Psychometric properties of the Indonesian Version of McMaster Family Assessment Device-General Functioning Subscale in a sample of University Students with Non-Suicidal Self-Injury

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Abstract. This study aimed to examine the psychometric properties of the Family Assessment Device General Functioning (FAD-GF) scale in a sample of self-injurious students. This study is part of a multi-stage study that will lead to the development of an etiological model of NSSI. Participants in this study were 102 college students with a history of self-injury (32 males and 70 females) aged 18 to 25 years (M= 19, SD= 0.9). The Cronbach's alpha reliability value for the total scale was 0.876. Confirmatory factor analysis results identified that the FAD-GF items had factor loadings in the range of 0.514 - 0.825. The test results indicate that the twelve items of the FAD-GF can be used to measure family functioning in students with self-injury.

Keywords: Family functioning, FAD-GF, confirmatory factor Analysis

1 Introduction

The family is a fundamental unit of the social environment that plays a crucial role in the physical and mental development of individuals [1] [2] [3]. To play an optimal role in an individual's development, the family must function optimally. A family functions when it builds the ability to solve problems together and involves each family member taking responsibility for family conditions [4]. A functioning family is seen as a family unit that has strong connections that support the emergence of cohesiveness, closeness, interaction, and good relationships between family members [5]. Family functioning is also defined as the ability of a family system to work as a unit and adjust to various situations, especially those that cause stress (Minuchin et al., in [2]). Theories related to family functioning generally define family functioning based on the aspects that a family has or what stages and processes the family goes through [3].

ICPSYCHE 2024, July 24-25, Semarang, Indonesia

DOI 10.4108/eai.24-7-2024.2354283

In recent years, there has been increasing interest in identifying the role of family functioning in the identification and prognosis of medical problems and psychiatric disorders in individuals [6] [7]. Family functioning has been shown in many studies to be one of the main predictors of the emergence of psychopathology [8]. A dysfunctional family has been shown to have an influence on the emergence of non-suicidal self-injury (NSSI) [9] [10]. Furthermore, based on the results of research by Nemati et al. [11] on 4.216 students in Iran, poor family functioning increased the chances of NSSI occurrence by 13 times compared to well-functioning families. Based on some of the research above, this study aims to adapt the family assessment device to the Indonesian language and cultural context, especially in a sample of university students who have a history of self-injurious behavior. This adaptation study is part of a series of ongoing studies in the frame of a multi-method study that has the goal of building an empirical model of the factors that cause the emergence of non-suicidal self-injury in university students.

One tool that is widely used in research measuring family functioning is the McMaster Family Assessment Device (FAD [12] [13]). The McMaster Family Assessment Device (FAD) is a seven-subscale measurement tool developed based on the McMaster Model of Family Functioning (MMFF). The seven subscales contained in the FAD scale are Problem-Solving, Communication, Roles, Affective Responsiveness, Affective Involvement, Behavioral Control, and General Functioning. Of the seven subscales, the seventh scale, or the General Functioning Subscale (FAD-GF), is one of the subscales that has good internal consistency and is most frequently used and adapted separately to various languages, including Spanish, French, Italian, and even Malay [6] [12] [14] [15] [16]. The score range on each item on this scale is 1 to 4, meaning that the higher the score obtained, the better the respondent's perception of family functioning.

The FAD-GF subscale consists of 12 items, is unidimensional, and evaluates general family functioning disorders through six items that reveal healthy family functions (favorable items) and six items that reveal unhealthy family functions (unfavorable items) [17]. This measurement tool has been created since 1983 by Epstein, Baldwin, and Bishop and continues to be used by various researchers today. Adaptation of the complete family functioning scale (FAD) has previously been conducted in Indonesia, including by Mutiah et al. [18] and Qudsyi et al. [19] but no separate adaptation of FAD-GF has been found, especially in samples of students with non-suicidal self-injury history. Given the importance of the existence of reliable and valid measuring instruments in measuring family functioning, especially in participants with typical clinical conditions, this study will attempt to examine the psychometric quality of the FAD-GF in a sample of Indonesian students who have engaged in repeated self-harming behaviors with moderate severity, without suicidal intent.

2 Method

2.1 Studi design

This study is a quantitative study to test the validity and reliability of measuring instruments adapted to the Indonesian language and culture. This research has received research ethics approval from the Research Ethics Committee of the Faculty of Psychology, Gadjah Mada

University, with Number: 11972/UN1/FPSi.1.3/SD/PT.01.04/2023. Data collection was conducted on student participants in the Special Region of Yogyakarta and Central Java, Indonesia.

2.2 Participants

The participants of this study were 102 university students (32 males and 70 females), aged 18 to 25 years. Participants in this study were selected using a purposive sampling technique. The selected participants met the criteria of having a history of moderate severity self-harming behaviours (such as cutting, hitting, biting, etc.), not just behaviours limited to pulling hair, scratching, biting nails, piercing, or tattooing the body. Participants were involved in the study voluntarily.

2.3 Instruments

The McMaster Family Assessment Device General Functioning Subscale (FAD-GF) will measure family functioning in this study. The FAD-GF scale was developed based on the McMaster model of family functioning (MMFF; Cong et al., 2022). The FAD-GF scale is part of the seven subscales of The McMaster Family Assessment Device (FAD) that are most often used separately. The FAD-GF scale consists of 12 questions (Cronbach's alpha reliability value for the scale was 0.92), with 4 Likert scale response options of strongly disagree to strongly agree that evaluate general family pathological conditions [17]. It is a unidimensional measure that evaluates pathological conditions or general family functioning with six items addressing healthy family functioning (2, 4, 6, 8, 10, and 12) with the example item "*Kami merasa diterima apa adanya* [We feel accepted for what we are]". Furthermore, six items addressing unhealthy family functioning (1, 3, 5, 7, 9, and 11) with the example item "*Kami tidak rukun saat bersama* [We don't get along well together]" [17]. Currently, the FAD-GF has been adapted to various languages, including Malay [12] [13], French [6], Portuguese [20], Chinese [21], and Italian [14].

2.4 Procedure

The adaptation process of the McMaster Family Assessment Device-General Functioning Subscale (FAD-GF) was carried out based on the guidelines for the cross-cultural adaptation process of measuring instruments [23] and also referred to several points from the guidelines of the International Test Commission (ITC) Guidelines for Test Adaptation [22]. This adaptation process was carried out through five stages. The first stage is The forward translation stage (the translation of the original scale into an Indonesian translation of the scale). The second stage is the synthesis stage of the forward translation results, which aims to produce a complete translation based on the summary results that refer to the translation results, understanding, or opinions of the two forward translators. The third stage is backward translation, which ensures that the synthesized Indonesian translation does not change the meaning and deviate from the original English scale.

The fourth stage is an expert committee review that aims to consolidate all versions and synthesize the results of the translation of the measuring instrument. This process produced a pre-final version of the measuring instrument for field testing [23].

The fifth stage is the field test, which consists of a mini-field test (initial small-scale trial) and a field test. A mini-field test or mini-initial trial of this research scale was conducted on 10 student respondents from various majors (4 students were identified as having done NSSI). The initial mini-field test was conducted to criticize the quality of the items and instructions of the adapted questionnaire. This pilot test also aimed to check whether there were any errors or deficiencies in the items or instructions on the questionnaire and to identify items or instructions that could not be understood by the respondents [24]. In addition to asking for written input, specifically, the researcher also conducted interviews with each respondent. This interview was conducted to find out the duration of processing time, input related to the content of the questionnaire, and psychological responses or mental conditions of respondents during and after responding to the questionnaire. The field test was then administered to 102 participants who met the NSSID criteria to assess the psychometric properties of the items and the structure of the questionnaire [24]. This analysis aims to identify the quality of the items and seek evidence regarding the validity and reliability of the instrument.

2.4 Data analysis

The data analysis process in this study was carried out using JASP software version 0.18.3 (Intel). The construct validity test was carried out using Confirmatory Factor Analysis (CFA) to test the measurement model and factor load test. The measurement model test was conducted to determine whether the FAD-GF measurement tool met the criteria for goodness of fit as a unidimensional construct. The estimator used is maximum likelihood. Some acceptable fit index criteria include Chi-square; $p > .05$, Root Mean Square Error of Approximation (RMSEA) < .08, Goodness of Fit Index (GFI) ≥ .90, Comparative Fit Index (CFI) ≥ .90, Tucker-Lewis Index (TLI) ≥ .90, Normed Fit Index (NFI) ≥ .90 [25].

Factor loading (λ) analysis was also conducted using confirmatory factor analysis to see whether an item (observed variable) reflects the measured construct (latent variable). The results of the factor loading test can be the basis for retaining or discarding certain items. The factor loading limit that is considered to describe a structure well is equal to or above 0.70, but factor loading above 0.30 is considered to be maintained to fulfill the minimum level for interpreting the structure [26] [27].

The reliability test of the measuring instrument in this study was carried out by looking for internal consistency using Cronbach's alpha coefficient [28]. The instrument is acceptable if it has a Cronbach's alpha value of at least 0.6 or 0.70 [28]. Discrimination power analysis (item-rest correlation) was also conducted in this study. According to Johari et al., items can be categorized as good items if the item-rest correlation is greater than or equal to 0.4 [29].

3 Result

3.1 Participant’s characteristics

Data were collected from 102 university students with a history of self-injurious behaviors (males=32 and females=70) aged 18 to 25 years old (M= 19, SD= 0.9). As much as 70% of the

participants were from Javanese ethnicity, while the rest were from Ambonese, Bataknese, Betawi, Bengkulu, Minang, and Sundanese ethnicities. Participants came from various universities and departments in Central Java and Yogyakarta Special Region.

3.2 Data analysis

The results of confirmatory factor analysis (CFA) of the adapted FAD-GF scale before modification showed the results of Comparative Fit Index (CFI) = 0.922 (fit), Tucker Lewis Index (TLI) = 0.905 (fit), NFI=0.885 (not fit), Root Mean Square Error of Approximation (RMSEA) = 0.105 (not fit), and Goodness of Fit Index (GFI) = 0.968 (fit).
Some modifications were proposed from the CFA results, which involved creating residual correlation pairs between some items. Following the suggestions, the residual covariances between item 4 with item 8 and item 6 with item 12 were included in the modified model. After modifying the model, the modified model showed an increase in Fit index values, namely CFI = 0.953, TLI = 0.941, NFI=0.916, and IFI=0.954. In addition, there were also improvements in other fit measures, including RMSEA = 0.078 and GFI = 0.979.

The modified model plot can be seen in Figure 1.

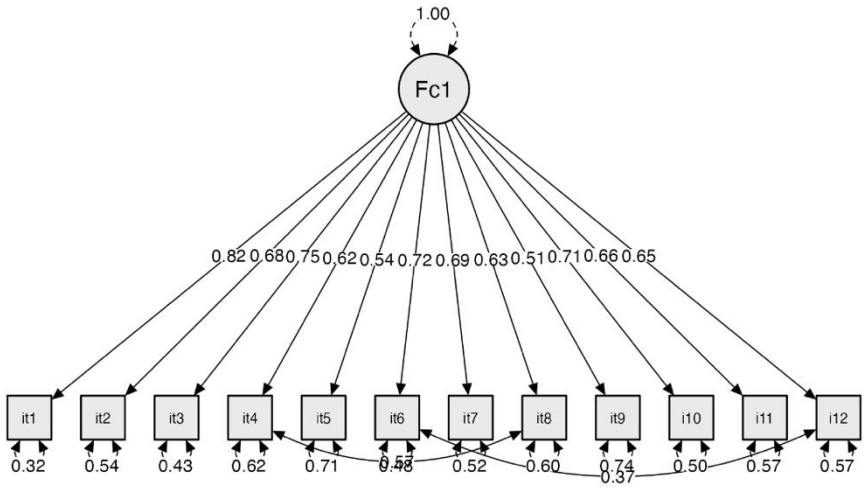

Figure 1. Model plot after modification

Factor loading analysis conducted using confirmatory factor analysis shows the results that all FAD-GF adaptation items have factor loadings in the range of 0.514 - 0.825. factor loading values for each item can be seen in Table 1.

Table 1. Factor loadings

Factor	Indicator	Std. Error	p	Std. Est. (factor loading)
FAD-GF	item 1	0.032	< .001	0.825
	item 2	0.036	< .001	0.679
	item 3	0.032	< .001	0.754
	item 4	0.036	< .001	0.616
	item 5	0.035	< .001	0.542
	item 6	0.036	< .001	0.719
	item 7	0.036	< .001	0.694
	item 8	0.031	< .001	0.633
	item 9	0.037	< .001	0.514
	item 10	0.035	< .001	0.707
	item 11	0.034	< .001	0.655
	item 12	0.038	< .001	0.654

Based on the results of the reliability test, it is known that Cronbach's alpha reliability value for the total scale is 0.876. This indicates that the reliability value for the FAD-GF scale is acceptable because it has a Cronbach's alpha coefficient value above 0.70. It can be concluded that this instrument has strong enough reliability that there will be consistency of results if the measurement is repeated. Furthermore, based on the test results, it is known that all FAD-GF items are classified as good because they have an item-rest correlation value greater than or equal to 0.40. The results of the discrimination power analysis (item-rest correlation coefficient) are presented in Table 4.

Table 2. Item discrimination index

Item	If item dropped	
	Cronbach's α	Item-rest correlation
1. Merencanakan aktivitas keluarga adalah hal yang sulit karena kami tidak saling memahami satu sama lain	0.858	0.711
2. Saat ada masalah, kami dapat meminta dukungan pada satu sama lain.	0.868	0.554
3. Kami tidak bisa berbagi tentang kesedihan yang dirasakan pada satu sama lain	0.862	0.638
4. Setiap anggota keluarga diterima apa adanya	0.868	0.539
5. Kami menghindari membahas tentang ketakutan dan kekhawatiran kami	0.873	0.472
6. Kami dapat mengekspresikan perasaan pada satu sama lain	0.861	0.655
7. Terdapat banyak perasaan negatif dalam keluarga	0.866	0.586
8. Kami merasa diterima apa adanya	0.867	0.574
9. Membuat keputusan adalah hal yang sulit untuk keluarga kami	0.876	0.400
10. Kami mampu membuat keputusan tentang bagaimana memecahkan masalah	0.866	0.583

Table 2. Item discrimination index

Item	If item dropped	
	Cronbach's α	Item-rest correlation
11. Kami tidak rukun saaat bersama	0.869	0.536
12. Kami saling curhat satu sama lain	0.866	0.586

4 Discussion

This study aimed to adapt and examine the psychometric properties of the Indonesian version of the McMaster Family Assessment Device-General Functioning Subscale (FAD-GF) in a sample of university students. The results indicated that the adapted FAD-GF has a unidimensional structure consistent with the structure proposed by the original scale from Epstein et al. [17]. The construct validity test conducted by confirmatory factor analysis (CFA) showed that the hypothesized one-factor model met the criteria of the model fit index values including CFI = 0.953, TLI = 0.941, IFI=0.954, and GFI = 0.979.

These model fit criteria were obtained after several modification indices based on suggestions from the confirmatory factor analysis test results. The modification created residual correlation pairs between some items as described in the results section above.

The first suggestion from the modification indices was to perform residual covariances between item 4 and item 8. When examined, the two items do show similarities related to the sense of belonging. Item 4 states "*Setiap anggota keluarga diterima apa adanya* [Individuals are accepted for what they are]" while item 8 states " *Kami merasa diterima apa adanya* [We feel accepted for what we are]". In Indonesian society, which has a collectivistic culture, individuals tend to view themselves as an inseparable part of the group, this is different from individualist cultures, which tend to view individuals as independent and separate from the group [30] [31]. This leads to a tendency for participants to assume that acceptance of the family as a whole is the same as acceptance of each individual or vice versa.

The second suggestion was to conduct residual covariance between item 6 and item 12, which showed similarities related to bidirectional communication. Item 6 states, "We can express feelings to each other," while item 12 states, "We confide in each other". For Indonesian society in general, there is a hierarchy or level of politeness in the family, especially between children and parents. This is in contrast to the Western world, which tends to consider the relationship between parents and children as equal. For Western societies, expressing emotions openly to other family members may be possible even if there is no reciprocal communication interaction within the family. In contrast, in Indonesia, unidirectional expression of emotions tends to be perceived as possible only if there is a two-way interaction between family members, especially if parents have the openness and acceptance to listen to their children's stories. This is also related to the vertical and horizontal varieties of collectivism and individualism that need to be observed in understanding culture and psychology [30].

Based on the study of some of the items above, it is quite important to look at the role of cultural, country, and racial differences in influencing how individuals will perceive an item. Moreover, most of the research adapted so far in Indonesia is research from Western countries that have cultural differences from Indonesia. Future research is important to examine qualitative differences and cultural influences in the process of thinking and perceiving the world, in order to obtain more accurate measurement results [32]. These characteristics of the influence of racial

and cultural differences on psychometric properties are things that need to be observed in the process of scale adaptation, especially from Western to Eastern cultures [9] [33].

The results of the confirmatory factor analysis test further illustrate that all items in this adaptation scale have factor loading above 0.50 which indicates that the 12 items contribute to the measured construct. Hair et al. [26] suggested that an item that has a factor loading range of around ±0.30 to ±0.40 is said to have been able to fulfill the minimum level to interpret a structure. However, to be classified as an item that defines a structure well, an item should have a factor loading of ±0.70. In the results of this FAD-GF scale adaptation test, all of the items on the scale were categorized as practically necessary [26].

Regarding the reliability test, a measuring instrument is said to be very reliable if it has a reliability coefficient above 0.8 [34]. Based on the test with Cronbach's Alpha method, FAD-GF has a reliability value for the total scale of 0.876. Furthermore, Item-Rest Correlation in this study was conducted to define the relationship of an item with the total score on other items. The rule of thumb for the Item-Rest Correlation value is 0.20, 0.30, or 0.40 [35]. The test results conducted on the FAD-GF scale show that the lowest Item-Rest Correlation is 0.40 (item 9), while the maximum value is 0.71 (item 1). This indicates that all items in this scale are qualified and can be used.

The weaknesses of this study will be presented and will hopefully serve as recommendations for future research. The first weakness is that this study did not conduct validity tests other than those described in the results section. To obtain more optimal results, future research can add other validity test evidence such as convergent and divergent validity to enrich the evidence of measurement results. The strengths and weaknesses of this study are that this research was conducted on a special sample, students with a history of self-injurious behaviors. The strength is that the results of this study are able to fill the measurement gap in clinical samples, but on the other hand, the limited sample size and sampling (both in the form of psychological disorders and data collection areas) make the results of this study still not considered to be able to reflect the measurement results in the population of students with clinical disorders as a whole. Future research can increase the number and method of sampling in order to obtain more representative information.

5 Conclusion

The Indonesian version of the FAD-GF scale, which consists of 12 items, showed acceptable psychometric properties. The results of the construct validity test with confirmatory factor analysis showed that the FAD-GF met the criteria for a good model fit while the reliability test results with Cronbach's alpha coefficient also showed good internal consistency test results. It can be concluded that this scale can be used to measure family functioning in a population of Indonesian university students aged 18-25 years with non-suicidal self-injury. This study is the first to adapt and test the psychometric properties of the FAD-GF Scale into Bahasa Indonesia specifically in a population with self-injury. Of course, this study still has limitations in constructing norms due to the relatively small sample size. In addition, this study also did not test the correlation between family functioning and similar constructs. Based on these various shortcomings, future research can be carried out with a larger sample size and add validity evidence based on correlations with related constructs.

Acknowledgement. This research was carried out without funding assistance from any party, but the research process is part of the Doctoral study funded by a scholarship from Universitas Diponegoro.

References

[1] Moscato, E., Patronick, J., Wade, S.L.: Family functioning and adaptation following pediatric brain tumor: A systematic review. Pediatr Blood Cancer. Vol. 69, (2) (2022)
[2] Carvalho, J., Fernande, O. M., & Relva, I. C.: Family functioning and its relation to parental discipline. Child Adolec Soc Work J. (2017).
[3] Dai, L. & Wang, L.: Review of Family Functioning. Open Journal of Social Sciences. Vol. 3, pp. 134-141. (2015).
[4] Ryan, C.E., Epstein, N.B., Keiner, G.I., Miller, I.W., & Bishop, D.S.: Evaluating and Treating Families: McMaster Approach. Routledge; New York, NY, USA. (2005).
[5] Shek, Daniel TL.: A longitudinal study of Hong Kong adolescents' and parents' perceptions of family functioning and well-being. The Journal of Genetic Psychology, Vol. 159.4, pp. 389-403 (1998)
[6] Speranza, M., Guénolé, F., Revah-Levy, A., Egler, P.J., Negadi, F., Falissard, B.: The French version of the Family Assessment Device. Can. J. Psychiatry. Vol. 57, pp. 570–577 (2012).
[7] Staccini, L., Tomba, E., Grandi, S., & Keitner, G. I.: The evaluation of family functioning by the family assessment device: a systematic review of studies in adult clinical populations. Family process, Vol. 54(1), pp. 94–115 (2015).
[8] White, J., Shelton, K.H., Elgar, F.J.: Prospective associations between the family environment, family cohesion, and psychiatric symptoms among adolescent girls. Child Psychiatry Hum. Dev, Vol. 45, pp. 544–554. (2014).
[9] Shou, Y., Chen, H.-F., Takemura, K., Wu, J., Yang, C.-T., & Wang, M.-C.: Editorial: From West to East: Recent advances in psychometrics and psychological instruments in Asia. Frontiers in Psychology, Vol. 13 (2022).
[10] Ardhiani, L.N., & Retnowati, S.: Understanding Non-Suicidal Self-Injury: Qualitative Study of a Complex Phenomenon. Proceedings of 3rd International Conference on Psychological Studies (ICPsyche). Vol. 3, pp. 84-94. (2022).
[11] Nemati, H., Sahebihagh, M. H., Mahmoodi, M., Ghiasi, A., Ebrahimi, H., Barzanjeh Atri, S., & Mohammadpoorasl, A.: Non-Suicidal Self-Injury and Its Relationship with Family Psychological Function and Perceived Social Support among Iranian High School Students. Journal of research in health sciences, Vol. 20(1) (2020).
[12] Babar, M.G., Bilal, S., Yusof, Z.Y.M., Chinna, K., Doss, J.G., Pau, A.: Cross-cultural adaptation of the General Functioning Scale of the family into the Malay language. IeJSME. Vol.15, pp. 46–56. (2021).
[13] Cong, C. W., Tan, S. A., Nainee, S., & Tan, C. S.: Psychometric Qualities of the McMaster Family Assessment Device-General Functioning Subscale for Malaysian Samples. International journal of environmental research and public health, Vol. 19 (4), 24-40. (2022).
[14] Roncone, R., Rossi, L., Muiere, E., Impallomeni, M., Matteucci, M., Giacomelli, R., Tonietti, G., & Casacchia, M.: The Italian version of the Family Assessment Device. Soc. Psychiatry Psychiatr. Epidemiol., Vol. 33, pp. 451–461 (1998).

[15] Barroilhet, S., Cano-Prous, A., Cervera-Enguix, S., Forjaz, M.J., Guillén-Grima, F.: A Spanish version of the Family Assessment Device. Soc. Psychiatry Psychiatr. Epidemiol. Vol. 44, pp.1051–1065 (2009).
[16] Wo, S.W., Lai, P.S.M., Ong, L.C., Low, W.L., Wu, D.B.C., Nathan, A.M., Wong, C.P.: Factorial validation of the Chinese General Functioning Subscale (GF-12) of the Family Assessment Device in Malaysia. J. Health Transl. Med. Vol. 21, pp. 23–30 (2018).
[17] Epstein, N.B., Baldwin, L.M., Bishop, D.S.: The McMaster Family Assessment Device. J. Marital Fam. Ther. Vol. 9, pp. 171–180. (1983).
[18] Mutiah, D., Mayasari, R., & Deviana, T.: Validating an Indonesian version of the Family Assessment Device among Indonesian Muslim university students during the COVID-19 pandemic. Mental Health, Religion & Culture, Vol. 26(4), pp. 324–338 (2021).
[19] Qudsyi, H., Sa'diyah, S. K., & Mahara, R.: Family functioning, peer support, and student engagement among high school students in Central Java island, Indonesia. In F. L. Gaol, F. Hutagalung, & C. F. Peng (Eds.), The social sciences empowered (pp. 145-152). CRC Press. (2020).
[20] Pires, T., Assis, S. G., Avanci, J. Q., & Pesce, R. P.: Cross-Cultural adaptation of the General Functioning Scale of the Family. Revista de saude publica, Vol. 50, 32. (2016).
[21] Shek D. T.: The General Functioning Scale of the Family Assessment Device: does it work with Chinese adolescents?. Journal of clinical psychology, Vol. 57(12), pp. 1503–1516. (2001).
[22] Hernández, A., Hidalgo, M. D., Hambleton, R. K., & Gómez Benito, J. International test commission guidelines for test adaptation: A criterion checklist. Psicothema, vol. 32, num. 3, pp. 390-398. (2020).
[23] Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B.: Guidelines for the process of cross-cultural adaptation of self-report measures. Spine, Vol. 25(24), pp. 3186-3191. (2000).
[24] Berk, R. A., & Theall, M.: Thirteen strategies to measure college teaching: A consumer's guide to rating scale construction, assessment, and decision-making for faculty, administrators, and clinicians. Routledge. (2006).
[25] Hooper, D., Coughlan, J., & Mullen, M. R.: Structural equation modelling: Guidelines for determining model fit. Electronic Journal of Business Research Methods, Vol. 6. (1), pp. 53–60 (2008).
[26] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E.: Multivariate Data Analysis (8th ed.). Annabel Ainscrow. (2019).
[27] Furr, R. M.: Scale construction and psychometrics for social and personality psychology. SAGE Publication, Inc. (2011).
[28] Taber, K.S.: The use of cronbach's alpha when developing and reporting research instruments in Science Education. Res Sci Educ. Vol. 48, pp. 1273–1296 (2018).
[29] Johari, Johanim, & Yahya, K. K.: An assessment of the reliability and validity of job performance measurement. Jurnal Pengurusan. Vol. 36, pp. 17-31 (2012).
[30] Triandis, H.C. Individualism-collectivism and personality. Journal of personality, Vol. 69(6), pp. 907-924 . (2001).
[31] Moalosi, W. T. S.: Cultural Concepts of Learning and Development. International Journal of Scientific Research in Education, Vol. 5(4), pp. 287-291 (2012).
[32] Roberts S. O., Rizzo M. T.: The psychology of American racism. American Psychologist. Advance online publication. (2020).
[33] Roberts, S. O., Bareket-Shavit, C., Dollins, F. A., Goldie, P. D., and Mortenson, E.: Racial inequality in psychological research: trends of the past and recommendations for the future. Perspect. Psychol. Sci. Vol. 15, pp. 1295–1309. (2020).

[34] Ursachi, G., Horodnic, I. A., & Zait, A.: How reliable are measurement scales? External factors with indirect influence on reliability estimators. Procedia Economics and Finance, Vol. 20, pp. 679–686. (2015).
[35] Zijlmans, E. A. O., Tijmstra, J., van der Ark, L. A., & Sijtsma, K.: Item-Score Reliability in Empirical-Data Sets and Its Relationship With Other Item Indices. Educational and psychological measurement, Vol. 78(6), pp. 998–1020. (2018).