Analysis of the psychometric properties of the Indonesian version of the McMaster family assessment device general functioning subscale (FAD GF-12)

Elgi Selis Setiana¹ and Marselius Sampe Tondok¹

Abstract
This research aimed to evaluate the reliability and validity of the McMaster Family Assessment Device subscale General Functioning (GF-12), an assessment tool with 12 indicators of family educational function in high school present in the Indonesian form. A purposive non-random sampling method was employed on 103 adolescent students, aged 16-18 years, consisting of 75 females and 27 males currently in high school. The results showed that the questionnaire was valid and reliable. The GF-12 subscale items showed r value of 0.5-0.8 compared to the table index of 0.3 using the pearson correlation. The Cronbach’s alpha value for the GF-12 subscale items was 0.8. In light of these results, the GF-12 questionnaire of the Indonesian version is a valid instrument for assessing family function. This showed that the level of family functioning in adolescents can be assessed more accurately. The results are recommended as the basis for a more accurate assessment of the Indonesian cultural and linguistic context. Furthermore, it is suggested a standard for researchers, practitioners, and educators who focus on adolescent welfare issues.

Keywords
Family functioning, general family function, middle adolescence

Introduction
Family function is a multidimensional concept characterized by both effective and ineffective activities, as well as relationships that facilitate the achievement of objectives, which include contributing to each member’s growth and prosperity as well as providing emotional and financial support (Lana & Indrawati, 2021). It also includes various activities carried out to meet various needs such as economic, daily care, social, medical, and educational (Fithriyana, 2019). Previous research showed that the quality of family functioning has a correlation with individual well-being. People with good social skills and emotional stability tend to be a product of families with decent communication and emotional support. Conversely, family dysfunction can contribute to individual psychological problems, such as anxiety, depression, and maladaptive behavior (Rofiatul Hidayah, 2020).

The McMaster Model of Family Functioning (MMFF) tends to be useful and comprehensive, integrating multidimensional theory regarding function, evaluation of instruments, and well-formulated family therapy methods (Robinson, 2022). This model was developed by Epstein based on the McMaster Family Assessment Device (FAD) for more than 40 years with six main dimensions, namely problem-solving, communication, role, affective responsiveness, participation, and behavioral control (Rochaningsih, 2014). General subscale was selected to assess family functioning because it only has 12 items. All items in the general family functioning subscale (GF 12) are highly correlated with other dimensions and are also free from cultural bias when assessed in various populations and countries (Cong, 2022).

Previous research focused on FAD measuring instruments, but the FAD GF-12 subscale has not been studied further. The research FAD GF-12 was designed to measure specific aspects of family functioning that are relevant. Practical factors such as ease of use and administration influenced the selection of the GF-12 FAD scale which is relatively easy to implement and manage, which is a practical advantage over other scales that may be more complicated. The GF-12 consists of 12 questions or statements designed to evaluate several key aspects of family functioning, including communication, conflict resolution, participation, support, and emotions about changes and challenges (Permatasari, 2021). This measurement scale allows individuals or families to respond to questions with a rating scale that includes aspects such as “strongly agree” to “strongly disagree”. The results of completing the GF-12 questionnaire are then analyzed to measure the overall level of family functioning, with a lower score showing better unit, while a higher value signifies dysfunction (Lana & Indrawati, 2021).

Family functioning is critical, specifically as teenagers approach adulthood, while adolescents’ ages span from 10 to 19 years (World Health Organization, WHO). When confronted with stresses and problems, the capacity to successfully manage emotions will be critical in helping people overcome them. Teenagers who are able to use

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emotions effectively can control their responses to situations. Effective use of emotions helps them communicate with family, friends, and the environment better. It is in this context that the FAD GF-12 measuring instrument becomes relevant, enabling teens to develop healthy communication skills with their families and colleagues. Considering these perspectives, adolescents can understand and express their emotions appropriately, strengthen family relationships, and expand social networks. Research showed that there is a relationship between the affective function of family and adolescent promiscuity (Pattiruhu, 2019). However, it is important to examine the suitability of these measurement tools within the context of adolescence. It is important to consider whether the FAD GF-12 has been adapted to the adolescent age range and the scale’s validity and reliability. The use of measuring instruments can be useful in understanding family function during adolescence.

The reliability and validity of assessment tools are important areas of psychometric research, specifically the psychosocial, such as family functioning. In this context, valid and reliable assessments are needed to determine the relationship between family functioning and different variables, including psychological well-being, the quality of interpersonal relationships, and family dynamics. The further exploration of the validity and reliability of the assessment tool will enable researchers, counselors, and mental health practitioners to assess family functioning more accurately in the context of the Indonesian culture and language (Pascoe, 2020). This research has a significant effect on the use of assessment tools, appropriate to the local cultural and environmental context, which can be used as a basis for intervention and further essay in the field of family psychology.

Method

Participants

The number of participants was recorded using a Google-based survey, which includes 103 persons—75 women and 27 men. The inclusion criteria using a purposive sampling method for participants was adolescents aged 16-18 years, studying at the senior high school level. The samples were selected from various regions, including students in senior high school in Surabaya and those outside of the Sidoarjo area. Most of the participants were in grade 11 (69.8%), followed by 12 (6.6%) and 10 (23.6%). The participants were provided with information and consent sheets before answering questions. The data collection procedures were reviewed and approved by the University of Surabaya (UBAYA) Institutional Scientific and Ethics Review Committee with number 61/KE/IV/2022.

Research Instruments

The selection of the McMaster FAD Scale as a tool in the validation test has fundamental proof that is relevant to the Indonesian context. This scale has gained recognition internationally for measuring family functioning. It was first developed by (Shi et al., 2023) and has consistently been assessed for validity and reliability in a variety of linguistic and cultural contexts. Considering these perspectives, the selection of FADs have been proven to be valid and reliable in various populations, including in Indonesia. FAD stands out for its multidimensionality, enabling the assessment of multiple aspects of family functioning. The FAD covers important dimensions consisting of 60 items divided into seven subscales, such as problem-solving, communication, roles, familism and participation, behavioral control, social behavior, and general family functioning. From this viewpoint, FAD provides a thorough view of the dynamics and general well-being in addition to showing particular facets of family functioning. The use of FAD in research validation tests in Indonesia reinforced the cross-cultural validity of the instrument. This research contributes an in-depth knowledge of family function by integrating relevant cultural aspects and understanding specific social contexts. FAD also offers a possibility to systematically compare and track trends in family functioning, which can be used as a basis for more interventions and policies to enhance future welfare.

The FADs translation into the Indonesian context by (Djabumir, 2015) enables it to be more accessible and understandable. Research can be conducted more accurately with the translated version, and applied to respondents who have Indonesian cultural and language backgrounds. The selection of instruments that are cognizant of cultural variety is important in the Indonesian environment, where family dynamics and cultural values may vary. The results may be more applicable to the daily experiences of Indonesian families because cultural varieties and the local context are taken into consideration when choosing which FADs to translate. The selection of FAD is consistent with related literature which describes the importance of assessing family functioning in the context of individual development, specifically in adolescents. Considering this perspective, the instrument is in accordance with the research objectives, which focus on assessing family function in adolescents in senior high school.

The selection of the McMaster FAD Scale, which has been translated into Indonesian, not only guarantees the validity and reliability of the instrument but also takes into account cultural factors and local context for relevance and suitability. This instrument is unidimensional and only measures one phase, namely the General Functioning (FAD-GF) subscale, with the following items written in Table 1.

Data Analysis Technique

Statistical data analysis using CFA (Confirmatory Factor Analysis). CFA is a measurement evaluation method where the theoretical model of measurement is compared with the data (Brown, 2006). In addition to CFA, the item-total correlation coefficient was computed (Azwar, 2013) to determine whether the items were appropriate for the construct being examined. Meanwhile, the reliability of the measuring instrument is assessed based on Cronbach’s Alpha coefficient.

Result

Item Analysis and Reliability Test

The questionnaire used consisted of 12 questions regarding the FAD subscale GF (FAD-GF 12) and was tested on
103 respondents consisting of 16-18 year-old male and female senior high school students. Each questionnaire item’s analysis using a total corrected item correlation index <0.3 shows that it is either not recommended or does not significantly contribute to the overall score. When the total corrected item correlation index is positive and greater than >0.3, then it is declared to have made a significant contribution to the total score or can be recommended. Several items that were not recommended for each aspect were removed to ensure a balanced composition on the FAD-GF 9 scale.

Based on the results of the item analysis in Table 3, the FAD-GF 12 scale showed that questions regarding family function were declared recommended and can be used in conducting research with a correlation value greater than 0.03 based on 9 question items showing an r-count > 0.5-0.8 compared to r-table 0.3. The validation criteria were divided into five categories, namely 1) when the calculated r is 0.8-1 then the validity is very high. 2) When the calculated r value is 0.6-0.799, it means that the validity is high. 3) When the calculated r value is 0.4-0.599, it means that the validity is quite high. 4) When the calculated r value is 0.2-0.399, it means that the validity is low. 5) When the calculated r value is 0-0.199, it means that the validity is very low or invalid. Given these scenarios, it should be stated that when the FAD-GF12 scale becomes 9 items, it needs to be renamed FAD-GF-9.

The test for measuring instrument reliability is carried out using the Alpha model. Cronbach Alpha figures in the range of 0.6 are acceptable, and above 0.8 is good. In this research, the reliability value obtained was $\alpha = 0.894$ for a total of 9 questions after the items from the test analysis that were not recommended were dropped. This means that the total of 9 items analyzed is close to 1.00 hence it can be declared good or reliable to be used as a measuring instrument.

### CFA Test

A fit model was produced based on the analysis after covariating the errors through the Chi-Square, CMIN/DF, Goodness of fit index (GFI), and Root Mean Square Error of Approximation (RMSEA) values. Table 3 shows the fit results and according to the parsimony principle, when one or two criteria are suitable, the model is term fit. Therefore, it can be broadly understood that this construct is fit to be used in measuring the GF-12 questionnaire, which is a valid instrument for assessing family functioning. The model obtained from the CFA analysis results can be seen in Table 3.

### Discussion

FAD has been validated and translated in various countries, namely Brazil, and China studied with PCA, and the Spanish and French versions explored with EFA in three dimensions. The Dutch version refers to the original FAD, while the Italian and Icelandic forms have seven and eight dimensions, respectively (Boterhoven de Haan et al., 2015). Research and translation of the McMaster FAD measuring instrument was carried out into Indonesian by Djabumir in 2015. However, there has been no previous research regarding the validity, reliability, and factor analysis of the Indonesian version of the FAD general family function subscale measuring instrument.

The Indonesian version of the FAD-GF 12 scale is used to measure social and psychological functioning in various contexts (Djabumir, 2015). The reliability, consistency, and stability of the scale is needed to ensure the precision, hence it is necessary to carry out a retest on a number of individuals at different periods (Lana & Indrawati, 2021). This will help assess the consistency of the scale in generating better results over time. In addition to consistency, it is also important to ensure that the FAD-GF 12 scale genuinely measures the intended parameters (Barroilhet et al., 2022). The stability of the measuring instrument is the scale’s ability to provide consistent results within a certain period, as long as the condition of the subject being measured does not vary (Arikunto, 2019). Stable measurements should provide consistent results when the subject’s condition does not change.

### Table 1. General Functioning of Family Subscale Items

<table>
<thead>
<tr>
<th>Statement Items and Serial Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I find it difficult for us to plan activities in family because we do not understand each other</td>
</tr>
<tr>
<td>2. When my family is in trouble, we support each other</td>
</tr>
<tr>
<td>3. I don’t talk to others in my family about the sadness I feel</td>
</tr>
<tr>
<td>4. Every family member is accepted as they are</td>
</tr>
<tr>
<td>5. Every family member avoids discussing fears and worries</td>
</tr>
<tr>
<td>6. Each family member can express their feelings to one another</td>
</tr>
<tr>
<td>7. Many negative feelings in family</td>
</tr>
<tr>
<td>8. I feel accepted</td>
</tr>
<tr>
<td>9. Making decisions is an issue in my family</td>
</tr>
<tr>
<td>10. My family members are able to make decisions to solve problems</td>
</tr>
<tr>
<td>11. My family does not get along</td>
</tr>
<tr>
<td>12. Every family member confides in each other</td>
</tr>
</tbody>
</table>

### Table 2. Correlation Value (Each Question Item on the FAD-GF 9 scale)

<table>
<thead>
<tr>
<th>Item</th>
<th>r-table</th>
<th>r-count</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>0.3</td>
<td>0.358</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 2</td>
<td>0.3</td>
<td>0.436</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.3</td>
<td>0.325</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 4</td>
<td>0.3</td>
<td>0.344</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 5</td>
<td>0.3</td>
<td>0.440</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 6</td>
<td>0.3</td>
<td>0.470</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 7</td>
<td>0.3</td>
<td>0.013</td>
<td>Unrecommended</td>
</tr>
<tr>
<td>Item 8</td>
<td>0.3</td>
<td>0.405</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 9</td>
<td>0.3</td>
<td>0.052</td>
<td>Unrecommended</td>
</tr>
<tr>
<td>Item 10</td>
<td>0.3</td>
<td>0.477</td>
<td>Recommended</td>
</tr>
<tr>
<td>Item 11</td>
<td>0.3</td>
<td>0.090</td>
<td>Unrecommended</td>
</tr>
<tr>
<td>Item 12</td>
<td>0.3</td>
<td>0.358</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
fluctuate significantly (Djabumir, 2015). The limitation of this research is that it only examined construct validity or whether the scale accurately assesses the test parameters. Therefore, this research was only limited to the FAD-GF 12 scale, which showed good internal consistency, and shown by reliability coefficient values, namely Cronbach’s alpha (Arikunto, 2019). Therefore, the Indonesian version of the FAD-GF 12 assessment tool is being examined to determine the validity, reliability, and factor between the items.

The implication of this research is the importance of ensuring that the Indonesian version of the FAD-GF 12 scale is a valid and reliable tool for assessing social and psychological functioning in various contexts. The scale’s reliability and consistency are important to ensure consistent results over time (Shao et al., 2020). This tool can provide stable results when there are no significant changes in the condition of the subject being measured. This implication is very relevant in the context of social and psychological research which recognize measurement consistency (Djabumir, 2015). Furthermore, testing construct validity is an important step to ensure that the scale genuinely measures the intended parameters. Construct validity includes an analysis of the extent to which this scale reflects the test parameters (Djabumir, 2015). This research can confirm the Indonesian version of the FAD-GF 12 scale by ensuring construct validity.

The result application can influence various contexts, including scientific and social research, and practical use in the measurement of social and psychological functioning (Safira et al., 2021). Practitioners and researchers in various scientific disciplines can use the Indonesian version of the FAD-GF 12 scale as a valid and reliable assessment tool for social and psychological functioning in appropriate populations. It can be used in longitudinal or survey research that needs consistent measurements over time. Furthermore, this research can also aid in developing a better understanding of social and psychological functioning in various contexts (Cong, 2022). The implications can help to support further research and provide an understanding of the variables assessed by the FAD-GF 12 scale (Lana & Indrawati, 2021). Therefore, this research contributes to the development of better social sciences and psychology.

The application in clinical practice or social services could also provide significant benefits. Assessment of social and psychological functioning is an important part of mental health services, particularly in evaluation and intervention planning (Najmudin et al., 2023). Furthermore, practitioners can carry out more precise and accurate assessments, and plan more effective interventions for individuals or groups who need assistance (Cong, 2022). The results also have important implications in the context of research and clinical practice (Djabumir, 2015). The application can offer significant benefits in assessing social and psychological functioning, as well as a better understanding of the variables assessed by the scale.

This research showed that the Indonesian version of FAD-GF 12 has good validity and reliability, indicating consistent and accurate evaluation of variables. It also showed that the scale is a good tool for surveys, specifically in contexts where cost and ease of administration are important considerations (Shao et al., 2020). The results showed that the order in which the tests were carried out did not significantly influence the score results. This provided users with flexibility in administration and allowed adjustments as required (Barroihet et al., 2022).

This research is limited to testing the validity and reliability of the Indonesian version of the FAD-GF 12 scale. Therefore, the generalization of results to various contexts or specific populations needs to be performed with caution because the sample size was relatively small, namely 103 respondents. Future research could consider a larger sample size to increase the confidence level in the results. A purposive non-random sampling method was used with inclusion criteria for adolescents aged 16-18 years in high school. This can create limitations in the generalization of results to adolescent populations outside certain age groups or educational environments (Djabumir, 2015). This research focused on testing the validity and reliability of the Indonesian version of the FAD-GF 12 scale, hence there was a limitation to additional information that can be obtained regarding other factors that can influence family functioning in adolescents (Fithriyana, 2019).

The methodological limitations may affect the generalization of the results, which may not be widely applicable to the adolescent population throughout Indonesia, with the limited sample size (Djabumir, 2015). Furthermore, the limited characteristics of the participants also hinder the ability to generalize these results to groups of adolescents with different backgrounds or characteristics. The specific focus on the validity and reliability of the FAD-GF 12 scale also shows that this research did not provide an in-depth understanding of other factors that may influence family functioning in adolescents (Cong, 2022). Therefore, result generalization should be limited to understanding the validity and reliability of the instrument and not all aspects of family functioning as a whole (Permatasari, 2021). Future research that addresses these limitations could consider using larger samples, selecting more participants, and further exploring factors that influence family functioning in adolescents. This will enable the generalization of results to different contexts and populations more accurately.

<table>
<thead>
<tr>
<th>Table 3. Results of FAD-GF 12 scale analysis before and after modification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original version</strong></td>
</tr>
<tr>
<td><strong>Control of value</strong></td>
</tr>
<tr>
<td>Chi-Square</td>
</tr>
<tr>
<td>CMIN</td>
</tr>
<tr>
<td>GFI</td>
</tr>
<tr>
<td>RMSEA</td>
</tr>
</tbody>
</table>
Conclusion
The research shows that the Indonesian version of the FAD-GF 12 scale has significant validity and reliability, which enables the assessment of the intended parameters. Therefore, enabling its use in various contexts produces reliable and consistent results. The advantage of adopting this scale is the small amount of items employed, ensuring ease of use by participants. However, it is still necessary to consider the general family function score required.

There are several suggestions put forward for further research because of these limitations, namely being able to test the validity and reliability of the Indonesian version of the FAD-GF 9 scale in a wider context or different populations. In addition to testing, future research could consider developing instruments to meet specific needs in various research or measurements of family functioning. Further research could also consider a longitudinal approach to understanding changes in family functioning over time. By considering the advantages, limitations, and suggestions of this research, future assays can expand the practice of using the Indonesian version of the FAD-GF 12 scale in various research contexts and clinical practices.

Declaration
Acknowledgement
We sincerely thank our research participants for completing the questionnaire. We also extend our gratitude to the anonymous reviewers for their valuable comments and suggestions, which have significantly improved the quality of this manuscript.

Author contributions
ESS contributed to designing the research, collecting and analyzing the data, as well as writing the initial draft of the manuscript. MST contributed to developing the research idea and framework, validating the results, reviewing and editing the manuscript. All authors read and approved the final version of the manuscript.

Conflict of interest
The authors declare that they have no competing interests.

Funding
This research received no external funding.

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Article history
Submissions: 2023-08-01
Review Process: 2023-11-05
Revised: 2023-12-03
Accepted: 2024-06-26
Published: 2024-08-09

References


Prepared using psyj.cls