

Rapid mental health screening in conflict zones: a translation and cross-cultural adaptation into Arabic of the shortened Revised Child Anxiety and Depression Scale (RCADS-25)

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Abstract

Background

During conflict, children and adolescents are at increased threat of mental health pathology and in particular, anxiety and depression. However, mental health screening in conflict settings is problematic and carries risk making the need for fast, easy-to-administer, screening instruments paramount. The shortened version of the Revised Child Anxiety and Depression Scale (RCADS-25) is one method of rapidly assessing anxiety and depressive symptoms in youths. This self-report questionnaire demonstrates good internal consistency and diagnostic capacity in clinical and non-clinical populations. Nevertheless, few studies have tested the psychometric properties of translated versions of the RCADS-25 limiting its applicability worldwide.

Objectives

To expand the reach and utility of the RCADS-25, the present study sought to develop an Arabic version of the instrument (RCADS25-Arabic) and to explore its reliability and underlying factor structure. In light of changes to DSM classification, the effects of removing indicator variables for obsessive-compulsive disorder on the psychometrics of the RCADS25-Arabic were also explored.

Method

The scale was back translated into Modern Standard Arabic and administered to 250 Arabic speaking schoolchildren between 8-15 years of age. Mean and standard deviation were used to characterise the sample and summarize scores. The reliability and factor structure of the RCADS25-Arabic was explored using confirmatory factor analysis.

Results

Females were 127 and mean age was $12.11 \pm SD 2.35$. Males scored lower on anxiety ($M 15.05 SD \pm 8.0$, $t(248) = -3.15$, $p = .003$, $d = 0.39$) and internalizing factors ($M 26.1 SD \pm 13.1$, $t(248) = -2.36$, $p = .0160$, $d = 0.31$) with no statistical gender difference recorded for depression ($t(248) = -1.27$, $p = .202$). Fit statistics were good for two- and one-factor solutions ($\chi^2/df = 1.65$, RMSEA 0.051, CFI .91, TLI .90 and $\chi^2/df = 1.64$ and RMSEA 0.051, CFI .91 and TLI .89 respectively). DIFFTEST showed no significant difference between models ($\chi^2_{diff}(1) = 0.03$, $p < 0.86$) indicating a one-factor (internalizing) solution was preferable. No improvement in scale integrity was found after deleting obsessive-compulsive disorder items.

Conclusion

The RCADS25-Arabic is useful for rapid screening of depression and anxiety but is better used to identify a one-factor internalizing construct. Obsessive-compulsive disorder items should be retained in the RCADS-25.

Introduction

According to estimates, one out of every four to five young people will experience a mental health problem in any given year (Patel, Flisher, Hetrick & McGorry 2007). Anxiety and depression are two prominent psychopathologies, which are related to other mental health issues such as; post-traumatic stress, substance abuse or aggressive behaviours (Blain-Arcaro & Vaillancourt, 2016).

During times of conflict, anxiety and depression are known to increase (Attanayake, McKay, Joffres, Singh & Mills 2009). The Middle East and North Africa are areas that continue to suffer significant turmoil and these regions have elevated levels of mental health burden (Perkins et al., 2018; Al-Jawadi & Shatha Abdul-Rhman, 2009; Thabet, Abed & Vostanis, 2002). Access to vulnerable populations in these areas is greatly diminished by the 'facts on the ground', highlighting the necessity for quality diagnostic and screening tools in Arabic that are quick to administer and easily available to distribute. The usefulness of Arabic mental health screening tools is further highlighted by the large numbers of Arabic speaking refugees living in other parts of the world, with many having suffered significant psychological distress in their home countries, during their flight experience and in adapting to new cultures (Turner, 2015).

Adapting mental health screening tools across cultures and contexts is problematic. A systematic review of 26 different child and adolescent screening instruments found that none were convincingly satisfactory with regards to cross-cultural validity (Stevanovic et al., 2017). Multiple factors contribute to this finding such as variation in understanding, expression and responses to mental health problems between cultures (Kirmayer, 2006). In addition, translation is rarely a case of substitution as words often have alternate meanings or different connotations in the target language. Despite these difficulties a number of child mental health screens have been adapted to Arabic (e.g. the Children's Depression Inventory 2) (Kovacs, 2010). However, their usefulness can be limited by factors such as; measuring only a single mental health dimension, not being based on *Diagnostic and statistical manual of mental disorders* DSM-V (APA, 2013) classifications, measuring only a limited age group, being too costly or too long to complete where sometimes brief assessment is required (e.g. in conflict zones).

The Revised Child Anxiety and Depression Scale

A freely available self-report questionnaire used worldwide is the Revised Child Anxiety and Depression Scale (RCADS) (Chorpita, Yim, Moffitt, Umemoto & Francis, 2000). The full version has 47 questions pertaining to depression and the five dimensions of anxiety specified by the DSM-IV (APA, 2000): generalized anxiety disorder, separation anxiety disorder, social phobia, panic disorder and obsessive-compulsive disorder. However, the more recent DSM-V (APA, 2013) classifies obsessive-compulsive disorder as a distinct category (Obsessive-Compulsive and Related Disorders). In addition to overall anxiety and depression scores, the RCADS captures a unidimensional factor (anxiety and depression together) which is a higher-order construct described as an 'internalizing disorder' or 'general negative affect' (Brown et al., 2013; Ebesutani et al., 2012). The scale is aimed at youths in grades 3-12 and asks participants to rate statements such as "I would feel afraid of being on my own at home", using a 4-point

Likert scale ranging from 0 (never) to 3 (always). Clinical significance is determined by t-scores after raw totals are adjusted in relation to gender and school year.

As 47-items are cumbersome for brief assessment, a shortened 25-item version (RCADS-25) including 15 anxiety and 10 depression questions was produced (Ebesutani et al., 2012). As with the larger scale, child (RCADS-25) and parent versions (RCADS-25-P) were developed which have been validated in clinical and non-clinical populations (Ebesutani, Korathu-Larson, Nakamura, Higa-McMillan & Chorpita, 2016; Park et al., 2016). The brevity of the RCADS-25 makes it ideal for screening children in a fast and efficient manner, and therefore, for use in conflict zones. However, the RCADS-25 has yet to be validated in Arabic, limiting its reach in areas of the world where it is greatly needed.

The aims of this study were to create an Arabic version of the RCADS-25 and to test its reliability and factor structure in a cohort of Arabic speaking children. In addition, this work explored how changes in the DSM-V classification of anxiety (i.e. removing OCD items) effected the psychometric properties of the scale.

Methods

Translation

The RCADS-25 was translated using aspects of the protocol suggested by Sousa & Rojjanasrirat (2011). Professional translators, with the assistance of psychologists familiar with mental health assessment carried out the interpretation. The English version was forward translated into Modern Standard Arabic (MSA) before being back-translated by a different team and compared. Discrepancies between versions were resolved by both teams and the Arabic scale amended.

Participants and protocol

Children from grades 3-10 completed the RCADS25-Arabic. We aimed to enrol a minimum of twenty children from each grade, (10 males and 10 females). Participants were recruited from schools in Damascus Governate, Syria. Ethical approval was secured from the Faculty of Education, Damascus University. Ten schools were randomly approached via headteachers to request participation. Three schools agreed to take part and written informed consent was obtained from parents/guardians and children. No incentives were given for participation. The RCADS25-Arabic was administered on paper in the classroom with a teacher and psychologist present and demographic information was collected simultaneously. The survey was explained and children were encouraged to answer all questions as best they could. Children were informed of their right not to answer questions they were uncomfortable with and to withdraw from the study at any time. Information was given regarding local and web-based mental health providers in case taking part in the study raised concerns. Completion of the questionnaire took approximately 10 minutes.

Data Analyses

Thirty-one out of 250 participants (12.4%) had one or more missing responses. Missing data were addressed by prorating the remaining items within the scale as described by the authors. Independent-samples t-tests (two-tailed) were run in SPSS version 22 (IBM Corp., Armonk, N.Y., USA) to investigate gender differences in mean raw scores for each scale with significance set at $p < 0.05$. To examine the extent to which different scales represented individual phenomena, Cronbach's alpha coefficients were calculated with scores ≥ 7.0 used to indicate acceptable reliability (George & Mallery, 2003). The contribution of each item to respective scales was evaluated with corrected item-total correlations. Performance was based on correlations being $\geq .30$, $< .8$, as well as the degree to which item removal affected coefficients (drops of $> 10\%$ were considered undesirable) (Nunnally & Bernstein, 1994).

Factor structure was explored using confirmatory factor analysis (CFA) in Mplus version 6.1 (Muthén & Muthén, 1998-2010). As a two-factor solution with depression and anxiety as latent factors has been established in studies of the full RCADS (e.g. Ebesutani et al., 2016), we looked to confirm this model. Structure and reliability were also explored with obsessive-compulsive disorder (OCD) items removed. Data was multivariate non-normal so weighted least-squares of mean and variance (WLSMV) was used as an estimator. Latent factor variance was freely estimated after loadings of the first item on each factor was set to one. To explore data fit, four indices commonly reported elsewhere were applied; relative chi-square (χ^2/df), root mean square error of approximation (RMSEA), the *Comparative Fit Index* (CFI) and the Tucker-Lewis Index (TLI). Cut-off criteria were < 2.0 for relative chi-square, close to 0.5 for RMSEA (with scores < 0.8 satisfactory) and $\geq .90$ for CFI and TLI (with $\geq .95$ indicating excellent fit) (Jackson, Gillaspay & Purc-Stephenson, 2009). To explain the interaction between indicators and latent factors, standardized factor loadings with a cut-off of value $\geq .35$ were used (Hair, Tatham, Anderson & Black., 2010).

Nested models were compared using DIFFTEST which produces chi-square statistics of change in model fit. A non-significant finding indicates no difference between models and suggests that the simpler (less constrained) model should be retained.

Results

Demographics

250 children took part in the study, 123 males and 127 females (mean age $12.11 \pm SD 2.35$, range 8-15 years). Statistically significant gender differences were observed in individual scale mean scores as determined by independent-samples t-tests. Males scored significantly lower on anxiety ($M 15.05 SD \pm 8.0$, $t(248) = -3.15$, $p = .003$, $d = 0.39$) and internalizing factors ($M 26.1 SD \pm 13.1$, $t(248) = -2.36$, $p = .0160$, $d = 0.31$), than females ($M 18.22 SD \pm 8.2$, $M 30.2 SD \pm 13.2$ respectively) (see Table 1). No statistically significant gender difference was recorded for depression ($t(248) = -1.27$, $p = .202$). Effect sizes were moderate for both anxiety ($d = .39$) and internalizing factors ($d = .31$).

Reliability

Cronbach's alpha was acceptable for all scale dimensions. The lowest score was .71 for depression with anxiety .76 and the internalizing factor .85 (Table 1).

Table 1. *T-tests and demographics for children and parents.*

Total sample n = 250					
	Grade	Male (n)	%	Female (n)	%
School	3	20	8.0	19	7.6
	4	10	4.0	12	4.8
	5	15	6.0	16	6.4
	6	20	8.0	19	7.6
	7	14	5.6	10	4.0
	8	11	4.4	14	5.6
	9	21	8.4	18	7.2
	10	12	4.8	19	7.6
	Total	123	49.2	127	50.8

RCADS-25	Scale	Mean (SD)	t(df)	p value	Cohen's d
M (123)	Anxiety	15.05 (8.0)	3.15(248)	.003*	.39
F (127)		18.22 (8.2)			
M (123)	Depression	10.6 (6.2)	1.28(248)	.202	-
F (127)		11.7 (5.9)			
M (123)	Internalizing	26.1 (13.1)	2.36(248)	.019*	.31
F (127)		30.2 (13.6)			

Note. M = males, F = females,*Significant at p<.05 level.

% = Percentage of total sample (250). Totals under 100% indicate missing data.

The ranges of corrected item-total correlations in the two-factor model were .24-.49 for anxiety and .28-.42 for depression (see Table 2). Three items fell below .3, items 5 and 12 on the anxiety factor and item 8 on the depression scale. Nevertheless, removal of any item did not improve Cronbach's alpha. Moreover, for depression, the removal of any item caused Cronbach's alpha to drop below .70 highlighting the importance of each question to scale integrity. For the one factor solution, corrected item-total correlations ranged from .26-.51. One item was below the .3 cut-off and this was also item 8 on the depression scale.

Removing OCD items worsened model parameters. Alpha coefficients for anxiety and internalizing factors reduced, (.72 and .83, Table 1) and a greater proportion of corrected item-total correlations fell below .3 (ranges .21-.48, .27-.47 and .24-.48 for depression, anxiety and internalizing respectively [data not shown]).

Table 2. *Reliability and item level statistics for RCADS25-Arabic.*

Reliability	Scale	Mean	Items	α	α^{β}
N = 250	Anxiety	16.8 (8.3)	15	.76	.72
N = 250	Depression	11.3 (6.1)	10	.71	-
N = 250	Internalizing	28.2 (13.5)	25	.85	.83

Scale	Item number in original RCADS-25	Factor loading (SE)*	Corrected item-total correlation*	Cronbach's alpha if item deleted*
Anxiety	2	.39 (.06) [§]	.30	.75
	3	.40 (.06) [§]	.32	.75
	5	.44 (.06) [§]	.28	.76
	6	.46 (.06) [§]	.30	.75
	7	.48 (.05) [§]	.32	.75
	9	.56 (.05) [§]	.34	.75
	11	.58 (.05) [§]	.33	.75
	12†	.62 (.04) [§]	.24	.76
	14	.57 (.05) [§]	.40	.75
	17†	.49 (.06) [§]	.43	.74
	18	.38 (.06) [§]	.41	.74
	20	.46 (.05) [§]	.49	.74
	22	.59 (.05) [§]	.48	.74
	23†	.62 (.04) [§]	.44	.74
	25	.63 (.04) [§]	.39	.75
Depression	1	.38 (.06) [§]	.37	.69
	4	.40 (.06) [§]	.37	.69
	8	.34 (.06) [§]	.28	.70
	10	.64 (.04) [§]	.34	.69

13	.62 (.04) §	.31	.70
15	.48 (.05) §	.42	.68
16	.47 (.06) §	.39	.68
19	.44 (.06) §	.40	.68
21	.56 (.05) §	.39	.68
24	.53 (.05) §	.42	.68

Note. α = Cronbach's alpha. † OCD items. β = OCD items removed. Significant at $p < 0.001$. *Factor loadings, item-total correlations and Cronbach's alpha if item deleted, derived from two-factor model/sub-scales and includes OCD items.

Factor structure

CFA statistics (Table 3) with OCD questions included supported a two-factor solution but fell short of excellent fit; relative chi-square $\chi^2/df = 1.65$ and RMSEA 0.051 (CI, 0.042, 0.059), CFI .91 and TLI .90. Factor loadings ranged from .38-.63 for anxiety and .34-.64 for depression with item 8 on the depression scale the only loading below acceptable cut-off (.34) (Table 2). Fit statistics also supported a one-factor model; $\chi^2/df = 1.64$ and RMSEA 0.051 (CI, 0.042, 0.059), CFI .91 and TLI .89 with factor loadings ranging from .35-.67 (Table 2). The DIFFTEST function in Mplus showed no significant difference in chi-square values between one- and two-factor models ($\chi^2_{diff}(1) = 0.03$, $p < 0.86$). After omitting OCD questions, fit statistics were decreased for all outcomes ($\chi^2/df = 1.74$, RMSEA = 0.055 CI, 0.045, 0.064), CFI = .89, TLI = .88). Scores remained tolerable but were marginally below conventional cut-offs for some indices.

Table 3. *Fit statistics for confirmatory factor analysis models.*

Fit measures							
RCADS25-Arabic	χ^2	<i>df</i>	P	χ^2/df	RMSEA	CFI	TLI
2 Factor model	450.90	274	0.001	1.65	0.051	.91	.90
2 Factor model (no OCD items)	364.58	209	0.001	1.74	0.055	.89	.88
1 Factor model	451.42	275	0.001	1.64	0.051	.91	.89
Correlation	Depression						
Anxiety	0.77						

Note. N = 250. RCADS25-Arabic = Revised Child Anxiety and Depression Scale (Arabic); χ^2/df = Chi-square/degrees of freedom, RMSEA = root mean square error of approximation, CFI = comparative fit index, TLI = Tucker Lewis Index.

Discussion

In the present study, we translated the RCADS-25 into Arabic and investigated its reliability and structure in a sample of Arabic speaking school-aged children. We found good cross-cultural validity in agreement with other works (Stevanovic et al., 2016). We attempted to replicate a two-factor solution as described by Ebesutani et al. (2016) but a single factor was a better solution for our data. We also explored how the removal of OCD items would influence shortened RCADS scale structure with our data indicating that inclusion was optimal.

In our study, that females scored higher than males for anxiety is in keeping with the literature (Altemus, Sarvaiya & Epperson, 2014). Depression is also commonly elevated in females (*Van de Velde, Levecque & Bracke, 2010*), however, in contrast to other RCADS investigations (e.g. Kösters, Chinapaw, Zwaanswijk, van der Wal & Koot, 2015), no significant difference was found in our work. This may relate to the onset of depressive symptoms generally being between 13-15 years of age (Hankin et al., 1998), whereas, the majority of our sample was younger than this category. Anxiety is also often known to develop before depression (Fichter, et al., 2010) increasing the likelihood of detecting a difference for this disorder and not depression in our sample. The gender findings reported here are consistent with how the RCADS25-Arabic would be expected to function in a cohort of 8-15-year-old children.

Cronbach's alphas reached acceptable levels for overall and subscale measures although coefficients were lower than reported for the RCADS-47 (Kösters et al., 2015) and parent versions in English of RCADS-25 (Ebesutani et al., 2016; Park et al., 2016). However, age is known to influence scale consistency which may explain the discrepancy between those findings and this study (Ursachi, Horodnic & Zait, 2015). Coefficients for a latent internalizing factor have typically been found to be high (e.g. Brown et al.,

2013) as was the case for our data. It is likely these values reflect an increased number of scale items (Tavakol & Dennick, 2011).

CFI nor TLI reached good but not excellent cut-off criteria implying the model could be improved. Nonetheless, for the two-factor solution we report higher scores than previous RCADS-25 research such as Park et al. (2016) that describes less robust fit statistics (RMSEA= .088 and CFI= .80 and TLI= .79). Only the depression item 8, which asks children if they have trouble sleeping at night, was below acceptable limits. There is a possibility that this finding reflects actual disturbance caused by the sounds of bombings and rocket fire at night, which are not uncommon to Damascus, rather than psychological distress. The majority of loadings (14/25) fell below .5 for both 1- and 2-factor solutions suggesting many items were low-to-moderate contributors to respective domains and may explain why CFI and TLI scores did not reach higher cut-off thresholds. That the 2-factor structure was not more clearly defined suggests shared variance between anxiety and depression items which is unsurprising given the overlap of symptoms. In the RCADS for example, the statements "*I feel scared if I have to sleep on my own*" for anxiety and "*I have trouble sleeping*" for depression are naturally associated. In our study the correlation between anxiety and depression was robust (.77) mirroring previous RCADS findings (e.g. Kösters et al., 2015) and the broader literature (Garber & Weersing, 2010; Essau et al., 2018). In the WHO World Mental Health Survey given in 24 countries, 45.7% of people with depression also experienced one or more anxiety disorder (Kessler et al., 2015). Anxiety has also been shown to predict depression in survivors of war, a factor that may influence our sample (Ayazi, Lien, Eide, Swartz & Hauff, 2014). Explanations for comorbidity include shared genetic origins, common neuroanatomical features, abnormal emotional processing and poor discriminant validity of screening instruments (Huberty 2012; Franić, Middeldorp, Dolan, Ligthart, & Bossmma, 2010; Etkin & Schatzberg, 2011). However, in the latest DSM-V, both disorders are framed within the context of "negative affectivity" and there is ongoing debate about whether depression and anxiety are unique constructs or part of a continuum (Kasper, 2001). A diagnostic category is also in use "anxious depression" but this remains controversial (Ionescu et al., 2013). Nevertheless, our DIFFTEST results are supportive of the idea of a single anxiety-depression concept and research on the RCADS parent version has also identified a "general negative affect" factor (e.g. Park et al., 2016, Brown et al., 2013).

However, it is important to consider the translation process as a possible contributor to our findings. In written Arabic, the words for anxiety and worry are the same, "قلق" (*qalaq*), whereas in spoken Levantine Arabic, قلق means "insomnia". Interpretation, therefore, is dependent on relevance and context. In addition, when the word is used to specify anxiety, it refers to an 'adult' concept that is unlikely to be understood by children. Hence, in some cases, items referring to 'worry' were translated to the more closely related "قلق" (*khašya*) "*fear of the likelihood of something happening*". Three statements were amended in this way; item 2, "*I worry when I think I have done poorly...*", item 5, "*I worry that something awful will happen to someone in my family*" and item 20, "*I worry that I will suddenly get a scared feeling when there is nothing to be afraid of*". Items 2 and 5 were poorly correlated (.28 and .30) and in the bottom quartile of our results for the two-factor solution. Item 2 remained so in the single factor model (.31) with item 5 marginally improving (.36). It is possible therefore, that the translation/cross cultural adaptation process

generated some ambiguity in understanding these questions and may have contributed to the single factor solution showing stronger statistical fit. A further translation issue was that in MSA there is no verb 'to be' thus the statement "*I am tired a lot*" (item 21) was modified to "*I feel tiredness a lot*", however, this appeared to not be an issue as it contributed well to both models.

We also explored the RCADS25-Arabic with OCD items removed. Classification of OCD items has generated considerable debate among investigators (Abramowitz & Jacoby, 2014). Two OCD items (12 and 23) were among the highest factor loadings for anxiety (both .62). Item 12 also had the lowest corrected-item correlation hinting that OCD may be an independent subscale as described by DSM-V (APA, 2013). Park et al. (2016) also explored RCADS without OCD items and reported contrasting outcomes with discriminant reliability improving but factorial statistics diminished. In agreement with the latter finding, our results show inferior alpha coefficients and CFA statistics without OCD items. Our conclusion, therefore, was that OCD items should be retained.

Study limitations

There were a number of limitations that should be considered when interpreting the results of this study. Only a single data collection was performed and no other mental health assessment tool was used, meaning convergent and discriminant reliability, as well as test-retest reliability, could not be evaluated. Further testing would have strengthened the findings reported here but was beyond the scope and finances of this project. Data was collected from under 16s limiting the generalizability of our findings to older teenagers. A final consideration is that, as Syria is currently undergoing significant turmoil, it is difficult to determine if our sample is representative of a general or clinical population.

Conclusions

This study confirms the psychometric properties of the RCADS25-Arabic and highlights its usefulness in screening for internalizing disorder, anxiety and depression in Arabic speaking children between 8-15 years of age. Our findings highlight the cross-cultural applicability of internalizing, depression and anxiety constructs and the use of self-report for screening these psychopathologies. Lastly, our findings support the inclusion of OCD items in the RCADS25-Arabic.

Declarations

Ethics approval and consent to participate

See text.

Consent for publication

Both authors consent to publication.

Availability of data and material

At request of lead author.

Competing interests

No competing interests.

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Authors' contributions

JS Study design, translation of materials, writing. JP Study design, translation of materials, writing, statistics.

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