Volume 5-1,2023, DOI: 10.59124/guhes.1222966

GUHES

Journal of Gazi University Health Sciences Institute

journal homepage: https://dergipark.org.tr/tr/pub/guhes

Developing a Scale for Awareness of Cervical Cancer: Study of Validity and Reliability

Seçil Güneysu Tunaman[1]. Canan Uçakci Asalioğlu[1]. Şengül Yaman Sözbir[1]

[1] Gazi University. Faculty of Health Sciences. Department of Nursing. Ankara. Türkiye

Article info:

Received: 15.01.2023

Accepted: 24.01.2023

Keywords:

Cervical cancer, Scale development, Awareness

Abstract

This study aims to develop a scale to determine women's awareness of cervical cancer. In development of the scale. a systematic algorithm was performed. The developed scale was applied on 512 individuals and the data was collected face to face. Two groups were formed with participants (n1=256. n2=256). With the data collected from the first group. exploratory factor analysis was performed while with the data of the second group. and confirmatory factor analysis was performed. At the end of the exploratory factor analysis. it was found that the scale consisted of 18 items and three factors. The validity of the obtained construct was confirmed with confirmatory factor analysis. It was also found that the Cronbach-alpha internal consistency coefficient for the whole scale was 0.84 and the internal consistency coefficients of sub-dimensions ranged among 0.69 and 0.83. For test-retest reliability coefficient. the scale was applied on the same group at 4 week intervals and the scale-wide correlation coefficient was calculated as 0.98 while it was found to be among 0.95 and 0.97 for sub-dimensions. therefore. correlation coefficients were found to be significant. The data collected indicated the scale was valid and reliable in measuring women's awareness of cervical cancer.

1. Introduction

Cervical cancer is the fourth common type of cancer among women worldwide. While only in 2020. 604.000 new cervical cancer cases were detected in the whole world. it was asserted cervical cancer caused 340.000 deaths. approximately 90% of which were seen in countries with low or middle income (Sung et al.. 2021).

It is claimed most of the deaths in countries with low or middle income result from insufficient cancer prevention and control programs that lack of regular scanning of women (Serrano et al.. 2022; Sung et al.. 2021).

Cervical cancer. as it has a long preinvasive process. is among cancers that has the potential to be treated with early diagnosis. When treatment begins with diagnosis in early stages. rate of recovery increases and even full recovery is possible (Kılıçsokan & İlhan. 2020). For this reason. vaccination (primary protection) and scanning (secondary protection) programs against Human Papilloma Virus (HPV). which is the most significant factor in cervical cancer. were developed (Apaydin et al.. 2018; Kaur et al.. 2017) . Although HPV vaccine. whose efficiency was proved and whose reliability in prevention of cervical cancer and genital warts was confirmed by European Medicine Agency exists in national vaccination schedule of numerous countries. it does not take part in the national vaccination schedule of Türkiye (Apaydin et al.. 2018; Brotherton & Bloem. 2018; Özdemir. Akkaya. & Karaşahin. 2020). In our country. it is applied for a certain amount of fee upon individuals' or families' demands (Yağız Altıntaş. Kilci Erciyas. & Ertem. 2022). Recognizing and regular application of Pap. smear and HPV scanning tests used for early diagnosis of the cervical cancer gives opportunity for not only detection but also treatment of the disease in early stages (Kılıçsokan & İlhan. 2020).

In our country. pap-smear and HPV tests are conducted free of charge as part of national scanning programs by Center of Early Diagnosis. Scanning and Training for Cancer (KETEM). AS part of cervical cancer scanning program. Pap smear and HPV tests are recommended to women of 30-65 once every 5 years and the tests are performed free of charge (Sağlık Bakanlığı. 2017). In an efficient scanning program. it is aimed to reach 70% of the whole population (Sağlık Bakanlığı. 2016). According to the Türkiye Cancer Control Plan published in 2016 by General Directorate of Public Health. routine scanning for cervical cancers in our country covers only 20%. Although cervical cancer was included in the routine scanning program in our country. scanning rates are still unsatisfactory. Studies have shown that frequency of Pap smear scanning and knowledge of tests are inadequate (Demirgöz Bal. 2014; Karabulutlu & Pasinlioğlu. 2016; Kolutek & Avcı. 2015) and insufficient participation of women in cancer scanning programs results from lack of awareness (Gökgöz & Aktaş. 2015; Karabulutlu & Pasinlioğlu. 2016).). Accordingly. in order to increase women's awareness of cervical cancer. numerous studies were carried out; for application of Pap smear. free transportation opportunities with KETEM mobile vehicles were offered. Nevertheless. rates of Pap smear application for women in Türkiye could not reach a satisfying level (Koç et al.. 2019; Saei Ghare Naz et al.. 2018; Sağlık Bakanlığı. 2016).

Research suggests one of the biggest steps in increasing participation in scanning of cervical cancers is to raise awareness (Bhatla & Joseph. 2009; Little. Ogilvie & Mirwaldt. 2015). Therefore. it is essential to determine women's awareness of cervical cancer and sketch plans to raise their awareness. However. literature holds limited number of valid and reliable tools to determine fertile women's awareness of cervical cancer (Güvenç. Akyüz & Açıkel; 2011; Ozdemir & Kısa. 2016).

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

It is regarded as a limitation that valid and reliable scales in our country including awareness. information. attitude. belief and behaviors towards cervical cancer does not include information about current scanning tests and HPV vaccine. Thus. this study aims to develop a valid and reliable scale that also covers information about current scanning tests and HPV vaccine.

2. Materials and Methods

This research is a study of development of a methodological scale.

2.1. Research Population

Research population consists of women (with no difficulty in communication and no experience of cervical cancer-specific malignity) who applied to Centers of Healthy Life in a county of Bursa province. Women who were literate and volunteered to participate in the research were included in the research. In studies of scale development. it is seen ideal to apply the scale to 10 times more individuals than the number of items in the scale (24 items) (Erkuş. 2014). It is also asserted the number of samples exceeding 10 times of the number of items is appropriate in terms of the reliability of the scale (Alp Dal. 2017). In the light of this information. a total of 512 participants were included in the research. In the study conducted by Koyuncu and Kılıç (2019). in cases where sample size is big enough. it is recommended to perform exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) in separate groups by dividing the number of participants into half. Thus. so as to provide proof for construct validity. EFA was performed with the first working group (n1=256) while CFA was performed with the second group (n2=256) to collect data that would confirm the construct.

2.2. Process of Scale Development

At the first stage of the scale development. relative literature was reviewed. Reviewing the body of literature. the statements that could be used in the scale as part of the scope of awareness of cervical cancer were examined and an item pool that consisted of 35 items were formed. 6 people who are specialized in their fields and were informed about the study of construct validity were asked to assess the item pool in the shape of triple scoring (suitable. partly suitable and not suitable). Besides. an explanation section was formed in order for the experts to give their opinions regarding each item. In the light of the opinions received from the experts. Lawshe technique was used to determine construct validity rates (CVR) and it was decided to omit 11 items (Yeşilyurt & Çapraz. 2018). Consequently. a trial form with 25 items was finalized. Scale items were triple scored (0- Disagree. 1-Not Sure 2-Agree).

2.3. Data Collection

Research data was collected on the dates January-July 2020. First. the aim of the study was explained to the participants who volunteered to participate in the research. After the explanation that the collected data would only be used for scientific purposes. informed consent forms were received from each participant. Research data was collected face to face. It took approximately 8-10 minutes for participants to answer the trial form of the scale.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

3. Results

It was determined that 35,7% of the women who participated in the research were among 25-35 age range; 66,4% were married; 60,9% were graduates of high school or over; 47,9% lived longest in a metropolitan city; 56,6% did not work in an income generating job and 62,1% perceived their income as "moderate".

3.1. Findings Regarding Validity

EFA and CFA were performed to testify the construct validity of the scale. The suitability assessment was carried out first via KMO and then via Bartlett's test. As a consequence of the performed analysis, it was found that KMO=0,87 and Bartlett's test was p=0,001. The fact that Bartlett's test appeared significant confirmed that the research data emerged from normal distribution. As a result of these findings, it was found that factor analysis was suitable with the data collected from the 24-item scale. During performance of the factor analysis, one of the rotation methods, varimax was used. After recurrent EFA analyses, 6 items that were cyclical (ambiguous), loaded more than one factor and had low factor coefficient (less than 0,30) were omitted from the scale (1-11-12-22-23-24). The rest 18 items were collected under 2 sub-factors whose eigenvalue was over 1 (Table 1). The first factor consisted of 7 items (15, 16, 17, 18, 19, 20, 21) whose factor loads ranged among 0,715 and 0,622; the second factor consisted of 6 items (7, 8, 9, 10, 13, 14) whose factor loads ranged among 0,730 and 0,396 and the third factor consisted of 5 items (2, 3, 4, 5, 6) whose factor loads ranged among 0,707 and 0,604. It was concluded that the first factor which formed 19,7% of the total variance was to be named "HPV Information"; the second factor which formed 14,98% of the total variance was to be named "Smear Test Information" and the third factor which formed 13,45% of the total variance was to be named "Cervical Cancer Risk Information". All factors explain 48,3% of the total variance (Table 1).

Table 1: Factor load values, Contribution level of sub-factor variance scores to total variance and total variance value

Original Scale Item Numbers	New Item numbers	Factor 1	Factor 2	Factor 3
Item 17	14	0,715		
Item 20	17	0,711		
Item 16	13	0,708		
Item 18	15	0,695		
Item 19	16	0,681		
Item 15	12	0,640		
Item 21	18	0,622		
Item 8	7		0,730	
Item 13	10		0,728	
Item 14	11		0,623	
Item 10	9		0,616	
Item 9	8		0,616	
Item 7	6		0,396	
Item 2	1			0,707
Item 4	3			0,683
Item6	5			0,655
Item 3	2			0,612
Item 5	4			0,604
Eigenvalue		**5,27**	**1,84**	**1,58**
Explained Variance		**%19,87**	**%14,98**	**%13,45**
Explained Total Variance			**%48,3**	

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

The construct validity of the 3-factor modal that emerged as a result of EFA was tested in accordance with certain fit indices via CFA. As a consequence, the results without any modification on the modal appeared as follows: [χ2/df=2.641 (p=0,000); RMSEA=0,057; CFI=0,911; AGFI=0,912; GFI=0,932]. The analyses revealed recommendations of modification among certain items (Figure 1). These recommendations were taken into consideration and modification processes were consecutively applied. The results after modification processes appeared as follows: [χ2/df=2.411 (p=0,000); RMSEA=0,053; CFI=0,925; AGFI=0,918; GFI=0,938] (Table 2).

Table 2: Modal-specific fit indices and benchmark values

	Benchmark Values	Modal Fit Indices
χ2	---	311,047
Sd	---	129
χ2/sd *	0 ≤ χ2/sd ≤ 2 ise perfect fit 2≤ χ2/sd ≤ 3 acceptable fit	2,411
RMSEA **	0,00≤ RMSEA ≤ 0,05 perfect fit 0,05≤RMSA≤0,08 acceptable fit	0,053
GFI [a]	0,95 ≤ GFI ≤ 1.00 perfect fit 0,90 ≤ GFI ≤ 0,95 acceptable fit	0,938
AGFI [b]	0,90 ≤ AGFI ≤ 1.00 perfect fit 0,85 ≤ AGFI ≤ 0,90 acceptable fit	0,918
CFI [c]	0,95 ≤ GFI ≤ 1.00 perfect fit 0,90 ≤ CFI ≤0,95 acceptable fit	0,925

*: χ2/sd: Chi-Square/Degree of Freedom, **RMSEA: Root Means Quare Error of Approximation, a: GFI: Goodness of fit index, b: CFI: Comparative fit index, c: AGFI: Adjusted goodness of fit index)

Following confirmation of the data related to construct validity of the scale, it was determined whether it would be assessed by the total score. In order to achieve a single total scale score with addition of each scale item, Tukey's test for non-additivity was performed (p=0,885). Also, whether participants' responses to the scale are the same was assessed via Hotelling T^2 test (Hotelling T2 = 1156,576, p= 0,000).

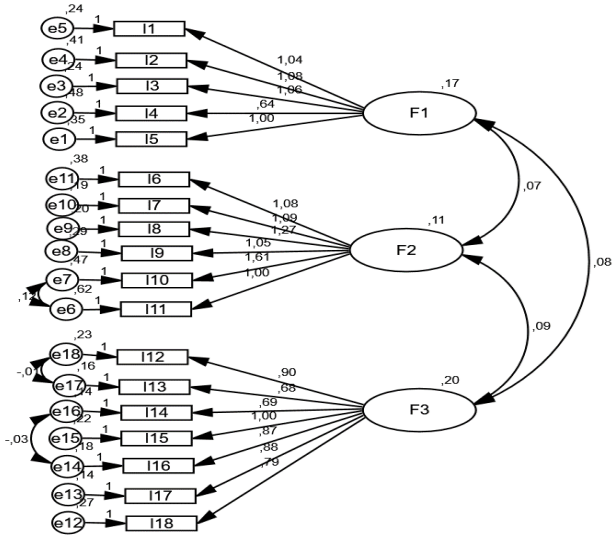

Figure 1. Path Diagram Analysis for CFA

3.2. Finding Relate to Reliability

In order to determine whether the scale is reliable, Cronbach-alpha internal consistency coefficient was utilized. Cronbach-alpha internal consistency coefficient was calculated separately for the overall scale and three sub-factors. As a result of the performed analyses, Cronbach-alpha internal consistency coefficient was found to be 0,841 for the overall scale, 0,832 for the first factor, 0,738 for the second factor and 0,691 for the third factor. Moreover, in order to determine whether it measured the targeted characteristic for each item in the scale, item-total score correlations were examined. As a result, item-total correlations were found to range among 0,435 and 0,568 in the first factor, 0,316 and 0,541 in the second factor and 0,163 and 0,435 in the third factor.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

Collected results related to reliability were summarized in Table 3. In order to testify the reliability and determine whether the scale is invariant with time, test-retest method was applied on 30 people after the first application of the scale. Whether there was a correlation was analyzed via Pearson product-moment correlation coefficient. Accordingly, the test-retest reliability coefficient for the overall scale was found to be r=0,98 (p<0,001). The test-retest reliability coefficient among sub-factors of the scale were consecutively found to be 0,95, 0,97 and 0,96 and very high positively significant correlations were observed (p<001).

4. Discussion

A recently developed scale is supposed to have two characteristics, which are validity and reliability. While validity refers to the degree at which the scale measures the targeted characteristic, reliability is related to how accurately a scale measures that characteristic.

So as to determine the validity of SACC, initially content validity then the construct validity were examined. Lawshe technique requires at least 5 at most 40 expert opinions to determine content validity. In the light of this, 6 expert opinions were asked and a 24-item trial form was developed. At the first stage of the trial form, EFA was performed with the data collected from 256 participants. In scale developing studies, it is recommended the sample be 10 times of the item number in the scale (Erkuş, 2014). In addition, when the sample is more than 10 times of the item number in the scale, it is seen ideal for reliability (Alp Dal & Ertem, 2017). Accordingly, it is thought that the sample number in this study is suitable.

In determining whether the scale is suitable for factor analysis, KMO and Bartlett's tests were performed. KMO is calculated to determine whether sample size is suitable. KMO values among 0,90 and 1,00 are seen excellent; among 0,80 and 0,89 very good; among 0,70 and 0,79 good; among 0,60 and 0,69 moderate; among 0,50 and 0,59 bad and less than 0,50 unacceptable (Büyüköztürk, 2011). For SACC, KMO value was calculated as 0,87, which was seen as a measurement that shows the sample is adequate. Bartlett's test is a statistical technique used to calculate whether data derives from a multivariable normal distribution (Büyüköztürk, 2011). As a result of the performed analysis, Bartlett's test was found to be statistically significant (p=0,01). This result indicates the data was normally distributed. It can be claimed that the data collected by the scale's trial form is suitable for factor analysis. In the performed factor analysis, a rotation method, varimax vertical rotation method was used. As a result, 6 items that were cyclical (ambiguous), loaded more than one factor and had low factor coefficient (less than 0,30) were omitted from the scale (1-11-12-22-23-24). A 18-item and 3-factor final scale, thus, emerged. In the first factor, factor loads range among 0,715 and 0,622; in the second factor, factor loads range among 0,730 and 0,396 and in the third factor, factor loads range among 0,707 and 0,604. It was taken into consideration that in the interpretation of the EFA results the factor load be over 0,30 in order for it to remain in the scale (Büyüköztürk, 2011). The 3-factor-construct emerged after the EFA explains 48,3% of the total variance. The fact that the explained variance is among 40% and 60& constitutes evidence that the scale's construct validity is on an adequate level (Tavşancıl, 2012).

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

The analysis of whether the construct after EFA works in a new sample was performed with CFA. It is asserted in scale developing studies that it is more appropriate to perform EFA and CFA separately in different sample groups (Koyuncu & Kılıç, 2019). Accordingly, CFA was performed with a second group consisting of 256 participants. In the path diagram drawn with CFA, modification recommendations among certain items emerged, which was taken into account. After the modification, modal-specific fit indices were found to be $\chi 2/df=2.411$ (p=0,000); RMSEA=0,053; CFI=0,925; AGFI=0,918; GFI=0,938. While according to Kline, for $\chi 2/sd$ 2≤, $\chi 2/sd \leq 3$; for RMSEA, 0,05≤RMSEA≤0,08; for CFI, 0,90 ≤ CFI ≤0,95; for AGFI, 0,90 ≤ CFI ≤0,95 refer to acceptable values, for AGFI, 0,90 ≤ AGFI ≤ 1,00 refers to perfect fit (Kline, 2016). These results indicate that the scale's $\chi 2/sd$, RMSEA, CFI and GFI values have acceptable fit while AGFI value has perfect fit.

The fact that as a result of the Tukey test, which reveals whether the scale items would be assessed on the total score, non-additivity appeared statistically insignificant points out that the scale has an addible characteristic. Also, Hotelling T^2 test illuminated participants' responses to the scale were not equal, which means there was no response bias.

In order to demonstrate that the SACC can perform a flawless measurement, collect accurate data and be repeated at different times, its reliability was examined at another stage. To assess reliability of SACC, Cronbach-alpha internal consistency coefficient, test-retest total mean scores and item-total score correlation coefficient were calculated. Cronbach alpha internal consistency coefficient was found to be 0,84 for the overall scale; 0,832 for the first factor; 0,738 for the second factor; 0, 691 for the third factor. If the Cronbach alpha internal consistency coefficient of a scale is $0,00 \leq \alpha < 0,40$, it is not reliable; if it is $0,40 \leq \alpha < 0,60$, the scale has low reliability; if it is among $0,60 \leq \alpha < 0,80$, the scale is quite reliable; if it is $0,80 \leq \alpha < 1,00$, the scale has high reliability (Kline, 2016). In accordance with these results, the overall scale and the first factor are among high reliable; the second and third factors are among quite reliable edges.

As another method for reliability, item-total correlations were examined for each item in the scale. It is asserted that item-total correlation coefficient must usually be over 0,30; however, literature suggests most researchers regard 0,20 as a limit (Kılıç, 2016). In addition, it is also claimed that when the item with low correlation value is omitted, a conviction might be established taking into consideration whether there is a alteration in the Cronbach alpha coefficient (Aksoy, Dutucu, Ozdilek, Acar Bektaş & Keçeci, 2019). In our scale, while correlation value of an item was found to be 0,163, overall item-total score correlations are 0,316 and over. In scale developing studies, since there is no alteration in the Cronbach alpha coefficient when items with low correlation values are omitted, it is seen appropriate to keep these items in the scale (Ağadayı, Çelik & Ayhan Başer, 2020; Güleç, 2012). Accordingly, taking into account the expert opinion, since there is no alteration in the Cronbach alpha coefficient when the item with low correlation value is omitted, it was decided to keep this item in the scale.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

Table 3: Item-total correlations, Cronbach α reliability coefficient when item is omitted and Cronbach alpha coefficient

	Modified Item-Total Correlation Values	Cronbach-alpha Internal Consistency Coefficients after Omitted Items	Cronbach Alpha
Factor 1: HPV Information			
Item 17	0,463	0,833	
Item 20	0,568	0,828	
Item 16	0,440	0,834	0,832
Item 18	0,555	0,827	
Item 19	0,489	0,831	
Item 15	0,547	0,828	
Item 21	0,435	0,833	
Factor 2: Smear Test Information			
Item 8	0,463	0,832	
Item 13	0,513	0,829	
Item 14	0,316	0,842	0,738
Item 10	0,408	0,835	
Item 9	0,541	0,828	
Item 7	0,483	0,831	
Factor 3: Cervical Cancer Risk Information			
Item 2	0,425	0,834	
Item 4	0,435	0,833	
Item 6	0,392	0,836	0,691
Item 3	0,417	0,835	
Item 5	0,163	0,848	
Total			**0,841**

Test-retest method is the power of a measurement tool to produce consistent results against elapsed time and changing situations (Karasar, 2014). Test-retest method can be applied to at least 30 individuals in certain intervals (2-4 weeks) or without any intervals at all. Due to the possibility of enabling remembrance of scale items, the fact that the time interval between two applications is short might lead to fake high scores of reliability. On the other hand, that the time interval between two applications is longer than 4 weeks might cause low scores of reliability due to the possibility of alteration in the measured characteristics (Karasar, 2014). Test-retest reliaiblity coefficient is valued among 0 and +1. The fact that the collected result, which is supposed to be at least 0,70, approaches to 1 demonstrates the scale is immutable over time (Karakoç, 2014). In the light of these, the scale was re-applied to 30 individuals after 4 weeks. The test-retest reliability coefficient was found to be 0,98 for the overall scale and 0,95 for sub-factors.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

These results indicate the findings received from the scale are immutable over time and conditions.

5. Conclusion

As part of the study, a new scale aiming to raise women's awareness towards cervical cancer was developed. The findings related to validity and reliability demonstrated that the scale can be used to determine women's awareness for cervical cancer. The scale consists of 18 items and 3 factors. The total score collectable from the scale range among 0-36. The score from the first factor range among 0 and 14; the score from the second factor range among 0 and 12 and the score from the third factor range among 0 and 10. There is no reverse item in the scale. The higher the score from scale gets, the more women's awareness of cervical cancer get. Just as the scale can be assessed in the shape of sub-factors, it can also be assessed through the total score.

6. Statistical analysis

Whether the scale is a valid and reliable measuring tool was analyzed via SPSS 22.0 and AMOS 22.0 package programs. In statistical analysis of the scale, support was received from a Statistics and Data Analysis expert.

For participants' descriptive characteristics, number and percentage distributions were calculated. After performing EFA in order to determine the construct validity of the scale, CFA was performed to confirm the final construct. For EFA, SPSS 22.00 package program was used. In order for EFA to be performed, initially, Kaiser-Meyer-Olkşn (KMO) and Bartlett Sphericity (Bartlett's) Tests were used to determine whether data was suitable for analysis. After confirmation of the suitability of data for EFA, it was determined how many factors the scale formed and under which factors the scale items were. CFA was performed to test the accuracy of the emerging construct. For CFA, fit indices were examined via AMOS 22.0. Although there was no clear conviction as to which fit indices were to be used as measurements in CFA analyses, fix indices were examined according to general acceptance in conducted studies (*χ2/df (Chi-Square/Degree of Freedom), RMSEA (Root Mean Square Error of Approximation), CFI (Comparative fit index), AGFI (Adjusted Goodness of Fit Index), GFI (Goodness of Fit Index)*) (Karaca, Açıkgöz & Demirezen, 2019; Yaşlıoğlu, 2017). In determining the reliability of the scale, for the whole scale and sub-factors of the scale separately Cronbach-alpha internal consistency coefficient; for item analysis, item-total correlation were calculated. So as to increase proof regarding reliability, test-retest method; to measure additivity of the scale, Tukey's test of additivity; to measure participants' response bias towards scale items, Hotelling T^2 test were performed.

Conflicts of interest

The authors declare no conflicts of interest The authors declare that they have no conflicts of interest.

Recommendations

It is recommended that new studies, which will make use of the scale, be conducted in a polycentric manner together with women in different communities.

It is recommended that when the scale is used to determine women's awareness in different communities, validity and reliability studies be repeated.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

Acknowledgements

The application was carried out after receiving research permit (61737632-903.07.01-) from the institution where the research was going to be conducted, ethical confirmation (13/09/2018-E.122016) and written consent from the participant women.

References

Ağadayı, E., Çelik, N., Ayhan Başer, D. (2020). Çocuklar için Uyku Bozukluğu Ölçeği'nin Türkçe geçerlik ve güvenirlik çalışması. *Journal of Turkish Sleep Medicine*, *2*:65-72.

Aksoy, S. D., Dutucu, N., Özdilek, R., Acar-Bektaş, H. & Keçeci, A. (2019). Gebelik Stresi Değerlendirme Ölçeğinin Türkçe'ye uyarlanması. *Kocaeli Üniversitesi Sağlık Bilimleri Dergisi, 5*(1), 10-14.

Alp Dal, N. & Ertem, G. (2017). Jinekolojik Kanserler Farkındalık Ölçeği Geliştirme alışması. *İnsan Ve Toplum Bilimleri Araştırmaları Dergisi, 6*(5), 2351-2367.

Apaydin, K. Z., Fontenot, H. B., Shtasel, D. L., Mayer, K. H., & Keuroghlian, A. S. (2018). Primary care provider practices and perceptions regarding HPV vaccination and anal cancer screening at a boston community health center. *Journal of Community Health*, *43*(4), 792–801.

Bhatla, N., & Joseph, E. (2009). Cervical cancer prevention & the role of human papillomavirus vaccines in India. *The Indian Journal of Medical Research*, *130*(3), 334–340.

Brotherton, J. M. L., & Bloem, P. N. (2018). Population-based HPV vaccination programmes are safe and effective: 2017 update and the impetus for achieving better global coverage. *Best Practice Research Clinical Obstetrics & Gynaecology*, *47*,42–58.

Büyüköztürk, Ş. (2011). *Sosyal bilimler için veri analizi el kitabı: İstatistik, araştırma deseni, SPSS uygulamaları ve yorum.* Ankara: Pegem Yayınları

Demirgöz Bal, M. (2014). Kadınların pap smear testi yaptırma durumlarının sağlık inanç modeli ölçeği ile değerlendirilmesi. *Clinical and Experimental Health Sciences*, *4*(3) , 133-138.

Erkuş, A. (2014). Psikolojide ölçme ve ölçek geliştirme-I temel kavramlar ve işlemler (2. baskı). Ankara: Pegem Akademi.

Gökgöz, N. & Aktaş, D. (2015). Kadınların serviks kanseri ve pap smear testi yaptırma durumlarına yönelik farkındalık düzeylerinin belirlenmesi. *Yıldırım Beyazıt Üniversitesi Sağlık Bilimleri Fakültesi Hemşirelik E-Dergisi, 3*(2), 11-23.

Guvenc, G., Akyuz, A., & Açikel, C. H. (2011). Health Belief Model Scale for cervical cancer and pap smear test: psychometric testing. *Journal of Advanced Nursing*, *67*(2), 428–437.

Güleç, H. (2012). Hastalık Davranışını Değerlendirme Ölçeğinin Türkçe uyarlamasının geçerlilik ve güvenirliği: Bir ön çalışma. *Düşünen Adam Psikiyatri ve Nörolojik Bilimler Dergisi,* 25140-146.

Karabulutlu, Ö. & Pasinlioğlu, T. (2016). Alanı sağlıkla ilgili olmayan akademisyenlerin serviks kanserine ilişkin bilgi düzeylerinin ve farkındalığının incelenmesi. *Kafkas Tıp Bilimleri Dergisi, 6*(3), 175-180**.**

Karaca, A., Açıkgöz F., & Demirezen D. (2019). Hemşirelik öğrencileri için Terapötik İletişim Becerileri Ölçeğinin Geliştirilmesi. *Süleyman Demirel Üniversitesi Sağlık Bilimleri Dergisi, 10*(2), 72-79.

Karakoç, F.Y., & Dönmez, L. (2014). Ölçek geliştirme çalışmalarında temel ilkeler. *Tıp Eğitimi Dünyası, 13*(40), 39-49.

Karasar, N. (2014). *Bilimsel araştırma yöntemleri: Kavramlar, teknikler ve ilkeler.* Ankara: Nobel Yayınları.

Kaur, P., Mehrotra, R., Rengaswamy, S., Kaur, T., Hariprasad, R., Mehendale, S. M., Rajaraman, P., Rath, G. K., Bhatla, N., Krishnan, S., Nayyar, A., & Swaminathan, S. (2017). Human papillomavirus vaccine for cancer cervix prevention: Rationale & recommendations for implementation in India. *The Indian Journal of Medical Research*, *146*(2), 153–157.

Kılıç, S. (2016). Cronbach's alpha reliability coefficient. *Psychiatry and Behavioral Sciences, 6*(1), 47-48.

Kılıçsokan, P. & İlhan, N. 2020. Bir aile sağlığı merkezine başvuran kadınların pap smear testi yaptırma durumları ile serviks kanserine ve pap smear testine yönelik sağlık inançları. *Jinekoloji-Obstetrik ve Neonatoloji Tıp Dergisi, 17*(2), 323 – 327

Kline, R.B. (2016). *Principles and practice of structural equation modeling (vol. 4).* Newyork: The Guilford Press.

Koç, Z., Kurtoğlu Özdeş, E., Topatan, S., Çinarli, T., Şener, A., Danaci, E., & Palazoğlu, C. A. (2019). The ımpact of education about cervical cancer and human papillomavirus on women's healthy lifestyle behaviors and beliefs: Using the PRECEDE Educational Model. *Cancer Nursing*, *42*(2), 106–118.

Kolutek, R. & Avcı, İ. A. (2015). Eğitim ve evde izlemin, evli kadınların meme ve serviks kanseri ile ilgili bilgi düzeylerine ve uygulamalarına etkisi. *Journal of Breast Health, 11*(4), 155-162.

Koyuncu, İ., & Kılıç, A. F. (2019). Açımlayıcı ve doğrulayıcı faktör analizlerinin kullanımı: bir doküman incelemesi. *Eğitim ve Bilim, 44*(198), 361–388.

Little, K.Q., Ogilvie, G., & Mirwaldt, P. (2015). Human papillomavirus awareness, knowledge, and vaccination status in a diverse population of male postsecondary students in greater vancouver. *British Columbia Medical Journal*, *57*, 64-69.

Özdemir, E., & Kısa, S. (2016). Validation of the Turkish Cervical Cancer and Human Papilloma Virus Awareness Questionnaire. *International Nursing Review*, *63*(3), 465–472.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com

Özdemir, S., Akkaya, R., & Karaşahin, K. E. (2020). Analysis of community-based studies related with knowledge, awareness, attitude, and behaviors towards HPV and HPV vaccine published in Turkey: A systematic review. *Journal of the Turkish German Gynecological Association*, *21*(2), 111–123.

Saei Ghare Naz, M., Kariman, N., Ebadi, A., Ozgoli, G., Ghasemi, V., & Rashidi Fakari, F. (2018). Educational ınterventions for cervical cancer screening behavior of women: A systematic review. *Asian Pacific Journal of Cancer Prevention : APJCP*, *19*(4), 875–884.

Serrano, B., Ibáñez, R., Robles, C., Peremiquel-Trillas, P., de Sanjosé, S., & Bruni, L. (2022). Worldwide use of HPV self-sampling for cervical cancer screening. *Preventive Medicine*, *154*, 106900.

Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). 2020: Global Cancer Statistics GLOBOCAN Estimates of ıncidence and mortality worldwide for 36 cancers in 185 countries. *A Cancer Journal For Clinicians*, *71*(3), 209–249.

T.C Sağlık Bakanlığı. (2016). Sağlık İstatistikleri Yıllığı. Ankara. Retrieved from https://dosyasb.saglik.gov.tr/Eklenti/13183,sy2016turkcepdf.pdf?0 (Accessed May 14, 2021).

T.C. Sağlık Bakanlığı. (2017). Serviks Kanseri Tarama Programı Ulusal Standartları. Retrieved from https://hsgm.saglik.gov.tr/tr/kansertaramastandartlari/listesi/servikskanseritaramaprogram%C4%B1-ulusal-standartlar%C4%B1.html (Accessed May 18, 2021).

Tavşancıl, E. (2012). *Tutumların ölçülmesi ve SPSS ile veri analizi.* Ankara: Nobel Yayın Dağıtım.

Yağız Altıntaş, R. , Kilci Erciyas, Ş. & Ertem, G. (2022). Sağlık bilimleri fakültesi öğrencilerinin serviks kanseri ile human papilloma virüs enfeksiyonu aşılamasına ilişkin sağlık inanç düzeylerinin belirlenmesi. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi*, *15*(1), 40-49.

Yaşlıoğlu, M.M. (2017). Sosyal bilimlerde faktör analizi ve geçerlilik: Keşfedici ve doğrulayıcı faktör analizlerinin kullanılması. *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, *46*, 74-85.

Yeşilyurt, S., & Çapraz, C. (2018). Ölçek geliştirme çalışmalarında kullanılan kapsam geçerliği için bir yol haritası. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 20*(1), 251-264.

***Corresponding author:** Seçil Güneysu Tunaman
e-mail address: guneysu06@hotmail.com