

Psychometric Properties of the Arabic Translated Version of the RCMAS: Preliminary Indicators from a Jordanian Sample

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This study examined the acceptability, reliability, and validity of the Arabic translated version of the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978). This instrument is one of the most widely used instruments for assessing childhood anxiety. It has been demonstrated to be reliable across different gender, racial, and age groups. A cross cultural validation was performed in three phases: Forward-backward translation, pilot testing, and estimation of reliability and validity. A sample of 98 children (19 boys and 79 girls) was recruited from two regular primary schools in Jordan. Analysis showed that the RCMAS possesses satisfactory internal consistency; however, the test-retest reliability over an average of two weeks was lower than desirable.

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Child and adolescent anxiety is classified into seven disorders according to the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 1994). The DSM-IV is considered to be the most accurate measure of diagnosing clinical anxiety in children and adults. However, self-report measures remain the most common way of measuring symptoms of anxiety and distress in children.

The Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978; 1985) is one of the most widely used self-report instruments in measuring childhood anxiety symptoms (Pina, Silverman, Saavedra, & Weems, 2001). The RCMAS consists of 37 items that assess anxiety symptoms in children aged from 6 to 19 years. Items in the RCMAS are distributed into three factors (a) Psychological Anxiety (including 10 items), (b) Worry/Oversensitivity (including 11 items), and (c) Social Concerns/Concentration (including 7 items) (Frick, Barry, & Kamphaus, 2010, p. 428). The RCMAS also included nine items arranged to constitute a

Lie scale with two factors measuring the approval of desirable behaviors and denial of undesirable behaviors (Turgeon & Chartrand, 2003).

Items are prepared in a yes/no fashion, in which the scoring process depends on summing the number of "yes" responses for each item in each scale to calculate a Total Anxiety score. Scores can also be calculated for each scale and for the Lie scale (Pina, Silverman, Saavedra, & Weems, 2001). An overall cut-off point of 19 out of 28 can be used to identify children experiencing clinically significant levels of anxiety (Stellard, Velleman, Langsford, & Baldwin, 2001, p. 200).

Psychometric properties (validity and reliability) of the RCMAS have been extensively researched in the literature (Reynolds & Paget, 1981; Reynolds & Richmond, 1979; Reynolds, 1980; Reynolds, 1982; Reynolds, 1979; Reynolds, 1981; Reynolds, 1985; Reynolds & Paget, 1983; Dadds, Perrin, & Yule, 1998; Varlea & Biggs, 2006; Hagborg, 1991; Muris, Merckelbach, Ollendick, King, & Bogie, 2002; Perrin & Last, 1992; Dierker et al., 2001). Utility of the RCMAS in terms of predicting a child's anxiety level was supported by several studies. For example, investigation of concurrent validity of the RCMAS with the Minnesota Multiphasic Personality Inventory (MMPI) for adolescents indicated that the RCMAS is a valid measure of anxiety for adolescents (Lee, Piersel, Friedlander, & Collamer, 1988). The RCMAS has been investigated also with 284 anxious children. Results indicated that scale scores were able to predict children's level of anxiety, and distinguish children with anxiety disorder from children with externalizing disorders (Pina, Silverman, Saavedra, & Weems, 2001).

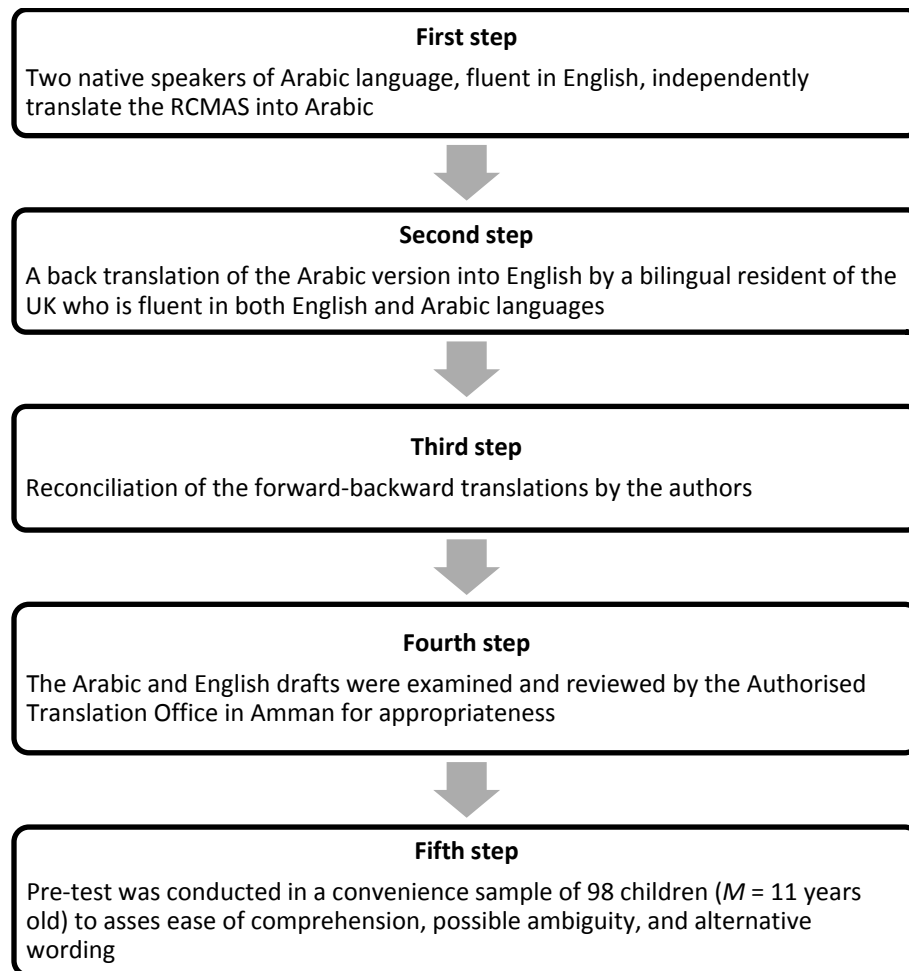
The clinical relevance of the RCMAS as a tool used to discriminate between children with a DSM-III anxiety disorder and other DSM-III psychiatric diagnoses was investigated by Mattison, Bagnato, & Brubaker (1988). They found that the RCMAS Worry/ Oversensitivity sub-factor of the anxiety scale can significantly discriminate between children who do not have a diagnosable anxiety disorder and children who do not have any anxiety disorder. Thus, the RCMAS may be used as a diagnostic tool for screening those children who may be in need of counseling for anxiety (Perrin & Last, 1992).

Although the RCMAS has been developed and tested in English speaking cultures (mainly European American and African American children) (Varela & Biggs, 2006), it is unclear whether or not this tool is applicable to Arabic speaking children. Utility and psychometric properties of the RCMAS in non-English speaking countries supported the utility of using it cross culturally. For example, RCMAS was investigated with samples from Zimbabwe (Wilson, Chibaiwa, Majoni, Masukume, & Nkoma, 1990), Nigeria (Pela & Reynolds, 1982), Spain (Ferrando, 1994), Germany (Boehnke, Silbereisen, Reynolds, & Richmond, 1986) and with Mexican and Mexican American (Varela & Biggs, 2006).

For Arabic speaking communities, the RCMAS attracted researchers as a measure of anxiety (Hamdan, Auerbach, & Apter, 2009; Khamis, 2008; Hadi, Llabre, & Spizer, 2006; Thabet & Vostanis, 1998; Thabet, Abed, & Vostantis, 2002; Thabet, Tawahina, El-Sarraj, & Vostanis, 2007; Nader, Pynoos, Fairbanks, AL Ajeel, & AL Asfour, 1993). However, the aims of these studies were directed toward utilizing the RCMAS in measuring anxiety symptoms for different psychological assessment. No studies have yet investigated the psychometric properties of the instrument for Arabic speaking children and adolescents. The purpose of the current study is to determine the RCMAS acceptability, reliability and validity in Jordan. Figure 1 shows the stages of translating the RCMAS utilizing appropriate translation procedures (Brislin, 1970, 1986) prior to it being administered to a sample of Jordanian students.

Figure 1

The Stages of Translating the English Version into Arabic Language



Method

Participants

A convenience sample of 98 children and adolescents (79 girls and 19 boys) participated in the study. Participants completed the RCMAS to determine its ease of comprehensibility, possible ambiguity, and alternative wording. The average age of the sample was 11 years. Participants were recruited from two regular primary schools in Jordan. Of the students, 43 were in the fifth grade, 49 students in the sixth grade, and 6 students in the seventh grade.

Procedures

Respondents were asked to indicate how long it took them to complete the charts, and whether any question was confusing, difficult to answer, intrusive, or annoying. In addition, the acceptability and utility of the translated version was discussed further by a group of school and hospital social workers, and was evaluated to be highly appropriate. Two weeks later the same 98 children took the test again to obtain data that could be used in computing reliability indicators for the translated version. Children were then interviewed to determine whether any questions were too difficult to be comprehended.

The Statistical Package for Social Science (SPSS 16) was utilized to compute descriptive statistics and reliability coefficients. To obtain reliability indicators, two reliability tests were implemented. The first, test-retest reliability, measured temporal stability through calculating the correlation between the pre and post test scores. The second test measured internal consistency with Cronbach's alpha to ensure that all the items are measuring the same concept.

Results

The main purpose of the current study was to assess psychometric properties (validity and reliability indicators) of the translated Arabic version of the RCAMS in Jordan as a measure of anxiety.

Reliability Indicators of the Arabic RCMAS Version

Internal consistency

Means and standard deviations of scores were calculated for each item. Means of the RCMAS ranged from 0.20 ("My hands feel sweaty") to 0.94 ("I always have good manners"). Most items (21 out of 37) were slightly negatively skewed. On the other hand, appreciable positive skewness for 16 items was also observed.

Internal consistency reliability using coefficient alpha helps researchers compute test items reliability to make generalization to different items samples by using a single administration of a single form (Overton,

2006). It also helps researchers understand the consistency of responses to all items on the test (Anastasi, 1988, p. 122). Alpha coefficients were calculated for each scale in the RCMAS in both pre and post anxiety scores (Table 1). Results of post-test scores demonstrated better internal consistency with an alpha of 0.81, compared to 0.79 for the pre-test scores. The overall alpha for both pre and post test scores was 0.79. The lowest internal consistency of the RCMAS was for the Physiological Anxiety subscale, with 0.58 in the pre-test and 0.70 in the post-test. The other subscale alphas were 0.72 for Worry /Oversensitivity and Concentration in the pre-test, and 0.80 and 0.73 respectively in the pre-test. This result supports the internal consistency of the RCMAS.

Table 1

Reliability Analysis of the Arabic RCMAS

RCMAS	Pre-test			Post-test		
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α
Total Score	18.66	5.97	0.79	18.29	6.65	0.81
Anxiety Scale Factor						
Physiological Anxiety	4.23	2.22	0.58*	4.29	2.55	0.70
Worry/Oversensitivity	5.71	2.77	0.72	5.67	3.19	0.80
Concentration	2.5	2.07	0.72	2.49	2.08	0.73
Total Anxiety Scale	12.45	6.78	0.89	12.86	6.22	0.86
The Lie Scale Factor						
Lie 1	4.66	1.42	0.61*	4.37	2.00	0.51*
Lie 2	1.54	0.89	0.26*	1.47	0.95	0.38*
Total Lie Scale	6.26	1.85	0.58*	5.84	2.58	0.61*

* Values of Cronbach's $\alpha < 0.70$ indicate inappropriate internal consistency

Test-retest reliability

Test-retest method involves administering the same instrument twice to the same group after a period of time elapses between both of them (Fraenkel & Wallen, 2006). Reliability of the Arabic RCMAS was investigated by calculating Spearman's correlation coefficients of subscales. Inspection of the correlation (pre values with post values) yielded a weak positive correlation between pre and post items. The Arabic RCMAS demonstrated significant correlation in eight items in which rho ($n = 98$) ranged from 0.210 to 0.349.

Table 2*Test-retest Reliability of RCMAS Subscales*

RCMAS	Spearman's Correlation (ρ)
Sum of Anxiety Scale Factors Pre and Post	0.096
Physiological Anxiety	0.233*
Worry/Oversensitivity	-0.084
Concentration	0.10
Sum of Lie Scale Factors Pre and Post	0.224*
Lie 1	0.082
Lie 2	0.226*
Pre Anxiety scale to Pre Lie Scale	-0.326**
Post Anxiety scale to Post Lie Scale	-0.405**

* Correlation is significant at the $p < 0.05$ level (2-tailed).** Correlation is significant at the $p < 0.01$ level (2-tailed).***Validity Indicators of the Arabic RCMAS Version******Face and content validity***

Content validity is an appraisal of the adequacy of the content area being measured by an instrument (Polit & Hungler, 1999). A multidisciplinary panel from schools and university professors were asked for feedback on the translation wording and acceptability of using the Arabic version of the RCMAS in Jordan. The utility of the translation was further discussed with a group of school children and hospital social workers.

Feedback from the children focused on the wording of statements. A literal translation was cumbersome or inappropriate in some items of the RCMAS, thus, minor modifications were necessary for some concise English expressions to improve their clarity in the translation. Further adaptation of the instrument was necessary to make it more culturally relevant to Jordan, and more suitable according to the developmental age group of the children. All the suggested recommendations were considered and the scales were adjusted accordingly and tested again.

Among the hospital social workers, there was no disagreement on the content of the instrument. The total of 28 anxiety items out of the 37 items of the RCMAS were found adequately representative for all aspects of the Anxiety construct, thereby indicating content validity.

Construct validity

Examining construct validity allows researchers to determine if the scores obtained from an instrument actually represent the phenomenon being measured (Fraenkle & Wallen, 2006). Among the different methods of obtaining construct validity is the application of confirmatory factor analysis.

The factor structure of the Arabic-RCMAS was tested with confirmatory factor analysis. The purpose was to support the concept that the Anxiety and Lie scales provided a better fit to the data than either one-factor solution. Results demonstrated that while the Arabic RCMAS significantly discriminates between Anxiety and Lie items; there is less differentiation between the scales in comparison with the English RCMAS version as reported by Reynolds and Paget (1981).

Previous studies identified three to eight factors for the RCMAS (Lee et al. 1988). The pattern of factor loading with the five-factor solution revealed two Lie scale factors (accounting for 75%, and 25% of the variance), and three distinct Anxiety scale factors (accounting for 34%, 42%, and 24% of the variance). However, subsequent studies have failed to replicate this factor structure, hence recommending its use as a general measure of anxiety (Wilson, Chibaiwa, Majoni, Masukume, & Nkoma, 1990). Moreover, the factor loadings in this study are generally comparable to those reported by Reynolds and Paget (1981) for the Lie scale factor, but less sensitive to the anxiety factor. Factors extracted by factor analysis were rotated via Varimax procedure to maximize the variance accounted for each factor, and to increase the distinction between factors. The pattern of factor loading in the current study revealed two Lie scale factors accounting for 30% and 70% of the variance, but less sensitivity with the Anxiety scale factor.

Consistent with Wilson, Chibaiwa, Majoni and Masukume's (1990) findings, the RCMAS Lie scale results in this study displayed the highest reliability and validity for the tool. The moderate to low factor loading of the Anxiety scale factor for the Arabic RCMAS indicates that the items are tapping into the constructs under study, but generally unable to distinguish the Anxiety factors of Physiological, Worry/ Oversensitivity, and Concentration. However, the factor loadings of the Lie scale factor are generally comparable to those of Reynolds and Richmond (1979), and Reynolds and Paget (1981).

Discussion

The RCMAS has been used by a variety of practitioners including clinicians, teachers, and researchers. As presented in the current study, several types of reliability indicators have been demonstrated with the Arabic translated version of RCMAS in terms of stability, internal consistency, and possible equivalence. Cronbach's alpha results ranged from 0.79 for the pre-test to 0.81 for the post test. Previous values for the Cronbach's alpha were reported by Gerard & Reynolds (1999) with relatively high alpha coefficients for the total Anxiety Scale score ($\alpha = 0.80$). Similar reliability ($\alpha = 0.82$) was also reported by Reynolds, Bradley and Steele (1980) and in the majority of the Arabic studies targeted the RCMAS as a measure in their research studies as well.

With regard to the Lie scale of the RCMAS, Wilson, Chibaiwa, Majoni, and Masukume (1990) reported that the RCMAS Lie scale displayed the highest reliability of the RCMAS subscales. Joiner, Schmidt, & Schmidt (1996) provided similar support to the tool. However, the lowest internal consistency of the Arabic version of the RCMAS was for the Lie scale. This value, in addition to the pre-post test results, might suggest problems of instrument reliability with Jordanian children and adolescents. Further establishment of test-retest reliability for the RCMAS negates the need to address the nature of variables in terms of expressing mood states and attitudes which naturally change over time irrespective of the stability of the tool itself, and in such cases, a low correlation might still be accepted (Pallant, 2001). However, comparisons can be made between the reliability coefficients of the RCMAS in previous studies in which Pearson correlations ranged from 0.60 to 0.88, significant at $p \leq 0.01$ (Wisniewski, Mulick, Genshaft & Coury, 1987) and an insignificant difference between test and retest mean raw scores. These results would support the stability of the scale over brief periods.

Reynolds (1981) found a 0.68 correlation between RCMAS Anxiety scale scores and a 0.58 correlation with the Lie Scale scores in 534 children in Grades 4 to 6. This would be indicative of relatively high temporal stability. Pilot and Hungler (1999) believed that reliability is a property of the tool when administered to a certain sample, under certain conditions, rather than the property of the specific tool itself. Despite the stability of the tool in previous studies among American, English and Canadian children, the reliability of the Arabic-RCMAS in Jordan needs further assessment.

It is essential to acknowledge the limitations of the convenience sample used in the test-retest procedure. The sample may not have been representative of all school-attending children in Jordan (e.g., capital city-Amman, poverty districts, Palestinian refugees camps, and Bedouin areas) since this tool was only validated among two schools of As-Salt city. Further testing of the instrument on a more representative sample of all geographic regions of Jordan is recommended.

Further inspection of the highest and lowest subscale correlations yielded further evidence regarding reliability of the RCMAS in the Jordanian culture. The Anxiety scale factors show the lowest correlation in the RCMAS, suggesting no reference to a common affective process, as did the items in the Lie scale factors. As a matter of fact, items "I never lie," "I never say things that I shouldn't," and "I never get angry" in the Lie scale factors [$\rho(98) = 0.226, p < 0.05$] appear to be related to a construct that is thought to be taught at school, or to a concern for social desirability, which may elicit defensiveness.

Support for the content validity of the RCMAS items has been thought to be related between both pre-post Anxiety scale factors and Lie scale factors scores (see Table 2). Reynolds and Richmond (1979) found a low but significant positive correlation between child's level of anxiety and social

desirability on the Lie scale of the RCMAS. The Arabic version of the RCMAS is challenging this finding. The Anxiety scale correlated significantly with the Lie scale ($p < 0.001$). Table 2 shows that there was a significant inverse correlation between the Anxiety and Lie scales of the Arabic RCMAS for the entire sample (correlation coefficient = - 0.326 and - 0.405, $p = 0.001$). Therefore, higher self-reported anxiety scores were associated with lower defensiveness scores and vice-versa.

Conclusion

Although the Arabic version of RCMAS appears less reliable than is desirable, our study suggests its acceptability as a measure of child anxiety. Pallant (2001) stated that "a scale designed to measure current mood states is not likely to remain stable over a period of a few weeks; the test-retest reliability of a mood scale, therefore, is likely to be low" (p.6). Thus, such questionnaires especially over an average of two weeks are expected to show correlations lower than desirable. It is suggested that discriminant validity of the RCMAS is considered open to discussion, as it has failed to discriminate between children with different anxiety diagnoses in previous studies (Perrin & Last, 1992).

A possible explanation for the low level of discriminant validity observed among commonly used self-report anxiety questionnaires is that they tap into a general negative affectivity component that is common to all anxiety disorders (Brady & Kendall, 1992). However, the overall results of this study, taking in account the limitation of its sample, constitute a promising support to the translated version. Further investigation with more representative populations might improve these results. Finally, a more thorough investigation of each scale might also provide more insights about its utility in Arabic.

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