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Psychometric properties of the Attachment in Middle Childhood Questionnaire for Iranian children

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Abstract

Introduction: Measuring attachment identifies strengths and weaknesses in parent-child relationships and allows early interventions to improve these relationships and prevent future problems. This study aims to validate the psychometric properties of the Attachment in Middle Childhood Questionnaire (AMCQ) for Iranian children.

Materials and Methods: This descriptive study used psychometric and validation methods. The population was children aged 8 to 10 years in Bandar Abbas-Iran, in 2023. A total of 900 participants were selected using cluster sampling. Data collection involved administering the AMCQ and the Middle Childhood Attachment Questionnaire (MCAQ). Validity and reliability were assessed using content validity, concurrent validity, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and internal reliability measures. Data analysis was performed using SPSS 18 and LISREL 8.8 software.

Results: High Content Validity Ratio (> 0.80) and Content Validity Index (> 0.83) values indicated strong content validity. A positive correlation (r= 0.78, *P*= 0.001) between AMCQ and MCAQ scores confirmed concurrent validity. Factor analysis identified three dimensions—anxiety, avoidance, and security—explaining 60.19% of the variance. High Cronbach's alpha values (0.883-0.919) and split-half reliability (0.952) showed strong internal consistency. Guttman's lambda coefficients (λ= 0.845-0.950) further confirmed reliability.

Conclusion: The Attachment in Middle Childhood Questionnaire is a valid and reliable tool for assessing attachment in Iranian children. The comprehensive assessment methods and large sample size bolster its effectiveness, making it suitable for various cultural contexts.

Keywords: Child attachment, Psychometrics, Questionnaire, Validation

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Introduction

Attachment is the deep emotional bond between a child and their primary caregiver, playing a crucial role in children's social and emotional regulation (1). Various factors, such as the quality of care, parental responsiveness, and the family environment, influence the formation of this bond (2). Secure attachment is a protective factor for children's social and emotional development, while insecure

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attachment can lead to psychological and behavioral problems in adolescence and adulthood (3). Specifically, children with secure attachment tend to perform better in social settings and develop more positive relationships with peers and adults (4). In contrast, insecure attachment can result in issues such as anxiety, depression, and behavioral problems (5,6).

Measuring attachment in children is important as it can help identify strengths and weaknesses in parent-child relationships, leading to early interventions to improve the quality of these relationships (7). During middle childhood, children gain greater abilities to understand and manage their emotions and measuring attachment can provide better insight into their psychological and emotional state (4). These measurements can assist professionals in designing appropriate intervention programs to improve parent-child relationships and prevent future psychological and behavioral issues (8). Furthermore, measuring attachment can help researchers better understand the psychological and social processes related to the development of attachment (7).

There are various tools for measuring attachment in children, including the Security Scale (SS) (9), the Parent-Child Interaction Questionnaire (PACQ) (10), and the Revised Experiences in Close Relationships (ECR-RC) scale (11,12). While these tools have their specific advantages, they also have limitations. For instance, some of these tools may not fully measure insecure attachment dimensions, and others may not be suitable for younger children (13-15). Some of these tools may be inappropriate for younger children because their questions are complex or require advanced cognitive abilities (1). These limitations highlight the need to develop new and improved tools for measuring attachment in children.

The Attachment Measure for Middle Childhood (AMCQ) is a new and comprehensive tool for assessing the quality of parent-child relationships in middle childhood. This questionnaire includes 15 questions that measure two dimensions, anxiety, and avoidance, and it includes a complimentary security scale. Studies have shown that this questionnaire has acceptable psychometric properties and can be used as a valid and reliable tool for measuring attachment in children (10,16). The AMCQ is designed to meet the specific needs of children in middle childhood and can effectively measure various aspects of attachment. This tool can help researchers and professionals better understand attachment in children and design more effective interventions to improve the quality of parent-child relationships (10,17).

Given the limitations of existing tools and the need for more valid and comprehensive instruments, the present study focuses on the development and psychometric evaluation of the AMCQ. This tool can assist researchers and professionals in gaining a better understanding of attachment in children and designing more effective interventions for improving parent-child relationships. The research question is whether the AMCQ can measure attachment in Iranian children validly and reliably. This study could help fill the gaps in attachment measurement tools for children and contribute to developing new and improved instruments for assessing attachment in children. Additionally, the findings of this study could improve the quality of parent-child relationships and reduce psychological and behavioral problems in children.

Materials and Methods

This descriptive study utilizes psychometric and validation methods according to ethical considerations of Helsinki (18). The target population of this study included children aged 8 to 10 years in Bandar Abbas, Iran, in 2023 who had lived in the city for at least one year. The sample size was determined based on criteria found in the literature for validation studies. For concurrent validity assessment, at least 100 participants were required, which was increased to 150 for this study. For Exploratory Factor Analysis (EFA), a minimum of 20 participants per item was necessary, leading to the selection of 350 participants to enhance the accuracy of the findings. For Confirmatory Factor Analysis (CFA), the recommended sample size ranged from 200 to 1000 participants, with 300 participants considered for this study. For reliability, at least 40 participants were recommended, and 100 participants were included in this study. In total, 900 participants were selected for the study, 879 completed the questionnaire (19-23).

Cluster sampling was used to select participants. Initially, one of the two educational districts was randomly selected (District 2). Then, 10 boys' schools and 10 girls'

schools were chosen from the elementary schools in Bandar Abbas. Three classes from each school were selected (one from the second, third, and fourth grades). All students present in the selected classes were chosen as the sample for participation in the study. The sampling was conducted such that two schools were randomly selected for the concurrent validity sample, five schools for the exploratory factor analysis sample, four schools for the confirmatory factor analysis sample, and two schools for the reliability sample.

The inclusion criteria for this study required participants to be enrolled in elementary schools in Bandar Abbas, aged between 8 and 10, residents of Bandar Abbas for at least one year, and to have obtained consent to participate from both the student and their parents. The exclusion criterion was not completing more than 20% of the questionnaire.

Participants and their parents were informed about the objectives and methods, and written consent was obtained from the participating students and their parents before completing the questionnaire. Participants and their parents were also assured that their information would be protected and that they could withdraw from the study anytime. The AMCQ was administered to children during school hours, with researchers present to assist if clarification was needed. However, the Middle Childhood Attachment Questionnaire (MCAQ) was completed by parents at home or during parent-teacher meetings to ensure that they had adequate time and context for responding accurately.

Research instruments

A) Attachment in Middle Childhood Questionnaire (AMCQ): It was developed by Marci et al. in 2019 to assess attachment in children and includes 15 questions divided into three dimensions: anxiety, avoidance, and security. Each question is rated on a 5-point Likert scale (from 1 to 5). Anxiety questions address the child's concerns about their relationship with their parents, avoidance questions address the child's tendency to distance themselves from their parents, and security questions address the child's sense of confidence in their relationship with their parents. The total score ranges from a minimum of 15 to a maximum of 75, with higher scores indicating stronger attachment patterns. This questionnaire has high validity and reliability and is suitable for children between 6 and 12 years old (10). In this study, the AMCQ was completed directly by children aged 8 to 10 years, with the researcher ensuring that they understood the questions and response scale.

B) Middle Childhood Attachment Questionnaire (MCAQ): It includes 20 questions answered using a five-point Likert scale (never to always). This questionnaire measures four dimensions: positive adaptive development (questions 1 to 6), emotional response (questions 4 to 10), negative behaviors (questions 11 to 16), and avoidance of attachment figure/support (questions 17 to 20). The minimum possible score is 20, and the maximum score is 100. Halpern and Kappenberg (2006) designed the original version of this questionnaire, which has high validity and reliability. In Iran, Soleimani et al. (2014) examined the validity and reliability of this questionnaire, and the results showed that the tool has desirable convergent, divergent, and concurrent validity and a test-retest reliability of 0.79 (24,25). In this study, the MCAQ was completed by the parents of participating children, ensuring alignment with the questionnaire's design and purpose.

Adaptations for child comprehension

1. Understanding concepts by children aged 8 to 10 years: The questionnaire was designed for children aged 8 to 10, considering their cognitive and language development. It uses the format by Harter (1982) to reduce cognitive load, helping children choose between two contrasting statements and then indicate which one is more similar to their situation (26).
2. Comprehensibility of items for children: Simple, age-appropriate language was used, avoiding complex or double-negative sentences. Pilot testing with small groups of children confirmed that the items are understandable and that children can appropriately respond (27).
3. Alignment of items with children's cognitive abilities: The questionnaire aligns with the cognitive abilities of middle childhood (7-12 years), considering their enhanced ability to understand and manage emotions and behaviors (28).

Translation and cultural validation

After obtaining permission from the original questionnaire creator, the research team began the bidirectional translation and cultural adaptation process. This process included

translating the questionnaire into Persian and back-translating it into English (30,31). A standard tool was used to assess the accuracy of the translation and cultural adaptation. The translation team consisted of two individuals fluent in English and a native English linguist fluent in Persian. After reaching a consensus among the translators, the final version of the questionnaire was prepared. To ensure cultural appropriateness and content clarity, two bilingual and bicultural individuals reviewed the questionnaire and provided feedback. Their opinions were crucial in confirming the accuracy and comprehensibility of the translation for the target population. Based on the feedback received, necessary revisions were made to improve the validity and applicability of the tool in the study (32,33).

The researcher personally visited the selected individuals and provided them with the questionnaire, a pen, and a folder as a token of appreciation. Participants had 20 minutes to complete the questionnaire. After completion, the responses were securely stored in an Excel file. Informed consent was obtained from participants and their parents before participating in the study to ensure adherence to ethical principles. The data collection period lasted two months, from October to December 2023. To maintain data integrity, the research team conducted weekly reviews to ensure the completeness and accuracy of the collected information and proactively addressed any incomplete submissions or data inconsistencies. Detailed data cleaning protocols were implemented to remove any abnormal, duplicate, or inconsistent entries. Ultimately, this process resulted in 879 valid responses.

Evaluation of validity and reliability of the tool

The following methods were used to evaluate the validity and reliability of the scale in this study:

Construct validity: Examined through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) within the framework of Structural Equation Modeling (SEM). EFA used Principal Axis Factoring (PAF) because it effectively identifies underlying structures when data are not normally distributed or when the primary goal is to understand shared variance among items rather than modeling the population covariance matrix, better suited for Maximum Likelihood (ML). While ML is advantageous when data normality is assumed, and inferential statistics are a priority, PAF was deemed more appropriate given the study's focus on explaining shared variance and addressing potential non-normality in the dataset. The number of factors was determined through parallel analysis, the scree plot, and the Kaiser criterion. The analysis revealed three factors, although the scree plot suggested considering up to four factors. Parallel analysis confirmed that three factors should be retained (26,34). The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's sphericity test assessed the dataset's suitability, with KMO values above 0.60 indicating adequacy (35).

CFA: Involved fitting a theoretical factor model to the data, using fit indices such as Root Mean Square Error of Approximation (RMSEA, threshold< 0.08), Comparative Fit Index (CFI, threshold> 0.90), Normed Fit Index (NFI, threshold> 0.90), Non-Normed Fit Index (NNFI, threshold> 0.90), Incremental Fit Index (IFI, threshold> 0.90), Standardized Root Mean Square Residual (SRMR, threshold< 0.08), Goodness of Fit Index (GFI, threshold> 0.90), and Adjusted Goodness of Fit Index (AGFI, threshold> 0.90) (27,32).

Concurrent Validity: Evaluated using Pearson and Spearman correlation coefficients between AMCQ and MCAQ scores.

Internal reliability: Determined through the split-half method (splitting based on odd and even questions), Cronbach's alpha coefficient, and Guttman's lambda coefficient.

Content validity: Assessed by calculating the Content Validity Index (CVI) and Content Validity Ratio (CVR) with input from 10 experts. The experts included psychologists, psychometricians, and counselors, all holding doctoral degrees. The panel comprised three educational psychologists, two counselors, two family psychologists, one psychometrician, and two psychiatrists. CVR values above 0.62 and CVI values above 0.70 indicated strong content validity (35-37). The CVI was evaluated across three dimensions: relevance, clarity, and simplicity. CVI was deemed essential due to the translation and adaptation of the AMCQ for Iranian children, considering the unique cultural and economic context, which can impact attachment constructs (30,38). Data analysis was performed using SPSS 18 and LISREL 8.8 software.

Descriptive statistics (mean, standard deviation, frequency, percentage) described the demographic profile of participants. Inferential statistics (Pearson correlation coefficients, EFA, CFA, Cronbach's alpha, test-retest reliability, independent samples t-test) accurately assessed the validity and reliability of the questionnaire. A significance level of 0.05 was maintained throughout the study.

Results

Based on the demographic data of 879 participants, the mean age is 9.01 years, with a standard deviation of 0.82. The gender distribution includes 48.2% females and 51.8% males. Regarding education, 58.2% of fathers and mothers have non-university education, while 41.8% have university education. The employment status of fathers shows 16.7% retired, 6.7% unemployed, 4.2% deceased, and 72.4% employed. For mothers, 8.4% are retired, 2.0% are unemployed, 53.0% are homemakers, 1.9% are deceased, and 34.6% are employed. This summary provides a comprehensive overview of the demographic characteristics of the samples (Table 1).

Table 1. Demographic characteristics of participants across different stages

Variable		Total (n=879)	Concurrent (n=146)	Exploratory (n=343)	Confirmatory (n=292)	Reliability (n=98)
Gender	Female	424 (48.2%)	69 (47.3%)	164 (47.8%)	138 (47.3%)	53 (54.1%)
	Male	455 (51.8%)	77 (52.7%)	179 (52.2%)	154 (52.7%)	45 (45.9%)
Father's education	Non-university	512 (58.2%)	77 (52.7%)	179 (52.2%)	154 (52.7%)	45 (45.9%)
	University	367 (41.8%)	69 (47.3%)	164 (47.8%)	138 (47.3%)	53 (54.1%)
Mother's education	Non-university	512 (58.2%)	77 (52.7%)	179 (52.2%)	154 (52.7%)	45 (45.9%)
	University	367 (41.8%)	69 (47.3%)	164 (47.8%)	138 (47.3%)	53 (54.1%)
Father's employment status	Retired	147 (16.7%)	24 (16.4%)	57 (16.6%)	46 (15.8%)	20 (20.4%)
	Unemployed	59 (6.7%)	14 (9.6%)	26 (7.6%)	11 (3.8%)	8 (8.2%)
	Deceased	37 (4.2%)	9 (6.2%)	15 (4.4%)	10 (3.4%)	3 (3.1%)
	Employed	636 (72.4%)	99 (67.8%)	245 (71.4%)	225 (77.1%)	67 (68.4%)
Mother's employment status	Retired	74 (8.4%)	12 (8.2%)	28 (8.2%)	21 (7.2%)	13 (13.3%)
	Unemployed	18 (2.0%)	4 (2.7%)	8 (2.3%)	6 (2.1%)	0 (0.0%)
	Homemaker	466 (53.0%)	80 (54.8%)	189 (55.1%)	144 (49.3%)	53 (54.1%)
	Deceased	17 (1.9%)	1 (0.7%)	8 (2.3%)	8 (2.7%)	0 (0.0%)
	Employed	304 (34.6%)	49 (33.6%)	110 (32.1%)	113 (38.7%)	32 (32.7%)

Before conducting inferential analyses, several assumptions were evaluated to ensure the validity of the statistical methods used, specifically for correlation coefficients, Confirmatory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA):

Assumptions for EFA

With 343 participants, the sample size met the recommended minimum of 300. Mardia's coefficient was within acceptable limits (≤ 5), and despite slight multivariate normality violations, the robust maximum likelihood (MLR) estimator addressed this issue. The KMO measure of 0.92 indicated sampling adequacy, and Bartlett's test of sphericity was significant ($P< 0.001$), confirming the suitability of data for factor analysis (35,39).

Assumptions for CFA

The study, with 293 participants, exceeded the recommended minimum for CFA, ensuring sufficient model estimation power. Mardia's coefficient was within acceptable limits, and despite slight multivariate normality violations, the robust MLR estimator addressed this. Fit indices (RMSEA= 0.060, CFI= 0.98, NFI= 0.96) indicated a good model fit.

Standardized factor loadings (0.76 to 0.82) showed strong associations between indicators and latent factors. Error terms were uncorrelated, and constructs were unique with no significant cross-loadings. The model was overidentified, ensuring parameter estimation feasibility (32,40).

Assumptions for Correlation Analysis: Shapiro-Wilk test results showed that most variables had normal distributions ($P > 0.05$), with skewness and kurtosis values within −1 to 1. Levene's test confirmed the homogeneity of variance ($P > 0.05$), supporting the use of Pearson correlation coefficients (29,41).

EVA

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.900, indicating that the data were suitable for factor analysis. Bartlett's test of sphericity was significant ($\chi^2(105) = 2726.277$, $P < 0.001$), confirming the appropriateness of the factor analysis. Initial communalities ranged from 0.491 to 0.605, and extraction communalities ranged from 0.540 to 0.682, demonstrating that the extracted factors accounted for a substantial portion of the variance for each item (32). The analysis revealed three factors with eigenvalues greater than 1, explaining a cumulative variance of 60.190%, with the first factor accounting for 39.434%, the second for 14.591%, and the third for 14.087% of the variance. Parallel analysis was also performed to confirm that three factors should be retained.

The scree plot suggested the possibility of up to four factors, but parallel analysis confirmed three. The rotated factor matrix indicated clear loadings for the three dimensions of attachment: security (items 11-15, loadings 0.709-0.795), avoidance (items 6-10, loadings 0.716-0.798), and anxiety (items 1-5, loadings 0.722-0.783).

The factor transformation matrix showed the relationships between the factors, indicating their degree of correlation (Table 2 and Figure 1). Varimax rotation provided a clearer separation of factors, aiding in the interpretability of the factor structure (42).

Table 2. Rotated component matrix for the items

Item	Factor			CVR	CVI	CVI (Overall)
	Security	Avoidance	Anxiety			
i1	0.19	0.15	0.73	1	0.83	
i2	0.18	0.17	0.72	1	0.93	
i3	0.12	0.13	0.74	0.8	0.83	
i4	0.17	0.13	0.72	0.8	0.97	
i5	0.12	0.16	0.78	1	0.90	
i6	0.17	0.72	0.16	0.8	0.87	
i7	0.15	0.74	0.13	0.8	0.80	
i8	0.15	0.80	0.13	1	0.93	0.87
i9	0.19	0.73	0.16	0.8	0.90	
i10	0.10	0.74	0.16	1	0.83	
i11	0.71	0.16	0.12	1	0.97	
i12	0.75	0.11	0.17	1	0.97	
i13	0.73	0.26	0.17	0.8	0.97	
i14	0.80	0.16	0.16	1	0.90	
i15	0.75	0.11	0.17	1	0.90	

Figure 1. Scree plot of the eigenvalues of the factors

The Confirmatory Factor Analysis (CFA)

It demonstrated a good model fit with the following indices: RMSEA= 0.060 (90% CI: 0.048 - 0.073), CFI= 0.98, NFI= 0.96, NNFI = 0.97, IFI= 0.98, SRMR= 0.063, GFI= 0.92, and AGFI= 0.90. The Chi-square statistics were significant ($\chi^2(87)= 189.96$, $P= 0.00$), with a minimum fit function of 189.96 and a normal theory weighted least squares chi-square of 178.66. The estimated Non-Centrality Parameter (NCP) was 91.66 (90% CI: 57.24 - 133.85). Factor loadings for the three dimensions of attachment ranged from 0.99 to 1.14, with squared multiple correlations for items between 0.51 and 0.68. These results confirm the multidimensional structure of the AMCQ in the Iranian sample, consistent with the original validation study, and demonstrate the scale's strong psychometric properties (Figure 2) (32).

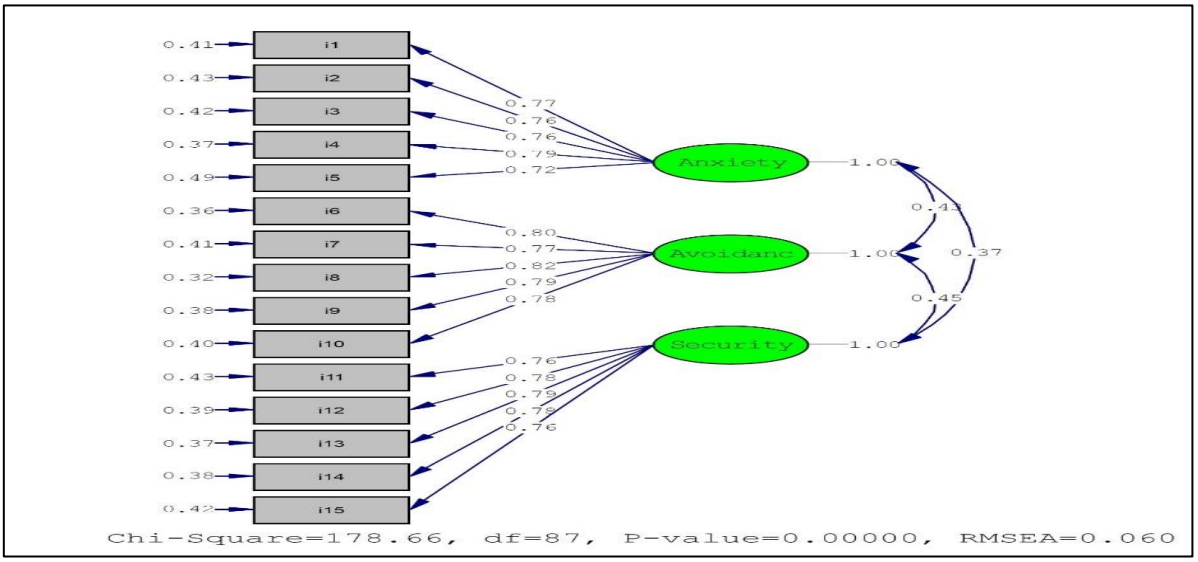

Figure 2. Factor loadings and model fit indices of the CFA

Concurrent validity

The concurrent validity analysis revealed a strong positive correlation between the AMCQ and MCAQ scores (r= 0.75, *P*= 0.001). This finding indicates that higher AMCQ scores align closely with higher MCAQ scores, confirming that the AMCQ measures attachment characteristics consistently and comparably to the MCAQ. Table 3 presents detailed correlation coefficients across the sub-dimensions of both questionnaires, further supporting their concurrent validity.

These results substantiate the AMCQ as a robust tool for assessing attachment patterns in middle childhood (Table 3) (43).

Table 3. Concurrent validity analysis of AMCQ and MCAQ questionnaires

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Anxiety	1.00	0.83	0.82	0.94	0.67	0.65	0.67	0.66	0.71
Avoidance	0.83	1.00	0.80	0.94	0.63	0.64	0.68	0.67	0.69
Security	0.82	0.80	1.00	0.93	0.67	0.65	0.68	0.64	0.70
AMCQ	0.94	0.94	0.93	1.00	0.70	0.69	0.72	0.70	0.75
Positive adaptive development	0.67	0.63	0.67	0.70	1.00	0.86	0.86	0.84	0.95
Emotional response	0.65	0.64	0.65	0.69	0.86	1.00	0.84	0.80	0.92
Negative behaviors	0.67	0.68	0.68	0.72	0.86	0.84	1.00	0.88	0.95
Avoidance of attachment figure/support	0.66	0.67	0.64	0.70	0.84	0.80	0.88	1.00	0.93
MCAQ	0.71	0.69	0.70	0.75	0.95	0.92	0.95	0.93	1.00

Reliability

The internal reliability of the AMCQ was assessed using Cronbach's alpha for each dimension. The five-item anxiety dimension had a Cronbach's alpha of 0.909, the five-item avoidance dimension had a Cronbach's alpha of 0.883, and the five-item security dimension had a Cronbach's alpha of 0.919. The overall scale

demonstrated a Cronbach's alpha of 0.905 for all 15 items. Additionally, the split-half reliability, based on even and odd items, showed a Spearman-Brown coefficient of 0.952 and a Guttman split-half coefficient of 0.945, with Cronbach's alpha values of 0.839 for the first half and 0.778 for the second half, indicating high internal consistency. Guttman's lambda coefficients were also calculated, with the following results: λ1= 0.845, λ2= 0.912, λ3= 0.905, λ4= 0.709, λ5= 0.883, and λ6= 0.950. These results confirm the strong reliability of the AMCQ in measuring attachment dimensions in Iranian children (28).

Content validity

Based on the content validity assessment by ten experts, the CVR values ranged from 0.80 to 1.00, and the CVI values also ranged from 0.83 to 0.97. These results exceed the threshold values established by Lawshe's criteria, which are 0.62 for CVR and 0.78 for CVI with a ten-member panel. This confirms the strong content validity for the intended construct it aims to evaluate (Table 3) (44).

Discussion

The factor analysis results confirm that the AMCQ possesses a multidimensional structure encompassing three dimensions: anxiety, avoidance, and security. This finding aligns with the initial validation study conducted by Marci et al. which identified these three dimensions in the AMCQ (10). Furthermore, other multidimensional attachment scales, such as the Attachment Style Questionnaire (ASQ) and the Adult Attachment Questionnaire (AAQ), have identified similar underlying factors, reinforcing the robustness of the AMCQ structure (45-47). The AMCQ design is grounded in attachment theory, which posits that children's early interactions with caregivers form internal working models influencing their emotional and social development.

The dimensions of anxiety, avoidance, and security correspond to distinct attachment styles theorized by Bowlby and Ainsworth, providing a theoretical foundation that enhances the interpretability of our findings. The alignment of the AMCQ with established attachment dimensions effectively captures the multifaceted nature of attachment as conceptualized in attachment theory (48). The concurrent validity analysis revealed a strong positive correlation (r= 0.78, *P*= 0.001) between AMCQ and MCAQ scores, indicating that the AMCQ measures attachment similarly to the MCAQ. This high correlation suggests that the AMCQ retains the essential characteristics of the MCAQ, effectively measuring critical aspects of attachment. Such concurrent validity is crucial as it demonstrates that the AMCQ is consistent with other validated measures, thereby supporting its utility in assessing attachment in middle childhood (10). Reliability analyses demonstrated that the AMCQ has high internal consistency, with Cronbach's alpha values ranging from 0.909 to 0.919 and a split-half reliability coefficient of 0.952.

These findings indicate that the items within the AMCQ consistently measure the same underlying constructs (10). Additionally, Guttman lambda coefficients confirm the reliability in measuring multidimensional attachment. High reliability ensures that the instrument yields consistent and dependable results across different administrations and populations (49).

The Content Validity Ratios (CVR) and Content Validity Indices (CVI) range from 0.80 to 1.00, exceeding standard thresholds and indicating strong content validity of the questionnaire (44). This suggests that the AMCQ effectively measures the intended constructs, with expert reviews confirming that the items represent the theoretical dimensions of attachment. Similar studies, such as the validation of AMCQ, have also reported high content validity values, reinforcing the robustness of this scale across different cultural contexts (10). High content validity ensures that the instrument comprehensively covers the domain of interest, which is critical for accurately assessing attachment in middle childhood. In our study, children and their parents provided reports on attachment, offering a comprehensive perspective on attachment relationships. Self-reports from children in this age group can provide direct insights into their perceptions and experiences, while parental reports offer valuable observations of the child's attachment behaviors. The AMCQ is designed to integrate these perspectives, enhancing its applicability in diverse assessment contexts.

However, it is important to acknowledge that self-reports may be influenced by the child's cognitive and emotional development, and parental reports may be subject to biases. Therefore, utilizing multiple informants can

provide a more nuanced understanding of attachment patterns.

Our findings indicate that Iranian children exhibited attachment patterns similar to those observed in other cultural contexts. This cross-cultural consistency suggests that the dimensions measured by the AMCQ-anxiety, avoidance, and security-are universally relevant constructs in understanding attachment during middle childhood. However, cultural factors can influence attachment behaviors and perceptions, and it is essential to consider cultural nuances when interpreting these results. Future research should explore the cultural adaptability of the AMCQ to ensure its validity across diverse populations.

In conclusion, the AMCQ demonstrates robust psychometric properties, including multidimensional structure, strong reliability, and validity in measuring attachment in middle childhood. Its alignment with established attachment theory and consistency across different cultural contexts underscore its utility as a comprehensive tool for assessing attachment. Future research should explore its applicability in various populations and settings to establish its generalizability and cultural sensitivity further.

The psychometric validation of the AMCQ for Iranian children demonstrated notable strengths, particularly in its comprehensive validity and reliability assessments. However, key limitations exist.

The reliance on self-report measures introduces potential response biases, suggesting the need for future studies to incorporate objective tools like observational methods or physiological indicators. An item analysis is recommended to identify problematic items within the questionnaire, ensuring each item contributes meaningfully to the overall scale. The sample's geographic restriction to Bandar Abbas limits the generalizability of findings, which could be improved by including diverse locations. The cross-sectional design constrains causal inference, highlighting the value of longitudinal approaches in future research.

Additionally, the rigorous translation and back-translation process lacked review by the original authors or a native English-speaking expert, potentially leading to semantic inconsistencies or cultural mismatches. Future research should involve original authors or native experts and document translation challenges to enhance accuracy and cultural relevance. Addressing these limitations will strengthen the robustness and applicability of subsequent studies.

Conclusion

In conclusion, the psychometric validation of the AMCQ for Iranian children demonstrates that the questionnaire is a robust and reliable tool for assessing attachment in middle childhood. High content validity, strong concurrent validity with MCAQ, and confirmed multidimensional anxiety, avoidance, and security structure highlight its effectiveness. The comprehensive approach and large, diverse sample enhance the generalizability of the findings. However, future research should address the limitations of self-report measures, regional sample restrictions, and the cross-sectional design by incorporating objective measures, expanding geographic diversity, and employing longitudinal designs. Overall, the AMCQ is valuable for evaluating attachment in various cultural contexts.

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Conflict of Interest

The authors declare no conflict of interest.

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Ethical Considerations

The present study was conducted with the approval of the Ethics Committee of Islamic Azad University and according to the principles of the Helsinki Declaration. These principles include respecting participants' rights, ensuring informed consent, maintaining data privacy and confidentiality, presenting honest results, and avoiding ethical conflicts. The Ethics Committee of Azad University of Qeshm approved this research.

Code of Ethics

IR.IAU.BA.REC.1402.048

Authors' Contributions

TA and EY wrote the manuscript, TA and LKH performed the statistical analysis and validation, and TA and EY approved the final article.

References

1. Walker SA, Double KS, Kunst H, Zhang M, MacCann C. Emotional intelligence and attachment in adulthood: A meta-analysis. Pers Individ Dif 2022; 184: 111174.
2. Waters KA, Salinas-Miranda A, Kirby RS. The association between parent-child quality time and children's flourishing level. J Pediatr Nurs 2023;73: e187-96.
3. Spruit A, Goos L, Weenink N, Rodenburg R, Niemeyer H, Stams GJ, et al. The relation between attachment and depression in children and adolescents: A multilevel meta-analysis. Clin Child Fam Psychol Rev 2020; 23(1):54-69.
4. Elhusseini S, Rawn K, El-Sheikh M, Keller PS. Attachment and prosocial behavior in middle childhood: The role of emotion regulation. J Exp Child Psychol 2023; 225: 105534.
5. Ye Z, Wei X, Zhang J, Li H, Cao J. The impact of adverse childhood experiences on depression: The role of insecure attachment styles and emotion dysregulation strategies. Curr Psychol 2024; 43(5): 4016-26.
6. Maheri Nooryani Z, Ghanbari Z, Sanjari S. The relationship between self-esteem, resilience and differentiation with Covid-19 anxiety in hospital nurses: A cross-sectional study. J Crit Care Nurs 2022; 15(1): 63-72.
7. Thompson RA, Simpson JA, Berlin LJ. Taking perspective on attachment theory and research: nine fundamental questions. Attach Hum Dev 2022; 24(5): 543-60.
8. Pinto R, Canário C, Leijten P, Rodrigo MJ, Cruz O. Implementation of parenting programs in real-world community settings: A scoping review. Clin Child Fam Psychol Rev 2024; 27(1): 74-90.
9. Brumariu LE, Madigan S, Giuseppone KR, Movahed Abtahi M, Kerns KA. The Security Scale as a measure of attachment: Meta-analytic evidence of validity. Attach Hum Dev 2018; 20(6): 600-25.
10. Marci T, Moscardino U, De Carli P, Altoé G. Measuring insecure attachment in middle childhood: Psychometric evaluation of the short form of the Preoccupied and Avoidant Coping Questionnaire. Pers Individ Dif 2019; 147: 91-101.
11. Pooravari M, Fathi Ashtiani A. Reliability, validity, and factor structure of Experiences in Close Relationships Scale –Revised for Using in Children and Adolescents (ECR-RC). International journal of behavioral sciences 2017; 11(1): 5-10.
12. Nasab AH, Sanjari S, Soleimani MRM, Kashani M, Alidousti K. Maternal and neonatal outcomes following COVID-19 vaccination in pregnancy. Arch Clin Med Microbiol 2023; 2(2): 23-7.
13. Alexander SL, Frederico M, Long M, Vicendese D. Attachment security in children with disability or developmental delay: Systematic review of quality and interventions. J Occup Ther Sch Early Interv 2024; 17(2): 228-58.
14. Godor BP, van der Horst FCP, Van der Hallen R. Unravelling the roots of emotional development: Examining the relationships between attachment, resilience and coping in young adolescents.J Early Adolesc 2024;44(4):429-57.
15. Yas Salari Pashghi F, Sanjari S, AmirFakhraei A. [Presenting a conceptual model of Islamic strategies for coping with Coronavirus stress: Fundamental theory]. Iranian journal of culture and health promotion 2023; 6(4): 688-93. (Persian)
16. Heidari A, Babaei Nezhad A. [Evaluation of the relationship between emotional intelligence and social intelligence with employees' job performance (Case study: General Department of Social Security of Kerman province)]. Political sociology of Iran 2022; 4(4): 4974-90. (Persian)
17. Salari Chineh P, Tavan A, Soltani Nezhad N, Manzari Tavakoli V. [A model of professional ethics education for the student-teachers at Teacher Training University: A qualitative study]. Journal of higher education curriculum studies 2023; 14: 143-69. (Persian)
18. Jia Y, Shao X, Shen C, Wang W. Development of a structure-validated hypersexuality scale in Chinese university students. BMC Psychiatry 2021; 21(1): 352.
19. Martin CR. Minimum sample size requirements for a validation study of the Birth Satisfaction Scale-Revised (BSS-R). J Nurs Pract 2017; 1(1): 25-30.
20. Bujang MA, Omar ED, Baharum NA. A review on sample size determination for Cronbach's alpha test: A simple guide for researchers. Malays J Med Sci 2018; 25(6): 85-99.
21. White M. Sample size in quantitative instrument validation studies: A systematic review of articles published in Scopus, 2021. Heliyon 2022; 8(12): e12223.
22. Mokkink LB, de Vet H, Diemeer S, Eekhout I. Sample size recommendations for studies on reliability and measurement error: an online application based on simulation studies. Health Serv Outcomes Res Methodol 2023; 23(3): 241-65.
23. Anthoine E, Moret L, Regnault A, Sébille V, Hardouin J-B. Sample size used to validate a scale: a review of publications on newly-developed patient reported outcomes measures. Health Qual Life Outcomes 2014; 12(1): 2.
24. Eftekhari A, Bakhtiari M, Kianimoghadam AS. The relationship between the attachment styles of children, parenting styles, and the socio-economic status of parents. Journal of community health research 2022;11(4): 249-55.
25. Soleimani H, Bashash L, Latifian M. [Psychometric properties of the Kinship Center Attachment Questionnaire (KCAQ) of latency-aged for children]. Journal of psychological models and methods 2014; 4(16): 41-63. (Persian)

26. Sanjari S, Kamali A, Amirfakhraei A, Mohammadi Soleimani MR, Afshar EK. Construction and validation of a self-report violence scale in Iranian women. Journal of fundamentals of mental health 2021; 23(3): 181-9.
27. Bayat Mokhtari L, Tavan A, Sanjari S, Mohammadi Soliemani MR, Salajegheh A. The impact of peer relationships, moral development, and family relationships on collective violence with the mediating role of psychological security. Middle East journal of rehabilitation health studies 2025; 12(1): e151732.
28. Torabi B, Amirfakhrae A, Rezaei Gazaki P, Mohammadi Soleimani MR. [Investigation of factor structure and validation of Ryff's Psychological Well-Being Scale in working children in the corona crisis: A descriptive study]. Journal of Rafsanjan University of Medical Sciences 2022; 21(2): 149-64. (Persian)
29. Torabi B, Amirfakhraei A, Gazaki PR, Soleimani MRM. [Predicting the psychological well-being of working children based on work anxiety, school anxiety and hope for education in Bandar Abbas]. Iranian journal of pediatric nursing 2023; 9(4): 44-51. (Persian)
30. Sanjari S, Rafati F, Amirfakhraei A, Mohamadi Soleimani MR, Karimi Afshar E. [Evaluation of factor structure and validation of electronic form of CAQ fear of delivery questionnaire in pregnant women]. Health psychology 2021; 10: 57-70. (Persian)
31. Yeganeh H, Parvaresh H, Dehghani M, Soltani M. Construction and standardization of performance evaluation test of health, safety and environment management systems of industrial sector contractors. Journal of healthcare management 2021; 12(3): 73-86.
32. Barani H, Amirfakhraei A, Mohammadi Soleimani MR, Wahab Samavi SA. [Transcultural adaptation and psychometric evaluation of the online learning self-efficacy scale among high school seniors in Bandar Abbas City]. Interdisciplinary journal of virtual learning in medical sciences 2024; 15(1): 62-75. (Persian)
33. Sanjari S, Soleimani MRM, Keramat A. Development and validation of an electronic scale for sexual violence experiences in Iranian women. Crescent journal of medical and biological sciences 2023; 10(1): 27-35.
34. Sanjari S, Rafaati F, Kamali A, Mohamadisoleymani M. [Construction stardization ability to prevent HIV test]. Psychometry 2018; 6: 107-18. (Persian)
35. Sajadi Monazah H, Mohammadi Soliemani MR, Jahan F. Investigating the factor structure and validation of the Multidimensional Scale of Acceptance of Collective Violence among teenagers: An exploratory and confirmatory factor analysis. Iran J Psychiatry Behav Sci 2024; 18(2): e137999.
36. Waltz CF, Bausell BR. Nursing research: Design statistics and computer analysis. Pennsylvania: Davis FA; 1981.
37. Romero Jeldres M, Díaz Costa E, Faouzi Nadim T. A review of Lawshe's method for calculating content validity in the social sciences. Frontiers in education 2023; 8: 1-8.
38. Hashemian Moghadam A, Nemati-Vakilabad R, Imashi R, Yaghoobi Saghezchi R, Mirzaei A. Psychometric properties of the Persian version of the Innovative Behavior Inventory-20 items (IBI-20) in clinical nurses: A cross-sectional study. BMC Nurs 2024; 23(1): 944.
39. Li CH. Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. Behav Res Methods 2016; 48(3): 936-49.
40. Abdolpour G, Nasiri M, Mafakheri M, Mansouri K, Abdi R. [Structural equation modeling of intolerance of uncertainty and symptoms of depression and general anxiety disorder: Investigation of the mediating role of rumination]. Iranian journal of psychiatry and clinical psychology 2019; 24(4): 400-15. (Persian)
41. Sanjari S, Fakhraei AA, Soleimani MRM, Alidousti K. Validation of the Slade Fear of Childbirth Scale for Pregnancy in a sample of Iranian women: A cross-sectional study. Crescent journal of medical and biological sciences 2022; 9(3): 138-46.
42. Iacobucci D, Ruvio A, Román S, Moon S, Herr PM. How many factors in factor analysis? New insights about parallel analysis with confidence intervals. J Bus Res 2022; 139: 1026-43.
43. Sanjari S, Mohammadi Soleimani MR. Validation of the Persian version of the Engagement in E-Learning Scale in students of the school of nursing and midwifery in Iran. Middle East journal of rehabilitation health studies 2023; 10(3): e134881.
44. Sanjari S, Mohammadi Soleimani MR. Validation of the Knowledge Sharing Behavior Scale among nursing and midwifery faculty members in Iran: Psychometric properties and cross-cultural adaptation. Middle East journal of rehabilitation health studies 2024; 11(1): e134886.
45. Richaud MC, Mesurado B, Minzi MP. Attachment Style Classification Questionnaire for latency age: Psychometrics properties of Argentine sample. Int J Psychol Res (Medellin) 2019; 12(2): 59-70.
46. Osa-Subtil Idl, Arias Astray A, Mateo Fernandez PV, de Dios-Duarte MJ. Adult Attachment Questionnaire: evidence of validity in a sample of IPVAW offenders. Front Psychol 2024; 15: 1265303.
47. Tanaka Y. The development of a parental attachment recognition scale for mothers nurturing preschool children. Public Health Nurs 2020; 37(2): 310-20.
48. Amani R. Mother-infant attachment styles as a predictor of aggression. Journal of midwifery and reproductive health 2016; 4(1): 506-12.
49. Trizano-Hermosilla I, Gálvez-Nieto JL, Alvarado JM, Saiz JL, Salvo-Garrido S. Reliability estimation in multidimensional scales: Comparing the bias of six estimators in measures with a bifactor structure. Front Psychol 2021; 12: 508287.