Adaptation of the "Brief Family Relationship Scale" for Measuring Perceived Quality of Family Relationship in the Ethiopian Context

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Abstract

Background: Family psychology is in its infancy in Ethiopia mainly because local tools that assist in research and intervention are non-existent. As a result, family issues, which are vital to human development, are understudied in this context.

Objective: This paper presents an adaptation study of the "Brief Family Relationship Scale" (BFRS) that purports to measure perceived quality of family relationship. Three specific issues were addressed in the validation process: establishing scale reliability, identifying the underlying factor structures, and evidence for validity.

Materials and Methods: In the study, a sample of 101 (46 males and 55 females) who are working in government offices in Addis Ababa participated. Procedures involved forward and backward translation of the English version of the Scale into the local (Amharic) language, establishing content validity through expert ratings, administration of the scale to the target groups and then successive validation measures employing "Satisfaction with Family Life Scale" as an anchor variable.

Results: The findings indicated that the full-scale ($\alpha = 0.70$) as well as the three sub-scales (Cohesion $\alpha = 0.86$, Expressiveness $\alpha = 0.69$, and Conflict resolution $\alpha = 0.60$) have an acceptable reliability index. Validity of the scale was checked through correlation analysis between the anchor variable and Brief Family Relationship Scale (BFRS) yielded a significant value. Exploratory factor analysis has confirmed the three original factor structure of the scale, explaining a total of 48.2% of the variance. Following Exploratory Factor Analysis (EFA), Confirmatory factor analysis (CFA) was made to cross-check the obtained three dimensions. The modified index of CFA confirmed that, the Comparative Fit Index (CFI), Goodness of Fit Index (GFI) (GFI) and Root Mean Square Error of Approximation (RMSEA) are within the desired minimum range. These values suggest that, after the removal of 3 items from the initial 16-items, the previously established domains were confirmed.

Conclusion: It is concluded that the scale has reasonable psychometric properties; as a result, it could be useful for studies and interventions for family relationship issues in Ethiopian context. A further adaption process could be done on adolescents to make the scale valid for other age groups.

Keywords: Cohesion; Conflict; Ethiopia; Expressiveness; Family relationships

1. Introduction

Family is an active whole, comprised of constantly changing interrelationships in which each person in the family impacts the others across a generation (Segrin and Flora, 2018). For example, according to family system theory, a family is made up of interrelated individuals, and each individual has an expected and recurrent impact on the other members of the family, where the process of influencing each other never ends even as most of families behaviors are passed down to their children (Johnson and Ray, 2016). According to family system theory, an individual's behaviors should be understood in

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the context of family relationships. Beliefs, values, emotional warmth, organization, and communication among family members all appear to be intertwined. That is to say, an individual's behavior cannot be explained separately from his or her family environment; thus, each family member's positive and negative behavior is a mirror of his or her family environment(Johnson and Ray, 2016). Healthy family relationships foster trust and respect, which is shown in each family member's warmth, love, affection, support, and care. The quality of family interactions, for example, in terms of closeness between parents, parents and children, and among children themselves, has a significant impact on each family member's life (Olanrewaju *et al.,* 2015). Supportive and nurturing family relationships contribute to wellbeing while abusive and tense family relationships deter family stability and health (Thomas *et al.,* 2017). Evidences indicate that togetherness, acceptance, commitment, resilience, affection, support, communication, sharing activities, appreciation, and conflict management skills are the qualities that promote healthy relationships within a family (Triana *et al.,* 2019).

Because a family cannot be described without considering the relationships among its members, understanding family relationships and quality of life requires use of family functioning measures having proper psychometric properties. There are different measures of family relationship scale today that are with good psychometric properties and, hence, widely used for diagnosing family dynamics including the "Brief Family Relationship Scale" (BFRS). The "Brief Family Relationship Scale (FES)" was adapted from the 'Relationship Dimension' of the "Family Environment Scale" that was developed by Moos and Moos in1986 and consisted of 90 True/ False sorts of items that are organized into ten subscales. Of the ten dimensions of the scale, one is the 'Relationship Dimension' component that in turn is composed of three subscales: cohesion, expressiveness, and conflict (Oliver *et al.,* 1988). Out of the 90 items that make up the 'Family Environment Scale', 27 items represent family relationship dimension. From adolescence through adulthood, the scale has been used to assess the family environment from the views of several informants inside the family, as well as from a single individual among respective family members (Charalampous *et al.,* 2013). That is, among the particular family members an individual over 11/12 years old can fill out the questionnaire representing his/her families. This also explains why the present instrument validated on adults though it was adapted on individuals from 12 to 18 years old. In sum, the scale can be utilized on both adolescents and adults. The scale was designed using the Family Systems Theory (FST) as framework, which views a family as a small group of interconnected and interdependent individuals.

Despite the widespread use of FES in family environment research, there has long been a debate about the instruments' psychometric qualities, including reliability and validity. For example, Oliver *et al.* (1988) stated that because scores on the Family Environment Scale have been shown to vary as a function of age, socio-economic status of respondents and family size, there is a good reason to suppose that its factor structure is not necessarily stable across samples and varies as a function of characteristics of samples. With the same token, from its origin the scale has low to high reliability scores for different dimensions of the scale especially expressiveness/ communication and conflict. For example in terms of reliability, the originally reported alpha coefficients for each subscale ranged from .64 to .79 with the acceptable benchmark to be generally above .60 (Charalampous *et al.,* 2013).

Due to this and other factors, Fok *et al.* (2014), have adapted the 'Brief Family Relationship Scale' having 16 items with three dimensions (cohesion, expressiveness, and conflict) from the relationship dimension of the Family Environment Scale. The Brief Family Relationship Scale got the present name after the family relationship dimensions of 27 items were tried out on Alaska Native youth, USA. Alaska Native communities are indigenous people living in Alaska, USA, Barnhardt (2018). The common ethnic groups in Alaska include Eskimos, Indians, and Aleuts, together known as Alaska Natives. The large majority of non-Native people are migrants from the Lower 48 states, along with increasing numbers of Asian and Latin. Rural Alaska is primarily populated by Alaska Natives who live in settlements with populations ranging from 25 to 5,000 people. Despite the fact that an increasing number of Native people dwell in the state's urban areas, the labels "rural" and "Native" are commonly interchanged. Alaska Natives that live in rural locations have a distinct and distinct way of life (Barnhardt, 2018). Hence, Brief Family Relationship Scale was tested for psychometric properties and internal structure with participants aged 12 to 18 years old; predominately Alaska Native adolescents from rural, remote communities in USA (Fok *et al.,* 2014). Results demonstrated that a subset of the adapted items function satisfactorily, a three-

response alternative format ("Not at all" "Somewhat" and "A lot") provided meaningful information, and the subscales' underlying structure is best described through three distinct first-order factors, organized under one higher-order factor. Convergent and discriminant validity of the Brief Family Relationship Scale was assessed through correlational analysis. The scale with 16-items has acceptable CFA fit, χ^2 (101) = 164.9, χ^2 /df = 1.63, GFI = 0.93, CFI = 0.95, and RMSEA = 0.05. Internal consistency was acceptable for Cohesion (α = 0.83) and Conflict (α = 0.80) and for the full-scale BFRS (α = .88) and Expressiveness (α = 0.65) (Fok *et al.,* 2014). The scale has also good relationship with anchor variables Communal Mastery Family Scale scores (r = 0.51, P < 0.01), the Reasons for Life Scale scores (r = 0.48, p < 0.01) (Fok *et al.,* 2014).

Despite the strong psychometric properties of BFRS, evidence is lacking as to how far it would persist with these features in contexts like Ethiopia. Ethiopia retains a culture in which marriage and family are highly valued, extended family is the norm, the different religions, widely articulate divergent views regarding matrimonial issues, the status of women and the roles each family members purport to play. The climatic and ecological conditions are quite varied and variations in ethnic and cultural makeup of the country, too, are equally high. Besides this, Ethiopia is also among the countries that follow collectivist cultural orientations (Nsamanang, 2010). Given all these diversities in Ethiopia, it is not feasible to use imported instruments without validating them against the Ethiopian context. Basically, the scale was developed and being used in the western context where the culture of the society appreciate independence over interdependence, competition over cooperation, better technological advancement, better economic development and etc. whereas in Ethiopia context things are different. For example, the value family put to its members' interaction, communication, supporting each other, providing sympathy to each other, when need be, to mention a few. Hence, it is worthy then to conduct this validation because of two major reasons. Firstly, even though the scale has met the statistical qualities of a standardized instrument, to the best knowledge of the researchers the present instrument has not been validated in the Ethiopian context particularly in Amharic language. Incase if validated so far, given the nature of Ethiopian diversity in terms of language and culture, it is no doubt that further research needs to be conducted until established knowledge will be obtained as regards the scale. Secondly, since its adaptation in 2014, in USA, there is no data base review evidence that indicate the validation of the Brief Family Relationship Scale in another context in general and in Ethiopian context in particular specifically in Amharic language. Therefore, the scale is worth validating in the Ethiopian context. Ultimately, the following specific objectives were forwarded for the scale validation:

1. Examine the internal consistency of the Brief Family Relationship Scale;
2. Assess the evidence for the (content, construct, divergent and discriminant) validity of the Brief Family Relationship Scale and
3. Explore the underlying structure of the Brief Family Relationship Scale by employing Exploratory and Confirmatory factor analysis

Model Employed for Scale Adaptation Process

In fact, there is no globally agreed-upon procedure for validating instruments in a different cultural context. However, during the current validation exercise, (Gjersing *et al.*, 2010)'s model for the adaptation of research instrument in diverse cultures was used. According to this model, the instrument/scale validation process should at least include checking item equivalency, back-and-forth instrument translation, synthesizing the translated version, expert evaluation, and finally employing exploratory and confirmatory factor analysis.

2. Materials and Methods

2.1. Design

A Cross-Sectional Research Design was employed to facilitate the present instrument validation study. The selected design was found to be appropriate because it allowed involving participants from a wider spectrum of age ranges; which in the present case is 20- 60 years. The design is also relatively inexpensive and takes little time to conduct. In an event where participants of different age groups like the present study and one-time data collection is planned, the appropriate research design is cross-sectional research design (Levin, 2006).

2.2. Study Area

Addis Ababa, the capital city of Ethiopia, was the study area where different international organizations are based. Since Addis Ababa is the capital city of Ethiopia, it is possible to find diversity of adults working in government offices who came from different corners of the country in such way that it is possible to deduce that the present

adaption process reflects the inclusive features of the Ethiopian situation.

2.3. Participants

Addis Ababa has ten sub-cities of which Kirkos and Nefas-Silk are amongst them. Kirkos sub-city has a population of 235,441 (Male: 110,069, Female: 125,372) while Nefas-Silk has an estimated population of 335, 74 (Male: 158,126, Female: 177,614) (Aklilu and Necha, 2018).

Concerning sample size determination, suggestion from some validation experts was taken into account. For example, Comrey (2013) suggested a range of minimum sample sizes, from 50 (very poor) to 1,000 (excellent) and advised researchers to obtain sample sizes larger than 500. Gorsuch (1988) characterized sample sizes above 200 as large and below 50 as small. However, Tabachnick and Fidell (2007) suggested 5 people for 1 item ratio. Keeping in view the recommendations of these experts, the present study considered a total sample of 101 adults (46 males and 55 females). The data for this study were obtained from the aforementioned sub cities, Kirkos and Nefas Silk. There were only ten sub cities in Addis Ababa before data for this study was collected, and one sub city was added only after the data for the study was collected. Accordingly, the two sub cities were chosen using a lottery method among the city's ten sub cities then. Consequently, from the government employers in the Kirkos sub city 44, and from Nefas Silk sub city 57 employees were selected randomly balancing both sexes respectively. As a reminder, the researchers did not choose to be careful in selecting the sub cities for the current study because government employers' economic and living statuses in Addis Ababa are virtually identical, and this is why the lottery method was used to select the previously mentioned sub cities.

2.4. Measures

Two measures were employed for the validation purpose: the main scale (the Brief Family Relationship Scale, BFRS) and the anchor scale (Satisfaction with Family Life Scale). The 'Brief Family Relationship Scale' (BFRS) was adapted from Family Environment Scale in 2014 by (Fok *et al.,* 2014) to measure family relationship. The scale has a total of 16 items and three factors namely, cohesion (7 items), expressiveness (3 items), and conflict (6) items respectively. The scale has an overall Internal consistency reliability of (α = 0.88). For Cohesion factor (α = 0.83), Conflict factor (α = 0.80), and for Expressiveness (α = 0.65). The Brief Family Relationship Scale was scored using a 3-point Likert scale and the participants are then required to rate the degree of how much they agree with each of the statements on a scale of 1-5 (with '1' being 'Not at All', '3'being 'Somewhat' and '5' being 'Alot'). From adolescence through adulthood, the scale has been used to assess the family relationship from the views of several informants inside the family, as well as from a single individual among respective family members (Charalampous *et al.,* 2013). That is, among the particular family members an individual over 11/12 years old can fill out the questionnaire representing his/her families. This also explains why the present instrument validated on adults. As regards the meanings of the scale, high score on cohesion dimensions represents better bonding and interaction among family members and vice versa. For expressiveness dimension, high score on expressiveness dimension represents better sharing of ideas and understanding each other among family members and vice versa. Items on conflict dimensions will be reverse coded.

The 'Satisfaction with Family Life Scale' (SWFL) (Zabriskie and McCormick, 2003) is a modified version of the 'Satisfaction with Life scale' used to measure life satisfaction. The SWFL scale is composed of five items that require respondents to agree or disagree with global statements about family life on a 7-point Likert-type scale ranging from 1 = strongly disagree to 7 = strongly agree. Scores are calculated by summing all items and producing satisfaction with family life score with a possible range of 5 to 35. Descriptive data for the SWFL scale were collected from a variety of family populations and from multiple perspectives, including a parent and young adolescent child (11 to 15 years old) within each family (Zabriskie and Ward, 2013). The SWFL scale appears to measure a single dimension. The consistency of the SWFL factor analyses suggests the scale is accurately capturing family satisfaction across time, place, and culture, which supports its possible use as a universal instrument in measuring family satisfaction. Across all samples, a consistent unidimensional factor structure was maintained, with Cronbach's alpha ranging from 0.94 to 0.79. Evidence of usability, criterion, and construct validity were also established (Zabriskie and Ward, 2013).

The reason for selecting 'Satisfaction *with Family Life scale'* as an anchor scale/ variable is that: (1) similarity of the anchor scale to the main scale in terms of purpose (e.g. both focus on family functioning; that refers to

relationship, interaction, communication etc.), content (similarity of some of the contents of the both measures) and approach; (2) robust psychometric properties of this anchor variable, (e.g., very high reliability indices, content and construct validity of the scale); (3) recommendation by experts used in the previous study about content, context, and purpose- relevance of the tool to the research setting; for example, Brief Family Relationship Scale and family satisfaction scale are theoretically related constructs (DeVellis, 2003); and (4) its simplicity and feasibility of use.

2.5. Procedures

Validation of the present instrument went through different stages beginning from checking the face and content validity of the scale using three experts in the field. Concerning face and content validity of the scale, two PhD holders in psychology and one professor from the same discipline were requested to check the scale's feasibility in light of relevance, likely effectiveness, appropriateness, clarity and conceptual scope where they endorsed the two scales along these criteria. Accordingly, the expertise came to agreement that the scales were considered appropriate for use in the stipulated age groups from 12 years onwards confirm to the scale's original guideline. Once decision was reached to use the scales as it is, the scales were then translated forward from English to the native language (Amharic) and then backward from the Amharic version to English by bilingual language experts, one of whom was a PhD in English as a Foreign Language and the other an MA in Amharic Language. Differences noted in the two English versions were continuously inspected until such time that full congruence was achieved. Once equivalence was established in the translations through successive adjustments of phrasing, the scale was administered to the participants of the study.

Procedure of data collection: After participants of the study were identified, they were asked for the consent of participation to the study and oriented about the purpose and confidentiality of their response. Following this, convenient time for participants to fill out the questionnaire was identified. Hence, almost all participants were expressed their willingness to fill out the survey questionnaire during their tea break time on weekdays at their work place. In addition, the respondents were encouraged to respond honestly to all items. Accordingly, data collection was made as needed.

Ethical consideration: The data were collected after the consent of the respondent was achieved. Confidentiality of the data collected from the participants was assured and guaranteed and the results would be used for academic purposes and nothing more.

2.6. Data Analysis

Instrument validation was begun with describing demographic characteristics of participants followed by exploring the internal consistency of the Brief Family Relationship Scale and its subscales along with anchor variable (Satisfaction with Family Life Scale) using Cronbach alpha internal consistency test. To assess the evidence for the validity of the Brief Family Relationship Scale, Pearson product- moment correlation coefficient was carried out to check the relationship between being validated variable (Brief Family Relationship Scale) and anchor variable (Satisfaction with Family Life Scale) and explain its relationship to the validity of the scale being validated. Principal factor analysis with a Varimax rotation was used to explore the structure underlying the 16 items and construct validity of the scale. The inclusion or exclusion of an item in a construct was determined by examining factor loadings and Cronbach alpha to identify whether the scale sufficiently measures the same underlying construct. The inclusion or exclusion of an item in a construct was determined by factor loadings. Items with Pearson's correlation coefficient <0.40 were excluded from further analysis following the suggestion of Souza *et al.* (2017) Confirmatory factor analysis was carried out to test the factor structures identified in the exploratory factor analysis. The completed data were analyzed using a statistical package for social science (SPSS) Version 24 and (AMOS) version 24.

3. Results

In this section, demographic characteristics of the participants and the obtained results are presented respectively based on the specific objectives.

3.1. Demographic Characteristics of the Study Participants

In the study, a total of 101 (46 males and 55 females) individuals were participated. Out of the total participants', 70.3% of them were married whereas the rest 29.7% of them were single. Concerning the ages of participants, from the ages of 20 to 60 was participated. Participants who had the educational level of certificate to second degree holders were involved in the study.

3.2. Reliability of the Scales

Internal consistency measure was applied to estimate reliability indices of the two scales and sub-scales. As indicated in Table 1, the internal consistency reliability of the scales and subscales were within the acceptable range. For example, according to Griethuijsen *et al.* (2014) there is no universally agreed rule for determining alpha level as acceptable or not, however, alpha level above 0.60 is acceptable and useful. In support of this notion, Mun *et al.* (2015) argued that, while different scholars have suggested different alpha levels as acceptable, alpha levels greater than 0.60 are acceptable and useful. The same token, Excellent reliability (0.90 and above), high reliability (0.70–0.90), moderate reliability (0.50–0.70), and low reliability (0.50 and below) are the four cut-off values proposed by Taherdoost (2016). Furthermore, Hajjar (2018) stated that alpha level between 0.6 and 0.8 is acceptable. Though it appears old source, Hulin *et al.* (2001), suggested that the general recommendation of acceptance is α values of 0.60–0.70, while α value of 0.80 or above is a very good level. However, values higher than 0.95 are not necessarily good, since this may be an indication of redundancy.

Some differences between the original Cronbach alpha results and the present obtained results were reported (Table 1). This could be attributed to such factors as sample size, nature of participants that participated in the study, situations in which participants fill out the scale others. Level of education, motivational factors (existence of a reward for questionnaire completion, relevance of the study for the investigated population, gender of the survey operator); and environmental factors (type of administration, level of noise, intimacy during questionnaire completion) are some of the factors that influence the level of Cronback alpha results Ursachi *et al.* (2015). In connection to the present argument, Taber (2018) after reviewing different research article on reliability of the scales urged that despite many authors following a rule-of-thumb that alpha should reach 0.70 for an instrument to have an acceptable level of internal-consistency, there are limited grounds for adopting such a heuristic. That is, it is not always the case that an extremely high alpha value is a positive thing.

A high value does not necessarily suggest that an instrument or scale is one-dimensional, and in some circumstances, a very high value may indicate inefficient item redundancy. The current instrument validation did not, in fact, end with reliability assessment. Exploratory and confirmatory factor analysis was used in addition to Cronbach alpha internal consistency reliability test. According to (Taherdoost, 2016) to run for exploratory factor analysis, reliability of the scale should be equal to or above = 0.60, which the current obtained reliability of each dimension of the scale was qualified for and recommended for further analysis (i.e., running exploratory and confirmatory factor analysis) which the present researchers did.

Table 1. Internal consistency reliability Cronbach alpha results for BFRS, subscales and anchor variable.

Variables	No. of items	Original Cronbach α	Current Cronbach α
Brief Family Relationship Scale (BFRS)	16	0.88	0.70
• Family Cohesion	7	0.83	0.86
• Expressiveness	3	0.65	0.69
• Conflict Resolution	6	0.80	0.60
Satisfaction with family life (SWFL)	5	0.94 to 0.79	0.82

3.3. Validity of the Scale

Convergent and discriminant evidence for validity of BFRS were reported below in the Table 2.

3.3.1. Convergent validity

Convergent validity of Brief Family Relationship Scale was established after examining the relationship between BFRS with an anchor variable, Satisfaction with Family life scale (SWFLS) which is also theoretically related constructs with BFRS (DeVellis, 2003). Hence, a statistically significant relationship between BFRS and Satisfaction with Family Life Scale (SWFLS) was achieved ($r = 0.187^*$, $P < 0.01$). In the same table, a significant relationship between cohesion dimension of Brief Family Relationship Scale with an anchor variable i.e., Satisfaction with Family Life Scale was reported ($r = 0.220^{**}$, $P < 0.01$). In tune with this finding, the factorial

loads obtained from Exploratory Factor Analysis for all items of the scale proved that the scale has strong convergent validity where all items have loaded above .40 on the scale. In light with Souza *et al.* (2017) suggestion in which they stated that at convergent validity, the items that indicate a specific construct must have a high proportion of variance in common and high factorial loads indicate that they converge to a common point, that is, there is convergent validity. In tune with Souza *et al.* (2017) suggestion, each item of the present validating scale was loaded more than 0.60 variance on the scale that clearly depicts convergent validity of the scale.

3.3.2. Discriminant validity

The scale has also high discriminant validity such that the correlation between SWFLS and family conflict dimension is almost zero ($r = 0.004$, $P > 0.05$).

Table 2. Convergent and Discriminant Evidence for Validity of BFRS.

Variables	BFRS	Expressiveness	Conflict	Cohesion	SWFLS
BFRS	1				
Expressiveness	0.379**				
Conflict	0.558**	–0.190			
Cohesion	0.853**	0.134	0.226*		
SWFRS	0.187*	0.085	0.004	0.220**	1

Note: ** and ** refer to correlation, which is significant at 0.05 and 0.01 probability level (2-tailed), respectively.*

3.4. Exploratory Factor Analysis (Principal Component Analysis)

Exploratory factor analysis was employed to check the underlying structure of BFRS. Originally the scale has three dimensions as follows:

Cohesion with 7 items (*In our family we really help and support each other, in our family we spend a lot of time doing things together at home, in our family we work hard at what we do in our home, in our family there is a feeling of togetherness, my family members really support each other, I am proud to be a part of our family, in our family we really get along well with each other).*

Expressiveness with 3 items (*in our family we can talk openly in our home, in our family we sometimes tell each other about our personal problems and, in our family, we begin discussions easily*) and

Conflict with reversely coded 6 items (*in our family we argue a lot, in our family we are really mad at each other a lot, in our family we lose our tempers a lot, in our family we often put down each other, my family members sometimes are violent and, in our family, we raise our voice when we are mad*).

The 16 items of the Brief family Relationship Scale (BFRS) were subjected to principal components analysis (PCA) using SPSS version 24. Before performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.30 and above. The Kaiser Meyer-Olkin value was 0.681, exceeding the recommended value of 0.60 (Revelle, 2016) and Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. Principal components analysis revealed the presence of the following three components with eigenvalues exceeding 1, explaining 22.08%, 16% and 10.50% of the variance, respectively.

Component 1 (cohesion dimension) involves four items:

- *In our family, we really help and support each other,*
- *In our family, we spend a lot of time doing things together at home,*
- *In our family, we work hard at what we do in our home, and*
- *In our family, there is a feeling of togetherness.*

Component 2 involves the following 'Expressiveness dimension' items:

- *In our family, we can talk openly in our home,*
- *In our family, we sometimes tell each other about our personal problems and*
- *In our family, we begin discussions easily.*

Component 3 involves conflict dimension with six items:

- *In our family, we lose our tempers a lot,*
- *In our family, we often put down each other,*
- *My family members sometimes are violent,*
- *In our family, we raise our voice when we are mad,*
- *In our family, we argue a lot, and*
- *In our family we are really mad at each other a lot.*

An inspection of the scree plot revealed a clear break after the third component. Using Catell's scree test, it was decided to retain three components for further investigation. The three-component solution explained a total of 48.20% of the variance.

Confirmatory factor analysis was employed to cross validate the factor structure identified by the exploratory analysis. This analysis was carried out to determine if the factor model identified by the exploratory analysis was a good fit for the hypothesized factor model. The goodness of fit for the competing models was evaluated through fit indices: Root Mean Square Error of Approximation (RMSEA); Comparative Fit Index (CFI); chi-square test, BIC and Goodness-of-Fit Index (GFI). The results are presented in Table 3.

Table 3. Model fit indexes of first-order confirmatory factor analysis.

No of items	χ^2 (df)	BIC	GFI	CFI	RMSEA
16	1.989	362.399	0.792	0.763	0.099

First round confirmatory factor analysis was made to examine the fitness of the model such that the obtained result was not fit to the existing model suggested by the developer of the Brief Family Relationship Scale (BFRS) χ^2 (101) = 200.869, χ^2/df = 1.989, GFI = 0.792, CFI = 0.763, and RMSEA = 0.099. The figure of first round confirmatory analysis presented as follows:

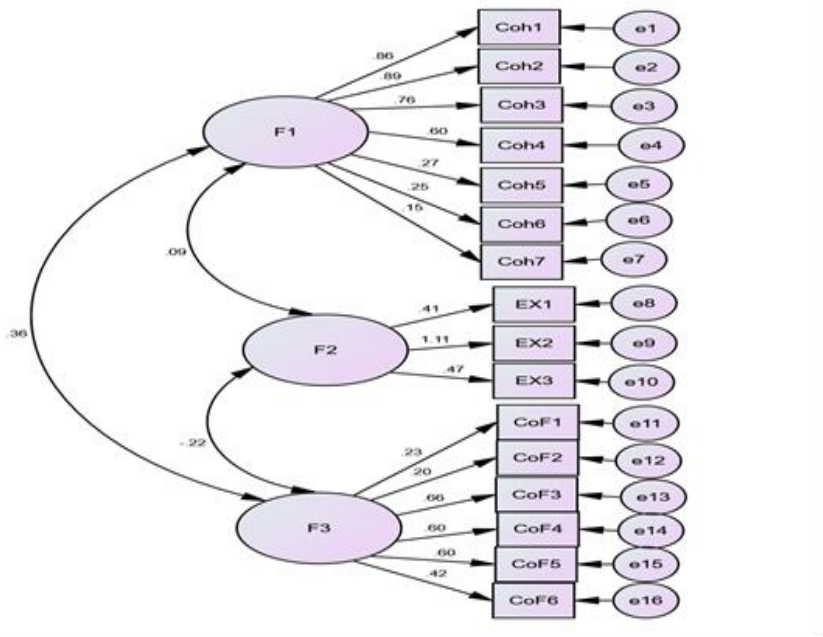

Figure 1. First order confirmatory factor analysis.

As can be seen from the model, originally, the scale has three dimensions such as cohesion (seven items), expressiveness (communication) (three items) and conflict (six items). However, while confirmatory factor analysis was made, the model fails to fit to the originally suggested model. This unfitness of the first-order model gave rise to running for post hoc modification presented (Table 4). Post hoc modification indices were conducted employing confirmatory factor analysis such that great improvement to fit the existing model was observed χ^2 (98) = 144.95, χ^2 /df = 1.479, GFI = 0.851, CFI = 0.889, and RMSEA = 0.069. RMSEA values ranging from 0.05 to 0.08 are indicative of a reasonable fit (MacCallum *et al.,* 1996; Tabachnick and Fidell*,* 2007).

Table 4. Post hoc modification indexes.

No. of items	χ^2 (df)	BIC	GFI	CFI	RMSEA
16	1.479	320.331	0.851	0.889	0.069

As can be seen from Figure 2, to make a model modification, after correlation of three items of the same factor (Cohesion) that seems to be redundant in measuring the same construct such as, "*my family members really support each other, I am proud to be a part of our family and in our family, we really get along well with each other*", were made, post hoc model modification analysis was found to be reasonably fit. Owing to the incompatibility of these three items, they were removed from the scale and following the removal of these three items from the cohesion dimension of the scale, the Cronbach alpha result of the factor improved from α 0.79 to 0.86.

In a nutshell, the original three subscales of the scale (Cohesion, Expressiveness, and Conflict resolution) are retained in the current adaption process of the Brief Family Relationship Scale to our setting, with the exception of the three items retracted from the cohesion dimension of the scale. Hence, in the present adaptation, the total obtained Cronbach's alpha result of the scale is α = 0.70 whereas for each dimension of the scale (Cohesion (4 items) α = 0.86, Expressiveness (3 items) α = 0.69 and Conflict resolution (6 items) α = 0.60) were reported and suggested to use in the Ethiopian context for the same purpose. The current obtained result may be challenged with new research findings that would be conducted by other interested researchers in the Ethiopian context. Hence, until the current conclusion is convincingly contested by the results of future study, the three retracted items from the cohesiveness dimension are proposed to be deleted from the scale when collecting data in the Ethiopian context while using the scale for the intended purpose.

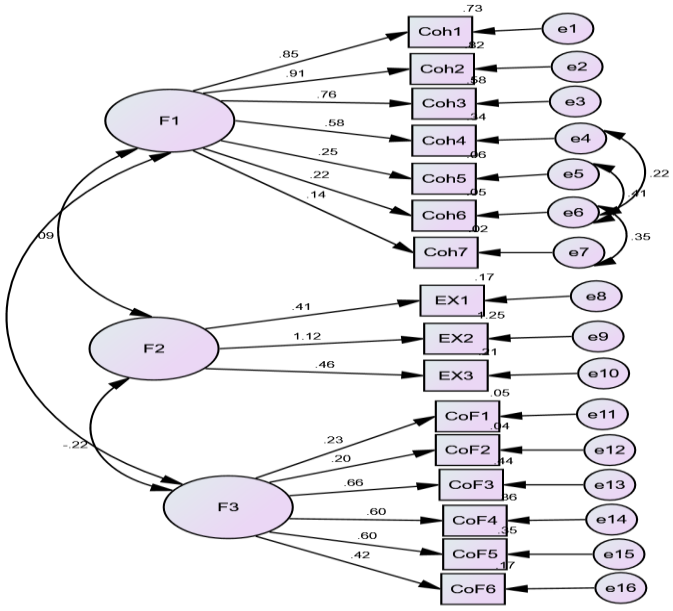

Figure 2. Post hoc confirmatory factor analysis.

4. Discussion

It is common in Ethiopia that the tools used to measure different family concerns have been developed in English-speaking countries that could influence the effective use of the scales to the Ethiopian local context. Owing to cultural nonequivalence, some items of the scales may not accurately measure the domains of the construct under consideration. Because, in Ethiopian context, family psychology is in its infancy stage, validated instrument set to measure family relationship is hardly found. Thus, a validated tool designed to measure family relationship is needed. Instruments that are aimed to measure family relationship are required to be validated prior to being administered to other populations, while maintaining the context of the original assessment tool. Having this information in mind, an attempt was made to adapt Brief Family Relationship Scale to the Ethiopian

context. Consequently, in the present study three specific issues were addressed in the validation process: Reliability, underlying factor structures, and evidence for validity. Adequate internal consistency was found for each of the subscales as well as the overall scale. Thus, the obtained result proved that the Brief Family Relationship Scale has a reasonable internal consistency with overall Cronbach alpha result of ($\alpha = 0.70$) as well as the three sub-scales of the scale: Cohesion ($\alpha = 0.86$), Expressiveness ($\alpha = 0.69$), and Conflict ($\alpha = 0.60$) in the Ethiopian context. In support of the present findings Griethuijsen *et al.* (2014), urged that although there is no universally agreed rule for determining alpha level as acceptable or not, alpha level above 0.60 is acceptable and useful. Consistent with Griethuijsen his associates' statement, Mun *et al.,* (2015) argued that while different scholars have suggested different alpha levels as acceptable, alpha levels greater than 0.60 are acceptable and useful. With the same token, (Paiva *et al.,* 2014) urged scales with internal consistency 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good level. Furthermore, Hajjar (2018) stated that alpha level between 0.6 and 0.8 is acceptable. A high value does not necessarily suggest that an instrument or scale is one-dimensional, and in some circumstances, a very high value may indicate inefficient item redundancy. Indeed, according to Paiva *et al.* (2014), divergences in internal consistency could be attributed to the influence of cultural and social contexts of participants. Alpha level can be fluctuated owing to different factors including, but not limited to, cultural differences, number of items, sample size, psychological readiness of participants while filling out the questionnaire. Hence, it is not striking if the alpha level difference between the original instrument and the current validated instrument obtained as there is clear and visible cultural difference between the setting where the instrument was originally developed, Alaska, USA and Ethiopian cultural context. However, the most important and promising thing is that although slight alpha level difference was reported between the original scale and the present scale, the original dimensions of the scale were maintained in the Ethiopian context. That it means, originally the scale has three dimensions (Cohesion, Expressiveness and Conflict) and again in the Ethiopian context it maintains its three dimensions as it is.

In the present adaptation process of the Brief Family Relationship Scale three dimension factors that explained 48.20% of the overall variability in the data was reported. The percentage of explanation of the overall variability was reasonable. After Confirmatory factor analysis was employed to cross validate the factor structure identified by the exploratory factor analysis, three items from the initial cohesion dimension of Brief Family Relationship Scale were removed. The removed items were; *my family members really support each other, I am proud to be a part of our family and in our family, we really get along well with each other.* Following the removal of the mentioned items from the model, the previously established dimensions of the scale were confirmed. After the elimination of the three items, the present modified model confirmed to the original/ established model of Brief Family Relationship Scale developed by (Fok *et al.,* 2014).

The incompetence of the three items could be attributed to different factors such that cultural and language nonequivalence, poor fitness of the items to non-western context are some of them. In support of the present argument (Charalampous *et al.,* 2013) in their attempts to validate family environmental scale in Greek culture, they came up with low reliabilities with the conflict dimension of the scale where they stated concerns that some items may not have equivalent meaning across cultures which also hold true for some of the dimensions of Brief Family Relationship scale in the present adaptation process to the Ethiopian context. Similarly, Omar *et al.* (2010) in their effort to validate family environmental scale in Malaysian culture they came to conclude that for all dimensions of the scale Cronback alpha result between 0.61–0.70 were reported. This indicates how the scale has also a history of low reliability status in Malaysian culture as well. This could be explained such that in the sense that Malaysians follow collectivist cultural orientation like Ethiopians (Nsamanang, 2010), this could be served as a justification for the reason why low Cronback alpha score were reported for the some of the dimensions of the scale though the total Cronback alpha result of the scale is within acceptable range.

5. Conclusion and Recommendations

This study used statistical analyses and a review of the literature to discover a construct validity of Brief Family Relationship Scale (BFRS) in the Ethiopian context. The principal findings of this study confirmed that the BFRS is comprised of three sub-factors, with acceptable internal consistency for the full-scale as well as the three sub-scales: Cohesion, Expressiveness and Conflict. The cohesion dimension of the scale has also a good relationship with anchor variable (i.e., satisfaction with

Family Life Scale). Convergent and discriminant validity of the sub-factors was demonstrated in the process of adaptation. Based on the present study, three items of cohesion dimension such as "*my family members really support each other, "I am proud to be a part of our family, and in our family, we really get along well with each other*" are proved to be retracted from the original cohesion dimension of the scale through both Exploratory and Confirmatory factor analysis. After performing a factorial analysis, our findings offer evidence of the validity and reliability of a final 13-item to measure the three dimensions of Brief Family Relationship Scale (Cohesion, Expressiveness and Conflict). Given the psychometric features of the scale, we can deduce that this scale is a valid tool to measure status of family relationship in the Ethiopian context. Therefore, the scale can be helpful for the research and interventions regarding family relationship affairs in the Ethiopian context. This is, therefore, until the present finding proved wrong may be with a large sample size more than the number of samples involved in the present study by other interested researchers, the mentioned three items are suggested to be removed from the cohesion dimension. Similar research with a large sample size, inclusive of all age groups, and diversity that entertain the real Ethiopia picture need to be conducted to further affirm or disprove the present obtained findings. The validation of the Brief Family Relationship Scale is hoped to stimulate the advance of studies in the field of family relationship in the Ethiopian context.

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7. References

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