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Development of an exercise attitude scale in Turkish for pregnant women: validity and reliability

Seyda Toprak Celenay [a], Esra Calik Var[b], and Derya Ozer Kaya [c]

[a]Department of Physiotherapy and Rehabilitation, Health Sciences Faculty, Ankara Yildirim Beyazit University, Ankara, Turkey; [b]Department of Social Work, Health Sciences Faculty, Ankara Yildirim Beyazit University, Ankara, Turkey; [c]Department of Physiotherapy and Rehabilitation, Health Sciences Faculty, Izmir Katip Celebi University, Izmir, Turkey

ABSTRACT

This study, conducted between October 2018 and May 2019, aimed to develop an Exercise Attitude Scale in Turkish (EAS-Turkish) for pregnant women and to determine its validity and reliability. The scale was prepared in Turkish to comprehensively measure pregnant women's exercise attitudes. Then, it administered in 253 pregnant women, who were native speakers of Turkish and older than 18 years, in the Obstetrics Polyclinic at Ataturk Training and Research Hospital, Ankara, Turkey. Validity with exploratory and confirmatory factor analysis and reliability with test-retest and internal consistency methods were tested. The 37-item scale was found to be 2-dimensional (knowledge and benefit; barrier). All indexes of the goodness of fit ($\chi 2/df = 2.0$, Comparative Fit Index = 0.90, Goodness-of-fit Index = 0.85, Root Mean Square Error of Approximation = 0.06) indicated that the fit between the model and the sample data was acceptable. The item-total score correlations varied between r = 0.22 and 0.60. The Cronbach alpha coefficients were found as 0.90 for the whole scale, 0.91 for the knowledge and benefit sub-dimension, and 0.87 for the barrier sub-dimension. In the test-retest analysis conducted with 41 pregnant women, the reliability coefficients were detected as 0.93 for the whole scale and 0.84 for each sub-dimension. The EAS-Turkish for pregnant women was found to be a valid and reliable tool.

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Exercise; pregnancy; questionnaire; reliability; validity

Introduction

Exercising during pregnancy is safe in the absence of any contraindications and with avoidance of high-risk activities, and most obstetrical society guidelines recommend that pregnant women should exercise moderately and regularly for 20–30 min per day on most days of the week (Mottola et al. 2018; Obstetricians, A.C.O. and Gynecologists 2015). Participation in regular exercising during pregnancy can have many benefits for the pregnant woman, fetus, and labor. These benefits include improved physical fitness (Ramírez-Vélez et al. 2011), reduced risks of excessive weight gain (Muktabhant et al. 2015), reduced risks of pre-eclampsia, gestational diabetes mellitus, and pre-term birth (Davenport et al. 2018; Hegaard et al. 2007), reduced urinary incontinence and low back pain (Davenport et al. 2019; Park et al. 2013), improved sleep (Youngstedt 2005), enhanced psychological well-being (Robledo-Colonia et al. 2012), and improved health perception, self-reported body image, and fetus body composition (Barakat et al. 2011; Mudd et al. 2013; Nascimento, Surita, and Cecatti 2012). Regular exercises during pregnancy have also been shown to decrease the duration of the first phase of labor and the total duration of labor (Barakat et al. 2018) and to lower the risk of induced labor (Ferreira et al. 2019).

CONTACT Seyda Toprak Celenay sydtoprak@hotmail.com Department of Physiotherapy and Rehabilitation, Health Sciences Faculty, Ankara Yildirim Beyazit University Ankara, Esenboğa/Ankara 06970, Turkey

Despite these well-established benefits, many women remain inactive or significantly reduce their exercising during pregnancy (Gaston and Cramp 2011; Ribeiro and Milanez 2011). Previous studies have reported that pregnant women are not only unaware of the benefits of exercising during the perinatal period, but many women also believe that exercising is not safe (Ferrari et al. 2013; Lee et al. 2016). Therefore, inadequate exercise knowledge may be a barrier to exercising for pregnant women and it could be changed to improve their attitudes toward exercising (Petrov Fieril et al. 2014). Some studies have investigated the beliefs, knowledge, and attitudes of women concerning exercising in pregnancy and found that their beliefs and knowledge regarding exercising in pregnancy, level of education, concerns for maternal and fetal safety, and previous involvement in regular exercising have influenced their attitude, which is the strongest predictor of intention to exercise, and behaviors toward exercise in pregnancy (Duncombe et al. 2009; Guelfi et al. 2015; Mbada et al. 2014; Ribeiro and Milanez 2011; Thornton et al. 2006; Tinius et al. 2020). Generally, in these studies, questionnaires formed by the researchers have been used in evaluating the attitude toward exercising.

In the development of a positive exercise attitude, it is important to identify women's current exercise knowledge including their knowledge about the benefits of exercising during pregnancy, and the conditions that may prevent exercising. Investigating attitudes toward exercising during pregnancy is also very significant to create exercise programs and maximize exercise adherence. To the best of our knowledge, there exists no scale assessing pregnant women's attitudes toward exercising in the literature. Therefore, this study aimed to develop an Exercise Attitude Scale in Turkish (EAS-Turkish) for pregnant women and to investigate its validity and reliability.

Materials and methods

Study design

This study was designed as methodological research and aimed to develop an EAS-Turkish for pregnant women and to examine its validity and reliability. The study was approved by Izmir Katip Celebi University Non-interventional Clinical Studies Institutional Review Board (Approval date and number: 03.10.2018 and 281) and conducted under the principles of the 'Helsinki Declaration' between October 2018 and May 2019.

Participants

In this study, the EAS-Turkish was administered in pregnant women in the Obstetrics Polyclinic at Ataturk Training and Research Hospital, Ankara, Turkey. The inclusion criteria were being a native speaker of Turkish, older than 18 years, and being pregnant. The exclusion criteria were having communication problems involving both expression and comprehension, and not volunteering to participate in the study. The participants were informed regarding the objective and details of the study and their written informed consent was obtained.

Evaluation

Participants' physical information such as age, weight, height, and body mass index (BMI), and education status were recorded. Besides, the women's obstetric history, including the number of pregnancies, the number of births, and the type of delivery (vaginal, cesarean section, or both), were obtained. The risky state during pregnancy (as yes or no), conception method (as normal, intrauterine insemination or in vitro fertilization), and pre-pregnancy and during-pregnancy exercise habits (as yes or no) were recorded.

Development and implementation processes of the EAS-Turkish in pregnant women

The EAS-Turkish was developed in four stages, namely, problem identification, item writing, content validity evaluation (obtaining expert judgment), and application/analysis (Boateng et al. 2018; Buyukozturk et al. 2021). The literature was extensively investigated using the possible keywords of the study to develop the EAS-Turkish in pregnant women. Based on the review of the literature and the clinical experience of the authors, the titles of the sub-dimensions of the EAS-Turkish were developed as knowledge/benefit and barriers.

During the scale development process, the development stages of the attitude scales were followed, and cognitive, behavioral, and affective expressions as well as positive and negative expressions were included (Tavsancıl 2005). Thus, an item pool consisting of 52 statements was created. The compatibility of these items with the rules of language and assessment was evaluated with the help of an assessment and evaluation of experts. Five-point Likert type expressions were used in the scale: "Strongly disagree (1)," "Disagree" (2), "Neither agree nor disagree" (3), "Agree" (4), and "Strongly agree" (5). High scores obtained in the scale indicate that the pregnant women have a positive attitude toward exercising during pregnancy (Koklu 1998).

Then, the EAS-Turkish presented to experts for their opinions for content validity. To test the content validity of the EAS-Turkish, to assess whether the items measure the area to be studied, and whether they contain different points outside the area to be measured, four members consisting of two physiotherapists, a gynecologist and obstetrician, and a statistician were consulted. In line with the opinions of the experts, some items were removed from the scale, and some items were revised to increase clarity. As a result, a draft with 48 items was prepared.

Sample size and statistical analysis

It has been recommended to reach 5–10 times the number of items in the scale to determine the sample size in validity-reliability studies in the literature (Akgul 2005). For this reason, it was targeted to include at least 5 times (240 pregnant women) the number of items (48 items) in the EAS-Turkish. First, 280 pregnant women were enrolled in the present study. Twenty-seven pregnant women were excluded because they did not volunteer to participate in the study, and the study was completed with 253 pregnant women.

The normality assumption for the continuous variables, such as age and body mass index (BMI), was assessed by the *Kolmogorov Smirnov* test and normality plots. All continuous and categorical variables were reported as median (interquartile range (IQR)), frequency (n), and percentages (%), respectively. Content validity of the scale was evaluated with the expert opinions. For construct validity, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used. The reliability of the study was calculated by item-total score correlation and the Cronbach's alpha analysis for both the entire scale and its sub-dimensions. Test-retest analyses of the scale were performed by t-test and correlation analysis for the dependent groups.

The validity and reliability analyses of the scale were performed using IBM SPSS Statistics 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, New York, USA) and IBM SPSS AMOS (Version 23.0), a powerful structural equation modeling software helping support research and theories by extending standard multivariate analysis methods, including regression, factor analysis, correlation and analysis of variance (Afthanorhan and Ahmad 2014; Blunch 2012). Any $p < .05$ was considered statistically significant.

Results

The age and BMI of the pregnant women were 27 (7) years and 26.06 (5.04) kg/m^2, respectively. It was found that 38.3% (n = 97) of the pregnant women were university graduates. The pregnant women's obstetric history, risky states related to pregnancy, conception method, pre-pregnancy exercise habit, and the status of performing exercises during pregnancy are presented in Table 1.

Table 1. The demographic and physical characteristics of the pregnant women.

Characteristics	Pregnant women (n = 253)
Age (years, median (IQR))	27 (7)
BMI (kg/m^2, median (IQR))	26.06 (5.04)
Education status (n (%))	
Elementary	7 (2.8)
Secondary	56 (22.1)
High school	93 (36.8)
Graduate	97 (38.3)
Number of pregnancy (median (IQR))	2 (1)
Number of birth (median (IQR))	0 (1)
The risky state during pregnancy (n (%))	
Yes	26 (10.3)
No	227 (39.7)
Conception method (n (%))	
Normal	243 (96.0)
Intra uterine insemination	6 (2.4)
In vitro fertilization	4 (1.6)
Pre-pregnancy exercise habit (n (%))	
Yes	84 (33.2)
No	169 (66.8)
Doing exercise during pregnancy (n (%))	
Yes	106 (41.9)
No	147 (58.1)

BMI: Body mass index, IQR: Interquartile range.

Validity analysis

To determine the construct validity of the scale, the EFA was performed using the principal component analysis with varimax rotation, which is a statistical technique used at one level of factor analysis as an attempt to clarify the relationship among factors (Allen 2017). In the analysis, factor loadings were set as at least 0.25 (Buyukozturk 2006). Before starting the factor analysis, multiple and single normality analyses were examined to determine the conformity of the data, and validity and reliability studies were conducted in 253 pregnant women. The Kaiser-Meyer-Olkin (KMO) coefficient was calculated and the Bartlett Sphericity test was performed. The KMO value was found to be 0.87 and the result of the Bartlett test (3953.440; $p < .001$) was found to be significant. According to these results, it can be interpreted that the necessary assumptions were met (Cokluk, Sekercioglu, and Buyukozturk 2012). As a result of the EFA, it was seen that the items were accumulated under 2 factors with an eigenvalue greater than 1, and the variance was 39%. Eleven items with a factor item load of less than 0.25 and overlapping sub-dimensions were excluded from the analysis (Buyukozturk 2006). As a result of the last factor analysis, the scale was finalized with two dimensions and 37 items, and 13 items were coded in reverse. The EFA factor loads of the items are presented in Table 2. The sub-dimensions were named based on expert opinions and the literature. The first factor was named *knowledge and benefit*, and the second factor was *barriers*.

The CFA was applied as another stage of the validity study of the scale. In the analysis performed using the AMOS program, it was found that all items had a significant relationship with the dimensions and their factor loadings were between 0.25 and 0.90. Schermelleh-Engel, Moosbrugger, and Müller (2003) required fit indexes for x^2 /df < 5, 0.05 < Root Mean Square Error of Approximation (RMSEA), 0.85 or 0.90 < Goodness-of-fit Index (GFI), 0.90 < Comparative Fit Index (CFI) < 0.95. The GFI value was found below 0.85 in the first analysis, and after modifications were made in the error variances of the 1st and 2nd, 13th, 14th, 22nd, and 23rd items, it was seen that the fit between the model and the data was acceptable. The ratio obtained by dividing the chi-square value by the degrees

Table 2. Explanatory and confirmatory factor load values of the items in sub-dimensions.

		Factor Load Values		
Post-analysis Item Numbers	Item Number	1. Factor (EFA)	2. Factor (EFA)	CFA Load Values
1	Item 1	0.683		0.60
2	Item 2	0.626		0.43
3	Item 5	0.449		0.50
4	Item 12	0.485		0.63
5	Item 13	0.639		0.43
6	Item 14	0.355		0.31
7	Item 15	0.238		0.22
8	Item 17	0.366		0.35
9	Item 18	0.427		0.36
10	Item 19	0.702		0.70
11	Item 20	0.766		0.79
12	Item 21	0.708		0.71
13	Item 22	0.647		0.63
14	Item 23	0.594		0.55
15	Item 24	0.705		0.70
16	Item 25	0.685		0.68
17	Item 26	0.636		0.57
18	Item 27	0.576		0.51
19	Item 28	0.601		0.60
20	Item 30	0.643		0.61
21	Item 31	0.532		0.50
22	Item 32	0.691		0.65
23	Item 33	0.718		0.69
24	Item 34	0.626		0.60
25*	Item 4 *		0.558	0.56
26*	Item 36*		0.612	0.57
27*	Item 37*		0.617	0.56
28*	Item 39*		0.521	0.48
29*	Item 40*		0.521	0.65
30*	Item 41*		0.606	0.54
31*	Item 42*		0.711	0.69
32*	Item 43*		0.553	0.49
33*	Item 44*		0.627	0.60
34*	Item 45*		0.637	0.58
35*	Item 46*		0.529	0.51
36*	Item 47*		0.672	0.67
37*	Item 48*		0.700	0.70

*Reverse scored items, EFA: Exploratory Factor Analysis, CFA: Confirmatory Factor Analysis

of freedom ($\chi 2/df$) was 2.00. The facts that GFI = 0.85, RMSEA = 0.06, CFI = 0.87, and Incremental Fit Index (IFI) = 0.85 also showed that model and data fit were acceptable (Schermelleh-Engel, Moosbrugger, and Müller 2003). The CFA of the scale is presented in Figure 1.

The factor loadings obtained as a result of the EFA and CFA performed on the scale are given in Table 2.

Reliability analysis

For the reliability studies of the scale, items were listed between 1 and 37, and item analyses were performed. It was observed that the item-total score correlations of the items varied between r = 0.22 and 0.69. It is presented in Table 3. The relationship between the total and sub-dimension scores of the scale was examined, and the correlation coefficients are presented in Table 4. An examination of the correlations between the sub-dimensions of the scale and the total score showed that there were positive and significant relationships.

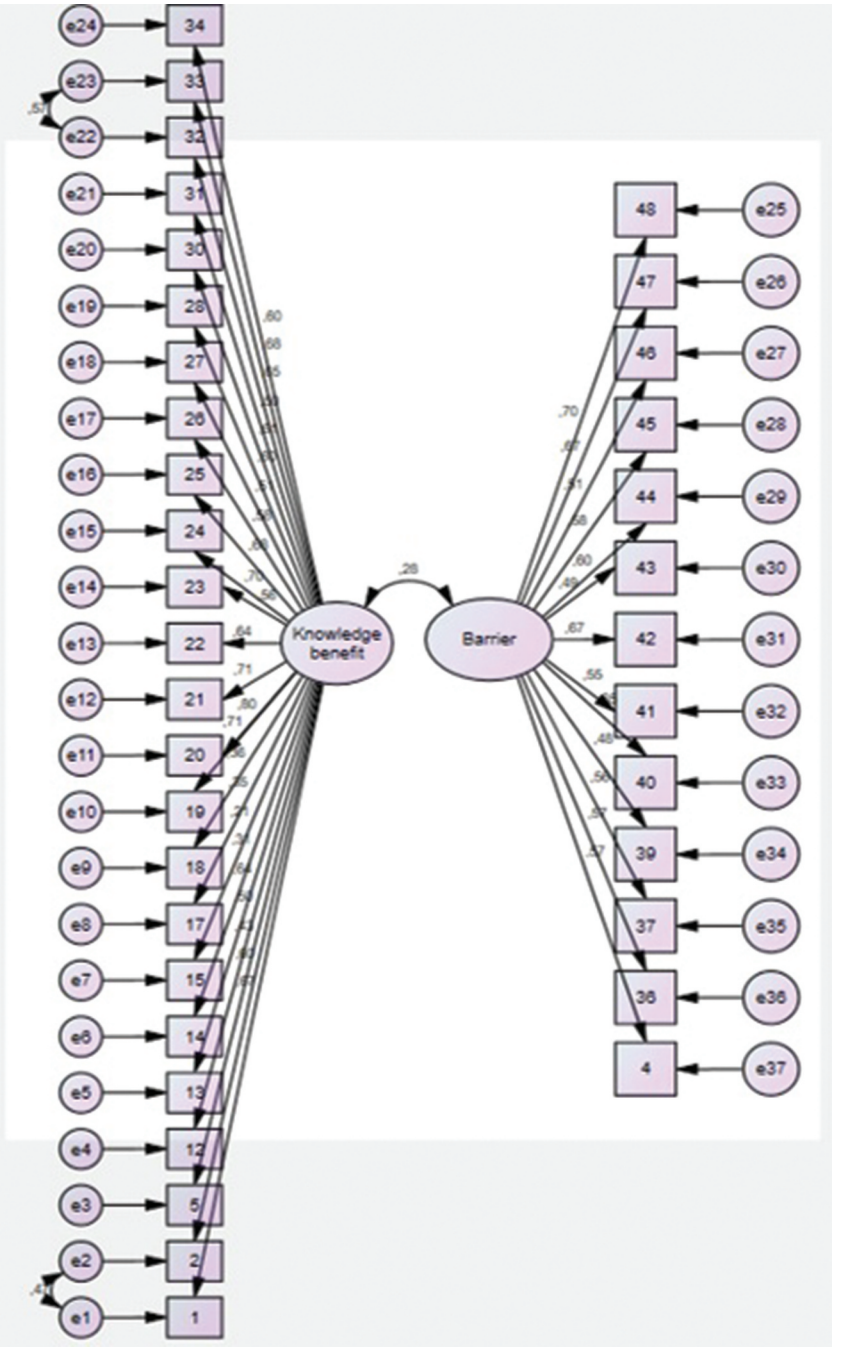

Figure 1. CFA of the items showing standardized estimates.

The Cronbach alpha internal consistency coefficient was calculated to test the internal consistency of the scale, and it was 0.90 for the whole scale, 0.91 (24 items) for the knowledge and benefit sub-dimension, and 0.87 (13 items) for the barrier sub-dimension. The fact that the Cronbach alpha internal consistency coefficient of the scale is above 0.7 indicates that it is reliable (Field 2005).

Table 3. Table of item-total correlation.

	Corrected Item-Total Correlation
Item 1	0.61
Item 2	0.53
Item 5	0.39
Item 12	0.53
Item 13	0.55
Item 14	0.23
Item 15	0.22
Item 17	0.31
Item 18	0.27
Item 19	0.57
Item 20	0.69
Item 21	0.57
Item 22	0.51
Item 23	0.43
Item 24	0.58
Item 25	0.55
Item 26	0.42
Item 27	0.32
Item 28	0.52
Item 30	0.51
Item 31	0.40
Item 32	0.54
Item 33	0.61
Item 34	0.47
Item 4	0.55
Item 36	0.40
Item 37	0.34
Item 39	0.33
Item 40	0.34
Item 41	0.25
Item 42	0.35
Item 43	0.25
Item 44	0.44
Item 45	0.29
Item 46	0.35
Item 47	0.46
Item 48	0.52

Table 4. Correlation coefficients of the total score and sub-dimensions of the scale.

Dimensions	Total Score	Knowledge and benefit	Barrier
Total Score	1.00		
Knowledge and benefit	0.85*	1.00	
Barrier	0.71*	0.23*	1.00

*$p < .05$.

A test-retest analysis was performed to evaluate the invariance of the scale concerning time. For this purpose, the scale was administered in 41 pregnant women at 1-week intervals. It was found that there was no statistically significant difference between the two measurement mean scores ($p > .05$). An examination of the relationship between the scores obtained in repeated measurements showed that the Pearson Product Moment Correlation Coefficient was 0.93 for the total score, 0.84 for the knowledge and benefit sub-dimension, and 0.84 for the barrier sub-dimension. In the test-retest analysis, all Intra Class Correlation (ICC) coefficients were significant ($p < .05$) and varied between 0.93 and 0.96, thus indicating good test-retest reliability. These calculated values show both the consistency of the scale scores and the time-dependent change in the measured property between the two applications.

Discussion

In the current study, a 37-item EAS was developed to learn the attitudes of pregnant women toward exercising during pregnancy (Appendix). Furthermore, the EAS-Turkish for pregnant women was found to be a valid and reliable tool.

The EFA and CFA were performed to examine the construct validity of the scale. As a result of the EFA, the scale was found to be 2-dimensional. Considering that 30% or over variance is acceptable in scale development studies (Buyukozturk 2006), it was seen that the construct validity of the scale (39%) was at an acceptable level. Items 25 to 37 of the scale are scored in reverse. Higher scores indicate more positive attitudes toward exercising during pregnancy.

The DFA was performed to determine whether the factor structure in the EFA was verified. The fit indices of the model obtained in the DFA were examined, and it was found that the value obtained from the division of $\chi 2/df$ (2.00) and the RMSEA (0.6) value was perfect, GFI (0.85), CFI (0.87), and IFI (0.85) values were within acceptable values (Cokluk, Sekercioglu, and Buyukozturk 2012; Schermelleh-Engel, Moosbrugger, and Müller 2003). According to these results, it was concluded that the structure of the scale was confirmed.

The Cronbach alpha reliability coefficient calculated to determine the reliability of the scale was found as .93 for the whole scale, .84 for the knowledge and benefits sub-dimension, and .84 for the barriers sub-dimension. These results showed that the scale has a very high internal consistency (Aksayan and Gozum 2003). The item-total score correlation coefficients were calculated to evaluate the contribution of each item to the total score of the scale and to what extent it was related to the scale. Since the coefficients were higher than .20, it was found that the item-total score correlations were sufficient for reliability (Buyukozturk 2006). A test-retest analysis was performed to measure the invariance of the scale against time. In a study conducted with 41 pregnant women, the test-retest reliability coefficient was .93 for the whole scale and. 84 for each sub-dimension, which indicate that the scale has a very high consistency for the measurements made at regular intervals (Tavsancıl 2005).

The strength of this study is that it is the first scale about exercise attitudes in Turkish pregnant women. Using this scale, exercise attitudes of pregnant women can be evaluated. This evaluation may also contribute to the creation of specific exercise programs for pregnant women and also suitable for the conditions of pregnant women. And thus, the participation of pregnant women in exercise can be increased.

There were some limitations of this study. First of all, other psychometric characteristics such as responsiveness of this scale could not be investigated in our study. Future studies should take this issue into account. Second limitation was that it was conducted in Turkish-speaking participants in Turkey. Therefore, it may or may not be valid and reliable in other countries and/or in other languages. Further studies should address the reliability and validity of this scale in other countries and potentially in other languages.

Conclusion

This is the first study in which a scale evaluating pregnant women's attitudes toward exercising during pregnancy in detail was developed. According to the results, it was concluded that the EAS-Turkish for pregnant women is a valid and reliable measurement tool for evaluating the exercise attitude. Using the scale might help to plan an appropriate exercise program and to maintain exercise adherence for pregnant women.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Seyda Toprak Celenay http://orcid.org/0000-0001-6720-4452
Derya Ozer Kaya http://orcid.org/0000-0002-6899-852X

References

Afthanorhan, W. M. A. B. W., and S. Ahmad. 2014. Path analysis in covariance-based structural equation modeling with AMOS 18.0. *European Journal of Business and Social Sciences* 3 (2):59–68.

Akgul, A. 2005. *Faktör analizi. Tıbbi araştırmalarda istatistiksel analiz teknikleri spss uygulamaları [Factor analysis. Statistical analysis techniques spss applications in medical research]*. 2th ed. Ankara: Emek Ofset.

Aksayan, S., and S. Gozum. 2003. Kültürlerarası ölçek uyarlaması için rehber ii: Psikometrik özellikler ve kültürlerarası karşılaştırma [Guidelines for cross-cultural scale adaptation ii: Psychometric properties and cross-cultural comparison]. *Hemşirelikte Araştırma Geliştirme Dergisi* 5:1–25.

Allen, M. 2017. *The sage encyclopedia of communication research methods*. Thousand Oaks, CA: SAGE Publications, Inc.

Barakat, R., E. Franco, M. Perales, C. López, and M. F. Mottola. 2018. Exercise during pregnancy is associated with a shorter duration of labor. A randomized clinical trial. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 224:33–40. doi:10.1016/j.ejogrb.2018.03.009.

Barakat, R., M. Pelaez, R. Montejo, M. Luaces, and M. Zakynthinaki. 2011. Exercise during pregnancy improves maternal health perception: A randomized controlled trial. *American Journal of Obstetrics and Gynecology* 204 (5):402. e1–02. e7. doi:10.1016/j.ajog.2011.01.043.

Blunch, N. 2012. *Introduction to structural equation modeling using IBM SPSS statistics and AMOS*. Thousand Oaks, CA: SAGE Publications, Inc.

Boateng, G. O., T. B. Neilands, E. A. Frongillo, H. R. Melgar-Quiñonez, and S. L. Young. 2018. Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health* 6:149. doi:10.3389/fpubh.2018.00149.

Buyukozturk, S. 2006. *Sosyal bilimler İçin veri analizi: İstatistik, araştırma deseni, SPSS uygulamaları ve yorum [Data analysis for social sciences: Statistics, research design, SPSS applications and interpretation]*. Ankara: Pegem Akademi Yayıncılık.

Buyukozturk, S., E. Cakmak, O. Akgun, S. Karadeniz, and F. Demirel. 2021. *Bilimsel araştırma Metodları [Scientific research methods]*. Ankara: Pegem Akademi.

Cokluk, O., G. Sekercioglu, and S. Buyukozturk. 2012. *Sosyal bilimler için çok değişkenli istatistik: SPSS ve LİSREL uygulamaları [Multivariate statistics for social sciences: SPSS and LISREL applications]*. Ankara: Pegem Akademi.

Davenport, M. H., -A.-A. Marchand, M. F. Mottola, V. J. Poitras, C. E. Gray, A. J. Garcia, N. Barrowman, F. Sobierajski, M. James, and V. L. Meah. 2019. Exercise for the prevention and treatment of low back, pelvic girdle and lumbopelvic pain during pregnancy: A systematic review and meta-analysis. *British Journal of Sports Medicine* 53 (2):90–98. doi:10.1136/bjsports-2018-099400.

Davenport, M. H., S.-M. Ruchat, V. J. Poitras, A. J. Garcia, C. E. Gray, N. Barrowman, R. J. Skow, V. L. Meah, L. Riske, and F. Sobierajski. 2018. Prenatal exercise for the prevention of gestational diabetes mellitus and hypertensive disorders of pregnancy: A systematic review and meta-analysis. *British Journal of Sports Medicine* 52 (21):1367–75. doi:10.1136/bjsports-2018-099355.

Duncombe, D., E. H. Wertheim, H. Skouteris, S. J. Paxton, and L. Kelly. 2009. Factors related to exercise over the course of pregnancy including women's beliefs about the safety of exercise during pregnancy. *Midwifery* 25 (4):430–38. doi:10.1016/j.midw.2007.03.002.

Ferrari, R. M., A. M. Siega-Riz, K. R. Evenson, M.-K. Moos, and K. S. Carrier. 2013. A qualitative study of women's perceptions of provider advice about diet and physical activity during pregnancy. *Patient Education and Counseling* 91 (3):372–77. doi:10.1016/j.pec.2013.01.011.

Ferreira, C. L. M., C. M. L. Guerra, A. I. T. J. Silva, H. R. V. D. Rosário, and M. B. F. L. D. O. Pereira. 2019. Exercise in pregnancy: The impact of an intervention program in the duration of labor and mode of delivery. *Revista Brasileira de Ginecologia e Obstetrícia* 41 (2):68–75. doi:10.1055/s-0038-1675613.

Field, A. 2005. *Discovering statistics using SPSS*. Thousand Oaks: Ca: Sage Publications, Inc.

Gaston, A., and A. Cramp. 2011. Exercise during pregnancy: A review of patterns and determinants. *Journal of Science and Medicine in Sport* 14 (4):299–305. doi:10.1016/j.jsams.2011.02.006.

Guelfi, K. J., C. Wang, J. A. Dimmock, B. Jackson, J. P. Newnham, and H. Yang. 2015. A comparison of beliefs about exercise during pregnancy between chinese and australian pregnant women. *BMC Pregnancy and Childbirth* 15 (1):1–8. doi:10.1186/s12884-015-0734-6.

Hegaard, H. K., B. K. Pedersen, B. Bruun Nielsen, and P. Damm. 2007. Leisure time physical activity during pregnancy and impact on gestational diabetes mellitus, pre-eclampsia, preterm delivery and birth weight: A review. *Acta Obstetricia et Gynecologica Scandinavica* 86 (11):1290–96. doi:10.1080/00016340701647341.

Koklu, N. 1998. Tutumların ölçülmesi ve likert tipi ölçeklerde kullanılan alternatif seçenekler [Measuring attitudes and alternative options used in likert-type scales]. *Ankara University Journal of Faculty of Educational Sciences* 28 (2):81–94. doi:10.1501/Egifak_0000000299.

Lee, C., I. Chiang, F. Hwang, L. Chi, and H. Lin. 2016. Using theory of planned behavior to predict women intention to regular exercise during pregnancy. *Midwifery* 42:80–86. doi:10.1016/j.midw.2016.09.014.

Mbada, C. E., O. E. Adebayo, A. B. Adeyemi, O. O. Arije, O. O. Dada, O. A. Akinwande, T. O. Awotidebe, and I. A. Alonge. 2014. Knowledge and attitude of nigerian pregnant women towards antenatal exercise: A cross-sectional survey. *International Scholarly Research Notices* 2014. doi:10.1155/2014/260539.

Mottola, M. F., M. H. Davenport, S.-M. Ruchat, G. A. Davies, V. J. Poitras, C. E. Gray, A. J. Garcia, N. Barrowman, K. B. Adamo, and M. Duggan. 2018. 2019 Canadian guideline for physical activity throughout pregnancy. *British Journal of Sports Medicine* 52 (21):1339–46. doi:10.1136/bjsports-2018-100056.

Mudd, L. M., K. M. Owe, M. F. Mottola, and J. M. Pivarnik. 2013. Health benefits of physical activity during pregnancy: An international perspective. *Medicine and Science in Sports and Exercise* 45 (2):268–77. doi:10.1249/MSS.0b013e31826cebcb.

Muktabhant, B., T. A. Lawrie, P. Lumbiganon, and M. Laopaiboon. 2015. Diet or exercise, or both, for preventing excessive weight gain in pregnancy. *Cochrane Database of Systematic Reviews* (6). doi:10.1002/14651858.CD007145.pub3.

Nascimento, S. L., F. G. Surita, and J. G. Cecatti. 2012. Physical exercise during pregnancy: A systematic review. *Current Opinion in Obstetrics & Gynecology* 24 (6):387–94. doi:10.1097/GCO.0b013e328359f131.

Obstetricians, A.C.O. and Gynecologists. 2015. Physical activity and exercise during pregnancy and the postpartum period. Committee opinion no. 650. *Obstetrics & Gynecology* 126 (6):e135–42. doi:10.1097/AOG.0000000000003772.

Park, S.-H., C.-B. Kang, S. Y. Jang, and B. Y. Kim. 2013. Effect of kegel exercise to prevent urinary and fecal incontinence in antenatal and postnatal women: Systematic review. *Journal of Korean Academy of Nursing* 43:3. doi:10.4040/jkan.2013.43.3.420.

Petrov Fieril, K., M. Fagevik Olsén, A. Glantz, and M. Larsson. 2014. Experiences of exercise during pregnancy among women who perform regular resistance training: A qualitative study. *Physical Therapy* 94 (8):1135–43. doi:10.2522/ptj.20120432.

Ramírez-Vélez, R., A. C. Aguilar De Plata, M. M. Escudero, I. Echeverry, J. G. Ortega, B. Salazar, J. J. Rey, C. Hormiga, and P. López-Jaramillo. 2011. Influence of regular aerobic exercise on endothelium-dependent vasodilation and cardiorespiratory fitness in pregnant women. *Journal of Obstetrics and Gynaecology Research* 37 (11):1601–08. doi:10.1111/j.1447-0756.2011.01582.x.

Ribeiro, C. P., and H. Milanez. 2011. Knowledge, attitude and practice of women in campinas, são paulo, brazil with respect to physical exercise in pregnancy: A descriptive study. *Reproductive Health* 8 (1):1–7. doi:10.1186/1742-4755-8-31.

Robledo-Colonia, A. F., N. Sandoval-Restrepo, Y. F. Mosquera-Valderrama, C. Escobar-Hurtado, and R. Ramírez-Vélez. 2012. Aerobic exercise training during pregnancy reduces depressive symptoms in nulliparous women: A randomised trial. *Journal of Physiotherapy* 58 (1):9–15. doi:10.1016/S1836-9553(12)70067-X.

Schermelleh-Engel, K., H. Moosbrugger, and H. Müller. 2003. Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online* 8 (2):23–74.

Tavsancıl, E. 2005. *Tutumların ölçülmesi ve SPSS ile veri analizi [Measuring attitudes and data analysis with SPSS]*. 2th ed. İstanbul: Nobel Yayın.

Thornton, P. L., E. C. Kieffer, Y. Salabarría-Peña, A. Odoms-Young, S. K. Willis, H. Kim, and M. A. Salinas. 2006. Weight, diet, and physical activity-related beliefs and practices among pregnant and postpartum latino women: The role of social support. *Maternal and Child Health Journal* 10 (1):95–104. doi:10.1007/s10995-005-0025-3.

Tinius, R., T. S. Nagpal, K. Edens, C. Duchette, and M. Blankenship. 2020. Exploring beliefs about exercise among pregnant women in rural communities. *Journal of Midwifery & Women's Health* 65 (4):538–45. doi:10.1111/jmwh.13080.

Youngstedt, S. D. 2005. Effects of exercise on sleep. *Clinics in Sports Medicine* 24 (2):355–65. doi:10.1016/j.csm.2004.12.003.

APPENDIX

Table A1. Gebelerde egzersiz tutum ölçeği.

Gebelerde Egzersiz Tutum Ölçeği	Kesinlikle Katılmıyorum (1)	Katılmıyorum (2)	Kararsızım (3)	Katılıyorum (4)	Kesinlikle Katılıyorum (5)
Bilgi ve fayda					
1- Gebelikte yapılan egzersiz benim için faydalıdır.					
2- Gebelikte yapılan egzersiz bebeğim için faydalıdır.					
3- Gebelik beni egzersiz yapmaya yönelten bir durumdur.					
4- Gebelikte yapılacak en iyi egzersiz yürüyüştür.					
5- Gebelikte egzersiz yapmak gebelikte beslenmeye dikkat etmek kadar önemlidir.					
6- Gebelikte egzersiz bilgisi televizyondan, kitaplardan veya internetten öğrenilebilir.					
7- Egzersizler, gebeye özel planlanmalıdır.					
8- Gebelikte egzersiz alanında uzman fizyoterapist tarafından planlanmalıdır.					
9- Diğer gebelerle birlikte egzersiz yapmak, gebeye keyif verir.					
10- Gebeler, sağlıklı bir anne olmak için egzersiz yapmalıdırlar.					
11- Egzersiz, gebelikte değişen fiziksel sağlığı iyileştirir.					
12- Gebelikte egzersiz yapmak stresi azaltır.					
13- Egzersiz, gebelikte görülebilecek olası sağlık sorunlarını (ağrı, diyabet, tansiyon gibi) azaltır.					
14- Egzersiz, gebelikte görülebilecek olan karın kaslarındaki zayıflamayı önler.					
15- Gebelikte egzersiz yapmak daha mutlu olmayı sağlar.					
16- Egzersiz yapmak, gebelikte yorgunluk hissini azaltır.					
17- Gebelikte egzersiz yapmak, kilo kontrolü sağlar.					
18- Gebelikte egzersiz yapmak, doğum öncesi kiloya dönüşü kolaylaştırır.					
19- Gebelikte yapılan egzersizler bebeğin sağlığını geliştirir.					
20- Gebelikte egzersiz yapmak, doğumun daha rahat geçmesini sağlar.					
21- Gebelikte egzersiz yapmak, normal (vajinal) doğum yapma ihtimalini artırır.					
22- Gebelikte egzersiz yapmak, doğum sırasındaki ağrıyı azaltır.					
23- Gebelikte egzersiz yapmak, doğumla ilgili kaygıyı azaltır.					
24- Gebelikte egzersiz yapmak, doğum sonrasında daha hızlı iyileşmeyi sağlar.					
Bariyer					
25- Egzersiz alışkanlığının olmayışı, gebelikte egzersiz yapmaya engeldir.					
26- Yeterli zamanın olmaması, gebelikte egzersiz yapmaya engeldir.					
27- Uygun bir merkez/ortamın olmaması, gebelikte egzersiz yapmaya engeldir.					
28- Ailesel sorumluluklar (çocuk/yaşlı bakımı) gebelikte egzersiz yapmayı engeller.					
29- Mesleksel sorumluluklar gebelikte egzersiz yapmayı engeller.					
30- Biri (eş, akraba, arkadaş) tarafından teşvik edilmemek, gebelikte egzersiz yapma isteğini azaltır.					
31- Uygun hava koşullarının olmaması (çok sıcak/soğuk, yağmurlu) egzersiz yapmaya engeldir.					
32- Gebelik döneminde yapılan her egzersiz aile bireylerini endişelendirir.					
33- Gebelikte egzersiz konusunda yeterli bilginin olmaması, egzersiz yapmaya engeller.					

(*Continued*)

Table A1. (Continued).

Gebelerde Egzersiz Tutum Ölçeği	Kesinlikle Katılmıyorum (1)	Katılmıyorum (2)	Kararsızım (3)	Katılıyorum (4)	Kesinlikle Katılıyorum (5)
34- Düşme/yaralanma riskinden dolayı gebelikte her egzersizi yapmak tehlikelidir.					
35- Gebenin başkaları önünde egzersiz yapmaktan utanması, egzersiz yapmaya engeldir.					
36- Gebelik sırasında yeterli enerjinin olmaması egzersiz yapmaya engeldir.					
37- Gebelik sırasında yeterli isteğin olmaması egzersiz yapmayı engeller.					

Table A2. Exercise attitude scale in pregnant women.

Exercise Attitude Scale in Pregnant Women*	Absolutely I disagree (1)	I don't agree (2)	neither agree nor disagree (3)	I agree (4)	Absolutely I agree (5)
Knowledge and benefit					
1- Exercising during pregnancy is beneficial for me.					
2- Exercising during pregnancy is beneficial for my baby.					
3- Pregnancy is a condition that leads me to exercising.					
4- The best exercise during pregnancy is walking.					
5- Exercising during pregnancy is as important as paying attention to nutrition during pregnancy.					
6- Information about exercising during pregnancy can be learned from television, books, or the Internet.					
7- Exercising should be planned specifically for pregnant women.					
8- Exercising should be planned by a physiotherapist who is an expert in the field of exercising during pregnancy.					
9- Exercising with other pregnant women gives pleasure to pregnant women.					
10- Pregnant women should exercise to be a healthy mother.					
11- Exercising improves physical health that changes during pregnancy.					
12- Exercising during pregnancy reduces stress.					
13- Exercising reduces potential health problems that can be seen during pregnancy (pain, diabetes, blood pressure ect.).					
14- Exercising prevents the weakening of abdominal muscles that may occur during pregnancy.					
15- Exercising during pregnancy makes you happier.					
16- Exercising reduces the feeling of fatigue during pregnancy.					
17- Exercising during pregnancy provides weight control.					
18- Exercising during pregnancy makes it easier to return to prenatal weight.					
19- Exercising during pregnancy improve the health of the baby.					
20- Exercising during pregnancy ensures more comfortable labor.					
21- Exercising during pregnancy increases the chances of having a normal (vaginal) birth.					
22- Exercising during pregnancy reduces pain during labor.					
23- Exercising during pregnancy reduces anxiety related to labor.					
24- Exercising during pregnancy provides faster recovery after labor.					
Barriers					
25- Lack of an exercising habit prevents exercising during pregnancy.					
26- Not having enough time is an obstacle to exercising during pregnancy.					
27- Lack of a suitable facility/environment prevents exercising during pregnancy.					

(*Continued*)

Table A2. (Continued).

Exercise Attitude Scale in Pregnant Women*	Absolutely I disagree (1)	I don't agree (2)	neither agree nor disagree (3)	I agree (4)	Absolutely I agree (5)
28- Family responsibilities (child/elderly care) prevent exercising during pregnancy.					
29- Occupational responsibilities prevent exercising during pregnancy.					
30- Not being encouraged by someone (spouse, relative, friend) decreases the desire to exercise during pregnancy.					
31- Lack of suitable weather conditions (very hot/cold, rainy) prevent exercising.					
32- Every exercise during pregnancy worries family members.					
33- Lack of sufficient knowledge about exercising during pregnancy prevents exercising.					
34- Doing any exercise during pregnancy is dangerous due to the risk of falling/injury.					
35- Feeling embarrassed about exercising in front of others is an obstacle to exercising.					
36- Lack of sufficient energy during pregnancy is an obstacle to exercising.					
37- Lack of desire during pregnancy prevents exercising.					

*This scale was translated into English, but its validity and reliability analysis were not performed in the English version.