

Cross-cultural adaptation of Revised Child Anxiety and Depression Scale in Kurdish Adolescents

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ABSTRACT:

Kurds face challenges due to ongoing conflicts and traumatic events, exacerbating mental health burdens. Understanding the importance of mental health becomes even more critical during adolescence, as they undergo significant changes predisposing them to mental health disorders. Addressing adolescents' mental health, particularly in conflict regions, is of paramount importance. The prevalence of anxiety and depression among adolescents in the Middle East, including Kurdish populations, underscores the urgent need for culturally appropriate screening measures. Despite the availability of the shortened Revised Child Anxiety and Depression Scale (RCADS-25) in various languages, its validation in Kurdish remains incomplete. Therefore, this study aimed to translate RCADS-25 into Kurdish language and culturally validate it among Kurdish-speaking adolescents in Iraq. The stages of the adaptation process involved forward translation into Sorani Kurdish, back translation, and translation validation by an expert committee, then scale was administered to 422 participants with a mean age of 12.94 years. Females scored significantly higher mean values of depression, anxiety, and total internalizing scale. Overall results provided strong evidence for the reliability and validity of RCADS-25-Kurdish, indicating that it can be considered a reliable tool for assessing anxiety and depression in Kurdish adolescents.

Keywords: Kurdish, Cross-Cultural, Depression, Anxiety, adolescent.

1. Introduction

Mental health, encompassing multiple dimensions such as emotional well-being, self-assurance, self-sufficiency, and cognitive ability. Therefore, holds a paramount significance in the overall assessment of

individuals' general health status (Rao, 2001). According to reports by the World Health Organization (WHO), forthcoming decades will face substantial increase in the prevalence of mental disorders, which are expected to emerge as predominant contributors to disability and

premature mortality, replacing other diseases in foreseeable future(Organization, 2004). Understanding the importance of mental health becomes even more critical during adolescence, a period defined by the American Academy of Pediatrics as spanning from 11 to 21 years old and categorized into three distinct developmental stages: early (11-14 years), middle (15-17 years), and late (18-21 years) adolescence(Hardin et al., 2017). Adolescents undergo significant physical, psychological, and social changes. These changes give rise to various behavioral patterns that can either facilitate normative development or predispose individuals to mental health disorders(Board, 2019).

Among the prevalent disorders during this stage are anxiety and depression (which unfortunately afflict many in early adolescence), sharing common symptoms such as sudden mood fluctuations and impaired psychosocial functioning(Saraceno, 2003). The correlation between depressive and anxiety symptoms (DAS) and negative outcomes, including suboptimal academic achievements, compromised peer relationships, addiction, and suicide attempts, underscores the seriousness of these conditions(Kupferberg & Hasler, 2023). Notably, regions in the Middle East persistently grapple with substantial turmoil, characterized by heightened levels of mental health disorders burden(de Castro et al., 2023). Continuous conflicts in these areas expose the majority of inhabitants to at least one traumatic event during their lifetimes, leading to higher rates of psychological distress and trauma, which are recognized as risk factors for the onset of DAS(Dimitry, 2012). A systematic review found that 3% of Middle Eastern adolescents in their early adolescence stage showed signs of anxiety, 5.4% exhibited signs of depression, and 2% displayed co-occurring signs of anxiety and depression(de Castro et al., 2023).

Previous investigations have revealed alarming rates of mental health disorders among Iraqi youths, with anxiety documented at 51.1% and depression at 29.4%(Al Omari et al., 2020). Despite these high prevalence rates, individuals facing such challenges often find themselves neglected within society, particularly ethnic minorities who experience even

higher degrees of neglect(Dimitry, 2012). Among these minority groups are the Kurds, an ancient ethnic demographic primarily concentrated within the Middle Eastern region, particularly in Kurdistan, spanning territories across Turkey, Iraq, Syria, and Iran. Additionally, Kurdish immigrants can be found across 18 countries in Europe, Transcaucasia, and North America(Kirmanj, 2013). Following the ISIS incursion into Iraq in 2014, Kurds have experienced significant repercussions from a multitude of life-threatening factors, including armed conflicts, forced displacements, natural disasters such as floods, and the ensuing economic downturn in the region. Therefore, they are more susceptible to the onset of DAS(Kulaksiz, 2015). It is imperative to acknowledge that if DAS remain undiagnosed and untreated, deleterious impacts may manifest. Therefore, timely prevention and diagnosis hold the potential to mitigate the adverse impacts, as they can perpetuate into adulthood(Perkins & Alós, 2021).

Meanwhile, the American Academy of Child and Adolescent Psychiatry (AACAP) advocates routine screening of young individuals to identify DAS early on. While clinical interviews based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) traditionally inform prognosis in psychology and psychotherapy, the consensus is that accurate prognostication necessitates the use of multiple scales(American Psychiatric Association & Association, 2013). Meanwhile, self-reported screening tools can, therefore, aid in facilitating and refining the complicated criteria of prognosis. One of the recommended consensus-based measures for use worldwide with adolescents is the Revised Child Anxiety and Depression Scale (RCADS)(Chorpita et al., 2000). Self-reported RCADS is available in two versions: a comprehensive 47-item (RCADS-47) and an shortened 25-item (RCADS-25)(Ebesutani et al., 2012). In terms of feasibility, both versions present several advantages over alternative measures, notably their cost-free accessibility compared to many other instruments. Moreover, both versions concurrently assess DAS(Lisoy et al., 2022). The RCADS-47 aligns most closely with the DSM-IV(Chorpita et al., 2000). Although the initial choice for inclusion in the set

of consensus-based measures was the full RCADS-47 version, recognizing the challenges associated with employing a 47-item scale, the final recommendation favored the shortened RCADS-25 (Krause et al., 2021), incorporating 25 items (15 anxiety and 10 depression) and permits aggregation into anxiety, depression, and overall internalizing scale. The RCADS-25 is designed to be reported by 8–18 years old individuals, employing a 4-point Likert scale for participants to rate 25 statements. Clinical significance is determined by t-scores, adjusted with respect to gender and grade.

As one of the prevalent self-reported measures, its cost-effectiveness, ease of implementation, validity, and reliability have prompted translations into various languages with subsequent validation in clinical and non-clinical populations (Chorpita et al., 2005). Although favorable psychometric properties have been reported for the RCADS-25 in diverse regions (Perkins & Alós, 2021; Piqueras et al., 2017), its validation in the Kurdish language has not yet been completed, thereby limiting its applicability in the Kurdistan Region of Iraq (KRI), where it is urgently needed. The significance of validating this measure is heightened by the substantial Kurdish-speaking population dispersed globally, many of whom have endured significant psychological distress in their home countries, during migration, or while adapting to new cultures.

Cross-cultural adaptation of mental health measures involves more than just linguistic translation; it requires careful consideration of cultural nuances, expressions, and interpretations of mental health constructs (Chang et al., 1999). Previous research has highlighted the challenges associated with achieving cross-cultural validity, including differences in cultural understandings of mental health, variations in symptom presentation, and linguistic intricacies that may affect the accuracy of translation (Jenkins et al., 2013). Despite these challenges, addressing mental health issues among adolescents, particularly in regions affected by conflict, is of paramount importance. The prevalence of anxiety and depression among adolescents in the Middle East, including Kurdish populations, underscores the urgent need for culturally appropriate screening and intervention

measures. Thus, the present study endeavors to accomplish two primary objectives: firstly, the creation of a Kurdish version of the RCADS-25 tailored for adolescents, and secondly, the examination of its reliability and factor structure within a sample of Kurdish-speaking adolescents residing in Erbil, the capital of KRI. This study aimed to adapt the RCADS-25, a widely used self-reported measure for anxiety and depression symptoms in adolescents, to Sorani dialect of Kurdish language and assess its reliability and validity as well as measurement invariance across gender among Kurdish-speaking adolescents in Iraq.

2. Methodology

This study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies (Elm et al., 2007) and aspects of Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) recommendations for studies on measurement properties (Gagnier et al., 2021) to examine reliability and construct validity, including factor structure assessment. The study was carried out in accordance with the code of ethics of the World Medical Association (Declaration of Helsinki) after obtaining Ethical clearance on (15-1-2021), from the Ethical Review Committee of College of Dentistry at Hawler Medical University (reference number: 28/2021). Written consent was obtained from adolescents' parents prior to data collection. An agreement to use the child version of RCADS-25 was granted from the Child FIRST RCADS Team (ID: 0827AD90-9B22-4A40-90F1-B2EFE39B018D).

Participants: Native Kurdish participants in their early adolescence stage period (12-14 years old) completed the Kurdish version of self-reported RCADS-25. Authors aimed to enroll equal male and female participants from public secondary schools in Erbil city. Sample size was determined based on guidelines for the respondent-to-item ratio ranged from 15:1 (Pedhazur & Kerlinger, 1982) (i.e., 375 respondents for the 25-item RCADS). Sample size

was maximized by initially recruiting 450 participants.

Instruments: The RCADS-25 was used to assess symptoms of anxiety and depression. The RCADS-25 is designed to be reported by 8–18 years old individuals, employing a 4-point Likert scale for participants to rate 25 statements. Clinical significance of anxiety, depression, and total internalizing symptoms are determined by t-scores, adjusted with respect to gender and grade.

Procedure:

- **Translation and adaptation**

Aspects of the protocol suggested by Beaton et al was used in translating the self-reported RCADS-25 (Beaton et al., 2000). The initial stage of the adaptation process involved forward translation, wherein two independent translated versions of the instrument from the English language to the Sorani dialect of Kurdish language were produced by bilingual professional translators proficient in the Kurdish language. These translators were selected from different backgrounds to offer diverse perspectives during the translation process. Translator 1 was a psychiatrist knowledgeable about the concepts in the questionnaire, provided a first translated version adapted from a clinical perspective. Translator 2, had no medical background, offered a second translated version. Subsequently, third opinion was obtained to synthesize one common version after reconciling discrepancies between the two translated versions.

In the next stage, back translation was conducted to validate the common translated version by translating it back into English language, ensuring consistency in item content. Two back-translations were produced by another two translators who were unaware of the concepts explored, in order to minimize information bias and elicit unexpected meanings of the items. Then an expert committee comprised four members (methodologist, psychiatrist, language professional, translator) consolidated all versions of the questionnaire, resolved any discrepancies, and developed the final version. Critical decisions were made by the committee and the rationale behind each decision

was justified after thorough discussion, ensuring transparency and accountability throughout the process.

- **Data collection**

Thirty schools were randomly selected from the 275 secondary public schools within Erbil city to participate in the study. Letters were sent home explaining the study process and to obtain written informed consent from adolescents' parents to participate in the study. Kurdish RCADS-25 version was printed on paper and administered to students in classrooms with the presence of a teacher and the researcher. Participants were encouraged to answer all the questions, furthermore they were informed that they have the right to refuse to answer the questions they felt uncomfortable with as well as the right to drop out at any time from the study. Those participants did not respond to all items, were excluded from the study.

Data analyses: Independent-samples t-tests were conducted using SPSS Statistics software (IBM, 2023) to investigate differences in mean scores for each scale between genders while setting significance level at $p < 0.05$. To assess the reliability of the scales, Cronbach's alpha coefficients were computed, with scores ≥ 0.70 indicating acceptable reliability (Hankin et al., 1998). Individual items' contribution to their particular scales was assessed through corrected item-total correlations. A correlation threshold of ≥ 0.30 was set for desirable performance, while any correlations below 0.30 were deemed undesirable. Furthermore, the factor structure was examined using confirmatory factor analysis (CFA) in R programming language version 4.3.2. Given prior research (Ebesutani et al., 2017) establishing a two-factor solution with latent factors (anxiety and depression) within RCADS-47, this model was tested for confirmation. The loadings of the first item on each factor were fixed to one to estimate the variance of latent factors. To indicate the association between indicators and latent factors, Standardized loading factor loading exceeding ≥ 0.35 were considered significant.

Model fit was assessed using four commonly reported indices: relative chi-square (χ^2/df), root mean square error of approximation (RMSEA),

Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). Standardized root means square residual (SRMSR) was also calculated, and its Value was interpreted in conjunction with other used indices. Cut-off criteria for acceptable fit were set at < 2.0 for relative chi-square, close to 0.05 for RMSEA (with scores < 0.08 considered satisfactory), and ≥ 0.80 for CFI and TLI (with ≥ 0.80 indicating good fit). SRMSR values close to zero were considered as an excellent fit (Jackson et al., 2009).

3. Results

A total of 450 participants aged 12-14 years were initially recruited. Twenty-eight of them dropped out from the study because they did not answer all questions, while the rest of them provided complete response to all items of the Kurdish version of RCDAS-25 included in the study. The final sample size included in the analysis was 422 participants with a mean age of 12.94 years with $SD = 0.73$. Near-equal gender distribution exhibited in the sample, with 52.6% and 47.4% being male and female respectively (Table 1).

Table 1: Descriptive Statistics and Independent Test Sample Result

Scales	Male (52.6%)		Female (47.4%)		T-Test (P-Value)
	Mean	SD	Mean	SD	
Depression	5.842	4.73	7.465	5.861	-3.143 (0.002)
Anxiety	11.122	7.661	14.535	8.558	-4.323 (0.000)
Total internalizing	16.964	11.888	22	13.706	-4.402 (0.000)

Gender differences in individual scale mean scores were found to be statistically significant based on independent-samples t-tests. It is worth highlighting that, females scored significantly higher mean values of all three scales (depression, anxiety, and total internalizing) than males. As shown above in (Table 1), 5.842, 11.122 and 16.964 were recorded for males, whereas females scored 7.465, 14.535 and 22 for depression, anxiety and total internalizing scales respectively.

- **Reliability**

Cronbach's alpha demonstrated satisfactory values across all dimensions of the scale. The lowest score

was observed for depression at 0.86, followed by anxiety at 0.882, and the total internalizing factor at 0.884 (refer to Table 2). Examining the corrected item-total correlations in the two-factor model revealed ranges of 0.465–0.681 for depression and 0.442–0.653 for anxiety (see Table 2). Notably, none of the items displayed correlations below 0.3 on both scales. Despite these findings, eliminating any item did not enhance Cronbach's alpha. It is worth noting that removal of any item for depression did not lead to a decrease in Cronbach's alpha below 0.86, underscoring the significance of each question for maintaining the scale's integrity.

Table 2: Cronbach's alpha Outcomes

Scale	Mean	SD	Cronbach's Alpha
Depression	6.612	5.345	0.86
Anxiety	12.740	8.257	0.882
Total internalizing	19.350	12.997	0.927

- **Construct validity**

Factor loading values indicate a strong association between a latent factor and its indicators after accounting for the scale of measurement (Table 3).

The values closer to 1 suggest a stronger association between latent factors and observed variable. In addition, larger values indicate that the observed variable is considered as a good indicator of the

latent factor. Referring to depression as latent factor, all the values related to its indicators were above the acceptable cut-off value 0.3, and all of the values were greater than 0.3. Furthermore, all items of both latent variables were statistically significant ($p < 0.05$), indicating a significant association

between the latent factor and each observed variable. The R-Square values for the observed variables were relatively small and it is recommended to be at range from 0.60 to 0.90, which is reported that the latent factors effectively explained the variability in the observed variables.

Table 3: Factor Loading, Corrected Item-Total Correlation, Cronbach's Alpha if Item Deleted and R-Square Results

Scales	Items	Factor Loading (SE)	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	P-Value	R-Square
Depression	Q1	0.489 (0.0328)	0.617	0.843	0.000	0.44
	Q4	0.444 (0.0414)	0.465	0.856	0.000	0.257
	Q8	0.558 (0.0419)	0.568	0.847	0.000	0.369
	Q10	0.451 (0.0387)	0.494	0.853	0.000	0.296
	Q13	0.53 (0.0362)	0.604	0.844	0.000	0.429
	Q15	0.466 (0.0368)	0.508	0.852	0.000	0.340
	Q16	0.434 (0.0289)	0.615	0.845	0.000	0.444
	Q19	0.467 (0.0332)	0.570	0.847	0.000	0.403
	Q21	0.55 (0.0383)	0.609	0.843	0.000	0.415
	Q24	0.579 (0.0342)	0.681	0.837	0.000	0.534
Anxiety	Q2	0.504 (0.0407)	0.546	0.874	0.000	0.326
	Q3	0.415 (0.0476)	0.442	0.879	0.001	0.178
	Q5	0.502 (0.048)	0.513	0.876	0.000	0.246
	Q6	0.562 (0.0404)	0.583	0.873	0.000	0.393
	Q7	0.599 (0.0432)	0.581	0.873	0.000	0.392
	Q9	0.465 (0.0443)	0.538	0.875	0.000	0.249
	Q11	0.335 (0.0273)	0.492	0.877	0.000	0.322
	Q12	0.488 (0.0447)	0.506	0.876	0.000	0.263
	Q14	0.504 (0.0372)	0.508	0.876	0.000	0.378
	Q17	0.54 (0.0459)	0.530	0.875	0.000	0.300
	Q18	0.508 (0.0384)	0.545	0.874	0.000	0.363
	Q20	0.554 (0.0319)	0.653	0.871	0.000	0.55
	Q22	0.507 (0.039)	0.529	0.875	0.000	0.353
	Q23	0.616 (0.0459)	0.597	0.872	0.000	0.373
	Q25	0.559 (0.0403)	0.599	0.872	0.000	0.392

CFA conducted on the a priori hypothesized RCADS-25 two-factor model (Table 4) exhibited a satisfactory fit with the data ($n = 422$): $\chi^2 = 967$ (274), $p < 0.001$; CFI = 0.836; TLI = 0.820; RMSEA = 0.0774. However, it is recommended

to end up with CFI above 0.90 and fortunately both RMSEA values were below 0.08, and SRMSR values were closer to zero indicating an acceptable fit to support CFI.

Table 4: Construct Validity Results

	X2	Df	P	CFI	TLI	SRMSR	RMSEA
One Factor Model	979	275	<.001	0.833	0.818	0.0558	0.0779
Two Factor Model	967	274	<.001	0.836	0.820	0.0553	0.0774
Correlation							
Depression ~ Anxiety	0.818						

4. Discussion

The present study conducted a thorough validation process of a translated version of the RCADS-25 into Kurdish language, including assessments of internal reliability, structural validity, and measurement invariance across gender in a sample of Kurdish speaking secondary school students in their early adolescence stage period.

The findings provide strong evidence for the internal reliability of Kurdish version of child reported RCDAS-25, as assessed through Cronbach's alpha and corrected item-total correlations, suggest that the scale demonstrates satisfactory reliability across all dimensions. Cronbach's alpha values indicated strong internal consistency within each dimension. These values exceeded the commonly accepted threshold of 0.70, indicating that the items within each dimension are highly correlated with one another, suggesting that they measure the same underlying construct reliably. Values were higher than reported for the Arabic version (Perkins & Alós, 2021) and within the range reported by RCADS-47(van Lier & Koot, 2010).

Moreover, the examination of corrected item-total correlations further supports the internal reliability of the scale. Additionally, the finding that eliminating any item did not enhance Cronbach's alpha suggests that each question plays a significant role in maintaining the scale's integrity and internal consistency. This indicates that all items are essential for capturing the full range of symptoms associated with anxiety and depression among Kurdish early adolescent population.

Our findings related to factor loading values underscore the robustness of the association between the items and the underlying constructs of anxiety and depression. These results provide

strong evidence for the construct validity of the scale, indicating that it effectively measures the intended constructs and can be considered a reliable tool for assessing anxiety and depression in Kurdish adolescents.

Furthermore, CFA supported the hypothesized two-factor structure of the RCADS-25 described by(Ebesutani et al., 2012), providing evidence of its structural validity in the Kurdish context. This finding agrees with previous studies(Perkins & Alós, 2021; Stevanovic et al., 2017). While the fit indices fell slightly below the recommended thresholds for model fit, they still indicated an acceptable fit to the data, supporting the use of the translated scale in assessing anxiety and depression symptoms among Kurdish-speaking adolescents.

Additionally, gender differences in mean scores highlighted variations in symptom, as females reported higher scores than males for anxiety, depression and internalizing scales, in line with existing literature (Altemus et al., 2014; Perkins & Alós, 2021; Van de Velde et al., 2010) emphasizing the importance of considering gender-specific differences in mental health screening and intervention efforts. These findings can be attributed to biological, psychological and social factors.

In terms of biological factors hormonal fluctuations during adolescence, particularly in females, are known to induce DAS(Stroud et al., 2002). Variations in estrogen and progesterone levels can further impact stress response between genders(Kundakovic & Rocks, 2022). Additionally, disparities in physical resilience and overall health can affect the capacity to cope with and manage stressors(Padmanabhan et al., 2023).

Psychological factors attributed to variability in temperament, personality, and cognitive ability across genders affecting their emotional responses (Daughters et al., 2013). Studies indicated that females can exhibit greater inclination towards rumination and engagement in negative self-evaluation, which can exacerbate DAS (Barbee et al., 1993).

Meanwhile, Social expectations and societal gender roles frequently impose greater expectations and pressures on females. These pressures often manifest in heightened competitiveness and a pursuit of perfection (Berger et al., 1999). Additionally, females commonly encounter the challenge of balancing contemporary societal expectations with traditional cultural norms (Jazrawi, 2014), that may exceed their capacities, leading to internal conflicts which subsequently induce DAS (Berger et al., 1999). Furthermore, females tend to prioritize social relationships and seek emotional support (Barbee et al., 1993), which, while beneficial, can expose them to interpersonal stressors and relational conflicts, thereby impacting their overall mental health (Belle, 1991). Moreover, females may face anxiety associated with gender discrimination, sexism, and societal expectations regarding behavior and appearance (Garner et al., 1980).

Overall, the findings contribute to the growing body of literature on cross-cultural mental health assessment and underscore the importance of adapting screening tools to diverse cultural contexts to ensure their validity and effectiveness in

identifying and addressing mental health issues among adolescents worldwide.

Strength of this study appears in filling the existing gap in literature by establishing the generalizability of the psychometric properties of a translated Kurdish version of RCADS-25 to a Kurdish context by specifically focusing on evaluating its internal reliability and structural validity. Consequently, this instrument can serve as a resource for mental healthcare professionals by providing reliable information in a cost-effective, time-efficient manner, as well as assessing DAS among early adolescents, facilitating the identification and monitoring of mental health issues.

On the other hand, generalizability of the findings to older adolescents has been limited as the study involved participants >16 years. Furthermore, assessments of convergent and discriminant reliability were not conducted within the scope of this study, thereby limiting the comprehensive evaluation of reliability measures. Expanding the scope of future investigations to include such assessments would strengthen the robustness of the study's findings.

5. Conclusion

This study established validity of a translated version of the RCADS-25 into Kurdish, providing mental healthcare professionals with a reliable tool for identifying and monitoring DAS among early adolescents. Lastly, this study lays the foundation for future research to further validate and refine mental health assessment tools in diverse cultural contexts.

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