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The Reliability and Validity of a Kurdish Version of SCL-90-R

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ABSTRACT

Background: We investigated the validity and reliability of the translated version of the Symptom Checklist 90 Revised (SCL-90-R) in the Kurdish population in Northern Iraq. **Design and Methods:** The English SCL-90-R was translated into Kurdish (Kurmanci Dialect) and the Kurdish version confirmed by back-translation. Then 269 people from the community were asked to complete SCL-90-R in order to determine the factor validity and internal consistency of the nine primary subscales. Test-retest reliability was examined for 128 psychiatric inpatient samples and 107 psychotherapeutic outpatients. The convergent-discriminant validity was determined for psychiatric inpatients who replied to both SCL-90-R (KR) and the ICD-10-Symptom-Rating (ISR). **Results:** The range of correlation coefficients between the nine primary subscales and items were from 0.53 to 0.85. The results for Cronbach's alpha coefficients were from 0.76 (Paranoid Ideation) to 0.82 (Anxiety). The scores for Pearson's correlation coefficients between test-retest in the case of the outpatients were 0.81 (Psychoticism) to 0.90 (Somatization), and for the student group, they were from 0.64 (Phobic Anxiety) to 0.78 (Paranoid Ideation). The evaluation of concurrent validity was in the relationship between the SCL-90-R subscales and ICD-10-Symptom-Rating (ISR) (the overall score ranged from 0.51 to 0.73). **Conclusion:** We were able to confirm the validity and reliability of SCL-90-R (KR) with regard to the measurement of individual distress. We also found that the nine primary subscales were in line with the original items in the English version.

INTRODUCTION

The Symptom Check-List-90 (SCL-90) is a questionnaire designed to measure self-reported symptom intensity on a number of different subscales. Its long developmental history started with the Cornell Medical Index (1948) [1], from which the Discomfort Scale (1953) [2] and later the 29-question version of the ICD-10-Symptom-Rating (ISR) [2, 3] were developed. After several revisions and additions of new items, the SCL-90-R was introduced [4].

The SCL-90-R is still among several self-report instruments that are extensively used in the mental health area. In the quality of life area, psychological distress (as measured by the SCL-90-R) is considered as a potential factor influencing the quality of life [5].

The checklist is made up of nine primary symptom dimensions, as follows: somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The first five dimensions were developed from factor analytical studies, and the last four were rationally developed and later validated [3, 4]. The instrument's three global indices of distress are the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI) and the Positive Symptom Total (PST).

However, the results of studies concerning the validity of the instrument are controversial. Many studies claim convergent validity for the SCL-90 [6, 7]. The nine SCL-90 dimensions in these studies were found to correlate with analogous measures from other tests. Few studies also claim discriminant validity for the instrument. In Derogatis' study (1983) [6], the finding that the dimensions correlated less strongly with non-analogous scales than they did with analogous scales is interpreted as a demonstration of discriminant validity. Rief and Fichter (1992) found that the SCL-90, by using discriminant analysis, differentiates between patients with dysthymia, anxiety disorders and anorexia nervosa [8]. Dining and Evans (1977) found that the original dimensions correlated both with non-analogous measures and with one another, indicating low discriminant validity [7]. Although Clark and Friedman (1983) found differences in the mean intensity level between anxious, depressed and schizophrenic patients, different profile shapes were not observed [9]. There is mounting evidence of difficulties in replicating the nine-factor groups, which calls into question the dimensionality of the SCL-90 [10]. According to Hoffman and Overals's (1978) data, within

a heterogeneous clinical population the checklist measures only a single global distress factor, rather than nine distinct dimensions [11].

The factor structure of the SCL-90 must be empirically established for each new population to which it is applied because it tends to depend on the sample being examined [8, 9]. This has been done so far for certain populations, including different groups of psychiatric out-patients such as those with dysthymia, anxiety disorders and anorexia nervosa [8], psychiatric inpatients with mainly functional psychoses and neuroses [7], veteran psychiatric populations of patients with anxiety, depression and schizophrenia [9], a non-psychiatric healthy population [12] and a geriatric population for which no factor analysis was performed [13]. Cross-cultural studies have also been conducted in different countries, and in a population of immigrants [12].

However, we decided to investigate the validity and reliability of the translated version of the Symptom Checklist 90 Revised (SCL-90-R) in the Kurdish Region in Northern Iraq with the Kurdish population, because in this region psychometric tests like the SCL-90-R in the language of origin become, after war and warlike situations, more important for the diagnosis and treatment of psychological disorders [14, 15].

In this paper, we report the development of a Kurdish version of SCL-90-R (SCL-90-R (KR)). The original American version of SCL-90-R was first translated from English into Kurdish, and then factorial validity and internal consistency were calculated so that the reliability could be confirmed. In the second step, we determined the test-retest reliability of SCL-90-R (KR) by testing two outpatient samples (psychiatric and psychotherapeutic patients) and healthy persons. We then considered how the SCL-90-R (KR) relates to the existing scales currently used to measure psychological symptoms in the Kurdistan Region of Northern Iraq. The investigation set out to assess the convergent-discriminant validity of the primary nine subscales of SCL-90-R (KR).

MATERIALS AND METHODS

The community sample (n = 269) for this study was recruited with the support of the Kurdish Health Directorate in the city of Duhok in Northern Iraq. The completed forms were given after between one and two weeks to the office of the Health Directorate. In total, from the

269 sample, 145 (53.9%) were women and 124 (46.1%) were men.

For analyzing the SCL-90-R (KR) test and retest, a community sample of 124 students (48 men, average age 26.3 years, and 76 women, average age 22.1 years) attending the University of Duhok (Institute for Psychotherapy and Psychotraumatology) was used. The period between test and retest was 8.6 days.

The psychiatric inpatient sample (n = 128) for this study was recruited from a psychiatric clinic in Duhok (Table 1). In this study, we used data from patients who participated in our psychometric screening program from May 2017 to September 2017. This sample contains 68 (53.1%) women and 60 (46.9%) men.

The psychotherapeutic outpatient sample was a consecutive sample of 107 Kurdish adult outpatients from the province of Duhok (Table 1). The sample comprised 62 women (57.1%) and 45 men (42.1%).

The psychotherapeutic outpatients (M = 42.92; SD = 9.39) and psychiatric in-patients (M = 45.21; SD = 7.48) are clearly older than the community sample [M = 26.93; SD = 7.11, (F(2, 272) = 180.12; $p < 0.01$. It is a great effect ($\eta^2 = 0.57$).

The community sample has a higher level of school education than the two clinical samples. Also the psychotherapeutic outpatients distinguish statistically significantly from the psychiatric inpatients (F (2, 501) = 194.93; $p < .01$; N = 504). It is a great effect ($\eta^2 = 0.58$). In the group of the psychiatric-inpatients men have (M = 2.84; SD = 1.35) a higher level of school education than women (M = 1.74; SD = 1.21, T = 4.67; $p < .01$; N = 126, M.V. = 1). In addition, this difference corresponds to a great effect (d = 0.86). All possible patients and refugees who were affected by the terror of IS ("Islamic State") since 2014 were excluded.

The University Ethical Review Board approved the group. The Institute of Psychotherapy and Psychotraumatology at the University of Duhok in Iraq did the study.

Everyone who was asked to participate in the study agreed to do so and completed the full procedure. The consent was written.

Table 1: Sociodemographic Data, Diagnosis according to ICD-10

Psychiatric inpatients (N=128)								
	Age (in years)	Diagnosis						Migration (in years)
	M (SD)	Depression ICD-10: F32, F33, F34	Somatization ICD-10: F45	Anxiety disorder ICD-10: F40, F41, F43	Obsessive-Compulsive disorder ICD-10: F42	Eating disorder ICD-10: F50	Personality disorder ICD-10: F60	M (SD)
women (n=68)	43,8(7.48)	58,6%	20,4%	16,2%	6,8 %	1,8%	3,0%	26,2 (6,8)
men (n=60))	46,6 (7,56)	54,5 %	14,2 %	21,9 %	9,2 %	3 (0,4%)	9,0 %	28,2 (8,2)
Psychotherapeutic outpatients (N=107)								
women (n=62)	40.2(8.48)	51,2%	18,4%	13,2%	4,7 %	1,2 %	2,8%	26,9 (6,3)
men (n=45)	45,6 (9,36)	45,6 %	12,6 %	10,9 %	6,3 %	0	9,7 %	27,1 (6,1)

The questionnaire used was a Kurdish translation of the SCL-90-R. Two separate translators made the translation from American English to Kurdish. The two translations were compared and retranslated into English and found to be identical.

Cronbach's coefficient alpha was used to test the internal consistency of the original subscales. Administration of the questionnaire was carried out together with the ICD-10-Symptom Rating (ISR) [15]. This instrument, an economical and comprehensive symptom survey across the spectrum of disorders, is designed to image psychological complaints in a way that allows patients to assess themselves and rate their degree of severity [15] and is therefore limited to the non-psychotic range of disorders, unlike the SCL-90-R. With its scales for compulsive and eating disorder syndrome, in addition to screening items relating to other conditions, the ISR goes further than such instruments as the SCL-90-R in imaging the most common psychosomatic disorders [15].

The results obtained from these questionnaires have been reported elsewhere [15]. The mean values of the original nine subscales and the General Severity Index [3] were calculated for the two samples, and the two average profiles were compared.

The Statistical Analysis System (SAS) was used for data analysis.

RESULTS

The mean values of the original subscales and the general scores (Table 2, below) indicate that the internal consistencies of all original nine subscales were good. Cronbach's α showed a range of 0.76 to 0.90 for the psychiatric inpatient and the psychotherapeutic outpatient samples. The reliabilities for the subscales were better for the clinical samples than those reported for the community sample.

Table 2: Internal consistency and test-retest reliability coefficients of SCL-90-R (KR)

	Psychiatric inpatient Sample (n=128)			**Psychotherapeutic outpatient Sample (n=107)**			**Community sample (n=269)**		
	Mean	**SD**	**Cronbach's coefficient alpha**	**Mean**	**SD**	**Cronbach's coefficient alpha**	**Mean**	**SD**	**Cronbach's coefficient alpha**
Somatization	2,26	1,37	0,90	1,08	1,23	0,90	0,43	0,64	0,82
Obsessive-Compulsive	2,13	1,28	0,87	1,19	1,37	0,90	0,37	0,62	0,81
Interpersonal Sensitivity	2,29	1,37	0,80	1,11	1,22	0,90	0,46	0,82	0,80
Depression	2,53	1,46	0,89	1,30	1,07	0,89	0,22	0,65	0,79
Anxiety	2.25	1,39	0,90	1,13	1,31	0,90	0,26	0,76	0,82
Anger-Hostility	1,26	1,48	0,83	0,81	1,05	0,87	0,42	0,85	0,82
Phobic Anxiety	2,12	1,29	0.90	1,05	1,20	0,87	0,22	0,65	0,79
Paranoid Ideation	1,80	1,32	0,78	1,38	1,34	0,83	0,68	0,86	0,76
Psychoticism	1,18	1,33	0,85	0,54	0,89	0,86	0.31	0,40	0,81
GSI	2,24	1,40	0,97	1,05	1,20	0,98	0,30	0,64	0,96

There was a high level of interdependence between the original dimensions of the SCL-90-R in the three samples. The average correlation was 0.59 in the psychiatric inpatient sample (range 0.41-0.90, SD = 0.12), 0.53 in the psychotherapeutic outpatient sample (range 0.37-0.83, SD = 0.14), and 0.43 in the community sample (range 0.22-0.82, SD = 0.12).

There was good discrimination shown between the reference sample and the patient samples by each of the subscales, as well as by the Global Severity Index (GSI). As expected, the highest mean scores were obtained for the psychiatric inpatient sample, while the lowest values were obtained for the community sample. Subjects in the psychotherapeutic outpatient sample had scores between the reference and the psychiatric inpatient group.

In the discriminant function analysis based on the nine subscales, 81% of the community sample and 79.9% of the patient sample were classified correctly. The total hit rate was 86.4%. The regression-coefficient with a value of .148 is highly significant ($p<.001$).

When we compared subscale scores of males and females in the three samples, gender differences were found on most of the subscales. As shown in Table 3, women had higher scores than men. Effect sizes were computed using the standardized mean difference to indicate the strength of the differences between males and females.

Table 3: Differences in subscale means between males and females; effective sizes were calculated on the basis of means and standard. All differences between males and females were significant.

	Psychiatric in-patient sample					**Psychotherapeutic outpatient sample**				
	Male (n=60)		**Female (n=68)**			**Male (n=45)**		**Female (n=62)**		
	Mean	**SD**	**Mean**	**SD**	**Effect**	**Mean**	**SD**	**Mean**	**SD**	**Effect**
Somatization	2,11	0,85	2,41	0,94	0,31	0,98	0,94	1,18	0,89	0,26
Obsessive-Compulsive	1,78	0,85	2,48	0,93	0,39	1,07	0,91	1,31	0,95	0,31
Interpersonal Sensitivity	2,20	0,88	2,38	1,06	0,03	0,96	0,75	1,26	0,95	0,36
Depression	2,39	0,86	2,67	0,94	0,12	1,05	0,89	1,55	0,92	0,29
Anxiety	2,14	0,92	2,36	1,08	0,17	1,10	0,85	1,16	0,91	0,12
Anger-Hostility	1,20	0,85	1,32	0,94	0,20	0,69	0,81	0,93	0,83	0,35
Phobic Anxiety	1,76	0,90	2,18	1,04	0,41	0,934	0,92	1,16	0,91	0,25
Paranoid Ideation	1,35	0,92	2,45	0,92	0,25	1,30	0,81	1,46	0,92	0,09
Psychoticism	1,04	0,85	1,32	0,84	0,13	0,79	0,40	0,34	0,68	0,23
GSI	2,06	0,82	2,42	0,94	0,24	0,98	0,70	1,12	0,97	0,18

In all three samples, subjects with lower levels of education (under 6 years) scored

consistently higher than those with higher levels of education (6 years of age) (Fig. 1). For three of the subscales, the difference was highly significant ($p<.001$). The differences remained significant after using gender as a covariate in the analysis of variance. The same result was obtained for the patient sample.

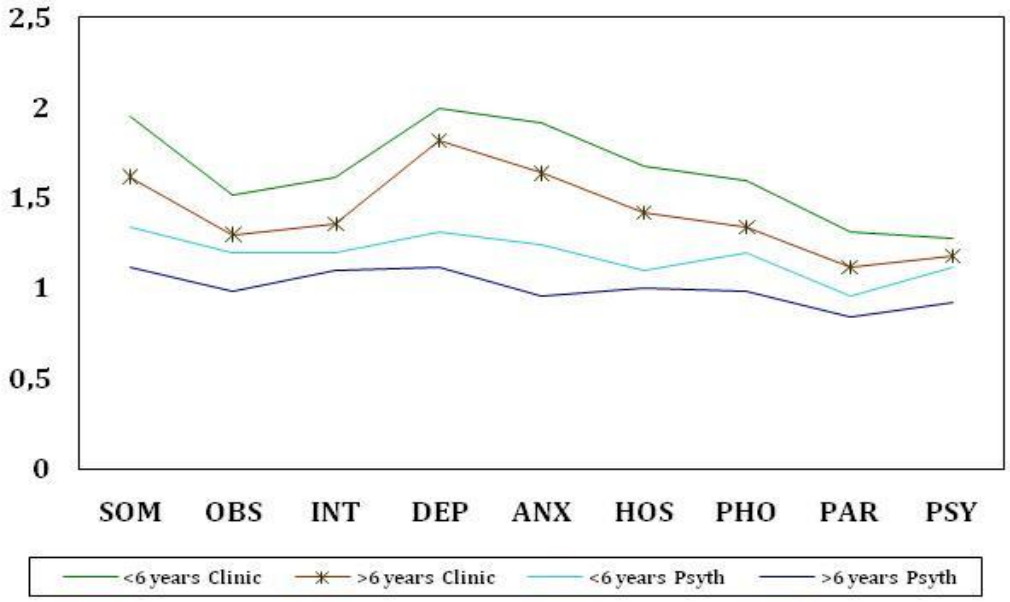

Figure. 1. SCL-90 mean scores of the psychiatric outpatient sample (n=128) with a low education and psychotherapeutic patient sample (n=107) show a high score. SOM, somatization; OBS, obsessive-compulsive disorder; INT, interpersonal sensitivity; DEP, depression; ANX, anxiety; HOS, hostility; PHO, phobic anxiety; PAR, paranoid ideation; PSY, psychoticism; Clinic (psychiatric outpatient sample), Psyhth (psychotherapeutic patient sample).

The confirmative factor analysis results are set out in Figure 2. An analysis was carried out for each of the nine factors. Results for the goodness of fit index (GFI) and adjusted GFI showed that all values for the nine primary symptoms were over 0.90. With regard to the goodness of fit index (GFI) and adjusted GFI, the effect and mean for the nine primary symptoms have been reported elsewhere [2, 10].

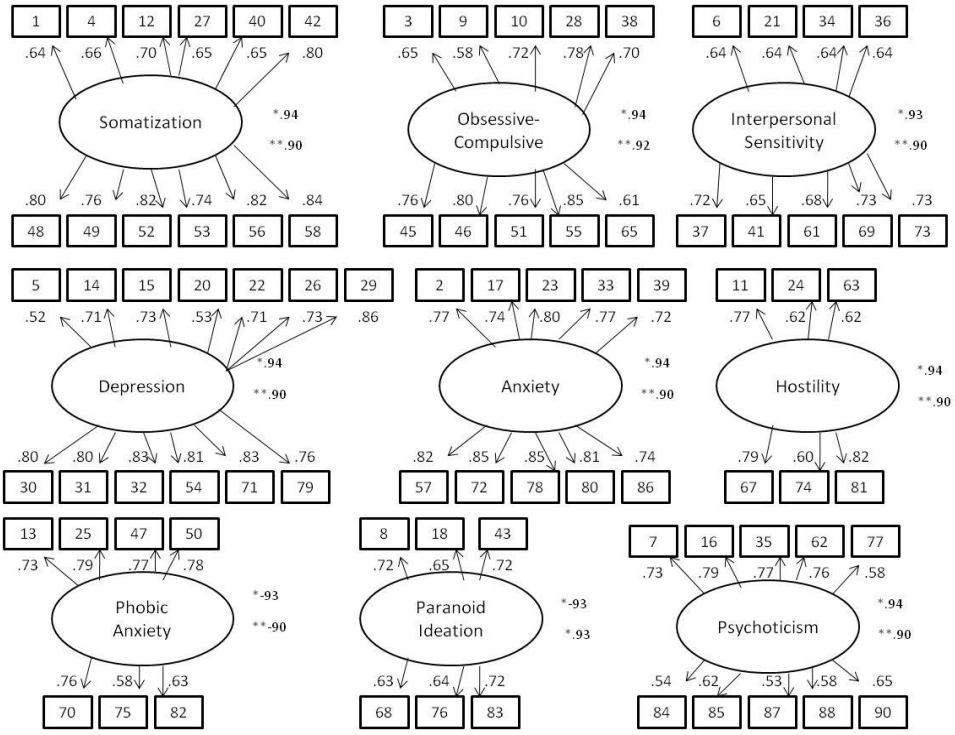

Figure 2: Confirmative factor analysis of the nine primary symptom constructs of SCL-90-R. Numbers in boxes accord with the item number of SCL-90-R. *Goodness of Fit Index(GFI), **Adjusted GFI(AGFI).

Furthermore, concurrent validity was established by examining correlations between the nine original scales and ICD-10-Symptom-Rating (ISR). Table 4 sets out the correlation coefficients. The correlations between the SCL-90-R subscales and the ISR global score ranged from 0.51 to 0.73.

Table 4: Correlations between SCL-90-R subscales and ICD-10-Symptom-Rating (ISR)

	Psychiatric in-patient sample ISR (n=128)
Somatization	0.51
Obsessive Compulsive	0.58
Interpersonal Sensitivity	0.66
Depression	0.73
Anxiety	0.72
Anger-Hostility	0.56
Phobic Anxiety	0.72
Paranoid Ideation	0.67
Psychoticism	0.52
GSI	0.73

DISCUSSION

The purpose of this study was to investigate the psychometric properties and clinical utility of the Kurdish version of the SCL-90-R. SCL-90-R (KR) was consistent with the nine primary scales of the original version. Full scale and subscale internal consistency reliabilities were better for the clinical samples than those found for the nonclinical sample. This could partly be explained by differences in the samples in that the two clinical samples contained a larger proportion of patients with psychological symptoms than did the community sample. For the clinical samples, internal consistencies are congruent with those reported by others [8, 10, 15].

The reliability if the test-retest was considered sufficient for the two clinical samples. Reliability coefficients in the community sample were moderate but lower than those of the two clinical samples. It could be that the community sample responses corresponded to the mood of participants at the time of completing the questionnaire, whereas the patients responded according to their symptoms. The community sample was able to do the retest online, and the sense of anonymity meant that their results had a higher reliability than the two clinical samples. We found that the results were the opposite of our expectations, which suggests that this scale will give us a superior performance when used with patients rather than with healthy subjects.

The convergent-discriminant validation shows that measures of interest indicate strong correlations with independent measures of the same construct, but weak or no correlation with measures of dissimilar constructs. The primary nine subscales of SCL-90-R (KR) showed the strong correlation with the ICD-10-Symptom-Rating (ISR) subscales of the same or similar construct. Additionally, dissimilar subscales of ICD-10-Symptom-Rating (ISR) showed a lower correlation with the SCL-90-R (KR) subscales. These results also suggest that the Kurdish Version of SCL-90-R has convergent and discriminant validity and that the scale is able to assess the constructs that it is intended to measure. Because it was possible that an individual item, translated from English to Kurdish, had a weak relationship with the subscale in the original version. We examined the nine primary scales of the Kurdish version consisted of items the same as the original version. Confirmative factor analysis showed that almost all items highly correlated with each factor (symptoms) contained in the items in the original version. The data showed that our nine subscales of the Kurdish version consisted of

the same items as in the English original version. High validation of each factor could be shown through a confirmative factor analysis.

Research that includes comparative cross-cultural studies would certainly benefit from the application of SCL-90-R (KR). Comparisons of the psychopathology between countries have been published in several studies using the SCL-90-R [2, 17, 18, 19, 20]. It is important that these studies should be consistent in their use of the same scale from the same items. Our version has good validation of this necessary condition.

Convergent-discriminant validation was demonstrated by contrasting the subscale scores of SCL-90-R (KR) with scores from the ICD-10-Symptom-Rating (ISR). It shows that nine subscales were consistent with the corresponding scales from ICD-10-Symptom-Rating (ISR). The tendency of the correlation coefficients was similar to the data of Derogatis et al. (1976). Tritt et al. (2008) reported that the Obsessive-Compulsive subscale was not well correlated with ISR constructs because there was no directly comparable scale on the ISR [15]. Although this was not changed essentially in our design, the Obsessive-Compulsive subscale had a moderate relationship with the subscale from ISR, which would explain the clinical symptoms of obsessive-compulsive disorder in our results.

Women scored higher than men specifically on items tapping depressive and somatization symptoms. These findings are in line with many epidemiological studies showing higher scores for women regarding self-reported psychological distress instruments [15, 17].

In our three samples the tendency to display psychiatric symptoms, or at least to report them, increased with lower levels of education. On most of the subscales, subjects with lower levels of education under 6 years scored on average higher than persons with higher levels of education (>6 years). The General Severity Index of the less educated persons was higher in all three samples (psychiatric outpatient sample, P=0.01; psychotherapeutic patient sample, P=0.001 and community sample, P=0.001).

LIMITATIONS

There are, however, several limitations to the study. The data on refugee psychiatric patients was not gathered, and data collection from such a group will be necessary for future studies. Utility for clinical application is a high priority when a cut-off point has been set.

In addition, our data were collected in the Kurdish Region in Iraq. This might include the possibility of "local" bias. Future research will include comparative studies of the data from Turkey, Iran, and Syria where Kurds are also located.

It can be concluded that SCL-90-R is an effective tool in the research into individual psychological distress. Because this psychological scale can evaluate multidimensional psychopathological aspects simultaneously, it is a useful screening test for setting up research as well as for clinical practice.

List of abbreviations:

SCL-90-R: Symptom Checklist 90 Revised

SCL-90-R (KR): Symptom Checklist 90 Revised (Kurdish)

ISR: ICD-10-Symptom-Rating (ISR).

Declarations

Ethics approval and consent to participate

The University Ethical Review Board approved the group. The Institute of Psychotherapy and Psychotraumatology at the University of Duhok in Iraq did the study.

Everyone who was asked to participate in the study agreed to do so and completed the full procedure. The consent was written.

Competing interests

The authors declare that they have no competing interests.

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