Developing a Health Belief Model Scale for Smoking Behaviour During Pregnancy: Validity and Reliability Study

Deniz Aslı Dokuzcan[1] (iD)
Nihal Gördes Aydoğdu[2] (iD)
Murat Bektaş[3] (iD)
Tuğba Ulukaya[4] (iD)

[1] Halk Sağlığı Hemşireliği, Sağlık Bilimleri Fakültesi, Balıkesir Üniversitesi, Balıkesir, Türkiye
[2] Halk Sağlığı Hemşireliği, Sağlık Bilimleri Fakültesi, Erzurum Teknik Üniversitesi, Erzurum, Türkiye
[3] Çocuk Sağlığı we Hastalıkları, Hemşirelik Fakültesi, Dokuz Eylül Üniversitesi, İzmir, Türkiye
[4] Kadın Hastlıkları ve Doğum Servisi, Cerrahpaşa Tıp Fakültesi Hastanesi, İstanbul, Türkiye

Sorumlu Yazar / Corresponding Author:

Deniz Aslı Dokuzcan

Email: denizdokuzcan@hotmail.com

Abstract

Objective: The Health Belief Model, which is one of the most frequently used models in explaining health behaviours, reveals the determinants of performing preventive health behaviours. Since our perceptions play an active role in changing a behaviour, a measurement tool is needed to evaluate the pregnant woman perceptually within the scope of HBM. Our study was conducted to analyze the perceptions of pregnant women about quitting smoking by developing a scale within the scope of Health Belief Model and analyze the validity and reliability of the scale within Turkish context.

Methods: In the methodological study, which was conducted at the gynecology polyclinic of an university hospital between 15.05.2018 – 30.04.2019, the data were collected by applying a questionnaire to pregnant women who smoked at least one cigarette per day. The sample of the study consists of 289 pregnant women who applied to the clinic for routine pregnancy follow-ups. The content validity of the scale was evaluated by taking the opinions of nine experts in the field of public health nursing. Descriptive and confirmatory factor analysis methods were used in the analysis of the data.

Results: 24.6% of the participants are high school graduates, 56.7% are not employed, 49.1% have a history of unplanned pregnancy, and 1% have started smoking during their current pregnancy. Cronbach Alpha values of the sub-dimensions of the scale ranged between .90 and .70, respectively. Confirmatory factor analysis fit indices were found as RMSEA = 0.066, CFI = 0.904 and NFI = 0.842.

Conclusion: The scale is a valid and reliable measurement tool for measuring perceptions of pregnant women about smoking cessation behavior smoking behaviours. It is recommended to use the assessment of perceptions of smoking cessation behavior among pregnant smokers.

Keywords: Health Belief Model, Pregnancy, Smoking

Öz

Gebelikte Sigara kullanımına Yönelik Sağlık İnanç Modeli Ölçeğinin Geliştirilmesi: Geçerlik ve Güvenirlik Çalışması

Amaç: Sağlık davranışlarının açıklanmasında en sık kullanılan modellerden birisi olan Sağlık İnanç Modeli koruyucu sağlık davranışlarının gerçekleştirilmesi ile ilgili belirleyicileri açıklamaktadır. Bir davranışı değiştirme de algılarımız etkin rol oynadığından dolayı gebeyi algısal yönden değerlendirmek için SİM kapsamında bir ölçüm aracına ihtiyaç duyulmaktadır. Bu araştırma, gebelerin sigara bırakma davranışına ilişkin algılarını sağlık inanç modeli kapsamında bir ölçek geliştirilerek Türk toplumunda geçerlik ve güvenirliğinin analiz edilmesi amacıyla yapılmıştır.

Yöntem: Çalışma metodolojik tipte olup, veriler bir üniversite hastanesi Kadın Doğum Polikliniği'nde 15.05.18 – 30.04.2019 tarihleri arasında günde en az 1 sigara içen gebelere anket formu uygulanarak toplanmıştır. Çalışmanın örneklemini rutin gebelik izlemleri için polikliniğe başvurmuş olan 289 gebe oluşturmaktadır. Ölçeğin kapsam geçerliliği halk sağlığı hemşireliği alanında 9 uzmanın görüşüne başvurularak değerlendirilmiştir. Verilerin analizinde açıklayıcı ve doğrulayıcı faktör analizi yöntemleri kullanılmıştır.

Bulgular: Katılımcıların %24.6'sı lise mezunu, %56.7'si çalışmıyor, %49.1'i planlanmamış gebelik öyküsüne sahip ve %1'i şu an ki gebeliklerinde sigara kullanmaya başlamıştır. Ölçeğin alt boyutlarının Cronbach Alfa değerleri sırasıyla 0.907 ile 0.701 arasında değişmektedir. Doğrulayıcı Faktör analizi uyum indeksleri, RMSEA=0.066, CFI=0.904 ve NFI=0.842 olarak bulunmuştur.

Sonuç: Ölçek gebelerin sigara bırakma davranışına ilişkin algılarını ölçmede geçerli ve güvenilir bir ölçüm aracıdır. Sigara içen gebelerin, sigara bırakma davranışına yönelik algılarını değerlendirmede kullanılması önerilmektedir.

Anahtar Kelimeler: Sağlık İnanç Modeli, Gebelik, Sigara

INTRODUCTION

Smoking during pregnancy is a critical and preventable public health problem due to its adverse effects on both maternal health and fetus (Guerby et al., 2020). According to the 2020 report of the World Health Organization (WHO), 22.3% of the world population over the age of 15 smoke. It is reported that 36.7% of them are male, and 7.8% are female (WHO, 2023). The 2008 and 2018 data of the Turkey Demographic and Health Survey revealed that the average age to start smoking among pregnant women was 17.4, and 11.4% continued smoking during pregnancy and smoking is prevalent in 33% of households in Turkey. The studies conducted in Turkey show that the smoking percentage of pregnant women varies between 28% and 10.7% (Cengizoğlu & Gölbaşı, 2021; Erbaş et al. 2020; Kayyaoğlu & Hür, 2020; Keten & Bal, 2024; Tarhan & Yılmaz, 2016; Koçak et al., 2015; Abide et al., 2018). Active or passive smoking during pregnancy affects fertility, fetus development, every stage of pregnancy, birth, baby health and development (Kutlu, 2008). Besides, smoking in pregnancy is known to be associated with negative consequences for children in the long term such as cognitive function disorder, academic failure, alcohol and drug use, psychiatric problems, mood disorder, criminal tendencies in adolescence, Type 2 diabetes, childhood cancers and chest diseases (Tarhan et al., 2016). The United States Public Health Service estimates that if all pregnant women in the United States quit smoking, 11% drop in stillbirths and 5% drop in neonatal deaths might occur (U.S. Department of Health & Human Services, 2014).

Pregnancy is a period when women have the motivation to quit smoking. In a study conducted in England, it was stated that half of the women who smoke were trying to quit smoking after pregnancy, but 75% of them started smoking again within one year (Orton et al., 2018). It is crucial to stop smoking during pregnancy, avoid passive smoking and restarting smoking. During primary healthcare services, as part of the follow-ups for women aged 15-49, public health nurses should record and monitor the smoking status of women. Support should be provided to smokers to quit smoking. If they quit, they should be encouraged not to relapse and to avoid passive smoking (Kahyaoğlu et al., 2018).

It is reported that approximately 30% of women who smoke prior to pregnancy continue to smoke during pregnancy, and a third of women who smoke during pregnancy continue smoking during and after the postpartum period. Active and passive smoking is higher in pregnant women who have low education level and income, do not work actively, have few rooms in their homes, have a large family life, and have several pregnancies before (Keskinoğlu et al., 2005). Factors affecting maintaining smoking during pregnancy are unplanned pregnancies, unwanted pregnancies, unwillingness to quit smoking, being pregnant at a young age, low education level, not getting prenatal care, stress, having too many children, divorce, unemployment, spouse and other family members related problems and lack of support (Brosky, 1995).

The Health Belief Model (HBM) is a popular tool for helping people establish healthy societal, family, and personal behaviors. Explaining the factors that influence engaging in preventive health behaviors is the HBM's basic belief (Glanz et al., 2008). The approach believes that a person's ideas, values, and attitudes will influence their health behaviors. The health education to be delivered or the treatment procedures to be used may be organized in a way that is more successful for that person when beliefs and attitudes that are recognized as a problem in the development of the individual's health behaviors are determined (Gözüm et al., 2014). According to Rohleder (2012) and Bulduk et al. (2015), HBM consists of eight elements: sensitivity perception, risk-awareness perception, benefit perception, motivation, challenge perception, threat, the efficacy of action, and likelihood of action.

Preventing smoking during pregnancy, which is a significant health problem in terms of public health, and helping pregnant women quit smoking should be among the primary targets of all healthcare professionals, especially public health nurses. The gestation period is the period when pregnant women are open to learning most about maternal health. In this respect, it is thought that developing a valid and reliable measurement tool to determine the factors affecting the smoking cessation of the pregnant woman will be useful.

This study was carried out to develop a scale that measures perceptions of pregnant women about smoking cessation behaviour within the scope of the HBM and analyze the validity and reliability of the scale in the Turkish context.

Research Questions

Can a scale measuring pregnant women's perceptions of smoking cessation behavior be developed within the scope of HBM?

Is this developed scale valid and reliable in Turkish society?

METHODS

Research Design

It is a methodological study.

Setting

The study was carried out between 15.05.2018 – 30.04.2019 in Gynecology and Obstetrics Polyclinic of an university hospital in Istanbul.

Procedure for Developing a HBM Scale for Smoking Behaviour During Pregnancy

Scale Item Selection: A literature research was completed prior to developing the HBM for Smoking Behavior in Pregnancy Scale. Studies on pregnant smokers and HBM Scales in the literature were investigated. A draft scale with 28 items was developed as a consequence of the data gathered.

Finding Expert Opinions on the Content Validity of the Draft Scale: In this study, we sought expert opinions on the content validity of the draft scale. The group of experts is made up of 9 specialists, including 7 faculty members in the department of public health nursing, one faculty member in the department of chest diseases, and a linguist. In this study, the draft scale's content validity was initially evaluated by experts. The Content Validity Index (CVI) was used to assess the consistency among the study's expert participants, and a value of 90.3% was discovered.

Results of the Piloting of the Draft Scale and Analysis: The 28-item form was given by the researcher to pregnant patients who came in for examination at the gynecology and obstetrics clinic and who smoked at least one cigarette per day. Consequently, several terms that are challenging to understand were changed.

Creating the Final Version of the Scale: Some changes were made based on the results pilot application expert opinions. The expressions of "tobacco" used in the scale were changed as "cigarettes". In addition, negative statements in items 13 and 15 were rewritten in a positive form.

Sampling: According to the literature, the sample volume for validity and reliability studies should be set at ten times the scale's number of items (Tavşancıl, 2010; Ozdamar, 2013). The target population for this study included 280 pregnant smokers, along with 289 other women who were at least 18 years old, smoked at least one cigarette per day, and agreed to take part voluntarily.

Data Collection Tools

Introductory Information Form

The researcher created this questionnaire to ascertain the features of women in terms of their demographic data and smoking status. There are 8 questions on the form.

HBM Scale for Smoking Behaviour During Pregnancy: The scale is a 5-point likert type scale (1=definitely disagree, 5=strongly agree) that comprises 28 items. It consists of six sub-dimensions: Sensitivity, risk-awareness, motivation, benefits, challenges and self-efficacy. The scale does not have any cut-off points. An increase in the scale score indicates a positive perception of the ability to quit smoking. Items 12, 18, 27, and 28 in the scale are reverse-scored. Cronbach Alpha values of the sub-dimensions of the scale ranged between .90 and .70, respectively.

Data Collection: Prior to the data gathering process, two researchers established the sample criteria for expectant women who visited gynecology and obstetrics clinics. The study included pregnant who smoke at least one cigarette per day. The study's female participants received questionnaire and scale forms. The information form and scale filling out took around 15 minutes.

Data Analysis: SPSS for Windows 25.0 and AMOS 22.0 software were used to analyze the study's data. Internal consistency analysis and total item score correlation was performed to assess the scales' reliability. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) in order to evaluate the construct validity. Lower-upper group analysis was applied to determine how the items' discriminative characteristic was analyzed. The scope validity index was calculated according to the Davis technique. The Kaiser-Meyer-Olkin (KMO) test was used to determine if the sample size is appropriate for factor analysis. The acceptable significance level was 0.05

Research Ethics: Ethics approval was obtained from the hospitals where the research was be carried out, and the ethical committee of the Dokuz Eylül University (Decision No: 2017/24-14, Date: 12.10.2017). In addition, the study was carried out by obtaining written consent from the individuals who participated in the study.

RESULTS

The demographic characteristics of the participants are presented in Table 1. 24.6% have completed high school. Furthermore, 43.3% of the participants are employed, 48.4% have income equal to their expenses, 90.1% have social security.

Table 1. Sociodemographic characteristics of the participants

Sociodemographic characteristics		N	%
Educational status	Illiterate	9	3,1
	Literate	16	5,5
	Primary school	66	23,9
	Middle school	56	19,4
	High school	71	24,6
	University and above	68	23,5
Marital status	Married	279	96,5
	Single	10	3,5
Working status	Working	125	43,3
	Not working	164	56,7
Income status	Income equals expenses	140	48,4
	Income exceeds expenses	51	17,6
	Expenditure is more than income	98	33,9
Social insurance	No social security	26	9
	There is social security	263	91
Planned pregnancy status	Not a planned pregnancy	142	49,1
	Planned pregnancy	147	50,9
Smoking status before pregnancy	No smoke	3	1
	Yes smokes	286	99
Trying to quit smoking	No I haven't tried	172	59,7
	Yes I tried	117	40,3
Smoking status in previous pregnancy (112 people first pregnancy)	I smoked	152	88,9
	I did not smoked	19	11,1
Recommended status of quitting smoking during pregnancy	No not recommended	95	32,9
	Yes recommendedè nurse (%33,0) è physician (%43,3) è family (%23,7)	194	67,1
Information about the harms of smoking	No, no information given	164	56,9
	Yes, information was given	125	43,1
Smoking cessation training	No I did not receive any training	282	98,3
	Yes I received training	7	1,7
Smoking place	Living room	26	9
	Kitchen	95	33
	Bedroom	3	1
	Balcony garden	34	11,8
	Everywhere	130	42,2
	Toilet	3	1
Is passive smoking harmful?	No it is not harmful	43	14,9
	Yes it is harmful	246	85,1

Regarding pregnancy, 50.9% of mothers reported planned pregnancies, and 99% reported smoking before pregnancy. About 40.3% mentioned attempting to quit smoking before.

Moreover, 67.1% of pregnant women mentioned receiving smoking cessation advice from nurses, midwives, doctors, or relatives. Additionally, 56.9% of the participants stated they did not receive information about the harms of smoking; 98.3% did not receive smoking cessation training, and 14.9% believed passive smoking was not harmful.

The scope validity scores for the items ranged between 0.8 and 1. The average CVO score was found to be 0.9.

The Kaiser-Meyer-Olkin (KMO) test was used to determine if the sample size is appropriate for factor analysis. Following examination, the KMO value was shown to be 0.776. Additionally, it can be observed from the Bartlett Sphericity test findings that the chi-square value is adequate $\chi2$ (378) =4532,116; $p<.05$).

The principal component analysis and varimax rotation methods were used as the factoring and rotation methods, respectively, to reveal the pattern of the factors of the HBM Scale for Smoking Behaviour During Pregnancy. The items were categorized under a total of 6 criteria as a result of the Varimax rotation. 62.3 % of the total variation is explained by these variables.

In this context, it is clear that a defined factor's contribution to the total variance is sufficient. As can be seen in Table 2, "F1: Sensitivity" domain explains the 14,8 % of the total variance, "F2: Risk-Awareness" explains 13,6 %, "F3: Motivation" explains 10,7 %, "F4: Benefits" explains 8.01 %, "F5: Challenges" explains 7.9 %, and "F6: Self-Efficacy" explains 7.4 % of the total variance.

When the validity of the HBM Scale and each of its subdimensions is assessed independently, the reliability coefficients for the first dimension are (0.907), the second dimension is (0.904), the third dimension is (0.701), the fourth dimension is (0.750), the fifth dimension is (0.759), the sixth dimension is (0.745), and the overall scale is (0.795). A path diagram illustrating the relationships between variables believed to be in a cause-and-effect relationship with each other was created using the Path Analysis technique, also known as a technique that examines relationships among standardized variables (Figure 1).

The average variance extracted (AVE) and compound reliability (CR) values of each item were looked at independently to determine the reliability of the measurement model. As shown in Table 3, the measurement model's latent variables' compound reliability value was discovered to be greater than 0.70, and the AVE value was higher than 0.50. Additionally, it was discovered that the measurement model's motivation factor was below 0.50, which is the AVE's cutoff point. The factor loads of the items are over 0.40, and all correlation values are significant when the correlations between the variables are analyzed.

Table 2. Exploratory Factor Analysis Results of the HBM Scale for Smoking Behaviour During Pregnancy

Items	F1: Sensitivity	F2: Risk Awareness	F3: Motivation	F4: Benefits	F5: Challenges	F6: Self-efficacy	Total Item Correlation
						Factors	
S1	0.825						0.840
S2	0.794						0.820
S3	0.670						0.712
S4	0.726						0.740
S5	0.673						0.716
S6		0.428					0.518
S7		0.520					0.543
S8		0.829					0.839
S9		0.853					0.869
S10		0.851					0.862
S11		0.779					0.799
S12			0.656				0.532
S13			0.476				0.430
S14			0.557				0.495
S15			0.514				0.487
S16				0.855			0.734
S17				0.836			0.702
S18				0.459			0.395
S19					0.394		0.440
S20					0.574		0.572
S21					0.497		0.501
S22					0.487		0.504
S23					0.333		0.402
S24					0.549		0.574
S25					0.302		0.357
S26						0.612	0.541
S27						0.700	0.575
S28						0.678	0.596
Cronbach Alpha	0.907	0.904	0.701	0.750	0.759	0.745	0.795
Explained Variance (%)	14.769	13.559	10.662	8.006	7.845	7.408	62.249
Eigenvalue (Λ)	6.252	3.081	2.379	2.236	1.822	1.660	

KMO =0.776; χ2(378) =4532,116; Bartlett's Test of Sphericity (p) = 0.000

The scale's 28 items and six sub-dimensions were connected to the scale structure, according to a confirmatory factor analysis that found the scale's structural equation modeling findings to be significant at the level of p<.001f (Table 4). The model has been enhanced. As the fit was being improved, factors that decreased it were identified, and additional covariance was established for those that had a significant level of covariance among the residual values. Additional testing revealed that the fit indices' ideal values had been attained.

The goodness of fit indices of the HBM scale for smoking behavior during pregnancy are RMSEA 0.066, GFI 0.848, CFI 0.904, and χ2 is 2.252 (p<.001), according to the findings of the first-level multi-factor analysis.

The independent sample t-test findings from Table 5 demonstrate the items' overall discriminative powers. The raw scores from each component were sorted from small to big in order to ascertain the discrimination of the scale's items, and the independent sample t-test was used to compare the mean scores of the groups in the lower 27% and the upper 27%.

It can be concluded from the comparison that the sub-dimensions of the scale are responsive to assessing the intended quality because there is a significant difference between the means of the sub and upper group item scores for all items for each sub-dimension at the 0.05 level.

Table 3. Results of Measurement Models

Factors	Items	Parameter Estimations (Factor Loadings)	t values	p values	CR	AVE
F1: Sensitivity	S1	0.928			0.90	0.65
	S2	0.924	25.546	***		
	S3	0.764	17.171	***		
	S4	0.699	14.692	***		
	S5	0.672	13.809	***		
F2:Risk-Awareness	S6	0.484			0.88	0.51
	S7	0.510	8.160	***		
	S8	0.930	8.959	***		
	S9	0.959	9.037	***		
	S10	0.887	8.818	***		
	S11	0.821	8.560	***		
F3: Motivation	S12	0.807			0.70	0.48
	S13	0.443	4.655	***		
	S14	0.728	6.923	***		
	S15	0.423	5.706	***		
F4: Benefits	S16	0.947			0.84	0.66
	S17	0.952	16.881	***		
	S18	0.406	7.136	***		
F5: Challenges	S19	0.412			0.71	0.52
	S20	0.646	6.469	***		
	S21	0.656	5.279	***		
	S22	0.611	5.177	***		
	S23	0.413	4.246	***		
	S24	0.711	5.373	***		
	S25	0.402	4.343	***		
F6: Self-Efficacy	S26	0.642			0.75	0.50
	S27	0.694	8.303	***		
	S28	0.770	8.200	***		

CR Composite Reliability
AVE Average Variance Extracted

Table 4. Goodness of Fit Values of the Structural Model

	Structural Model Values	Suggested Values
$x2/df$ (chi-square to the degrees of freedom ratio)	2.252	≤ 5
Root Mean Square Error of Approximation	0.066	≤ 0.08
Goodness-of-Fit Index	0.848	≥0.80
Adjusted Goodness of Fit Index	0.813	≥0.80
Comparative Fit Index	0.904	≥0.80
Normed Fit Index	0.842	≥0.80
Standardized Root Mean Square Residual	0.065	≤ 0.10
x2 :743.324, df:330, p:0.000		

Table 5. Item Analysis Results of HBM Scale for Smoking Behaviour During Pregnancy

Item No	t (Low % 27**-High %27**)	p-value (Low % 27**-High %27**)
F1: Sensitivity		
S1	-32.397	***
S2	-22.272	***
S3	-16.670	***
S4	-20.447	***
S5	-17.744	***
F2: Risk-Awareness		
S6	-10.928	***
S7	-11.912	***
S8	-28.964	***
S9	-29.408	***
S10	-35.579	***
S11	-29.633	***
F3: Motivation		
S12	-18.885	***
S13	-14.835	***
S14	-17.452	***
S15	-17.863	***
F4: Benefits		
S16	-10.546	***
S17	-11.126	***
S18	-25.413	***
F5: Challenges		
S19	-10.441	***
S20	-13.567	***
S21	-12.176	***
S22	-14.506	***
S23	-9.706	***
S24	-12.648	***
S25	-8.268	***
F6: Self-Efficacy		
S26	-18.663	***
S27	-16.295	***
S28	-18.939	***

t= bağımsız grup t-testi
*** p < 0,05 için anlamlı değerler.

Figure 1. First Level Multi-Factor Confirmatory Factor Analysis Model of the HBM Scale for Smoking Behaviour During Pregnancy

DISCUSSION

The Kaiser-Meyer-Olkin test was used in our study to determine the health beliefs of people regarding smoking during pregnancy. It was used to determine whether the sample size is appropriate for factor analysis before the explanatory factor analysis process. The study led to the discovery that the KMO value was 0.776 (Karagöz, 2019: 953). It was determined that the sample size was "sufficient" for factor analysis in light of this outcome. While KMO values between 0.6 and 1.0 are regarded as acceptable, values under 0.6 suggest that factor analysis is inappropriate for the present data set. (2010): 266 (Altunşk et al.). The chi-square value was also found to be acceptable when Bartlett Sphericity test results were reviewed χ2 (378) = 4532,116; p <.05).
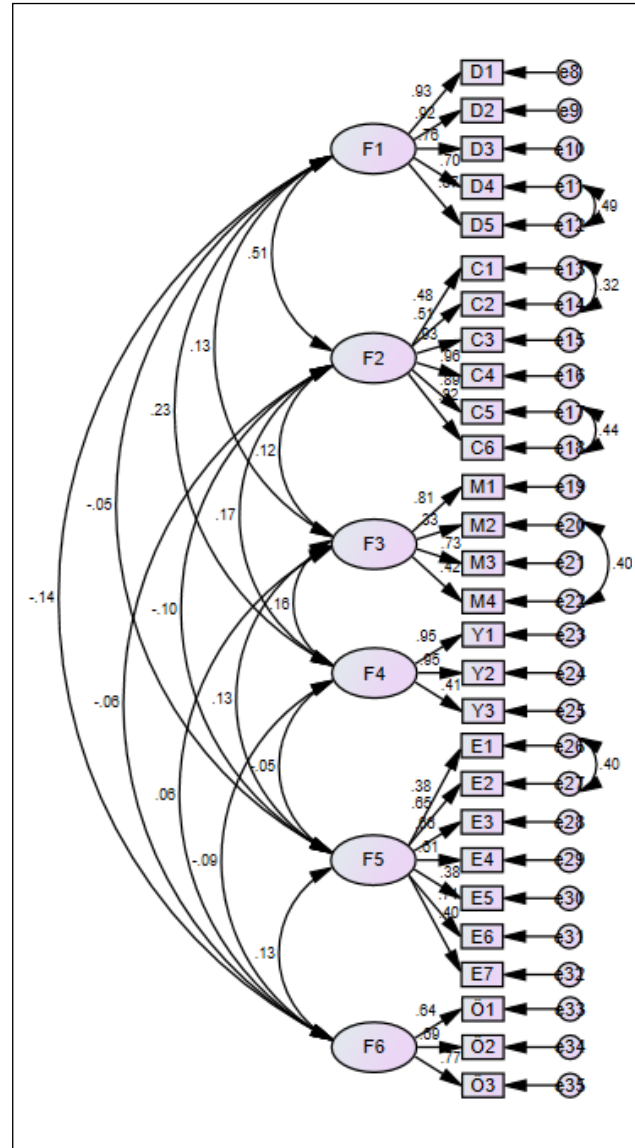
For multi-factor designs, it is generally accepted that the explained variance must be between 40 % and 60 % (Büyüköztürk, 2012; Tavsancil, 2010). The items in the study were organized into a total of six factors, and these factors account for 62,3 % of the overall variation.

Scales that have Cronbach Alpha scores over 0.70 are considered to be reliable. For each sub-dimension in our study, Cronbach Alpha values varied from 0.70 to 0.90, and the scale's overall Cronbach Alpha value is higher than 0.70. This demonstrates that the scale employed in the study has strong internal consistency (Karagöz, 2019: 1003).

By examining the average variance extracted and CR values of each element independently, the measurement model's reliability was examined. According to Hair, Black, Babin,

and Anderson (2014), the average variance extracted value should be greater than 0.50, and the compound reliability value of the latent variables in the measurement model should be higher than 0.70.

Values of CR are higher than the cutoff point of 0.70. However, AVE can be considered to be less than 0.5 when other reliability assessments are satisfactory (Çalık et al., 2013, p. 153).

The goodness of fit indices of the HBM scale for smoking behavior during pregnancy are RMSEA = 0.066; GFI = 0.848; CFI = 0.904; $\chi 2$ = 2.252 (p<.001) according to the results of the first-level multi-factor analysis, which is at an acceptable level (Özdamar, 2013). These findings demonstrated the relationship between the items and sub-dimensions, the items' sufficient representation of the feature that should be assessed, the scale's consistency, and its ability to accurately measure the feature that should be measured in practice.

Limitations

Smoking status, which is among the sampling criteria, is the reported statement of the participants. This situation may cause some women to hide their smoking status. In addition, interviews with participants were done in waiting rooms at polyclinics, and the absence of a separate meeting room adversely affected the data collection process.

CONCLUSION

Since the perceptions play a significant role in changing behavior, there is a need for a measurement tool within the scope of the HBM to assess pregnant women in terms of smoking cessation perception. In this context, the scale we have developed can be used to assess pregnant women's perceptions of smoking cessation behavior within the framework of HBM. This scale is a valid and reliable measurement tool for evaluating the smoking cessation behavior of pregnant women in the Turkish community.

The study revealed that pregnant women's smoking status was not thoroughly questioned and monitored. It is recommended that the smoking status of pregnant women be inquired by family health nurses in primary health care services, and in case of addiction, they should receive standard addiction education.

REFERENCES

Abide, Ç.Y., Kumruş, P., Ergenş E. B., & Kılıççı, Ç. (2018). Relationship between smoking doses and maternal and fetal outcomes of pregnancy. Medical Bulletin of Zeynep Kamil, 49(1), 31-35. http://dx.doi.org/10.16948/zktipb.393346

Guerby, P., Garabedian, C., Berveiller, P., Legendre, G., Grange, G., & Berlin, I. (2020). Tobacco and nicotine cessation during pregnancy. Obstetrics & Gynecology, 136(2), 428-429. https://doi.org/10.1097/AOG.000.000.0000004033

Altunışık, R., Coşkun, R., Bayraktaroğlu, S., & Yıldırım, E. (2010). Sosyal Bilimlerde Araştırma Yöntemleri. Sakarya Kitabevi, Adapazarı (in Turkish)

Brosky, G. (1995). Why do pregnant women smoke and can we help them quit? Canadian Medical Association Journal, 152(2), 163-166.

Bulduk S., Yurt S., Dinçer Y., & Ardıç, E. (2015). Health Behaviour Models, Journal of Duzce University Health Sciences Institute, 5(1), 28-34.

Büyüköztürk, Ş. (2012). Sosyal bilimler için veri analizi el kitabı. pp.107-123. Ankara: Pegem Akademi Yayıncılık (in Turkish)

Çalık, M., Altunışık, R., & Sütütemiz, N. (2013). An investigation of the relationship among integrated marketing communication (imc), brand performance and market performance. Int. Journal of Management Economics and Business, 9(19), 137-162. http://doi.org/10.24925/turjaf.v8i5.1108-1116.3292

Cengizoğlu, H., Gölbaşı, Z. (2021). Gebe kadınların sigara kullanımı ve pasif sigara dumanına maruziyetinin belirlenmesi. Gazi Sağlık Bilimleri Dergisi, 6(3), 78-89. https://doi.org/10.52881/gsbdergi.938147

Erbaş, B.G., Şengezer, T., Yıldırım, U., Özkara, A. (2020). Ankara'da bir kadın doğum hastanesine başvuran gebelerde sigara kullanımı ve sigara dumanından pasif etkilenme durumlarının araştırılması. Konuralp Tıp Dergisi, 12(2): 261-269. http://doi.org/ 10.18521/ktd.653859

Turkey Demographic and Health Survey (2008). Turkey Demographic and Health Survey 2008. Hacettepe University Access: 10.04.24 http://www.sck.gov.tr/wp-content/uploads/2020/02/Turkiye-Nufus-ve-Sa%C4%9Flik-Arastirmasi-2008.pdf (in Turkish)

Turkey Demographic and Health Survey (2018). Turkey Demographic and Health Survey 2018. Hacettepe University Access: 10.04.24 https://fs.hacettepe.edu.tr/hips/dosyalar/Ara%C5%9Ft%C4%B1rmalar%20-%20raporlar/2018%20TNSA/TNSA2018_ana_Rapor_compressed.pdf (in Turkish)

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). Health behavior and health education: Theory, research, and practice (4th ed. pp:1-592). Jossey-Bass.

Gözüm, S., & Çapık, C. (2014). A Guide in the development of health behaviours: Health Belief Model. Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi, 7(3), 230-237. (in Turkish)

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). Multi variate dataanalysis: Pearson new international edition. (7rd ed pp:1-740). Essex: Pearson Education Limited. ISBN-13: 978.129.2021904

Kahyaoğlu, S., Özel, Ş., Engin-Üstün, Y., Erdöl, C., (2018). Pregnancy and smoking cessation. Jinekoloji – Obstetrik ve Neonatoloji Tıp Dergisi, 15(1), 24 – 27.

Kahyaoğlu Süt, H., Hür, S. (2020). Üreme çağında, gebe ve postpartum dönemde olan kadınların sağlıklı yaşam biçimi davranışlarının değerlendirilmesi. ESTÜDAM Halk Sağlığı Dergisi, 5(2), 243 – 256 http://doi.org/10.35232/estudamhsd.677437 (in Turkish)

Keskinoğlu, P., Çımrın, D., Giray, H., Karakuş, N.E., & Aksakoğlu, G. (2005). Gebelerde aktif ve pasif sigara içiciliği ve etkileyen etkenler. Jinekolojik ve Obstetrik Dergisi, 19(3), 153-158. (in Turkish)

Keten, E.E., & Bal, S. (2024). Determination of pregnant women's beliefs about third-hand smoke. Journal of Midwifery and Health Sciences, 7(1),135-143. http://doi.org/10.5281/zenodo.10926708

Koçak, C., Kurçer, M.A., & Arıkan İ. (2015). Knowledge, attitudes, and behaviors of pregnant women regarding smoking who were admitted to the obstetrics clinic of the Bülent Ecevit University Hospital. İstanbul Medical Journal, 16, 133-136. http://dx.doi.org/10.5152/imj.2015.66588.

Kutlu, R. (2008). The effects of active and passive smoking upon pregnancy and fetus, TAF Preventive Medicine Bulletin, 7(5), 445-448

Orton, S., Coleman, T., Coleman-Haynes, T., Ussher, M. (2018). Predictors of postpartum return to smoking: A systematic review. Nicotine Tobacco Research, 20(6), 665–673. http://doi.org/10.1093/ntr/ntx163.

Özdamar, K. (2013). Paket programlar ile istatistiksel veri analizi. (1. Baskı, pp:1-649). Eskişehir: Nisan Kitapevi (in Turkish)

Rohleder P. (2012). Critical issues in clinical and health psychology, (1ed., pp:1-232London, SAGE Publications.

Tarhan, P., Yılmaz, T. (2016). Smoking during pregnancy and the effecting factors. Journal of Health Science and Profession, 3(3),140-147. http://doi.org/10.17681/hsp.61635

Tavşancıl, E. (2010). Tutumların ölçülmesi ve spss ile veri analizi. (6. Baskıç., pp:1-230) Ankara: Nobel Yayın Dağıtım. (in Turkish)

United StatesDepartment of Health and Human Services. (2014). Health consequences of smoking, surgeon general fact sheet. https://www.hhs.gov/surgeongeneral/reports-andpublications/tobacco/consequences-smoking-factsheet/index.html

World Health Organization (WHO) (2023). Tobacco key facts. Access: 10.04.2024 https://www.who.int/news-room/fact-sheets/detail/tobacco

Appendix – 1

The Health Belief Model Scale For Smoking Behaviour During Pregnancy

Dear Participant, the scale presented below aims to measure the perceptions of pregnant women towards smoking within the scope of the Health Belief Model. For each statement below, please check the most appropriate option for you by considering your smoking behaviour during pregnancy.

	THE HEALTH BELIEF MODEL SCALE FOR SMOKING BEHAVIOUR DURING PREGNANCY	Totally agree	Agree	Neutral	Disagree	Totally disagree
	SENSITIVITY PERCEPTION					
1	*Smoking increases the likelihood of miscarriage*					
2	*Smoking increases the likelihood of premature birth*					
3	*Smoking increases the likelihood that my baby will be born underweight*					
4	*Smoking increases the likelihood that my baby will be born with a disability*					
5	*Smoking increases the likelihood that my baby will have heart problems before birth*					
	RISK-AWARENESS PERCEPTION					
6	Cigarette causes addiction like heroin, cannabis and alcohol					
7	I'm aware that I'm addicted to cigarettes					
8	I'm afraid of miscarriage because I smoke					
9	I'm afraid of premature birth because I smoke					
10	I'm afraid that my baby will be born underweight because I smoke					
11	I'm afraid that my baby will be born disabled because I smoke					
	MOTIVATION PERCEPTION					
12	I don't want to quit smoking					
13	I can get advice from healthcare professionals to quit smoking					
14	I can try to quit smoking					
15	I think being pregnant will make it easier for me to quit smoking					
	BENEFIT PERCEPTION					
16	I believe that quitting smoking will be beneficial for my baby's development.					
17	I believe that when I quit smoking, I will have a healthier pregnancy period.					
18	I believe that quitting smoking will have no benefit for my baby and me					
	CHALLENGES PERCEPTION					
19	I don't know what to do to stop smoking					
20	I know it's very difficult to stop smoking					
21	I think I will start smoking again after birth even if I stop smoking during pregnancy					
22	I don't think I can quit because people around me smoke					
23	I believe that if I stop smoking, I will put on too much weight during pregnancy					
24	I believe that smoking makes me calm					
25	Smoking makes it easier for me to cope with pregnancy-related problems					
	SELF-EFFICACY PERCEPTION					
26	I know I can stop smoking if I want					
27	I tried to stop smoking a lot but I couldn't					
28	I believe I can't stop smoking whatever I do					

Ek-1

Gebelikte Sigara Kullanimina Yönelik Sağlik İnanç Modeli Ölçeği

Değerli Katılımcı, Aşağıda sunulan ölçek, Sağlık İnanç Modeli kapsamında gebelerin sigaraya yönelik algılarını ölçmeyi amaçlamaktadır. Aşağıdaki her ifade için lütfen hamilelik sırasında sigara içme davranışınızı dikkate alarak size en uygun seçeneği işaretleyiniz.

	GEBELİKTE SİGARA KULLANIMINA YÖNELİK SAĞLIK İNANÇ MODELİ ÖLÇEĞİ	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
	DUYARLILIK ALGISI					
1	Sigara kullanmam düşük yapma ihtimalimi yükseltir					
2	Sigara kullanmam erken doğum yapma ihtimalimi yükseltir					
3	Sigara kullanmam bebeğimin düşük kilolu doğma ihtimali yükseltir					
4	Sigara kullanmam bebeğimin engelli doğma ihtimali yükseltir					
5	Sigara kullanmam bebeğimin daha doğmadan kalp problemleri yaşama ihtimali yükseltir					
	CİDDİYET ALGISI					
6	Sigara; eroin, esrar ve alkol gibi bağımlılık yapar					
7	Sigara bağımlısı olduğumu biliyorum					
8	Sigara kullandığım için düşük yapmaktan korkuyorum					
9	Sigara kullandığım için erken doğum yapmaktan korkuyorum					
10	Sigara kullandığım için bebeğimin düşük kilolu doğmasında korkuyorum					
11	Sigara kullandığım için bebeğimin engelli doğmasından korkuyorum					
	MOTİVASYON ALGISI					
12	Sigara kullanmayı bırakmak istemiyorum					
13	Sigara kullanmayı bırakmak için sağlık çalışanlarından danışmanlık alabilirim					
14	Sigarayı bırakmayı deneyebilirim					
15	Gebe olmamın sigarayı bırakmamı kolaylaştıracağını düşünüyorum					
	YARAR ALGISI					
16	Sigarayı bırakmamın bebeğim gelişimi açısından faydalı olacağına inanıyorum					
17	Sigarayı bıraktığımda daha sağlıklı bir gebelik süreci geçireceğime inanıyorum					
18	Sigarayı bırakmamın bebeğime ve bana bir yarar sağlamayacağına inanıyorum					
	ENGEL ALGISI					
19	Sigara kullanmayı bırakmak için ne yapmam gerektiğini bilmiyorum					
20	Sigara kullanmayı bırakmanın çok zor olduğunu biliyorum					
21	Gebelikte sigara kullanmayı bıraksam bile doğumdan sonra tekrar sigara kullanmaya başlayacağımı düşünüyorum					
22	Çevremdekiler sigara kullandığı için bırakabileceğimi düşünmüyorum					
23	Sigara kullanmayı bırakırsam gebelikte fazla kilo alacağımı düşünüyorum					
24	Sigara kullanmanın beni sakinleştirdiğini düşünüyorum					
25	Sigara kullanmak gebeliğe bağlı yaşadığım problemlerle başa çıkmamı kolaylaştırıyor					
	ÖZ-YETERLİLİK ALGISI					
26	İstersem sigara kullanmayı bırakabileceğimi biliyorum					
27	Sigara kullanmayı bırakmayı çok denedim fakat başaramadım					
28	Ne yaparsam yapayım sigara kullanmayı bırakamayacağıma inanıyorum					

12, 18, 27 ve 28. Maddeler ters puanlanmaktadır.