparative Fit Index (CFI), and 0.879 for the Tucker-Lewis Index (TLI). Some of the goodness of fit indexes obtained correspond to excellent and some acceptable goodness of fit indexes found in the literature (Streiner, 2005). These results showed that the model constructed was appropriate. The results obtained after reviewing the predictions from the model are shown in Table 4.

The indirect effects of employment status, pregnancy week and duration of marriage on QoL through the mediator variables, PA and depression, were not found significant ($p > .05$). The direct effect of depression on quality of life/environment (WHOQOL_E) was found to be in the negative direction and significant ($p < .05$). It can be said that as depression level goes up, environment-related QoL declines. The direct effect of depression on quality of life/physical health was found to be in the negative direction and significant ($p < .05$). It can be said that as depression level goes up, physical health-related QoL declines. The direct effect of depression on quality of life/general health was found to be in the negative direction and significant ($p < .05$). It can be said that as depression level goes up, general health-related QoL declines. The direct effect of pregnancy week on PA was found to be in the negative direction and significant ($p < .05$). As the pregnancy week advances, PA declines. The direct effect of duration of marriage on PA was found to be in the positive direction and significant ($p < .05$). As time spent in marriage advances, PA increases (Table 4).

DISCUSSION

The main result obtained from the study that investigated the effects of PA and depression on QoL in pregnant women during the covid-19 pandemic was that increasing levels of depression were correlated with decreasing levels of WHOQOL_E, WHOQOL_PH and WHOQOL_GH. The result of our study is of critical importance in terms of interventions to be initiated towards improving QoL in pregnant women during COVID-19 and other pandemics that may occur in the future. Similar to our study result, Kazemi, Nahidi and Kariman (2016) have also reported in their study that the factors

associated with poor QoL in pregnancy were increased depression, anxiety, sleep disorders, and experiences of life-threatening events (Kazemi et al., 2016). Our study result may have been influenced by quarantines and economic effects of the pandemic, unpredictable future, worries of pregnant women about their own and children's health. The study made by Mirzaei et al. (2021) also pointed out that the QoL scores of pregnant and breastfeeding women decreased considerably during the pandemic. The World Health Organization recommended quarantines at a global scale to reduce transmission from human to human in the face of increasing cases (WHO, 2022). Quarantine brought about several stressors (fear of infection, decreased PA, loss of daily living routines, decreased social activity, fear of physical contact with others, insufficient basic materials, insufficient knowledge, insufficient clear directives for measures to be taken, and serious socioeconomic problems) (Brooks et al., 2020). A study investigating the effects of depression, sexual function, marital satisfaction, general health and corona-related anxiety on the QoL of married women during the COVID-19 pandemic using the path analysis has shown that these factors had direct impacts on the QoL of these women (Daneshfar et al., 2021). Pregnancy in general exerts a great pressure on women both physically and psychologically and influences their QoL to a large extent (Lagadec et al., 2018). Being under the influence of the COVID-19 pandemic may worsen these physical and psychological changes in pregnant women (Mirzaei et al., 2021). The result we obtained in our study supports the literature.

Our study has concluded that PA had no effect on the QoL of pregnant women who were experiencing lockdowns during the pandemic. In their study investigating the relationship between the PA patterns of pregnant women and their QoL and depression, Tendais et al. (2011) observed that except for the WHOQOL_PH dimension score, all dimension scores decreased from the first trimester through the second trimester regardless of PA. The result we obtained from our study may relate to the extent to which pregnant women complied with preventive measures. In Turkey, the first SARS-CoV-2 case was reported on March 11, 2020 and nearly a week later the first death due to SARS-CoV-2 occurred. Continuation of some of the strict rules implemented to prevent the spread of the infection in our country such as closure of borders,

travelling restrictions and quarantines also during partial lockdowns as well as the residences, physical conditions, diets and personal characteristics of the pregnant participants might have influenced our results.

The results obtained in this study showed that with advancing gestational weeks, the level of PA declined. A similar result was obtained in a study conducted before the pandemic (Çeliker Tosun ve Okyay, 2018). Besides being a consequence of the normal physiological process of pregnancy, pregnant women might have restricted their physical activities (particularly walking outside) also due to their concerns about the harm Sars-CoV-2 may cause to their growing fetus. Similarly, studies conducted during the pandemic have shown that most of the pregnant women exercised less during quarantines than they did previously except for a small group that increased their exercising (Biviá-Roig et al., 2020; Zhang ve Ma, 2021). However, there are also studies in the literature reporting that PA level of pregnant women during the pandemic did not differ from what it was before the pandemic (Hori et al., 2021; Azuma et al., 2021). These differing results from studies may have originated from various reasons such as areas of research, sample size, the period of the pandemic in which the study was conducted (periods of complete lockdown, partial lockdown or just social distancing and mask wearing). To maintain the level of exercising proposed by ACOG, pregnant women should be advised to perform the workout types that are possible to do during quarantine (ACOG, 2015; Büyükbayrak, 2016). This situation is said to be valid especially when women have to lower their PA associated with going to and coming back from their work due to working from home or the activity facilities they attend are generally closed or they cannot go out due to a lockdown. Fast walking and yoga are recommended as exercise types suitable for pregnant women in a quarantine setting (ACOG, 2015; Montoya Arizabaleta et al., 2010).

It was also concluded in the study that with more time spent in marriage, the length of PA increased. Studies have linked PA during pregnancy mostly with personal and obstetric characteristics such as age, education level, employment status, marital status, and body mass index before and during pregnancy (Çeliker Tosun ve Okyay, 2018; Kolu et al., 2014; Mourady et al., 2017; Goker ve ark., 2021). In the study of Mourady et al. (2017), it was found that as age increases, light and moderate-intensity activity increases, while

sedentary activity and inactivity decrease. It has been reported that as women's age advances, the time they spend on household/care activities increases. Considering the finding in our study that women with a longer marriage period are also women with an older age, it can be said that we obtained a finding similar to the literature. This interesting finding may be due to misunderstandings about PA, especially among young pregnant women, as well as the fact that young pregnant women, particularly those in their first pregnancy, are more worried about their babies and themselves due to the pandemic and thus resort to social isolation more. Better information on the benefits of PA during pregnancy to be given by healthcare professionals is important to eradicate the false belief that pregnant women need rest. In addition, healthcare professionals should continue prenatal care services in line with the international evidence-based guidelines during the pandemic and should enlighten pregnant women about PA within the scope of these services.

Limitations of the Study

Our research has some limitations. This study was conducted from a hospital located in western Turkey, using a convenient sampling method. Therefore, attribution of these results to other research settings is limited. In our study, the International Physical Activity Questionnaire Short Form was used to evaluate PA. In the literature, studies using the Pregnancy Physical Activity Questionnaire were also encountered. It is important to conduct studies with larger samples and to use the Pregnancy Physical Activity Questionnaire from different countries.

CONCLUSION

Our study is important in that it provides a new perspective to the literature about the effects of PA and depression on QoL in pregnant women during the COVID-19 pandemic. This study showed that as the depression level of pregnant women increased during the pandemic, their QoL worsened. Pregnant individuals experience high levels of anxiety and depression symptoms due to COVID-19-specific concerns such as their own lives, the health of their babies, insufficient monitoring for prenatal care and social isolation during the COVID-19 outbreak. It is stated that this level is above the levels normally expected during pregnancy and experienced by other groups of people during the current pandemic. Therefore, it is of great importance that pregnant

individuals are directed to interventions that will protect both their own and their babies' health. At this point, health professionals (nurses, midwives, and doctor etc.) should use their initiatives to prevent depression through tele-health services (strengthening social support systems, online individual interviews, etc.). Given the known effects of depression on pregnancy, infant and child outcomes, there is a great need to support pregnant individuals during this critical period to reduce negative long-term consequences. This will also contribute greatly to improving the QoL. It was also concluded that as gestational weeks advanced, the level of PA decreased. Increasing the level of PA during pregnancy is known to have positive effects on both the mother's and child's health. More studies are needed to examine the impact of PA and depression on quality of life in pregnant women during the COVID-19 pandemic. Health professionals should create online exercise classes for pregnant women who reduce their physical activity as the pregnancy progresses in pandemics such as COVID-19.

Health personnel should definitely inquire about depression and quality of life levels in pregnant women who come to receive prenatal care. Tele-health services should be provided for pregnant women who are determined to be more prone to poor quality of life and depression. Nurses and midwives should also increase their awareness about screening for depression in antenatal care and interventions to improve quality of life during the COVID-19 pandemic.

Ethics Committee Approval: This study was conducted in accordance with the guidelines in the Declaration of Helsinki. An ethics committee (Çanakkale Onsekiz Mart University Clinical Research Ethics Committee) approval was obtained from the Clinical Research Ethics Committee of a university. (06.05.2021-05-35). Informed consent was obtained from all participants.

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