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Cross-cultural adaptation and psychometric properties of the Brazilian version of the Autism Family Experience Questionnaire (AFEQ) quality of life instrument

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ABSTRACT

Introduction: The Autism Family Experience Questionnaire (AFEQ) aims to measure quality of life through the family experience of parents/caregivers of preschool-aged children with autism spectrum disorder. **Objective:** To carry out the cross-cultural adaptation of the AFEQ into Brazilian Portuguese (B-AFEQ) and to evaluate the psychometric properties of the Brazilian version produced by analyzing preliminary evidence of reliability and validity. **Methods:** Cross-cultural adaptation and assessment of psychometric properties were performed using Cronbach's alpha, test-retest reliability, exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. The sample consisted of 102 participants, of whom 17 responded a second time for the test-retest reliability analysis. **Results:** The total B-AFEQ score demonstrated acceptable internal consistency (>0.70-0.90). Test-retest reliability was excellent (>0.80). In the exploratory factor analysis (EFA), the prerequisites were met (KMO=0.72; Bartlett's test of sphericity significant [p<0.001]). In the confirmatory factor analysis (CFA), the goodness-of-fit indices were X2 (df)=1908 (1074), CFI =0.54, TLI =0.52, and RMSEA (95% CI) =0.08 (0.08-0.09). In the structural equation modeling (SEM), the goodness-of-fit indices were X2 (df)=1684 (1074), CFI =0.85, TLI =0.84, and RMSEA (95% CI) =0.07 (0.06-0.08). **Conclusion:** The cross-cultural adaptation of the AFEQ was satisfactory, and the dimensionality of the instrument was proven with acceptable model fit. The B-AFEQ proved to be valid and reliable for measuring the quality of life of parents of children with Autism Spectrum Disorder aged 2 to 5 years and their families.

Keywords: Validation Study; Surveys and Questionnaires; Quality of life; Autism Spectrum Disorder.

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INTRODUCTION

Autism Spectrum Disorder (ASD) has as diagnostic criteria the individual's difficulty in initiating and maintaining reciprocal social interaction and social communication, restricted, repetitive, and inflexible patterns and behaviors. Across the spectrum, people with ASD can show great variation in intellectual functioning and language skills[1].

The characteristics of ASD can lead to impairments in personal, family, social, educational, professional, or any other important areas for the individual[1]. The prevalence of ASD among children aged 08 in the United States of America increased from 1:59 children in 20142 to 1:36 children in 2020[3], however, in Brazil, robust epidemiological data are scarce.

ASD is heterogeneous and requires means for its condition and treatments to be better understood[4]. Several other neurodevelopmental conditions can be associated, such as speech and language difficulties, intellectual disability, and attention deficit hyperactivity disorder[1,4]. These individuals may face various challenges throughout their lives, such as difficulties with social interaction, communication, learning, behavior, and dependency, which will often require intervention and support from family and peers, resulting in a negative impact on their quality of life (QoL)[5-7].

Parents of children with ASD have a burden of care due to the high demands of their children, as they may have other associated disorders such as immunological conditions, sleep disorders, motor problems, obesity and developmental disorders, as well as facing difficulties with the health service and education, so they often have high levels of stress, depressive symptoms and anxiety, thus influencing QoL[4,8-12]. The increased prevalence of ASD and substantial collateral and economic costs at the individual, family and social levels require attention to interventions that can prevent the development or exacerbation of associated behaviors, and the earlier the intervention and the knowledge of its effectiveness, the greater the possibility of reducing the child's level of impairment in adaptive, educational and behavioral skills[13].

The World Health Organization (WHO) defines QoL as a reflection of the individual's perception of their position in life, in the cultural composition and value structure in which they are inserted, and about their goals, expectations, standards, and concerns. As a multidimensional concept, QoL can be measured using indicators[14]. QoL indicators associated with health conditions are developed with items capable of describing situations, feelings, and difficulties specific to the health condition for which they were designed, allowing the impact of this particular condition on aspects of people's lives to be measured[15].

There are a few QoL indicators related to ASD[16-18]. The Autism Family Experience Questionnaire (AFEQ) is a 48-item instrument developed in the UK with a focus on this population and was designed to measure QoL and, based on the responsiveness test, measure the prioritized results of early interventions in children aged 2 to 5 with ASD. Parents mediate many interventions for children with ASD, so they are best placed to advocate for their children's interests and opinions, observe and report on their progress, and identify the impact of these outcomes on the children's QoL, themselves, and the family as a whole[18]. There is no validated instrument available in Brazil to measure the same outcomes, but diagnostic instruments have already been translated and adapted[19-21]. Given the need to assess the impact on the QoL of the guardians of children with ASD, the family experience, and the results of early interventions in this population, it is necessary to adapt and validate this instrument for use in Brazil cross-culturally.

Therefore, this study focuses on the cross-cultural adaptation of the AFEQ, originally English, into Brazilian Portuguese and the evaluation of the psychometric properties of the Brazilian version produced through the analysis of preliminary evidence of reliability and validity, conferring transfer of meanings between languages with the achievement of similar effects on individuals belonging to the Brazilian territory.

METHODS

The study methodology followed two stages. The first stage aimed to cross-culturally adapt the AFEQ, and the second to evaluate the psychometric properties of the Brazilian version of the AFEQ, the B-AFEQ, which included testing reliability and validity. Figure 1 illustrates the methodology used. The cross-cultural adaptation processes were carried out following the standard published guidelines[15,22-24] and the COSMIN checklist guided the development of the study[25]. Permission was obtained from the authors of the original questionnaire to use and translate the AFEQ.

This study complies with Resolution 466/12 and its complementary provisions, with the 1988 Code of Medical Ethics, and

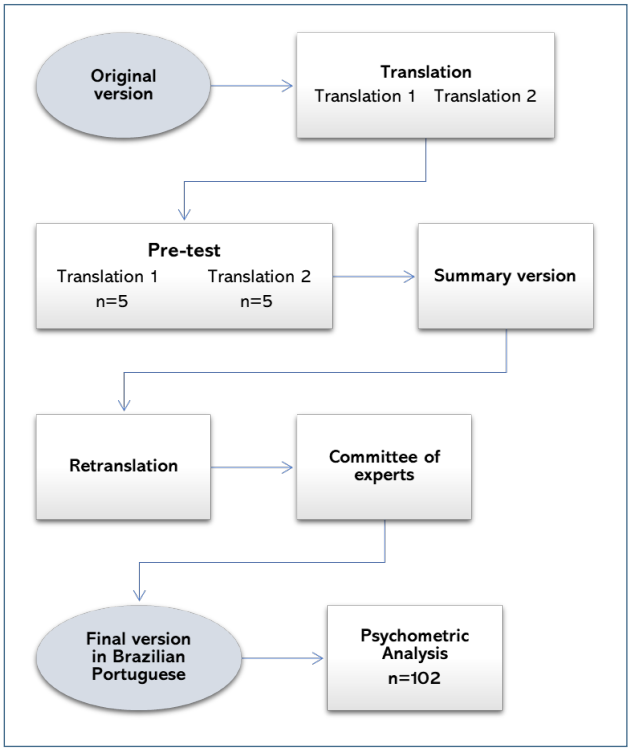

Figure 1: Stages of the methodology used to carry out the translation and cross-cultural adaptation of the Autism Family Experience Questionnaire (AFEQ).

was approved by the Research Ethics Committee (4.197.715). The research was carried out after the participant had agreed to the Free and Informed Consent Form.

Description of the Autism Family Experience Questionnaire (AFEQ)

The AFEQ is a self-administered instrument for parents of children with ASD aged 2-5 and assesses family experience and QoL related to ASD when administered only once. If used before and after interventions, it can provide information on the impact of these interventions on the family experience and QoL of parents of children with ASD. The questionnaire has 48 items distributed in four domains: 1) experience of being a parent of a child with autism; 2) family life; 3) child development, understanding, and social relationships; 4-child symptoms (feelings and behavior)[18].

The AFEQ has positively and negatively worded sentences scored on a Likert scale of 1-5. Positive sentences are scored as follows: 1= always; 2= often; 3= sometimes, 4= rarely, and 5 = never, with an option for "not applicable". Negative sentences are scored inversely: 5= always; 4= often; 3= sometimes, 2= rarely, and; 1= never, with an option for "not applicable". The scores can be explored for each domain or in general. Items marked as "not applicable" as well as unanswered items are prorated with average scores across all items. For the total score, a lower score indicates a positive result, and a higher score indicates a poor result. The overall score can range from 48-240[18].

Translation and cross-cultural adaptation

The primary aim was to ensure that the conceptual model was appropriate and to observe the pertinence and relevance of the questionnaire items in the Brazilian cultural context[23]. An expert committee (EC) carried out the analysis, consisting of 01 dental surgeon and researcher with experience in ASD and QoL, 01 psychologist with experience in ASD, and 02 pediatric dentists and researchers with experience in ASD and QoL. For the translation and cross-cultural adaptation of the instrument, a methodology based on previous work was used[15,22-24] and included the following stages.

Translation

The questionnaire was translated into Brazilian Portuguese independently by two Brazilian people whose mother tongue was Portuguese and who had extensive knowledge of English. The two independent translators (T1 and T2) were aware of the scope of the questionnaire and were instructed to use terms that were easily understood by people with low or high levels of education.

Pre-test

The T1 and T2 versions were applied as a pre-test, which was carried out with 10 guardians of people with ASD aged between 2 and 5 (invited to participate via social media among other virtual means: Facebook, Instagram, WhatsApp, e-mail). Five participants answered the T1 version, and another five answered the T2 version. Virtual forms (Google Forms) were used to administer the questionnaire due to the COVID-19 pandemic. The authors of the original questionnaire authorized this method of application. In the pre-test, each item had a gap for the person responsible to fill in if there was any difficulty with the item or any specific term in the item.

Summary version

The translated versions were evaluated by the EC, noting the items with the most doubts in the pre-test stage. Considering the results of this evaluation, the items were drafted into a summary version (SV) of the instrument in Brazilian Portuguese.

Retranslation

Once the SV was obtained, it was retranslated into English by a translator whose mother tongue was English and who had extensive knowledge of Brazilian Portuguese. The translator was not informed about the scope and conceptualization of the questionnaire.

Committee of experts

The retranslated version of the questionnaire was sent to the authors of the original questionnaire, who returned with their comments, which were answered. The EC compared the versions and made changes to ensure conceptual, semantic, and idiomatic equivalence. This step ensured that the essence of difficult-to-translate terms or concepts was maintained and ensured cross-cultural validity.

Production of the final version of the questionnaire

After a detailed analysis of each member of the EC, the final version (VF) of the AFEQ in Brazilian Portuguese (B-AFEQ) was created and applied to the sample in this study to analyze its psychometric properties.

Evaluation of psychometric properties

The B-AFEQ VF was administered via virtual forms (Google Forms) to parents of children with ASD aged 2-5 who were invited to take part in the survey via social media and other virtual means (Facebook, Instagram, WhatsApp, email) between September 2021 and February 2023. Included in the analysis were: parents of children between 2 and 5 years old with ASD who self-declared their child's condition, residents of Brazil, fluent in Brazilian Portuguese, and who were being professionally monitored. The exclusion criterion was for parents of children with ASD who did not report the age of the ASD diagnosis or who were still in the process of diagnosis.

The guardians also filled in a form with social, demographic, and economic information and information about the characteristics of their child's ASD. These included the respondent's relationship with the child (father, mother or other), level of education (primary, secondary or higher education), average family income (≤1 minimum wage, 1-3 minimum wages or >3 minimum wages, based on the Brazilian minimum wage, approximately R$1. 200.00), region of Brazil in which the child lives (north, northeast, central-west, south or southeast), the child's age, the child's gender (female or male), the age at which the ASD diagnosis was made (≤2 years, 3 years or ≥4 years), the child's ability to communicate (functional language or absence of functional language), whether the child attends school and how many professionals accompany the child in their treatment (1-4 professionals or >5 professionals).

The sample calculation for the validation study was based on Anthonie et al.26, who recommend 2 to 20 individuals per item, and an absolute minimum of 100 to 250 individuals. Assuming a minimum of 2 individuals per item, since the B-AFEQ consists of 48 items, a sample of 102 respondents was obtained.

Descriptive analyses (mean, standard deviation, and frequency) were carried out to characterize the sample and to generate the total and domain scores. To analyze the reliability of the B-AFEQ, internal consistency was calculated using Cronbach's alpha and test-retest reliability using the intraclass correlation coefficient (ICC), calculated for the overall score and each domain separately. Values of 0.70-0.90 for Cronbach's alpha were considered acceptable, and values ≥0.91 were considered excellent[27]. Test-retest reliability was carried out on 16.7% of the total sample, 2-3 weeks after the first application. After 10 days, the retest questionnaire was sent to the respondents by e-mail. The ICC was classified as: ≤0.40 weak correlation; 0.41-0.60 moderate correlation; 0.61-0.80 good correlation; and excellent correlation of 0.81-1.00[28,29].

The suitability of the data set for this analysis was verified by the Kayser-Meyer-Olkin (KMO) measure (>0.50), as well as Bartlett's test of sphericity ($p<0.05$) by performing exploratory factor analysis (EFA) with Varimax rotation and principal component analysis to extract the factors. In this analysis, values greater than 0.40 were considered to be high factor loadings. The number of factors extracted was determined based on the original instrument. Dimensionality was confirmed by performing confirmatory factor analysis (CFA) and structural equation modeling (SEM), which provided the path diagram. The ratio between the chi-squared value and the degrees of freedom of the model [X2(gl)], the comparative fit index (CFI), the Tucker Lewis index (TLI), and the root mean square error of approximation (RMSEA) were evaluated. As for the CFI and TLI indices, values ≥0.95 characterized an excellent model fit, and values of 0.90-0.95, an acceptable model fit. X2(gl)<3 ratio values indicate a good model fit. RMSEA values ≤0.06 indicate excellent model fit, but values of 0.06-0.08 suggest acceptable model fit[30]. EFA and CFA were used to determine construct validity (structural/factorial validity)[31,32].

Statistical analyses were carried out using SPSS (SPSS for Windows, version 20.0, IBM Inc., Armonk, NY, USA) and Jamovi (Jamovi for Windows, version 2.3.21.0, Jamovi Project, Sydney, Australia) with the significance level set at 5%.

RESULTS

The Brazilian version of the AFEQ was generated by each of the translators (T1 and T2). Having two translated versions made it possible to examine inconsistencies in wording or meaning by comparing the T1 and T2 versions. The 48 items of the B-AFEQ were considered pertinent, relevant, and appropriate to Brazilian culture by the EC. The authors of the original instrument were consulted to better understand the meaning of some items (items 3 and 6).

No items from the original questionnaire were deleted or added. The translations were similar. Respondents who took part in the pre-test stage pointed out that the items in the T1 version generated more questions than the T2 version. Based on the two translations, the SV was prepared, and the items were constructed taking into account the original version and the doubts raised by the pre-test respondents. The scholars of the original questionnaire evaluated the retranslation. All considerations were reviewed by the EC, which made the requested changes and subsequently received approval from the authors of the original questionnaire. The approved SV was revised again by the EC, resulting in the VF of the B-AFEQ, which was tested for psychometric properties.

The validation study was carried out with 102 children (82.4% male, 17.6% female), ranging in age from 2-5 years (SD ±0.98, mean 3.49 and mode 4). A total of 96% of the respondents were the child's mother, most of whom had higher education (53.9%), a family income of 1-3 minimum wages (46.1%), and lived in the southeast of Brazil (53%). Most of the children were diagnosed at the age of 3 (52.9%), have communication deficits (absence of functional language) (55.9%), attend pre-school (82.4%), and are accompanied by 1-4 professionals (60.8%) (Table 1).

There were no losses in the data collection procedures. The total score of the B-AFEQ ranged from 81-193, with a mean (SD) of 136.75±24.25. All the domains and the total score showed excellent reliability according to Cronbach's alpha and test-retest reliability (Table 2).

The prerequisites for EFA were met (KMO=0.72; Barlett's test of sphericity significant [$p<0.001$]). The four-factor solution with principal component extraction and Varimax rotation with Kaiser normalization explained 40.62% of the total variance. Only 9 items had low factor loadings (<0.40). Factor loadings for CFA were high for most items; 11 items had low factor loadings (<0.40) (Table 3). The models achieved an adequate or acceptable fit for most of the indices. In the CFA, the quality of fit indices

Table 1: Characterization of the sample during the B-AFEQ validation study

Variables	Frequency	
	N	%
Bond with the child		
Mother	98	96
Father	2	2
Others	2	2
Education		
Elementary school	8	7,9
Secondary school	39	38,2
Higher education	55	53,9
Average family income		
≤1 minimum wage	37	36,3
1-3 minimum wages	47	46,1
>3 minimum wages	18	17,6
Brazilian region of residence		
North Region	5	4,9
Northeast Region	15	14,7
Midwest Region	4	3,9
Southeast Region	54	53
South Region	24	23,5
Child's age		
2 years old	19	18,6
3 years old	32	31,4
4 years old	34	33,3
5 years old	17	16,7
Sex		
Male	84	82,4
Female	18	17,6
Age of ASD diagnosis		
≤2 years old	7	6,9
3 years old	54	52,9
≥4 years old	41	40,2
Ability to communicate		
Functional language	45	44,1
Absence of functional language	57	55,9
Preschool attendance		
Yes	84	82,4
No	20	19,6
Professional support		
1-4 professionals	62	60,8
>5	40	39,2

were X2(gl)=1908(1074) =1.77, CFI =0.54, TLI =0.52 and RMSEA (95%CI) =0.08 (0.08-0.09). In SEM, the quality of fit indices was X2(gl) =1684(1074) =1.56, CFI =0.85, TLI =0.84, and RMSEA (95%CI) =0.07(0.06-0.08), thus indicating an acceptable model fit as shown in the path diagram (Figure 2).

DISCUSSION

The study aimed to carry out the cross-cultural adaptation and evaluation of the psychometric properties of the Autism Family Experience Questionnaire (AFEQ) for the Brazilian Portuguese language, which makes it possible to analyze QoL and family experience, in addition to adding, based on responsiveness, to the understanding of how effective the interventions carried out in the treatment/therapy of children with ASD have proven to be and how their effects have been perceived by the family. Health-related QoL instruments may have excellent psychometric properties in providing a metric of general well-being in children with a variety of conditions, but they have deficits in measuring specific dimensions of ASD, such as the unique and complex practical, social, and emotional complexities of ASD16,18. In Brazil, there are some questionnaires used to diagnose ASD that have undergone the process of cross-cultural adaptation[19-21], but there are no questionnaires that assess the QoL of children with ASD between 2 and 5 years of age, with the same focus as the AFEQ.

The translation stage of the instrument proved to be adequate for the EC and the authors of the original instrument, as the items maintained the proposed content[18]. At this stage, the refinement and maintenance of the meaning of the items was made possible by direct consultation with one of the authors of the instrument, allowing for better comparability with the results of the original instrument and ensuring that the B-AFEQ had the same effect on the target population as the original instrument did in another language and culture[22,23].

To check for errors and deviations in the translation, a pre-test is carried out on a small sample of the population answering the questionnaire[22]. With 2 translated versions similar to each other, it was considered appropriate to carry out the pre-test at this point

Table 2: Reliability statistics for B-AFEQ total and domains (n=102)

Variable	Number of items	Score			Cronbach's alpha	Intraclass correlation coefficient (95% CI)
		Average	Minimum-Maximum	SD		
B-AFEQ	48	136.75	81-193	24.25	0.90	0.95 (0.91 – 0.98)
Domains						
Experience of being a parent of a child with autism	13	34.5	17-54	8.45	0.84	0.92 (0.85 – 0.97)
Family life	9	24.53	9-40	6.73	0.76	0.89 (0.79 – 0.96)
Child development, understanding, and social relationships	14	42.22	26-61	8.68	0.75	0.90 (0.81 – 0.96)
Child symptoms (feelings and behavior)	12	35.53	11-50	7.11	0.70	0.80 (0.61 – 0.91)

SD= Standard Deviation; CI= Confidence Interval

Table 3: Exploratory factor analysis of 4 and 1 factors with Varimax rotation and confirmatory factor analysis of 1 factor of the B-AFEQ

Item	Exploratory Factor Analysis				Confirmatory Factor Analysis
	Factor 1	Factor 2	Factor 3	Factor 4	
The experience of being a parent of a child with autism					
E1	0.166	0.551	0.072	-0.166	0.482
E2	0.368	0.209	-0.121	0.341	0.420
E3	0.179	0.191	-0.138	0.350	0.283
E4	0.135	0.501	0.177	0.282	0.495
E5	0.200	0.697	-0.017	0.312	0.684
E6	0.110	0.674	0.087	0.107	0.653
E7	-0.053	0.614	0.006	0.257	0.500
E8	0.261	0.711	0.151	0.112	0.783
E9	0.423	0.659	0.253	-0.018	0.826
E10	0.261	0.160	0.062	0.666	0.435
E11	0.370	0.232	0.019	-0.050	0.385
E12	0.221	0.246	0.388	-0.062	0.413
E13	0.283	0.343	0.074	0.464	0.585
Family life					
V14	0.656	0.080	0.172	-0.247	0.500
V15	0.077	0.588	0.129	-0.178	0.254
V16	0.316	0.210	0.109	0.017	0.376
V17	0.642	0.063	-0.028	0.023	0.545
V18	0.562	0.118	0.026	0.364	0.668
V19	0.599	0.117	0.139	0.225	0.747
V20	0.399	0.301	-0.098	0.463	0.607
V21	0.572	0.267	-0.111	0.355	0.736
V22	0.219	0.041	0.100	0.029	0.215
Child development, understanding, and social relations					
D23	-0.058	-0.052	0.414	0.503	0.400
D24	-0.065	0.056	0.699	0.150	0.655
D25	0.035	0.166	0.760	0.186	0.817
D26	-0.051	0.109	0.702	0.077	0.622
D27	0.492	0.055	0.182	0.002	0.286
D28	0.048	0.193	0.685	-0.008	0.677
D29	0.064	0.360	0.156	0.395	0.285
D30	0.648	-0.079	0.229	0.226	0.380
D31	0.210	-0.160	0.276	0.311	0.258
D32	0.107	0.054	0.057	-0.473	-0.050
D33	0.130	0.068	0.600	-0.297	0.420
D34	0.322	0.286	0.194	0.292	0.380
D35	0.181	0.053	0.532	0.291	0.538
D36	0.228	-0.125	0.293	-0.070	0.203
Children's symptoms (feelings and behavior)					
S37	0.314	0.341	0.010	0.269	0.460
S38	0.462	0.085	0.037	-0.317	0.343
S39	0.459	0.123	-0.009	0.034	0.404
S40	0.662	0.063	-0.052	0.013	0.620
S41	0.612	0.046	-0.021	0.141	0.633
S42	0.690	-0.107	0.048	0.250	0.650
S43	-0.063	0.114	0.718	-0.082	0.074
S44	0.309	0.153	0.595	-0.182	0.352
S45	0.099	0.465	0.281	-0.129	0.302
S46	0.131	-0.581	0.004	-0.135	-0.107
S47	0.669	0.207	-0.088	0.045	0.681
S48	0.615	0.069	0.282	0.080	0.636

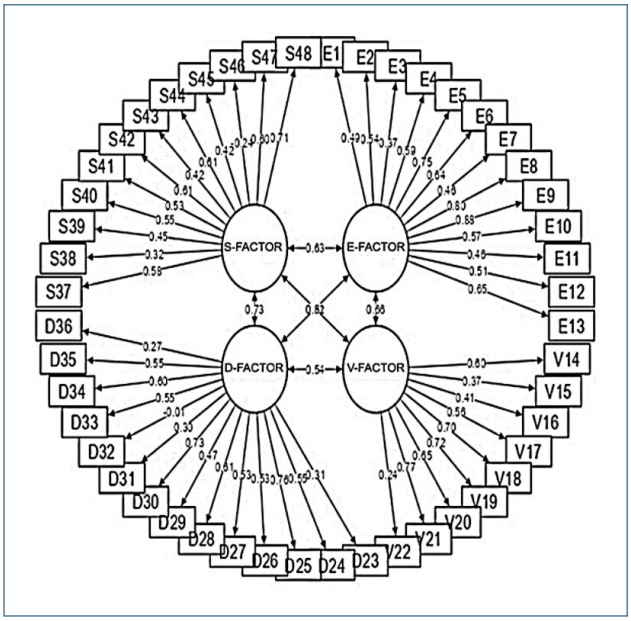

Figure 2: Dimensionality path diagram with factor loadings indicated.

in the process to compare the opinions of the experts with those of the target population and use this data to guide the selection of terms for the SV, as well as for the VF of the AFEQ. This strategy makes it possible to use terms that are more appropriate to the context in which the instrument will be applied[15]. No items were excluded or added, but some were modified according to the judgment of the EC and the considerations of the authors of the original instrument, who approved the VF in Brazilian Portuguese.

The second stage of the research sought to confirm the validity based on the internal structure and showed satisfactory results in the Brazilian cultural context[33], considering the values found. This study obtained a sample equivalent to the validation study of the original questionnaire[18]. The total score for the sample had similar results to the study of the original instrument[18] and the validation study of the Turkish version[34]. There was little difference between the three studies. The Turkish version had the lowest score[34] and the original instrument had the highest score[18]. For the total score, a lower score indicates a positive result, and a higher score indicates a poor result[18]. Various factors can contribute to different scores in different contexts, such as cultural differences which influence the way personal well-being is constructed; the different length of exposure to intervention services, since longer exposure leads to a different perception of QoL; the level of education and income of those interviewed; the treatment services available at the study site, among others[35].

The domains of the B-AFEQ and the total score obtained a good level of reliability, as did the findings of other studies[18,34]. The authors of the original instrument[18], as well as the validation study carried out in Turkey[34], found an analogous value for the domain experience of being a parent of a child with autism and the total B-AFEQ. Higher values for the domains family life, child

development, understanding, and social relationships, and child symptoms (feelings and behavior) were found by the authors of the original instrument[18]. The domain of child symptoms was the domain with the lowest alpha coefficient, as in the study by the authors of the original questionnaire[18]. In this domain, the child's symptoms are assessed considering feelings and behavior. Therefore, the respondents may have found it difficult to answer the feelings expressed by the child. A significant proportion of the sample was characterized as having no functional language, which may also have influenced the findings.

The good performance in the other domains of the B-AFEQ is explained by the fact that the caregivers were able to express their opinions about themselves. The coefficient for the fourth domain was lower than for the other domains, but the alpha coefficient for the total score was high, attesting to the reliability of the B-AFEQ. The stability of the B-AFEQ, as measured by the ICC, showed excellent test-retest reliability for the total questionnaire and each domain separately. The original questionnaire did not assess this measure.

The overall measure of sampling adequacy of the Kaiser-Meyer-Olkin (KMO) criterion ranges from 0-1; the closer to 1, the better[30]. In this study, the dimensionality of the original data can be described by the factors found in the EFA. In addition, the CFA and SEM were carried out, showing an excellent model fit, confirming the structural/factorial validity of the instrument and indicating acceptable construct validity[31,32]. Corroborating our findings, the validation study of the Turkish version of the AFEQ also found a good model fit[34]. Considering the sample size, about model fit, the CFA produced fit indices suggesting a well-adjusted model, according to the value found for X2(gl), whose index indicates a strong model fit, which was also confirmed by comparison with other relevant studies[30,34-36].

Future research is needed to assess criterion validity through concurrent and predictive validity. In terms of limitations, despite satisfactory results in test-retest reliability, due to the e-mail invitation to reapply, some responses exceeded the deadline proposed in the literature, which recommends an adequate interval of 10-14 days from the initial application[33], making it important to better control this stage in future replications of the survey.

Although the selected sample is representative of the population in Brazil in terms of socio-demographic characteristics, a potential bias may arise from the sampling method that obtained participants predominantly from the southeast and south regions and with a higher level of education. Future research could expand the sample to include more participants from the other Brazilian regions and with secondary and primary levels of education for a more comprehensive validation.

Based on responsiveness, the AFEQ aims to help understand how effective the interventions carried out in the treatment/therapy of children with ASD have proven to be and how their effects have been perceived by the family[18]. To this end, future studies should evaluate the instrument within the context of intervention programs to assess this factor.

In addition, there was a need for further research to reduce the instrument to have a questionnaire that could be completed in less time and that would summarily represent the measures in the original questionnaire, given that individuals with ASD have high demands, which means that their guardians have little time to enjoy individual activities, especially when there is no support network available[4,9].

Conclusion

The AFEQ was satisfactorily culturally adapted into Brazilian Portuguese, showing good content and cross-cultural validity. It is characterized as a robust, valid, and reliable measure with the potential to be applied in clinical and research contexts throughout Brazil.

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