Women & Health

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ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/wwah20

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To cite this article: Büşra Yılmaz, Eren Pek, Handan Alan & Ümran Oskay (2023): Cervical Dysplasia Distress Questionnaire: Turkish validity and reliability study, Women & Health, DOI: 10.1080/03630242.2023.2223670

To link to this article: https://doi.org/10.1080/03630242.2023.2223670

Published online: 14 Jun 2023.

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WOMEN & HEALTH
https://doi.org/10.1080/03630242.2023.2223670

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Cervical Dysplasia Distress Questionnaire: Turkish validity and reliability study

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ABSTRACT

The aim of this study was to determine the validity and reliability of the Turkish adaptation of the Cervical Dysplasia Distress Questionnaire (CDDQ) in women with abnormal Pap smear results. This validation study was conducted using a cross-sectional research design. A total of 115 patients who were being followed up in the obstetrics and gynecology outpatient clinic of a university hospital due to an abnormal Pap smear test were included. In the study, the results of language and content validity, item analysis, exploratory, and confirmatory factor analyses, internal consistency coefficients, and concurrent and convergent validity were assessed in order to adapt the CDDQ to the Turkish language and culture and to determine its reliability and validity. It was determined that all factor loads of the scale ranged from 0.13 to 0.85. The exploratory variance was found to be 29.986 for the first subscale, 19.734 for the second subscale, 16.551 for the third subscale, and 66.271 for the overall scale. Cronbach's alpha values for the tension during the examination, concerns about health consequences, and concerns about sexual consequences were 0.92, 0.91, and 0.87, respectively. The desired level of correlation was achieved between the CDDQ and the Hospital Anxiety and Depression Scale (HADS). In the study, the Turkish adaptation of the CDDQ was found to be a valid and reliable instrument to assess psychological distress in women with abnormal Pap smear results.

ARTICLE HISTORY
Received 16 August 2022
Revised 26 April 2023
Accepted 23 May 2023

KEYWORDS
Cervical dysplasia; distress; reliability; validity

Introduction

After the introduction of high-quality screening programs in developed countries, a significant decrease in cervical cancer-related mortality rates has been achieved (Cohen et al. 2019). Similar to other countries with limited resources, in Turkey, less than one-third of cervical cancer cases are detected in an early stage, while most diseases (cancer) are detected in the late stages (Arbyn et al. 2021). Achieving high screening rates has brought challenges for both developing and developed countries (Rippinger et al. 2019). Receiving an abnormal Pap smear screening result usually causes women to avoid seeking further monitoring and follow-up tests (Tan et al. 2020). Psychological distress is one of the reasons why routine monitoring and follow-up processes are not implemented after an abnormal Pap smear test result (Ilic et al. 2019).

Previous studies that have been conducted to evaluate psychological distress in women due to abnormal Pap smear results have certain limitations (Shinn et al. 2004). The majority of those limitations are associated with the fact that these studies have included questionnaires composed of general health questions, used forms consisting of questions without validation and reliability, and

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been conducted with a small sample group (Ilic et al. 2019). Only a few specific questionnaires have been developed so far in order to assess psychosocial effects, such as the Psychosocial Effects of Abnormal Pap Smear Questionnaire (PEAPS-Q; Bennetts et al. 1995), Cervical Dysplasia Distress Questionnaire (CDDQ; Shinn et al. 2004), and the Process and Outcome Specific Measure (POSM; Gray et al. 2006).

In 2004, Shinn et al. (2004) of the USA developed the CDDQ as an instrument for measuring the perception of diagnostic procedures and distress in women with positive screening tests for cervical cancer. The basis for the development of the CDDQ was the PEAPS-Q), a scale developed by Bennetts et al. (1995). The PEAPS-Q consists of 14 items and four factors. These factors are (1) experience of medical procedures, (2) beliefs and changes in perception of oneself, (3) worry about infectivity, and (4) effects on sexual relationships Shinn et al. (2004) significantly modified the PEAPS-Q to increase its adaptability for American and Canadian women. The same researchers then developed the CDDQ scale using a three-phase research design on three separate samples of 661 women who underwent colposcopy after receiving an abnormal Pap smear result. The finalized version of the CDDQ consisted of 23 items divided into two sets. These were defined as distress during medical procedures (two factors: embarrassment and discomfort/tension) and distress items (two factors: sexual and reproductive issues and health consequences). The original version of the CDDQ had good internal consistency with similar psychometrically validated distress scales in the literature (ranging from 0.76 to 0.90) (i.e., Center for Epidemiological Studies Depression Scale, Spielberger State-Trait Anxiety Scale, Cancer Worry Scale, and the single-item Pain and Anxiety Rating Scales; Shinn et al. 2004). A parallel system organized with the Pap smear test during gynecological examination has been conducted with success in Turkey in recent years. Colposcopy is usually performed as a result of an abnormal Pap test result (Aydın, Öncü, and Arıcı 2021). The original version of the scale was developed in English, and validity and reliability studies were conducted in German and Serbian (Ilic et al. 2019; Nagele et al. 2016). The current study is the first initiative of the Turkish adaptation of the scale. No valid or reliable instrument was found to determine the stress status of individuals who had been admitted to the clinic due to abnormal Pap smears in Turkey or who had received abnormal Pap smear results in the last 12 months. The CDDQ, developed by Shinn et al. (2004), was evaluated as a suitable instrument for women in Turkey in terms of its content, scope, and suitability. In addition, the original scale was found to be valid and reliable, and it has been widely used and adapted to different samples (Ilic et al. 2019; Nagele et al. 2016).

It is important that healthcare professionals, starting with those in primary healthcare, determine the psychological distress of patients. Especially in advanced diagnosis and treatment procedures, such as colposcopy performed in hospital settings, nurses in particular may be required to support patients, help them manage their emotions, and refer them to a specialist if necessary. Therefore, it is considered that nurse managers by encouraging nurses to receive training on this issue, and if possible assigning a consultation liaison psychiatric nurse while determining strategies for relevant issues, may prevent patients from avoiding further monitoring and follow-up tests when they receive an abnormal result (Shinn et al. 2004).

Today, unfortunately, questionnaires are inadequately designed and applied, especially for cervical cancer screening or medical procedures such as Pap tests and colposcopy (Ilic et al. 2019). In addition, while research is being conducted on the quality of life of Turkish women with cervical intraepithelial lesions, studies on the psychological effects of diagnostic procedures remain limited (Aydın, Öncü, and Arıcı 2021). In Turkey, which is a developing country, it is important to have a valid and reliable tool to determine the stress status of people with abnormal Pap smear results. It is thought that this tool will lead to studies that reveal the stress status of people with abnormal Pap smear results in the Turkish population and will contribute to the international literature (Ilic et al. 2019). The aim of this study was to evaluate the validity and reliability of the Turkish version of the CDDQ in women with abnormal Pap smear results.

Methods

Study design

This validation study was conducted using a cross-sectional research design.

The convenience sample

The sample of the study was composed of patients who had been admitted to the obstetrics and gynecology clinic of a university hospital due to abnormal Pap smear, or who had been monitored in the clinic due to abnormal Pap smear results in the last 12 months. Inclusion criteria were (1) not being pregnant, (2) applying to the clinic due to abnormal Pap smear, (3) having received an abnormal Pap smear result in the last 12 months, (4) being 18 years of age or older, and (5) volunteering to participate in the study. Accordingly, the number of participants in the study was estimated to be 5–10 times the number of items (Tabachnick and Fidell 2013), and since the scale consisted of 23 items, we included at least 115 patients. The data collection form was given to 121 patients. The purpose and content of the study were explained to all patients who met the inclusion criteria. Volunteer participants were included in the study. Three patients who met the inclusion criteria did not voluntarily participate. The data were collected by the researchers through face-to-face interviews in a private room.

Data collection instruments

The data were collected using sociodemographic form, the CDDQ, and the Hospital Anxiety and Depression Scale (HADS). The sociodemographic form prepared by the researchers consisted of 15 questions about the individual and sexual life of patients, such as age, gender, marital status, income status, age of first sexual experience, age of marriage, family history of cervical cancer, frequency of Pap smears, and information about cervical cancer.

Cervical Dysplasia Distress Questionnaire

The scale was developed by Shinn et al. (2004) to determine the stress status of individuals who had been admitted to the clinic due to abnormal Pap smears or who had received abnormal Pap smear results in the last 12 months. The scale consists of four subscales: tension and discomfort (6 items), embarrassment (2 items), sexual, and reproductive consequences (9 items), and health consequences (6 items). A total of 23 items are ranked on a 4-point Likert scale as 1 (Not at all), 2 (Somewhat), 3 (Moderately so), and 4 (Very much so). The overall score was obtained by taking the average of all item scores. The scale has no cutoff points, and higher scores indicate higher levels of stress. In the original study, Cronbach's alpha values of the subscales were reported as 0.86 for tension and discomfort, 0.76 for embarrassment, 0.85 for concerns about sexual and reproductive consequences, and 0.90 for concerns about health consequences (Shinn et al. 2004).

The Hospital Anxiety and Depression Scale

In the study, the HADS was used to predict the concurrent validity of the scale. The scale is often used in hospital settings to assess anxiety and depression symptoms that are self-reported by patients (Aydemir 1997). It was developed by Zigmond and Snaith in 1983, and its Turkish validity and reliability were determined by Aydemir (1997). The scale aims to determine the risk group through scanning anxiety and depression in a short period of time in those with physical illness rather than making a diagnosis. It consists of 14 items, seven of which are depression symptoms and seven which are anxiety symptoms. The items are ranked on a 4-point Likert scale ranging from 0 to 3. The lowest possible score that participants can obtain on either subscale is 0, while the highest possible score is 21. The Cronbach's alpha coefficient was 0.85 for the anxiety subscale, and 0.78 for the depression

subscale (Aydemir 1997). In the current study, Cronbach's alpha for the anxiety subscale was 0.81, and for the depression subscale, it was 0.88.

Turkish adaptation process of the CDDQ

The five-stage model proposed by Brislin, Lonner, and Thorndike (1973) was used to translate the CDDQ into Turkish: (1) the first translation to the target language, (2) evaluation of the first translation, (3) back-translation to the original language, (4) evaluation of the equality of the translation compared with the original language and scale, and (5) final evaluation by experts. A linguist and a professional translator performed the translation. Once the researchers made the necessary corrections, the scale was translated back into English by an academician who was a professional translator competent in both Turkish and English.

Data collection

The data were collected from January through December 2021 from patients who were examined in a university hospital. Questionnaires were distributed at the obstetrics and gynecology clinics to the patients who volunteered to participate in the study. It took approximately 10 minutes to complete the form.

Statistical methods

The data were analyzed after being transferred to IBM SPSS and AMOS programs. Frequency distribution for categorical variables (number, percentage) and descriptive statistics for numerical variables (mean, standard deviation) were used when evaluating the data. In the verification process, content validity was performed first, and item analyses (item-total correlations) and confirmatory factor analysis (CFA) were used. Internal consistency (Cronbach's alpha coefficient) was used for the reliability of the CDDQ and its subscales, and stability was evaluated using Pearson's correlation. The authors followed the guidelines of intercultural adaptation studies reported by the World Health Organization (WHO) and the Consensus-Based Standards for the Selection of Health Measurement Instruments (COSMIN) (Mokkink et al. 2010; WHO 2019). In addition, the authors applied the relevant tests at a standard rated "very good" according to the subheadings of the COSMIN Risk of Bias checklist as "Construct validity," "Internal consistency," "Cross-cultural validity/Measurement invariance," and "Reliability."

Ethical consideration

Permission was obtained from the authors via e-mail to adapt the CDDQ to Turkish and to conduct a validity and reliability study. Prior to data collection, ethical approval was obtained from the Social and Humanities Research and Publication Ethics Committee of a university (09/12/2020–161409). Written institutional permission was obtained from the university where the research was conducted. Before the application of the data collection instruments, the participants were informed about the purpose and scope of the research. Those who agreed to participate were included in the sample and asked to fill out an informed consent form.

Results

Characterization of the sample

The average age of the patients participating in the study was determined to be 42.57 ± 4.37 (min-max: 29–49); all were married (100 percent), the majority were high school graduates (36.5 percent), and

their income was equal to their expenses (68.3 percent). While none of the participants had a family history of cervical cancer, all reported that they had information about the disease, mostly based on information on the Internet (39.4 percent).

Content validity index process results

The Davis technique was used to calculate the content validity ratios of the items, and the content validity index of the overall scale. In this technique, expert opinions are rated in four categories ranging from 1 to 4 as "Completely appropriate" to "Not appropriate." The number of experts rating the items as (3) and (4) was divided by the total number to obtain the "Content Validity Ratio (CVR)" (Davis 1992). In this study, the Turkish form prepared for expert opinion was evaluated by 12 experts consisting of nurses, physicians, and academicians. The content validity ratio of the items ranged from 0.85 to 1. The CVR value of the scale was 0.98.

Construct validity process results

CFA was performed to assess the consistency of the original structure of the scale in the Turkish sample. Prior to starting the factor analysis, the results of the Kaiser – Meyer–Olkin (KMO) test and Bartlett's sphericity test were examined in order to evaluate the adequacy of the sample and the suitability of the data set for factor analysis. In the study, the KMO value was 0.742, and the Barlett's sphericity test value was found to be $x^2 = 2060.800$, $p < .001$. The results showed that the data were associated with each other, and were suitable for factor analysis.

As a result of the factor analysis, it was found that the factor loads of all the items ranged from 0.13 to 0.85 (Table 1). Item 5 ($r = 0.13$) and Item 11 ($r = 0.13$) with factor loads of $r = 0.30$ were removed from the scale, and analysis was reconducted. Item 5, "Did the exam hurt?," had a low factor loading since colposcopy is a painless procedure. Additionally, Item 11, "How concerned are you about your fertility?," had a low factor loading since the average age of the participants was 42. As a result of

Table 1. Cervical Dysplasia Distress Questionnaire factor analysis.

	R1	R2
1. Did you find the exams uncomfortable?	0.847	0.838
2. Did you find the exams emotionally upsetting?	0.665	0.679
3. Did the exams make you nervous?	0.724	0.700
4. Were you uncomfortable being partly undressed?	0.801	0.822
5. Did the exams hurt?	**0.129**	
6. Were you embarrassed having your private parts touched by the doctor or nurse?	0.772	0.793
7. Did you feel tense?	0.735	0.723
8. Were you nervous?	0.347	0.419
9. How worried are you that cancer will appear in your body?	.816	0.814
10. Have you been worried about the test results?	.683	0.701
11. How worried are you that you would lose your chance to have a baby?	**0.223***	
12. Have you been worried that you may have cancer?	0.841	0.847
13. How worried are you that you might die?	0.746	0.739
14. Have you been worried that your problem may turn into cancer?	0.666	0.679
15. Have you been worried that you could give the problem to a sexual partner?	0.563	0.557
16. Have you been worried whether a sexual partner will think they can catch the problem from you?	0.637	0.626
17. Have you been worried whether you should continue having sex?	0.509	0.507
18. Have you been worried that this problem might affect how attractive you are to a sexual partner?	0.715	0.726
19. Have you been worried whether having sex will make the problem worse?	0.613	0.617
20. Have you been worried whether others think you have had more sexual partners than you should?	0.379	0.403
21. How worried are you that you may die from cervical cancer?	0.489	0.494
22. Have you been worried about sex being more painful now?	0.678	0.691
23. Have you been worried that this problem might affect how much you enjoy sex?	0.629	0.633
% of Explained Variance	%61.78	%66.27

*R: Factor loadings

*<0,3.

the second factor analysis, the factor loads of all the items were above 0.40 (Table 1). The exploratory variance was found to be 29.986 for the first subscale, 19.734 for the second subscale, 16.551 for the third subscale, and 66.271 for the overall scale. In accordance with this result, the 21-item scale was finalized with a three-dimensional structure: tension during the examination, concerns about health consequences, and concerns about sexual consequences (Table 2). In order to obtain more accurate results after the explanatory factor analysis, CFA and structural equation modeling were established. When the compliance measurements of the CFA were examined, the x^2/SD value was 2.154, goodness-of-fit index (GFI) was 0.91, adjusted goodness-of-fit index (AGFI) was 0.92, comparative fit index (CFI) was 0.91, root mean square error of approximation (RMSEA) was 0.068, and standardized root mean square residual (SRMR) was 0.076. In accordance with the relevant compliance index values, the model was considered acceptable in the current structure (Table 2).

Reliability process results

In order to determine the internal consistency of the measurements obtained from the CDDQ, item-total correlations and Cronbach's alpha coefficients were calculated in case of a removed item. Cronbach's alpha values were found to be 0.92, 0.91, and 0.87 for the subscales of tension during the examination, concerns about health consequences, and concerns about sexual consequences, respectively (Table 3). The item-total correlations were also found to be above 0.30, and the removal of any items caused an increase in the Cronbach's alpha coefficient. Considering the internal validity values obtained from the study, it was concluded that the 21-item scale was a reliable instrument.

Validity process results

The parallelequivalent forms method was used to ensure the validity of the criteria. The HADS was used in parallel with in the study. A statistically significantly positive and low-level relationship was found between the scores obtained from the HADS_Depression subscale and the CDDQ ($r = 0.305$, $p < .01$), while there was a statistically significantly positive and moderate relationship between the scores obtained from the HADS_Anxiety and the CDDQ. The desired level of correlation was achieved between the two forms.

Table 2. Goodness of fit indices for the adapted version of the scale.

Goodness of Fit Indices	Normal value	Acceptable value	Found value
x2/SD	<2	<5	2.154
GFI	>0.95	>0.90	0.91
AGFI	>0.95	>0.90	0.92
CFI	>0.95	>0.90	0.91
RMSEA	<0.05	<0.08	0.068
SRMR	<0.05	<0.08	0.076

RMSEA = root mean square error of approximation; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; SRMR = Standardized Root Mean Square Residual; CFI = comparative fit index.

Table 3. Results of reliability and structural analyses.

Factor	Item	n	% of Explained Variance	Factor Loading	Corrected Item Total Correlations	Cronbach's Alpha
Tension during the examination	1,2,3,4,6,7,8	7	29.99	0.471–0.908	0.465–0.619	.92
Concerns about health consequences	9,10,12,13,14,21	6	19.73	0.561–0.914	0.311–0.526	.91
Concerns about sexual consequences	15,16,17,18,19,20,22,23	8	16.55	0.579–0.837	0.303–0.562	.87
Total		21	66.27	0.471–0.914	0.303–0.619	

Discussion

During the first phase of the research, the scale designed to help determine the stress status of women who received abnormal Pap smear results was examined through a literature scan. In order to ensure language validity in the adaptation process, WHO-recommended methods were applied to instruments developed in different cultures (WHO 2019) as well as to conduct content validity analysis (Polit and Beck 2012). Content validity is a method of examination that evaluates to what extent the overall scale and its items are suitable to measure the desired feature, in other words, to what extent it serves the purpose (Çapık, Gözüm, and Aksayan 2018; Polit and Beck 2012). The Davis technique was used to calculate the content validity ratios of the items and the content validity index of the overall scale (Davis 1992). The content validity ratio of the items ranged from 0.85 to 1.00, which exceeded the acceptable level of 0.80 reported in the literature (LoBiondo Wood and Haber 2018).

The correlation value, which may be an indicator of the consistency of an item with the overall scale, should be at least 0.30 (Alpar 2012). In this study, item-total score correlation analyses were performed to evaluate the consistency of the items with each other, and with the overall scale. As a result of the analysis conducted with 23 items included in the scale, the item-total score correlation coefficients (r) ranged from 0.35 to 0.85, and only Item 5 and Item 11 were found to have a correlation value of $r < 0.30$. As a result of this analysis, in which the item to overall scale correlations were evaluated, referred to as the presence of measuring the same feature, we decided to remove the items with a low correlation rate since the internal consistency of the overall scale and the relevant subscale change significantly (Alpar 2012). In the second factor analysis, the item-total score correlation coefficients of the expressions were higher than the values accepted in the literature (0.40) (Polit and Beck 2012; Tavşancıl 2019). The current results show that the Turkish version of the CDDQ is a valid instrument.

The KMO test and Bartlett's test values, which were used to calculate the adequacy of the sample size prior to the construct validity analyses, indicated that the studied sample size was sufficient to test the construct validity (Meydan and Şeşen 2015). In intracultural adaptation studies, consistency with the original scale is tested using CFA in order to assess construct validity (Esin 2014). In order to evaluate the fit of the model as a result of CFA, t-values, factor loads, and GFI results of the items are taken into consideration (Çapık, Gözüm, and Aksayan 2018). The t-values of each item in the model must be above 1.96. When the t-value of an item does not meet this requirement, that item should be removed or replaced. The factor load values of all the items remaining as a result of the CFA conducted to test the construct validity were above 0.30, which is the lowest limit value for factor loads found in the literature (Harrington 2009). Following these processes, the results of GFI were examined, and the final fit of the model was determined. In the literature, acceptable values for fit indices of a model obtained from the CFA are reported to be $x^2/df = 0.90$ (Esin 2014), GFI ≥ 0.90, RMSEA < 0.08 and SRMR < 0.08 (Esin 2014). The values obtained as a result of the CFA analysis were consistent within acceptable limits (Tabachnick and Fidell 2013) (Table 2). In the study, the KMO test value was 0.742, and the Bartlett's sphericity test value was found to be $p < .001$. The KMO measure of sampling adequacy was 0.804. Bartlett's test of sphericity was highly significant ($p < .001$). In the Ilic et al. study, the KMO measure of sampling adequacy was 0.804, and Bartlett's test of sphericity was highly significant ($p < .001$).

Time invariance and internal consistency must be tested in order to assess scale reliability. Two methods are usually employed to test the time invariance of a scale (consistency of the scale in time) (LoBiondo Wood and Haber 2018). One is the test – retest method (LoBiondo Wood and Haber 2018), and the other is parallel form reliability, which was employed in the current study (Seçer 2015). Recent studies have mostly used the HADS to measure stress and anxiety in the hospital environment in Turkey, and reliability values have been found to be high in these studies (Kebapcı and Türkmen 2022; Koç et al. 2022; Tore, Oskay, and Haznedaroglu 2022). Therefore, since the HADS has been considered the most convenient measurement instrument for Turkey sampling, we decided to use it as a parallel scale. Pearson's correlation value was found to be

positively significant at a medium level between the two scales (Esin 2014). These results indicate that the results of the two scales were consistent. Cronbach's alpha coefficient was calculated for internal consistency, and this value represented the correlation between scale items. The Cronbach's alpha coefficient, which shows internal consistency, is generally considered to be strongly reliable when ranging from 0.60 to 0.80 and to be highly reliable when ranging from 0.80 to 1.00. In this study, the factors varied from 0.87 to 0.92. Therefore, the internal consistency of the factors was found to be strongly reliable. The Serbian CDDQ showed high internal consistency with high Cronbach's alpha coefficients for all the subscales ($\alpha = 0.844–0.913$) (Ilic et al. 2019). In the original study, Cronbach's alpha ranged from 0.76 to 0.90 (Shinn et al. 2004), which was lower than those in the current study. Therefore, the factors and scales were found to be more reliable in the current study.

Limitations of the study

The data in the study were collected from a single hospital. Therefore, the results cannot be generalized to other samples. No test – retest was performed. In addition, all results were based on self-reported data, which may be subject to information bias.

Conclusions

To the best of our knowledge, the current study is the first validity study of the Turkish version of the CDDQ. According to the literature, this is also the third validity study of the scale worldwide. The Turkish version of the CDDQ is a valid and reliable instrument for assessing psychological distress in women with abnormal Pap smear results. Determining a good level of validity and reliability of the scale among Turkish women may expand the credibility of using the CDDQ in intercultural research. Finally, the good validity and reliability of the CDDQ will ensure an accurate assessment of the psychological impact of cervical screening. However, further research is needed in order to test the validity and reliability of the scale in different samples.

Disclosure statement

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

Funding

The author(s) reported there is no funding associated with the work featured in this article.

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