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Adaptation of the cyber aggression in relationships scale to Turkish: A validity and reliability study

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Abstract

Purpose: In this study, the cyber aggression in relationships scale (CARS) was intended to be adapted to Turkish.

Design and Methods: The study was designed as a methodological study with 426 students.

Findings: The best fit index values for both the cyber perpetration and cyber victimization scales (CVSs) were obtained through confirmatory factor analysis. Cronbach's α internal consistency coefficients for the overall and sub-dimensions of the cyber perpetration scale and CVS were found to range from 0.88 to 0.92 and 0.85 to 0.91, respectively.

Practice Implications: In the study, CARS was found to be a valid and reliable instrument for Turkish society.

KEYWORDS

cyber aggression in relationships scale, cyber perpetration scale, cyber victimization scale, reliability, Turkish adaptation, validity

1 | INTRODUCTION

With rapid technological advances, people of almost all ages have begun using smartphones, computers and social communication networks. It has become easier to establish and maintain new friendships, create social and communal relations and norms, exchange information, and establish even romantic relationships, especially due to young people's intensive use of these technologies.[1,2] However, such technological developments have led to the emergence of new forms of violence.[3] The World Health Organization defines violence as "The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation."[4] Violence can be physical, behavioral, verbal, and economic.[5] Cyber aggression caused by rapid technological advances is a form of violence related the desire of partners to control each other's behaviors.[6] Aggression and violence, which are identified in the virtual environment with "electronic aggression," or "cyber aggression," are defined as threats, humiliation, intimidation, sending sexual messages, and images to a victim or sharing them openly to access.[7] Violence between couples is a social problem. Black et al[8] have stated in their study that one in three women and one in four men in the United States are physically, psychologically, and sexually abused. However, the incidence of cyber aggression is varies because it is difficult to define it.[2] Jones et al[9] carried out a study on 4561 people and stated that the rate of cyberbullying was 11% in 2011, doubling from 6% in 2005 to 11% in 2011. Smith et al[10] carried out a study on high school students and stated that the prevalence of cyber victimization was 35.8% and cyber aggression was 33%. In the study conducted by Marganski and Melander[11] on university students, found that 73% of students had cyber aggression experience in the last 12 months. Taylor and Xia[12] reported that the rate of cyber victimization ranged between 1.1 to 77.1% and cyber aggression 1.8 to 90.3% in the systematic review study that examined 37 studies. In Turkey, studies showed that rate of cyber aggression ranged between 11.6% and 46%, cyber victimization 18.6% and 65% and cyber violence is quite common.[13,14] The studies examined gender relationship with cyber aggression/victimization in Turkey showed that women were exposed to both cyber aggression and partner cyber aggression more than men.[15-17]

Communication tools and social networking sites, which are products of technological developments, have a significant impact on romantic relationships of young people. Young people can even establish romantic relationships through social networking sites. Moreover, young people can keep a close watch on their partners and keep them under control through the opportunities offered by smartphones, computers and social networking sites.[18] Couples can keep each other under control by being able to display what are shared publicly on social networking sites (photos, texts, and status updates) and lists of friends who are in touch. In this way, miscommunication and uncertainty between couples are eliminated.[19] However, sometimes couples are tempted to use these opportunities that technology offers to them to cyberbully each other. They can behave in a way that is considered bullying, such as sharing photos without their partner's permission, sending sexually explicit messages via the Internet or smartphones, checking his/her phone messages or e-mails, monitoring the places he/she visits through the Internet.[20]

Violence is a multidimensional concept that is influenced by cultural differences. The meaning that each culture attributes to violence is different.[21] It may be possible to compare violence occurring in different cultures and to find common solutions only with the use of common measurement instruments. Partner cyberbullying, which is common among partners,[22] may be a subject that tends to be ignored because how to handle such cyberbullying is not known. There are few measurement instruments developed in recent years in this regard.[20,23] However, although there are measurement instruments in Turkey to assess cyberbullying/victimization, there are not any to assess partner cyberbullying/victimization. It is thought that a scale is needed to be able to compare partner cyberbullying with cyberbullying that occurs in different cultures, to draw attention to the subject, to determine its incidence, and to enable people to identify the aggression behavior against them in the virtual environment by their partners. In this context, it was aimed to adapt the "Partner Cyber Perpetration/Victimization Scale" developed by Watkins et al[20] to Turkish and to check its validity and reliability.

2 | MATERIALS AND METHODS

2.1 | Design and participants

This methodological research was conducted in the faculties of health sciences of two state universities in the eastern part of Turkey. Research population consisted of students aged 18 years or older who were actively studying in the faculties of the universities specified between 30 December 2017 and 30 June 2018 and who had a partner. The sample size required for reliable factor analysis during the adaptation of a scale to a different culture is classified as 100 "weak," 200 "medium," 300 "good," 500 "very good," and 1000 "perfect."[24] Based on this classification, 426 volunteer students were included in the sample of the study. The students who met the criteria for inclusion in the study were selected by using the nonrandom sampling method. Criteria for inclusion in the study were being 18 years old or older, having a partner, and being able to access the Internet at any time.

Average age of the students was 21.15 ± 2.09. Of the students, 82.4% were female, 32.9% were seniors, and 88.3% stated that they had moderate income. It was stated by 97.7% of the students that they used smartphones and by 80.8% that they were able to use the Internet service easily. Moreover, the students used the Internet for an average of 5.49 ± 4.10 hours a day, and 18% stated that they were subject to cyber aggression (Table 1).

2.2 | Instruments

2.2.1 | Descriptive characteristics form

This form consisted of questions that determined the demographic characteristics of the students (age, sex, income, and so forth), their use of smartphones and the Internet (frequency, duration of Internet use, and so forth) and their exposure to cyber aggression behavior.[2,25]

2.2.2 | The cyber aggression in relationships scale

The cyber aggression in relationships scale (CARS) developed by Watkins et al in 2016 is a scale of two-way assessment of the cyber aggression behavior that adults impose on their partners or their partners impose on them. The scale consists of 34 items, 17 of which assess cyber perpetration and 17 of which assess cyber victimization. It has three sub-dimensions composed of psychological cyber aggression, sexual cyber aggression, and stalking cyber aggression (SCA). Items are scored between 0 and 7 (0 = none, 1 = one time in the last 6 months, 2 = two times in the last 6 months, 3 = three to

TABLE 1 Descriptive characteristics of the students (n = 426)

Socio-demographic characteristics	n (%)
Age (mean ± SD), y	30.19 ± 5.85
Gestational age (mean ± SD)	30.08 ± 5.96
Occupation	
Unemployed	370 (92.7)
Employed	29 (7.3)
Family income	
My income is greater than my expenses	25 (6.3)
My income is equal to my expenses	275 (68.9)
My income is less than my expenses	99 (24.8)
Educational level	
No education, or illiterate	64 (16.0)
Primary school	150 (37.6)
Secondary school	97 (24.3)
High school or university	88 (22.1)

five times in the last 6 months, 4 = 6-10 times in the last 6 months, 5 = 11-20 times in the last 6 months, 6 = more than 20 times in the last 6 months, and 7 = not in the last 6 months but it happened previously). The minimum score one can score on the scale is 0, and the maximum score is 119. The scale does not have a cut off score. Cyber perpetration or cyber victimization increases as the score from the scale increases.[20]

2.3 | Process of cultural adaptation

The process of cultural adaptation of the scale was carried out in three phases. These phases were (a) language validity, (b) content validity, and (c) pilot study.

During the language validity phase, the "Cyber Aggression in Relationships Scale" was translated from English to Turkish by the researchers, a linguist, and three faculty members. The questions of the scale that were translated into Turkish were re-examined by the expert linguist, and the version of the scale that was translated into Turkish was compared with the original scale. Based on the comparison, it was determined that the meanings of the items of the scale were found not to change, and the language validity of the scale was completed.

The English and Turkish forms of the scale were sent by e-mail to six faculty members, who were experts in the field (three faculty members in obstetrics and gynecology nursing, and three in psychiatric nursing), for expert review in terms of content validity. The experts were asked to rate each item between 1 and 4 (1 = not suitable, 2 = item needs to be corrected, 3 = it is suitable but small changes are needed, and 4 = very suitable) and to assess the suitability and clarity of the scale items for the purpose of the study. The level of agreement of expert opinions was examined through Kendall W analysis.[26] It was seen that the scores obtained from the experts were not statistically different (Kendall W = 0.171; $P > .05$), and there was agreement between the experts. At this phase, the expressions that the experts recommended to be revised were reviewed, and a version of CARS before the final version was prepared.

CARS, which was modified in accordance with the suggestions of the experts, was pilot tested on 10 students. The results of the pilot study were not included in the results obtained from the actual sample. As a result of the pilot study, no questions were found to be misunderstood on the scale. Thus, the final version of the Turkish version of CARS was created.

2.4 | Psychometric testing of CARS

2.4.1 | Validity

Factor analysis was performed to test construct validity of the scale. Before the factor analysis, Kaiser-Meyer-Olkin (KMO) analysis was carried out to test suitability of sampling adequacy. Bartlett's test of sphericity test was carried out to determine sample testing size. In order for sample size to be suitable for factor analysis, KMO must be above 0.60, and the result of Bartlett's test of sphericity analysis should be statistically significant.[27] Principal component analysis, one of the most common statistical techniques of factor analysis, was carried out to examine the factor structure of CARS. In the literature, it is stated that factor loadings of 0.30 or 0.40 can be accepted as a minimum cut-off point when forming a factor structure.[28] In this study, the minimum cut-off score was accepted as 0.40.

After exploratory factor analysis (EFA), confirmatory factor analysis (CFA) was carried out to support the findings in relation to the sub-dimensions of the scale. The minimum values for the fit indices indicating that the model fits the data well were accepted as follows: the chi square/degrees of freedom (X^2/df) ratio obtained as a result of CFA had to be ≤5, root mean square error of approximation (RMSEA) had to be ≤0.08, and goodness of fit index (GFI), the comparative fit index (CFI), and incremental fit index (IFI) had to be greater than 0.90.[29,30]

2.4.2 | Reliability

Cronbach's α internal consistency coefficient technique is suggested to examine reliability of Likert-type scales. A reliability coefficient that can be considered sufficient in a measurement instrument should be as close to 1 as possible. Cronbach's α coefficient values corresponding to reliability of measurement instruments are considered as follows: a coefficient value less than 0.40: unreliable; 0.40 to 0.59: less reliable; 0.60 to 0.79: highly reliable; and 0.80 to 100: very reliable.[31]

Item-total correlation coefficients were examined to investigate the relationship between the scores on CARS test items and the total score of the test. The recommendation to have a coefficient greater than 0.20 as an acceptable value was taken into account when selecting items.[31]

CARS was re-administered to 30 students after 3 weeks for test-retest analysis of CARS. Time-invariance of the scale was tested by using a test-retest correlation.[32]

2.5 | Data analysis

Research data were analyzed using SPSS 16.0 for Windows software (SPSS Inc, Chicago, IL) and AMOS 24.0. In this study, this software was also used when analyzing the psychometric characteristics of CARS as well as descriptive statistics (frequencies, percentages, mean scores, standard deviations) representing the descriptive characteristics of the participants. Level of significance was considered to be 0.05.

2.6 | Ethical issues

Written permission was obtained from Watkins et al to adapt the "Cyber Aggression in Relationships Scale" into Turkish. Approval from the Scientific Research and Publication Ethics Board of the University (Approval No: 2017/27-19) and written permission from the faculties of health sciences of the universities were obtained to collect data. Additionally, the students were informed about the

study. They were told that their personal information would be protected. Those who volunteered were included in the study after their written consent.

3 | RESULTS

3.1 | Validity

KMO coefficient of the cyber perpetration scale (CPS) in the study was found to be 0.907, and based on Bartlett's Test of Sphericity analysis, the X^2 value was found to be 48091. KMO coefficient of the cyber victimization scale (CVS) was determined to be 0.902, and based on the Bartlett's Test of Sphericity analysis, the X^2 value was determined to be 3755.0. Test results for both groups were found to be significant at $P = .000$. The results showed that the sample size for both the CPS and the CVS was sufficient and suitable for factor analysis.

3.1.1 | Exploratory factor analysis of cyber perpetration scale

Based on EFA for the validity of CPS dimension of the CARS, factor loading values ranged from 0.64 to 0.86 for the psychological/sexual cyber aggression (PSCA) sub-dimension of the CPS, and from 0.70 to 0.84 for the stalking cyber aggression sub-dimension. It was also determined that CPS accounted for 67.8% of the total variance. The CPS was found to explain 64.2% of the variance in the PSCA sub-dimension and 59.8% of the variance in the stalking cyber aggression sub-dimension (Table 2). Because the factor loadings of items 15 and 17 in CPS were small (0.38 and 0.32, respectively), they were excluded from the Turkish version of the scale. This resulted in a 15-item two-dimensional CPS of the CARS.

3.1.2 | Exploratory factor analysis of CVS

Based on the EFA for the validity of CVS dimension of the CARS, factor loading values ranged from 0.55 to 0.85 for the PSCA sub-dimension, and from 0.65 to 0.82 for the stalking cyber aggression sub-dimension. In addition, CVS was found to account for 60.5% of the total variance, 60.7% of the variance in the psychological/sexual aggression sub-dimension and 53.6% of the variance in the stalking cyber aggression sub-dimension (Table 3). Because the factor loadings of items 15 and 17 in CVS were small (0.36 and 0.37, respectively), they were excluded from the Turkish version of the scale. This resulted in a 15-item two-dimensional CVS of the CARS.

Based on the CFA, fit index values of the 17-item CPS used to measure partner cyber aggression were found as follows: $X^2 = 711.970$, df = 103 ($P < .05$), $X^2/df = 6.91$, RMSEA = 0.121, GFI = 0.81, CFI = 0.86, and IFI = 0.86 (Table 4). It was determined in the analysis that the model did not fit well in terms of X^2/df and RMSEA values. At this stage of the analysis, the modification indices were examined, and the error covariances between items 16 and 4, between item 14 and items 11 and 10, between item 7 and items 4 and 8, and between item 5 and items 6 and 9 were found to be high. A second CFA model was established by linking the error covariances

TABLE 2 Distribution of item-total correlations and factor loadings of CPS

Item	Mean (SD)	Factor loading	Corrected item-total correlations
Psychological/sexual cyber aggression (PSCA)			
1a	0.22 (0.89)	0.64	0.51
3a	0.24 (0.92)	0.86	0.69
4a	0.24 (0.94)	0.83	0.66
7a	0.27 (1.02)	0.79	0.62
8a	0.24 (1.06)	0.82	0.65
10a	0.33 (1.13)	0.82	0.68
11a	0.30 (1.12)	0.81	0.64
14a	0.25 (0.95)	0.75	0.60
16a	0.18 (0.81)	0.77	0.62
Stalking cyber aggression (SCA)			
2a	0.92 (1.74)	0.74	0.59
5a	1.37 (1.94)	0.84	0.57
6a	1.28 (2.01)	0.80	0.65
9a	1.00 (1.84)	0.80	0.73
12a	0.85 (1.68)	0.82	0.68
13a	1.23 (2.09)	0.70	0.53

Note: PSCA variance: 64.2%, SCA variance: 59.8%, total variance: 67.8%; PSCA α: 0.94; SCA α: 0.89; total α: 0.90.
Abbreviation: CPS, cyber perpetration scale.

TABLE 3 Distribution of item-total correlations and factor loadings of CVS

Item	Mean (SD)	Factor loading	Corrected item-total correlations
PSCA			
1b	0.30 (1.03)	0.55	0.48
3b	0.25 (0.97)	0.85	0.67
4b	0.24 (0.94)	0.83	0.60
7b	0.25 (0.99)	0.82	0.65
8b	0.28 (1.11)	0.83	0.65
10b	0.32 (1.16)	0.68	0.61
11b	0.22 (0.89)	0.74	0.59
14b	0.23 (0.97)	0.76	0.62
16b	0.20 (0.85)	0.77	0.61
SCA			
2b	0.81 (1.68)	0.67	0.58
5b	1.21 (1.87)	0.82	0.58
6b	1.04 (1.83)	0.76	0.59
9b	0.79 (2.04)	0.67	0.61
12b	0.76 (1.61)	0.81	0.64
13b	1.11 (2.01)	0.65	0.49

Note: PSCA variance: 60.7%; SCA variance: 53.6%; total variance: 60.5%. PSCA α: 0.93; SCA α: 0.85; total α: 0.89.
Abbreviations: CVS, cyber victimization scale; PSCA, psychological/sexual cyber aggression; SCA, stalking cyber aggression.

TABLE 4 CFA goodness of fit indices for cyber perpetration and cyber victimization scales (CVS)

	□²	df	□²/df	RMSEA	GFI	CFI	IFI
CPS							
Model 1	711.970	103	6.91	0.121	0.81	0.86	0.86
Model 2	277.127	80	3.46	0.07	0.92	0.95	0.95
CVS							
Model 1	956.923	118	8.11	1.131	0.79	0.80	0.80
Model 2	281.835	81	3.55	0.07	0.91	0.94	0.94

Abbbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; CPS, cyber perpetration scale; GFI, goodness of fit index; IFI, incremental fit index; RMSEA, root mean square of approximation.

of the items in question. After the modifications, based on the CFA, fit index values were found to be as follows: $X^2 = 277.127$, df = 80 ($P < .05$), X^2/df = 3.46, RMSEA = 0.07, GFI = 0.92, CFI = 0.95, and IFI = 0.95. The model was found to show acceptable fit (Table 3). The CFA path diagram of CPS after the second CFA is shown in Figure 1.

Based on the CFA, fit index values of the 17-item CVS used to measure partner cyber aggression were found as follows: $X^2 = 956.923$, df = 118 ($P < .05$), X^2/df = 8.11, RMSEA = 0.131, GFI = 0.79, CFI = 0.80, and IFI = 0.80. It was determined in the analysis that the model did not fit well in terms of X^2/df and RMSEA values. At this stage of the analysis, the modification indices were examined, and the error covariances between items 4 and 16, between item 7 and items 4 and 8, between item 11 and items 10 and 14, and between item 5 and items 6 and 9 were found to be high. A second CFA model was established by linking the error covariances of the items in question. After the modifications, based on the CFA, fit index values were found to be as follows: $X^2 = 281.835$, df = 81 ($P < .05$), X^2/df = 3.55, RMSEA = 0.07, GFI = 0.91, CFI = 0.94, and IFI = 0.94. The model was found to show acceptable fit (Table 4). The CFA path diagram of CVS after the second CFA is shown in Figure 2.

3.2 | Reliability

Based on the Cronbach's α reliability analysis to measure the internal consistency of the CPS used to measure cyber perpetration, the internal consistency coefficients of the PSCA sub-dimension, the stalking cyber aggression sub-dimension, and the overall scale were found to be 0.94, 0.89, and 0.90, respectively (Table 2). CPS was found to be highly reliable overall and in terms of its sub-dimensions ($P = .001$).

Based on the Cronbach's α reliability analysis to measure the internal consistency of CVS used to measure cyber victimization, the internal consistency coefficients of the PSCA sub-dimension, the stalking cyber aggression sub-dimension, and the overall scale were found to be 0.93, 0.85, and 0.89, respectively (Table 3). CVS was found to be highly reliable overall and in terms of its sub-dimensions ($P = .001$).

Item-total correlation coefficients of CARS were examined. It was found that the item-total correlation coefficients ranged from $r = 0.51$ to $r = 0.73$ for CPS, and from $r = 0.48$ to 0.67 for CVS; the coefficients were seen to be acceptable for both cyber perpetration and cyber

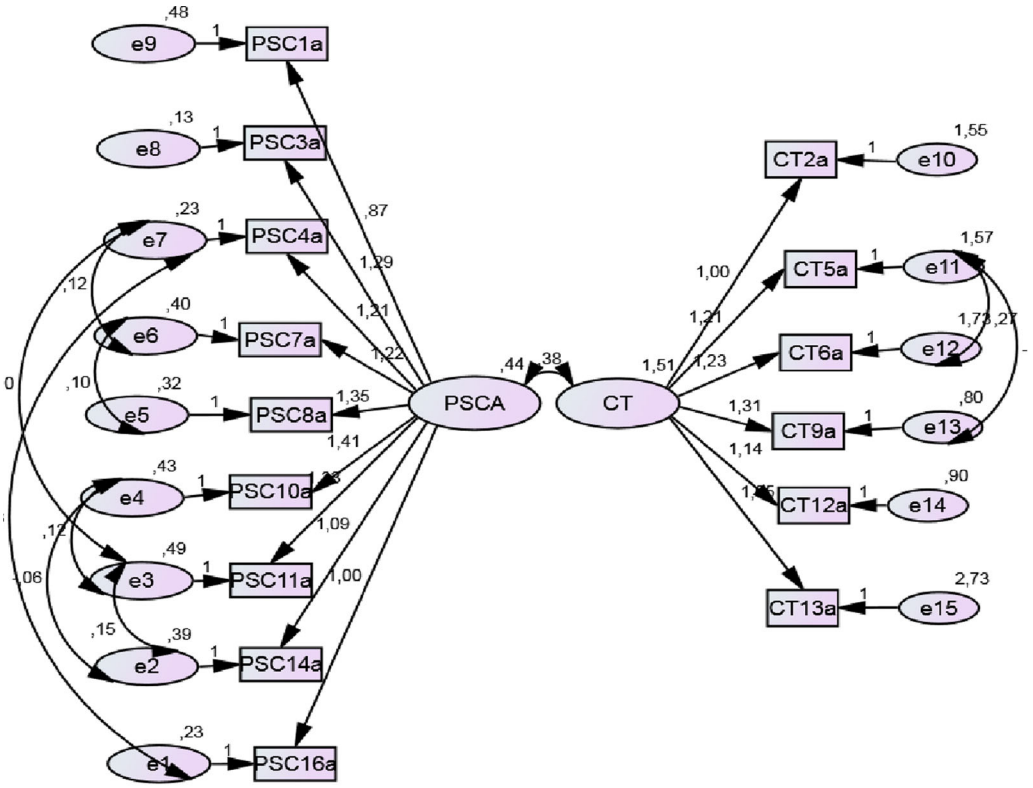

FIGURE 1 Model of the factor structure of cyber perpetration scale

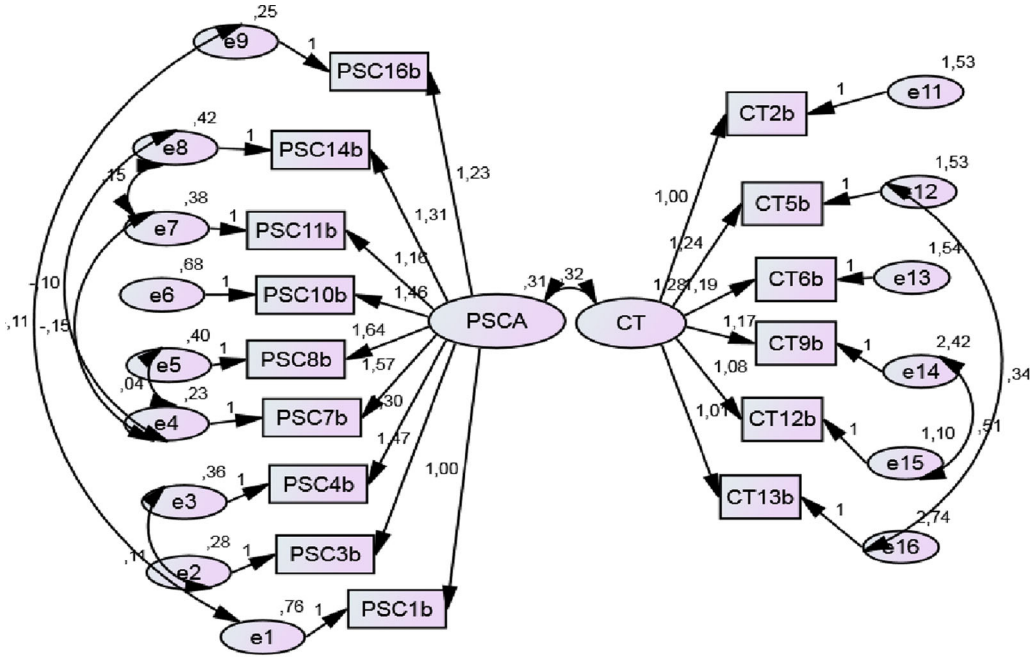

FIGURE 2 Model of the factor structure of cyber victimization scale

victimization (Tables 2 and 3). The correlation between each item and the total score was found to be statistically significant ($P = .001$).

In the study, the correlation values between the mean scores of the first administration and the second administration, which were 3 weeks apart, were found range from $r = 0.94$ to $r = 0.97$ for CPS, and from $r = 0.90$ to $r = 0.93$ for CVS, respectively (Table 5). Positive and high statistically significant correlations were found in overall CPS and overall CVS and in their sub-dimensions ($P = .001$, Table 5).

4 | DISCUSSION

In this study, the CARS which was developed by Watkins et al and is a scale of two-way assessment of the cyber aggression behavior that adults impose on their partners or their partners impose on them was adapted to Turkish. As a result of the assessment of its psychometric features on a sample of Turkish university students, both the cyber perpetration and CVSs of the CARS were found to be valid and reliable instruments in all students.

TABLE 5 The relationship between test-retest mean scores for CPS and CVS

Test-retest[a]	Total score	Psychological/sexual cyber aggression	Stalking cyber aggression
CPS	0.94	0.97	0.94
CVS	0.93	0.93	0.90

Abbreviations: CPS, cyber perpetration scale; CVS, cyber victimization scale.
[a]For the CPS, n = 30; for the CVS, n = 30.

4.1 | Validity

EFAs and CFAs were carried out to test the construct validity of CARS that was adapted to Turkish. As a result of the EFA for the validity of CPS and CVS, items 15 and 17 were excluded from the scale due to factor loadings that were smaller than 0.40.[28,33] Thus, the 15-item scales, CPS and CVS, were obtained. In scale adaptation studies, if scale items that are not appropriate for a culture cannot be identified by researchers, they may be identified during data analysis. In this case, the items that are not appropriate can be replaced with new ones, or they may be completely discarded from the scale.[34] In this direction, items 15 and 17 were excluded from CPS and CVS. Analysis of the items that were excluded from the scale:

Item 15a: *I took information or images from my partner's phone, e-mail, or social media profile without his or her permission.*

15b: *My partner took information or images from my phone, e-mail, or social media profile without my permission.*

In Turkish society, it is widely accepted that partners are representatives of one another in the society. This is also considered a sign of trust in a relationship.[35] Therefore, partners often use their social media accounts together and share their social account passwords with one another.[36] For this reason, the students may have thought it was okay to get information or images from their partner's social accounts or phone, or for their partner to do the same thing.

17a: *I intentionally ignored my partner's phone calls or text messages to hurt my partner's feelings.*

17b: *My partner intentionally ignored my phone calls or text messages to hurt my feelings.*

How people perceive and define violence is shaped within the framework of cultural values of society in which they live. People often describe physical violence when their exposure to violence is questioned.[37] Emotional violence, on the other hand, is very difficult to define.[38] Therefore, it is thought that the partners did not perceive the ignorance of each other's phone calls or messages as violence.

It was determined that the Turkish version of the scale, the original of which had items collecting under 3 factors, had items collecting under two factors. Thus, the psychological and sexual cyber aggression sub-dimensions were found to merge in both CPS and CVS. Due to sexual taboos that exist in our country, thoughts about sexuality cannot be expressed comfortably.[39,40] Therefore, it is thought that the students foregrounded the psychological influences when answering the questions about sexual cyber perpetration/victimization.

CPS was found to explain 67.8% of the total variance, and CVS was found to explain 60.5% of the total variance. Because a value ≥30 is considered for explained variance values in scale adaptation studies, the scale was found to meet the construct validity criterion.[20,30]

To assess whether the models established through the CFAs were suitable for the data, goodness of fit indices were taken into account. In the literature, it is stated that an X^2/df value of ≤3 indicates a perfect fit, and a value between ≤3 and ≤5 indicates a good fit. An RMSEA value is acceptable if it is 0.08 or smaller.[41] In this context, the X^2/df and RMSEA values were found to indicate poor fit in the analysis conducted for CPS. The modification indices were reviewed, and a second CFA model was established by linking the error covariances on the scale. After the modifications, based on the CFA, the fit index values were found to be as follows: $X^2 = 277.127$, df = 80 ($P < .05$), X^2/df = 3.46, RMSEA = 0.07, GFI = 0.92, CFI = 0.95, and IFI = 0.95. The model was found to show acceptable fit. The CFA fit index values of the original CPS scale were reported to be $X^2 = 199.10$, df = 116, RMSEA = 0.04, CFI = 0.96, TLI = 0.95. The results of the CFA showed that the 15-item, two-dimensional Turkish version of CPS was a valid measurement instrument that was compatible with the original scale.

When the goodness of indices of the model established for CPS were examined, the model was found not to have good fit in terms of the RMSEA value. The modification indices were reviewed, and a second CFA model was established by linking the error covariances on the scale. After the modifications, based on the CFA, the fit index values were found to be as follows: $X^2 = 281.835$, df = 81 ($P < .05$), X^2/df = 3.55, RMSEA = 0.07, GFI = 0.91, CFI = 0.94, and IFI = 0.94. The model was found to show acceptable fit. The CFA fit index values of the original CVS scale were reported to be $X^2 = 170.99$, df = 116, RMSEA = 0.04, CFI = 0.97, TLI = 0.97. The results of the CFA showed that the 15-item, two-dimensional Turkish version of CVS was a valid measurement instrument that was compatible with the original scale.

4.2 | Reliability

Reliability of CPS and CVS was assessed using Cronbach's α internal consistency coefficients, item-total correlations, test-retest analysis, and parallel forms reliability.

Based on the Cronbach's α reliability analysis to measure internal consistency of CVS, internal consistency coefficients of the PSCA sub-dimension, the stalking cyber aggression sub-dimension, and the overall scale were found to be 0.94, 0.89, and 0.90, respectively. Cronbach's α internal consistency coefficients of CVS, the internal consistency coefficients of the PSCA sub-dimension, the stalking cyber aggression sub-dimension, and the overall scale were found to be 0.93, 0.85, and 0.89, respectively. Considering that Cronbach's α internal consistency coefficient of a measurement instrument should be as close to 1 as possible,[26,31] the resulting internal consistency coefficients of CPS and CVS overall and of all their sub-dimensions were considered to be highly reliable ($P = .001$). Watkins et al[20] found the overall reliability and the reliability of all sub-dimensions of CPS and CVS to be more than 80%. The findings show that the reliability was high, as was the case on the original scale.

Item-total correlation coefficients in the study were above the acceptable value in terms of item selection, that is, ≥0.20,[26] and ranged between $r = 0.51$ and 0.73 for CPS and $r = 0.48$ and 0.67 for CVS. A high correlation coefficient for each item indicates that it is effective and sufficient to measure the intended behavior.[26] It was found in the study that the correlation between each item and the total score was acceptable and statistically significant for both cyber perpetration and cyber victimization ($P = .001$). Item-total correlation coefficients of the original scale were $r = 0.29$ to 0.87 for CPS and $r = 0.35$ to 0.89 for CVS. The findings that were obtained were similar to the results of item-total correlation coefficients of the original scale.[20]

In the study, the values of correlation between the mean scores of the first implementation and the second implementation of the scales, which were 3 weeks apart, were found range from $r = 0.94$ to $r = 0.97$ for CPS, and from $r = 0.90$ to $r = 0.93$ for CVS, respectively. Positive and high statistically significant correlations were found in CPS and CVS overall and in their sub-dimensions ($P = .001$). The findings that were obtained revealed that internal consistencies of CPS and CVS were high, and that reliable results could be achieved if the scales were administered more than once. No test-retest analysis was carried out for the original scale.[20]

4.3 | Implications for nursing practice

The findings that were obtained in this study were consistent with the analysis results of the original scale. The results of the EFA and CFA confirmed the two-factor structure of the scales. The scale had high correlations in terms of Cronbach's α internal consistency coefficients, item-total correlations, and test-retest analyses. These results show that CPS and CVS that we tested for validity and reliability in Turkish are well compatible with CARS and are valid and reliable instruments for rating cyber aggression and cyber victimization. It is thought that testing CARS in education, clinical practice, combating violence, and in all social areas and on couples of all age groups who intertwined with technology, will contribute to the early diagnosis and management of cyber violence.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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APPENDIX

Cyber aggression in relationships scale

Çiftler zaman zaman sorunlar yaşayıp tartışabilirler. Bazı çiftler bu durumlarda birbirlerine sosyal medya veya cep telefonu yoluyla baskı uygularlar. Böyle durumların sizin ilişkinizde ne sıklıkla olduğunu belirlemek için aşağıdaki soruları size uygun şekilde doldurmanız gerekmektedir. Soruları yanıtlarken son altı 6 ayınızı düşünmenizi rica ederiz. (Couples can have problems and bicker from time to time. In such situations, some couples put pressure on each other on social media or via mobile phones. To find out how often such situations occur in your relationship, you need to fill in the following questions in a manner suitable for you. we ask you to consider your last 6 months when answering the questions).

0 = Hiç (This has never happened)

1 = Son altı ayda 1 kez (Once in the past 6 months)

2 = Son altı ayda 2 kez (Twice in the past 6 months)

3 = Son altı ayda 3 to 5 kez (3-5 Times in the past 6 months)

4 = Son altı ayda 6 to 10 kez (6-10 Times in the past 6 months)

5 = Son altı ayda 11 to 20 kez (11-20 Times in the past 6 months)

6 = Son altı ayda 20 den daha fazla kez (More than 20 times in the past 6 months)

7 = Son altı ayda değil ama öncesin oldu (Not in the past 6 months, but it did happen before)

İfadeler (expressions)
1a. Partnerimin sosyal medyadaki bilgilerini onu aşağılamak veya hakaret etmek için kullanırım (I used information posted on social media to put down or insult my partner)
1b. Partnerim sosyal medyadaki bilgilerimi beni aşağılamak veya hakaret etmek için kullanır (My partner used information posted on social media to put me down or insult me)
2a. Partnerimin mail hesabını izni olmadan kiminle konuştuğunu veya mailleştiğini görmek için kontrol ederim (I checked my partner's e-mail account to see who he or she was talking to or e-mailing without my partner's permission)
2b. Partnerim mail hesabımı iznim olmadan kiminle konuştuğumu veya mailleştiğimi görmek için kontrol eder (My partner checked my e-mail account to see who I was talking to or e-mailing without my permission)
3a. Partnerim istemediği halde seksüel bilgileri için online olmasını isterim (I asked my partner online for sexual information about himself or herself when my partner did not want to tell)
3b. Partnerim istemediğim halde seksüel bilgilerim için online olmamı ister (My partner asked me online for sexual information about myself when I did not want to tell)
4a. Partnerimin izni olmadan özel veya utanç verici bilgilerini sosyal medya veya mesaj yoluyla paylaşırım (I shared private or embarrassing information about my partner via text or social media without his or her permission)
4b. Partnerim iznim olmadan özel veya utanç verici bilgilerimi sosyal medya veya mesaj yoluyla paylaşır (My partner shared private or embarrassing information about myself via text or social media without my permission)

(Continues)

İfadeler (expressions)
5a. Partnerimin sosyal medyayı ne amaçla kullandığını kontrol ederim (I kept tabs on the whereabouts of my partner using social media)
5b. Partnerim sosyal medyayı ne amaçla kullandığımı kontrol eder (My partner kept tabs on my whereabouts using social media)
6a. Partnerimin izni olmadan onun kiminle konuştuğunu veya mesajlaştığını görmek için telefonunu kontrol ederim (I checked my partner's phone to see who he or she was talking to or texting without my partner's permission)
6b. Partnerim iznim olmadan kiminle konuştuğumu veya mesajlaştığımı görmek için telefonumu kontrol eder (My partner checked my phone to see who I was talking to or texting without my permission)
7a. Seksüel iması olan mesaj veya resimleri istemediği halde partnerimin profiline gönderirim (I posted a sexually suggestive message or picture to my partner's online profile that she or he did not want.)
7b. Partnerim seksüel iması olan mesaj veya resimleri istemediğim halde profilime gönderir (My partner posted a sexually suggestive message or picture to my online profile that I did not want)
8a. Partnerime seksi veya çıplak fotoğraflarını göndermesi için baskı yaparım (I pressured my partner to send sexual or naked photos of him or her to me)
8b. Partnerim seksi veya çıplak fotoğraflarımı kendisine göndermem için bana baskı yapar (My partner pressured me to send sexual or naked photos of myself to him or her)
9a. Partnerimin internet aktivitelerini onun izni olmadan kontrol ederim veya izlerim (I checked or tracked my partner's internet activity without his or her permission)
9b. Partnerim internet aktivitelerimi iznim olmadan kontrol eder veya izler (My partner checked or tracked my Internet activity without my permission)
10a. Partnerime telefon veya sosyal medya yoluyla tehdit veya rahatsız edici mesajlar gönderirim (I sent threatening or harassing messages to my partner via text or social media)
10b. Partnerim telefon veya sosyal medya yoluyla tehdit veya rahatsız edici mesajlar gönderir (My partner sent threatening or harassing messages to me via text or social media)
11a. Partnerimin duygularını inciteceğini bildiğim bilgileri sosyal medyada yazar veya gönderirim (I wrote or posted content on social media that I knew would hurt my partner's feelings)
11b. Partnerim duygularımı inciteceğini bildiği bilgileri sosyal medyada yazar veya gönderir (My partner wrote or posted content on social media that he or she knew would hurt my feelings)
12a. Partnerimin izni olmadan sosyal medya hesabını aktivitelerini görüntülemek için kullanırım (I used my partner's social media account to view his or her activity without my partner's permission)
12b. Partnerim iznim olmadan sosyal medya hesabımı aktivitelerimi görüntülemek için kullanır (My partner used my social media account to view my activity without my permission)

(Continues)

İfadeler (expressions)
13a. Partnerimin yerini veya aktivitelerini öğrenmek için peş peşe online veya telefonla mesajlar gönderirim (I sent repeated online messages or texts asking about my partner's location or activities)
13b. Partnerim yerimi veya aktivitelerimi öğrenmek için peş peşe online veya telefonla mesajlar gönderir (My partner sent repeated online messages or texts asking about my location or activities)
14a. Partnerimin izni olmadan GPS teknolojisini onun konumunu takip etmek için kullanırım (I used GPS technology to track my partner's location without my partner's permission)

İfadeler (expressions)
14b. Partnerim iznim olmadan GPS teknolojisini konumumu takip etmek için kullanır (My partner used GPS technology to track my location without my permission)
15a. Partnerim istemediği halde onu online seks konuşturmaya çalışırım (I tried to make my partner talk about sex online when he or she did not want to)
15b. Partnerim istemediğim halde beni online seks konuşturmaya çalışır (My partner tried to make me talk about sex online when I did not want to)