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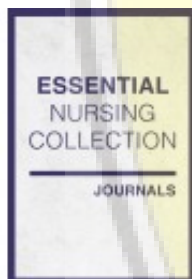
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# **Development and Testing of the Family Structure and Family Functions Scale for Parents Providing Adolescent Reproductive Health Based on the Friedman Family Assessment Model**

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**Background and Purpose:** To describe the development and testing of a psychometric of Family Structure and Functions (FSF) that measures parents' ability to provide adolescent reproductive health (ARH). **Methods:** A cross-sectional study of Indonesian parents ( $n = 525$ ). Multifactors FSF-ARH were examined using construct validity (exploratory factor analysis [EFA] and confirmatory factor analysis [CFA]) and content validity (Content Validity Index [CVI]). Internal consistency was explored using Cronbach's  $\alpha$  coefficient. **Results:** EFA revealed nine factors with 26 items accounting for 61.64% of explained variance and CFA validity testing fit for the construct validity of FSF-ARH. The



CVI indicated adequate content validity (0.80–0.10) and acceptable internal consistency (0.70). Conclusions: FSF-ARH contains valid, reliable, and robust measures although some subscales performed moderate reliability, establishing the purpose for further research.

**Keywords:** Friedman Family Assessment Model; adolescent reproductive health; psychometric properties; confirmatory factor analysis

Adolescents face barriers to acquiring adolescent reproductive health (ARH) information and care. Even those able to find accurate information about their health and rights may be unable to access the services needed to protect their health (United Nations Population Funds, 2016). Families play an essential role in facilitating and supporting ARH needs (Drake & Ginsburg, 2012). However, discussing ARH and educating adolescents within the family was taboo based on Indonesia's social and cultural context (Susanto, Kimura, & Tsuda, 2016a). In family health-care services, family as systems could be assessed through the Friedman Family Assessment Model (FFAM; Friedman, Bowden, & Jones, 2003) to measure family structure and family function (FSF) during the family life cycle with adolescent children. Therefore, it is essential to use the FFAM to measure the FSF of parents when providing ARH in an Indonesian context.

Family environment is an important factor in adolescent development (Drake & Ginsburg, 2012). Improper functions of parenting—such as communication, role performance, and norm standards—cause adolescent conduct risky ARH behaviors (Huang, Murphy, & Hser, 2011). Scientific evidence has shown that family structure (Wamoyi & Wight, 2014), family communication (Coetsee et al., 2014), the family microsystem (Lindberg & Maddow-Zimet, 2012), and family connectedness (Markham et al., 2010) are determinants in the protection and control of ARH. Therefore, among family life cycle developmental stages, maintaining a functional family while children are adolescents is a very large concern for parents.

Evidence has shown that Indonesian parents feel a sense of taboo or are uncomfortable or afraid when discussing sex education with their adolescents (Suwarni, Ismail, Prabandari, & Adiyanti, 2015). Previous studies in Indonesia reported that more boys (56.6%) than girls (43.7%) indicated active ARH behavior (Susanto et al., 2016a), instead, that more girls (40.6%) than boys (37.1%) indicated have negative attitudes toward ARH (Susanto et al., 2016b). Meanwhile, there has been an increase of approximately 30% in the number of cases of sexual violence, which is the equivalent of 35 additional people per day being victims of sexual violence in Indonesia (Trimaya, 2015); reported sexual violence included rape (72%), sexual abuse (18%), and sexual harassment (5%) (Komisi Nasional Perlindungan Perempuan dan Anak, 2016). On the other hand, based on culture and norms, the social environment, and religion in Indonesia (Utomo & McDonald, 2009), there is a certain sensitivity, as well as taboos, regarding discussing ARH (Naafs & White, 2012) in the family, school, and community. These findings suggest that the greatest problems of ARH in Indonesia of concern to the family during puberty should be the improvement of FSF for providing ARH information within an Indonesian context.

## **BACKGROUND**

Family action to provide ARH will become a critical caregiver issue during the family life cycle. This situation requires a scale of family ARH function to assess the relationship between parents and their children within the context of a system. Validated scales are required to perform cross-cultural adaptation of the family function scale (Pires, Assis, Avanci, & Pesce, 2016). Some scales have demonstrated promising psychometric properties (Speranza et al., 2012), such as the McMaster Family Assessment Device (FAD; Cooke, Marais, Cavanagh, Kendall, & Priddis, 2015; Du et al., 2014; Kazarian, 2010), the Family Assessment Measure (FAM; Catherine Massé Policy Research Directorate Human Resources and Skills Development Canada, 2009), the North Carolina Family Assessment Scale (Kirk, 2009), the Family Functioning Index (FFI; Boterhoven de Haan, Hafekost, Lawrence, Sawyer, & Zubrick, 2015; Pires et al., 2016), and the Family Environment Measurement (FEM; Omar, Musa, Hanif, & Azimah, 2010; Vostanis & Nicholls, 1995). To our knowledge, to date, no scale for self-assessment with a psychometric scale of family structure and family function regarding ARH (FSF-ARH; see Appendix) has been published. In addition, a psychometric scale assessment of FSF-ARH based on a nursing process assessment during an adolescent's family life cycle could be useful, as it is important in the assessment of FSF-ARH during puberty and can be applied to adolescents and their parents, teachers, and family nurses.

Friedman et al. (2003) developed the Friedman Family Assessment Model (FFAM) based on a structural–functional framework and developmental and systems theory on the family nursing process (Kaakinen, Coehlo, Steele, Tabacco, & Hanson, 2015). This model is commonly used when the family within the community is the setting for care that assesses the family as a system (Friedman et al., 2003). The FFAM assesses family interaction during family life cycle development, primarily using qualitative data from assessment questions regarding family problems. However, to our knowledge, no study to date has developed FSF of parents within a multidimensional model of FFAM, particularly with regard to ARH with psychometric properties. Thus, the FFAM could be useful in developing of scales to assess FFS-ARH through a family nursing approach.

## **Theoretical Framework**

The FFAM is a comprehensive multidimensional model with broad conceptual variables with two versions—a long and short assessments. The FFAM short-form assessment is comprehensive and allows depth as a family nurse assesses six domains with 27 subdomains in the family, including family characteristic, the developmental stage and history of the family, environmental data, family structure, family functions, and family stress, coping, and adaptation (Friedman et al., 2003). However, the FFAM is a general assessment guide based on specific questions. Therefore, data assessed from a majority of families are qualitative. The FFAM has been used in studies on rehabilitation after stroke and in a variety of studies using family nursing in family-centered care (Nyirati, Denham, Raffle, & Ware, 2012).

In the current study, the FFAM is used to describe multiple interactions between parents and their children and to identify FSF related to ARH during the family life cycle regarding family task development in adolescent stages. Meanwhile, the interaction between parents and adolescents in the context of the family system is complex, particularly regarding ARH issues within an Indonesian context. Therefore, a solution is needed to

measure parental provision of ARH by implementing FSF regarding the FFAM. Although the FFAM is a common assessment model in family nursing, no study has been designed using this model to measure FSF in ARH. The FFAM short assessment is commonly just a qualitative assessment with open questions for measuring a family as a systems, including family structure and family function; however, no study has developed a psychometric scale to measure ARH based on the FFAM. Such a scale may be useful for evaluating parents' provision of ARH to their children during adolescent development.

## METHODS

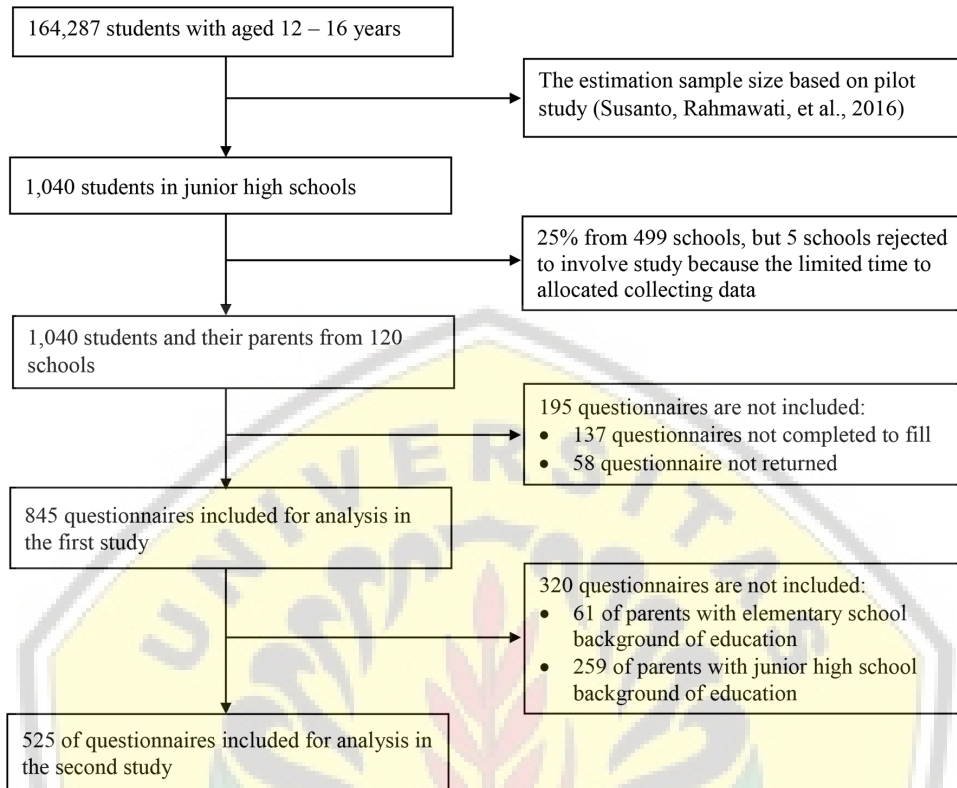
### Aim

In an Indonesian context, adolescents' limited access to information and low knowledge of reproductive health were negatively associated with attitudes toward ARH (Susanto, Rahmawati, & Wantiyah, 2016b) and sexually active behavior (Susanto et al., 2016a). The current study is the first to focus on the FFAM as a framework for recognizing the importance of FSF-ARH. Parents and health-care workers—in particular, family nurses—play essential roles in minimizing risky behaviors and supporting appropriate family functions for ARH. Therefore, a psychometric scale of FSF-ARH is essential to supporting families during children's adolescence. Furthermore, the aim of the present study was to develop the psychometric properties of the proposed FSF-ARH based on the FFAM in a representative general population sample of Indonesian parents. Therefore, this study aimed to (a) develop a scale for measuring the ability of parents to provide FSF for ARH based on the FFAM, with Indonesian parents as participants and (b) test its validity and reliability.

### Item Pool Development

To meet the research aim of this study, development and validation phases were utilized. The aim of the former phase was to develop FSF-ARH based on the FFAM. The aim of the latter phase was to assess the reliability and validity of FSF-ARH.

First, for the instrument development phase, we developed a conceptual framework drawing on the theory of the FFAM (Kaakinen et al., 2015) to standardize questions in questionnaires using a qualitative approach (Polit & Beck, 2010) among experts panels of pediatric nurse and researchers. The expert committee included two professors and associate professor in pediatric nursing, who assessed the content of questions using qualitative analyses. Two professors and associate professor and four pediatric nursing doctoral students reviewed and discussed the format and questions of questionnaires. From panel discussion results, a questionnaire asked about the sociodemographics of family and 82 questions regarding FSF-ARH, including family structure (communication patterns and process, values, role structure, and power and decision making) and family functions (affective, health-care, socialization, economic, and reproduction). The final standardized questionnaire in this study regarding the new ARH family development system used psychometrics scales. All FSF-ARH item responses were on a four-point Likert-type scale, ranging from never (1) to always (4). The minimum and maximum scores on this scale are 82 and 328, respectively; higher scores indicate a more positive FSF for ARH. The final version of the 82-item FSF-ARH was subjected to psychometric testing in the study's first phase.



**Figure 1.** Flowchart of the screening and study inclusion process of participants in this study.

Second, a two-stage examination was conducted in the validation phase to examine the instrument's validity. While exploratory factor analysis (EFA) was used in the first stage to determine the number of domains (constructed factors) of FSF-ARH, confirmatory factor analysis (CFA) was employed in the second stage to establish the construct validity of FSF-ARH.

## Design and Participants

We conducted a cross-sectional study based on school surveys. Participants were parents of children, aged 12–16, years in junior high school. The total number of participants was 1,040 students and their parents from 120 schools in 31 Indonesian districts.

Multistage random cluster sampling technique was employed to select participants from 120 public and private schools in five districts in different regions (north, south, east, west, and central). Thus, the participants had various sociodemographic backgrounds. In the first stage, participants were recruited in school clusters. Then, in the second stage, the selections of students were done. The participants were coded using numbers and selected randomly. Of the 1,040 questionnaires distributed to children in junior high schools, approximately 845 completed questionnaires were returned from parents, resulting in a response rate of 81.3%. Furthermore, 845 parents (fathers and mothers) with children aged 12–16 years were included in the first study's analysis. A flowchart of the screening and study inclusion process of participants is shown in Figure 1. In the second study, we

excluded parents with elementary and junior high school—level educational backgrounds. Therefore, 525 parents (fathers and mothers) with educational background levels of senior high school and higher degrees were included for analysis in the second study.

## Procedure

Data were collected from a representative Indonesian general population sample of parents of adolescents between 12 and 16 years of age using standardized questionnaires. First, we interviewed and informed students' teachers about the study, after which we informed students in their classrooms of the study and sent a letter to the families, informing them of the study details and soliciting informed written consent of those who agreed to participate. After permission was received from families, a data collection plan was designed. Parents (fathers or mothers) who agreed to participate in the study completed the questionnaire in their homes and returned the questionnaires to schools with their children. These completed questionnaires were collected by the teacher in the classroom, and a researcher collected the questionnaires from teachers.

## Ethics Approval

This study has obtained ethical and administrative approval from the Department of Political Unity of the Protection of the Public, the National Education District, and the school administrations. It has been approved by the Ethical Committee Review Board, the Faculty of Medicine, University of Jember (Number: 545/H25.1.11/KE/2014).

## Data Analysis

SPSS Software package version 22.0 was used in the statistical analyses (SPSS, Chicago, IL). To summarize sample characteristics, descriptive statistics were employed. Assessments of content validity, internal consistency reliability, and construct validity were conducted. The tests were two-tailed, and the significance was defined as a  $p$  value  $< .05$ . In the first phase of the study, the analysis of content validity was done using qualitative analysis to construct an assessment scale based on the FFAM. We formulated FSF-ARH as scales to measure the ability of parents for providing ARH. Then these scales were tested using EFA using principal axis factoring with varimax rotation was used to assess the validity. Thus, eigen values of  $\geq 1$  were retained. Items were then retained in a dimension with factor loadings of  $> 0.5$ . The method was used to explain the maximum amount of variance in the sample with enhanced component interpretability. Based on the assumption that underlying factors were uncorrelated, orthogonal rotation was selected.

In the second phase, regarding the results of EFA, content validity analysis with content validity index (CVI) was employed to determine content validity (Waltz et al., 2010). The survey's internal consistency was assessed using Cronbach's alpha. In reliability analysis, to measure the item difficulty for judgment and endorsement purposes, statistical means and standard deviations of the items were examined (Nunnally & Bernstein, 1994). While, to examine item discrimination, item-total correlation was employed (Waltz et al., 2010). Then, construct validity was assessed in the second stage by using confirmatory factor analysis (CFA) with a maximum likelihood estimation in order to determine whether the collected data were consistent (model fit) (Hooper, Coughlan, & Mullen, 2008) with the theoretical properties of the FFAM (Friedman et al., 2003).

## RESULTS

### Demographic Data

This study was surveyed on 845 parents and 525 parents in the first phases and second phases of the study, respectively. Participants' demographic data are described in Table 1. The median ages of the parents and children were 43 years (28–76) and 14 years (12–16), respectively, with a family size of four people (2–9). A majority of participants were fathers of adolescent girls. The majority of parent participants lived in rural areas, had junior high school-level education, had monthly income lower than the minimum regional salary, were ethnically Javanese, and were employed as entrepreneurs.

### Validation Phase of FSF-ARH Scales Development

Based on 82 questions answered by 845 Indonesian parents in the first study, CFA resulted in 22 components with eigenvalues of  $\geq 1$  and accounted for 61.67% of the total variance (Figure 2A). Based on these results, there are 22 loading factors, although, in this study, we limited nine factors for FSF-ARH regarding FSF from FFAM. Therefore, we reanalyzed content validity through qualitative analyses, reducing some questions that have the same meaning in each subscale and scale of FSF-ARH for the second study.

Finally, in the second study, we formulated 29 questions and decided to focus on 525 parents with senior high school to master's degrees. Regarding this second phase study of 525 participants, EFA resulted in nine loading factors with eigenvalues of  $\geq 1$  (Figure 2b). The nine-loading factors accounted for 61.64% of the total variance. Finally, we used 26 questions with values of loading  $>0.5$  to divide the nine loading factors for analysis through reliability testing in the second validation phase. These phases are described in more detail below (including item analysis and reliability, content validity, and construct validity).

### Item Analysis and Reliability

From the reliability analyses, it was found that FSF-ARH had good internal consistency. The Cronbach's  $\alpha$  of the internal consistency was 0.70. The Cronbach's  $\alpha$  of family structure and functions were 0.71 and 0.62, respectively. Each subscale of FSF-ARH is moderate (including family role, family value structure, family socialization, and family reproduction functions; ranging from 0.51 to 0.58) to high (including family communication and pattern process, family power and decision making, family affection, family health care, and family economic functions; ranging from 0.70 to 0.79; ranging from 0.70 to 0.79). The moderate and high reliability were indicated that FSF-ARH subscales was questionable (0.6–0.7) and acceptable (0.7–0.8) internal consistency (Cortina, 1993; Cronbach & Shavelson, 2004).

The corrected item-total correlation coefficients were between 0.29 (item FSF-22) and 0.67 (item FSF-2). The proportion of variance in a given item shared with other items was represented by the  $R^2$  values; higher values indicate greater consistency among the items (Pett, Lackey, & Sullivan, 2003). The  $R^2$  values were from 0.08 (item FSF-22) to 0.46 (item FSF-2). The coefficient alpha for item deletion was between 0.37 and 0.77 (Table 2). This suggests that all items contributed to the high reliability (Pett et al., 2003). It is evident that there were no items seriously reducing the alpha coefficient value when they

**TABLE 1. Characteristic Participants**

Variable	First Phase (n = 845)	Second Phase (n = 525)
	n (%)	n (%)
Age of parents (median/range)	43 (28–76)	43 (28–72)
Age of children (median/range)	14 (12–16)	14 (12–16)
Number of families (median/range)	4 (2–9)	4 (2–9)
Gender of parent		
Male	450 (53.3)	319 (60.8)
Female	395 (46.7)	206 (39.2)
Gender of children		
Boys	381 (45.1)	245 (46.7)
Girls	464 (54.9)	280 (53.3)
Area living		
Rural	594 (70.3)	169 (32.2)
Urban	251 (29.7)	359 (67.8)
Parents' education		
Elementary school	61 (7.2)	–
Junior high school	259 (30.7)	–
Senior high schools	210 (24.9)	210 (40.0)
Diploma	229 (27.1)	229 (43.6)
Bachelor	26 (3.1)	26 (5.0)
Master	60 (7.1)	60 (11.4)
Income parent per month		
Lower than 1,460,000 IDR	569 (67.3)	317 (60.4)
Higher than 1,460,000 IDR	276 (32.7)	208 (39.6)
Ethnic		
Java	594 (70.3)	380 (72.4)
Madura	200 (23.7)	112 (21.3)
Osing	27 (3.2)	17 (3.2)
China	10 (1.2)	8 (1.5)
Arab	4 (0.5)	4 (0.8)
Bugis	3 (0.4)	2 (0.4)
Batak	2 (0.2)	1 (0.2)
Bali	4 (0.5)	1 (0.2)
India	1 (0.1)	–
Parents' employment		
Entrepreneur	290 (34.3)	186 (35.4)
Farmer	205 (24.3)	97 (18.5)
Public government	81 (9.6)	63 (12.0)
Trader	65 (7.7)	49 (9.3)
Construction labor	75 (8.9)	39 (7.4)
Private company	40 (4.7)	31 (5.9)

(Continued)

**TABLE 1. Characteristic Participants (Continued)**

Variable	First Phase (n = 845)	Second Phase (n = 525)
	n (%)	n (%)
Teacher	37 (4.4)	31 (5.9)
Servant	17 (2.0)	11 (2.1)
Driver	16 (1.9)	6 (1.1)
Craftsmen	8 (0.9)	5 (1.0)
Livestock/raising	5 (0.6)	4 (0.8)
Pension	3 (0.4)	2 (0.4)
Gardener	3 (0.4)	1 (0.2)

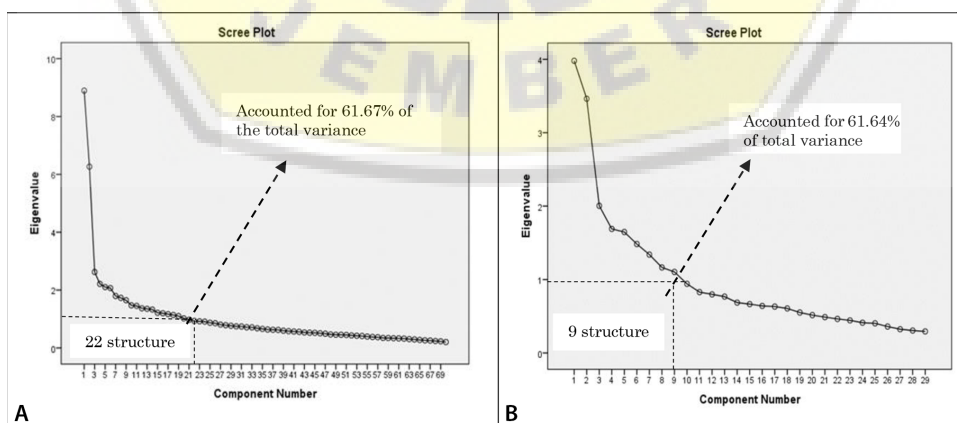
were removed from the analyses. Therefore, the 26 items of FSF-ARH with nine subscales exhibited questionable and acceptable internal consistency.

### Content Validity

To determine item validity, the CVI was employed. Ten experts, consisting of four community and family health nurses, three pediatric nurses, and three maternity nurses, were asked to rate each of the 26 FSF-ARH items based on relevance and clarity for measuring the ability parents to provide ARH. The questions rated employed a four-point Likert scale with a score of 1 meaning not relevant, a score of 2 meaning somewhat relevant, a score of 3 meaning quite relevant, and a score of 4 meaning highly relevant. As a result, the CVI was calculated; the number of experts giving a rating of either 3 or 4 was divided by the total number of experts. The CVI of FSF-ARH items was between 80% to 100%. This suggests that the content validity was adequate and appropriate (Polit & Beck, 2010).

### Construct Validity

Construct validity test was done based on 525 participants from the second study. The construct validity was determined by factor analysis. Factor analysis using principal



**Figure 2.** (A) Loading factors of 82 items. (B) Loading factors of 29 items.



**TABLE 2. Items Means, Standard Deviation, Corrected Item to Total Correlations, Squared Multiple Correlation, and Alpha if Item Deleted for the FSF-ARH Scale ( $n = 525$ )**

Item	Mean	SD	CITC	SMC	AID
Family Communication Pattern	Cronbach's $\alpha = 0.70$				
FSF 10	2.70	1.02	0.42	0.21	0.68
FSF 11	2.72	1.02	0.59	0.35	0.58
FSF 12	2.69	1.01	0.49	0.25	0.64
FSF 13	2.67	1.07	0.47	0.24	0.66
Family power structure	Cronbach's $\alpha = 0.73$				
FSF 7	2.52	1.13	0.53	0.30	0.67
FSF 8	2.67	1.00	0.62	0.38	0.56
FSF 9	2.72	1.03	0.51	0.27	0.69
Family role structure	Cronbach's $\alpha = 0.54$				
FSF 15	2.42	1.18	0.37	0.14	–
FSF 16	2.54	1.18	0.37	0.14	–
Family values	Cronbach's $\alpha = 0.58$				
FSF 14	2.84	1.11	0.41	0.16	–
FSF 17	3.05	1.23	0.41	0.16	–
Overall alpha family structure	0.71				
Family affective function	Cronbach's $\alpha = 0.75$				
FSF 1	2.66	0.92	0.49	0.25	0.77
FSF 2	2.93	0.94	0.67	0.46	0.57
FSF 3	2.99	0.91	0.59	0.41	0.65
Family socialization function	Cronbach's $\alpha = 0.57$				
FSF 4	2.02	1.07	0.39	0.16	0.46
FSF 5	2.39	1.09	0.35	0.12	0.52
FSF 6	2.08	1.05	0.41	0.17	0.43
Family health-care function	Cronbach's $\alpha = 0.72$				
FSF 26	1.88	0.98	0.54	0.29	0.63
FSF 27	2.03	1.02	0.57	0.32	0.59
FSF 28	1.98	0.98	0.51	0.26	0.66
Family reproduction function	Cronbach's $\alpha = 0.51$				
FSF 19	1.94	0.96	0.34	0.12	0.39
FSF 21	2.12	0.97	0.35	0.12	0.37
FSF 22	2.31	0.97	0.29	0.08	0.47
Family economic	Cronbach's $\alpha = 0.79$				
FSF 23	1.71	0.92	0.60	0.36	0.74
FSF 24	1.75	1.01	0.66	0.43	0.69
FSF 25	1.61	0.92	0.64	0.41	0.71
Overall alpha family functions	0.62				
Overall alpha FSF-ARH	0.70				

*Note.* FSF = family structure functions; ARH = adolescent reproductive health; SD = standard deviation; CITC = corrected item-total correlation; SMC = squared multiple correlation; AID = alpha if item deleted.

**TABLE 3. Factor Analysis of the Family Structure and Family Function (n = 525)**

Items	Factor and Loading								
	1	2	3	4	5	6	7	8	9
FSF 1	0.006	-0.100	0.093	<b>0.774</b>	-0.002	-0.072	-0.131	-0.023	0.036
FSF 2	-0.158	0.118	0.000	<b>0.827</b>	-0.047	-0.037	0.146	0.030	0.054
FSF 3	-0.078	0.108	0.016	<b>0.810</b>	-0.062	0.040	0.101	0.008	0.042
FSF 4	0.134	-0.011	0.015	0.048	0.081	<b>0.590</b>	-0.375	-0.043	0.176
FSF 5	0.037	0.197	0.051	-0.048	-0.057	<b>0.677</b>	0.152	0.172	-0.062
FSF 6	0.180	-0.145	0.118	-0.047	0.100	<b>0.725</b>	-0.033	0.013	0.051
FSF 7	0.001	0.209	<b>0.669</b>	0.030	0.048	0.303	0.182	0.090	0.067
FSF 8	-0.028	0.173	<b>0.809</b>	0.007	-0.042	0.099	-0.079	0.055	0.151
FSF 9	-0.003	0.259	<b>0.739</b>	0.089	-0.049	-0.148	0.047	0.030	-0.019
FSF 10	0.078	<b>0.503</b>	0.219	0.111	0.042	0.140	0.243	0.025	-0.302
FSF 11	-0.037	<b>0.767</b>	0.177	-0.022	0.048	0.025	0.126	0.055	-0.150
FSF 12	-0.044	<b>0.660</b>	0.234	0.152	-0.087	0.036	-0.110	0.122	0.190
FSF 13	0.052	<b>0.705</b>	0.145	-0.022	0.011	-0.052	0.096	0.148	0.061
FSF 14	-0.015	0.038	0.005	0.054	-0.019	0.025	<b>0.790</b>	0.037	0.196
FSF 15	0.022	-0.178	0.128	0.075	0.146	-0.138	0.240	0.038	<b>0.677</b>
FSF 16	-0.066	-0.034	0.121	0.015	0.066	0.122	0.115	0.018	<b>0.731</b>
FSF 17	-0.120	0.167	0.096	0.045	-0.127	-0.040	<b>0.719</b>	-0.023	-0.003
FSF 18	0.405	0.157	0.013	-0.048	0.122	0.101	-0.203	0.457	-0.108
FSF 19	-0.110	0.128	0.009	-0.066	0.046	0.368	0.162	<b>0.564</b>	0.057
FSF 20	-0.009	0.171	0.384	0.020	0.143	0.208	0.245	0.474	-0.178
FSF 21	0.187	0.235	-0.021	-0.010	0.101	0.214	-0.095	<b>0.552</b>	0.225
FSF 22	0.124	-0.019	0.115	0.082	-0.047	-0.258	-0.007	<b>0.752</b>	-0.014
FSF 23	<b>0.743</b>	0.011	-0.035	-0.079	0.181	0.157	-0.139	0.049	-0.027
FSF 24	<b>0.867</b>	0.053	0.086	-0.049	0.028	0.008	0.053	0.092	0.082
FSF 25	<b>0.806</b>	-0.068	-0.082	-0.089	0.091	0.087	-0.044	0.046	0.013
FSF 26	0.057	0.060	-0.148	-0.037	<b>0.778</b>	0.118	-0.060	0.015	0.109
FSF 27	0.132	-0.033	-0.009	0.042	<b>0.785</b>	0.028	-0.091	0.067	-0.012
FSF 28	0.106	-0.015	0.119	-0.115	<b>0.772</b>	-0.034	0.006	0.043	-0.016
FSF 29	-0.157	-0.248	0.105	-0.103	0.163	-0.147	0.169	0.002	-0.564
Factor eigenvalues	3.980	3.460	2.010	1.690	1.650	1.480	1.340	1.170	1.100
% of explanatory variance	13.72	11.94	6.910	5.830	5.680	5.120	4.620	4.020	3.810
Total % of explanatory variance	61.64								

*Note.* Values in boldface indicate items included in factor.

Factor 1: economic; Factor 2: communication; Factor 3: power; Factor 4: affective; Factor 5: health care; Factor 6: socialization; Factor 7: values; Factors 8: reproduction; Factor 9: roles.

axis factoring and the varimax rotation method was examined on 29 items in the first phase. In this study, eigenvalues ( $\geq 1$ ), Kaiser–Meyer–Olkin (KMO) sampling adequacy values ( $> 0.5$ ), scree plots, coefficients of factor loadings over 0.50, and explainable percentages of variance over 60% were employed to determine the number of factors (Pituch & Stevens, 2009). The KMO of 0.737 indicates the adequacy of sampling ( $> 0.5$ ; Pituch & Stevens, 2009). Nine factors were retained in Bartlett’s test of sphericity ( $\chi^2 = 3884.41$ ,  $p < .001$ ), accounting for 61.64% of the variance after rotation. The eigenvalues were between 1.10 and 3.98. All 26 items showed moderate to strong loading (Table 3).

The first to the ninth factors—which were labeled economic, communication, power, affective, health care, socialization, value, reproduction, and role—consisted of three, four, three, three, three, three, two, three, and two items, explaining 13.72%, 11.94%, 6.91%,

**TABLE 4. Summary of Confirmatory Factor Analysis of the FSF-ARH ( $n = 525$ )**

Model	$\chi^2$ (d.f.)	$\chi^2$ (d.f.)	GFI	AGFI	NFI	RMSEA
Ideal model		<3.00	>0.90	>0.80	>0.90	<0.05
26 item FSF-ARH	755.72 (263)***	2.87	0.90	0.90	0.78	0.06
24 item FSF-ARH	576.34 (216)***	2.67	0.90	0.90	0.90	0.05

Notes. AGFI = adjusted goodness of fit index; GFI = goodness of fit index; NFI = normal fit index; RMSEA = root mean square error of approximation.

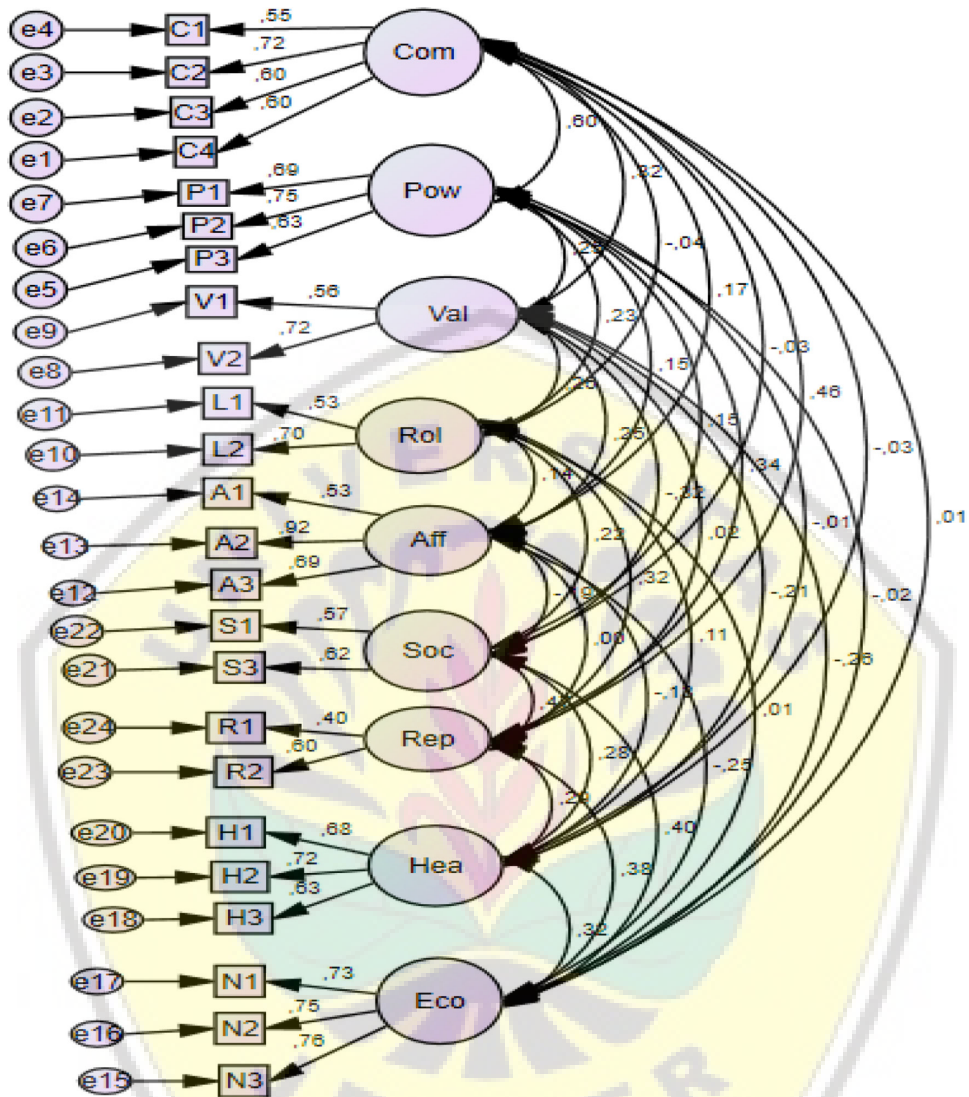
\*\*\* $p < .001$ .

5.83%, 5.68%, 5.12%, 4.62%, 4.02%, and 3.81% of the variance, respectively. All factors reflected family communication, family power, family role structure, family values, affective function, health-care function, economic function, socialization function, and reproductive function measured by FSF-ARH.

CFA was used in the second phase of construct validity examination to confirm the nine subscale models and assess the goodness of fit with interfactor correlations. The indicators of fit indices included value of chi-square goodness of fit divided by degrees of freedom ( $\chi^2/df$ ) < 3.0, goodness-of-fit index (GFI) > 0.90, adjusted GFI (AGFI) > 0.80, value of normed fit index (NFI), and cutoff root mean square error of approximation (RMSEA) < 0.06 (Hu, Bentler, & Hu, 1999). In this study showed that interfactor correlations ranged from 0.20 to 0.60,  $\chi^2$  (263) of 755.72 ( $p < 0.001$ ),  $\chi^2/df$  of 2.87, GFI was 0.90, AGFI was 0.90, NFI was 0.78, and RMSEA was 0.06. As the analytical model did not fit the data well (particularly, value RMSEA), a modified model was constructed to improve the model fitting (Schreiber, Nora, Stage, Barlow, & Schreiber, 2006). Then, items FSF-5 and FSF-22 were deleted. The modified model was found to have a  $\chi^2$  (216) of 576.34 ( $p < .001$ ),  $\chi^2/df$  of 2.67, GFI of 0.90, AGFI of 0.90, NFI of 0.90, and RMSEA of 0.05. The modified model which was fitted to 24 items had greater explanatory and feasibility parameters than the one fitted to 26 items, although only differ 2 items. The test statistics for model fits were correlated with general rules of thumb for each statistic (Hooper et al., 2008; Hu et al., 1999; Schreiber et al., 2006). The summary of the model fits for FSF-ARH is shown in Table 4, while the model structure is presented in Figure 3. Generally, the fitted 24-item scale was reliability analysis, which had an internal consistency of  $\alpha = 0.68$ . Then, subscales of family structure and family function for 24-item FSF-ARH had Cronbach's alphas of 0.71 and 0.61, respectively.

## DISCUSSION

FSF-ARH is a valid and reliable instrument for assessing Indonesian parents' family structure and family function toward ARH. This scale contained 26 items with nine subscales (including family communication, values, role structure, power, as well as affective, economic, socialization, reproductive, and health-care functions) fit for construct validity (nine factors with 26 items), adequate content validity (0.80–0.10), and high reliability (0.70). The nine subscales are fixed for FFAM model as family structures and family functions with a commonly used qualitative instrument for family assessment. FSF-ARH could measure and monitor family structure and family function toward ARH in Indonesian parents although some subscales exhibited moderate (questionable) internal consistency,



**Figure 3.** Confirmatory factor analysis of the Family Structure and Functions toward Adolescent Reproductive Health (FSF-ARH) Scale.

indicating that family characteristics and the environment may influence the family life cycle in a systems context.

In this study, we identified nine factors (subscales) that measured FSF-ARH. However, FSF-ARH with nine subscales as new scales that identified in this study is correlated with the FFAM for measuring parents' caring about ARH. Five subscales (communication, role, value, power, and affective) in this study have been identified in previous studies. The communication subscales were identified on the FAD (Kazarian, 2010) and FAM (Catherine Massé Policy Research Directorate Human Resources and Skills Development Canada, 2009) as communication and, on the FFI (Dai & Wang, 2015), as intrafamily communication. In the current study, family communication pattern subscales were measured

as discussing the topic of ARH between parents and their children based on the cultural background of family. The subscales of role was identified on the FAD and FAM (Cooke et al., 2015) as role and role performance. In this study, family role was identified as a set of rules that agreed to by each family member based on the whole family's involvement for the purpose of monitoring the growth and development of adolescents, especially with regard to ARH. The values subscales were identified in the FAM (Catherine Massé Policy Research Directorate Human Resources and Skills Development Canada, 2009) as values and norms. Family values were described as moral and ethical standards of ARH in family related to religious beliefs and social norms in an Indonesian context. The power subscale was identified on the FAD, FAM, and FFI (Speranza et al., 2012; Boterhoven de Haan et al., 2015) as problem solving, controlling, and decision-making, respectively. Family power indicated consensus in addressing ARH issues to control children during puberty based on parenting styles in the Indonesian context. The affective subscale was identified on the FAD and APGAR (for family functioning: adaptability, partnership, growth, affection, and resolve; Cooke et al., 2015) as affective involvement and affection, respectively. The family affective function was defined as showing affection and love so that family members felt a sense of belonging to one another to care for and support children in any change of family environment.

Meanwhile, the four subscales of economic, socialization, reproductive, and health-care functions were not identified in previous studies. Economic and socialization subscales are similar to parental capabilities and environment described in the NCFA and FAM (Counts, Buffington, Chang-Rios, Rasmussen, & Preacher, 2010; Kirk, 2009) as environment and social desirability. Family economic function referred to the ability of parents to balance revenue, processes, and family expenditures; whereas family socialization was described as balancing the freedom and responsibility of adolescents based on their accesses to sources of ARH information. Meanwhile, reproductive and health-care subscales are similar to those identified on the FFI and FAD (Omar et al., 2010) as marital satisfaction and general functioning of overall health and pathology of the family, respectively. Reproductive function indicated the experiences of parents providing education about menstruation for girls or wet dreams for boys; whereas family health-care function referred to parents' process of providing health care for children regarding ARH issues. Therefore, the current study concluded that the scale development of FSF-ARH as a psychometric assessment scale is unique for measuring family ARH functioning regarding parents' care for their children in the cycle of adolescent development. The current study's referral to family structure indicates arrangements for awakening family values and norms to be communicated with each other in accordance with each family member's role in actively controlling the strength of the family. If the structure and function are normal and functioning, a family will be able to use the system for adolescent family life to achieve its developmental tasks within Indonesian social, cultural, and religious contexts.

The CVI of 26 FSF-ARH items ranged from 80% to 100%, indicating adequate content validity (Polit & Beck, 2010). This finding illustrates that 26 FSF-ARH items were used to measure the relevance, clarity, and simplicity of the family life cycle on ARH regarding pediatric, family, and maternity nursing. Furthermore, using 26 items of FSF-ARH should be applicable to family health-care practices based on home health nursing and hospital setting.

The internal consistency of the 26 items (overall Cronbach's  $\alpha$ ) was 0.70, and the subscales of family structure and family function of Cronbach's  $\alpha$  were 0.71 and 0.62, respectively, which indicated acceptable internal consistency, satisfying the recommen-

dations of Spilsbury and Meyer (Spilsbury & Meyer, 2001). However, two subscales of family structures (subdomain as the family role structure and family values) indicated moderate reliabilities (questionable internal consistency) (0.54 and 0.58, respectively) that compared with those of previous studies (Boterhoven de Haan et al., 2015; Juliusdottir & Olafsdottir, 2015). Meanwhile, two subscales of family functions (subdomains as socialization and reproductive health functions) indicated moderate reliability (questionable internal consistency) (0.57 and 0.51, respectively) that compared with those of previous studies (Counts, Buffington, Chang-Rios, Rasmussen, & Preacher, 2010; Kirk, 2009; Omar et al., 2010). The moderate reliabilities of subscales illustrated the condition of ARH issues in an Indonesian context that agreed with those found in previous studies—that knowledge, attitudes, ARH skill in Indonesia are very limited (Susanto et al., 2016b) and the health promotion of ARH in schools and communities is limited (Susanto, Sulistyorini, Wuryaningsih, Bahtiar, & Wuri, 2016), which influences parents' provision of ARH education to their children. This finding may explain that process of interactions that occur within the family will facilitate the family's working to meet the ARH needs of their children. This need illustrates that subscales of family structure and function should be implemented to control and monitor all family members in achieving the goals of the family's helping children during puberty and parents learning to monitor and develop skills to improve family power and decision making to function maturely regarding ARH based on the Indonesian context.

## **IMPLICATIONS FOR NURSING PRACTICE**

FSF-ARH may be valuable in research and may also be useful in family nursing and pediatric nursing to measure FSF as a system for meeting ARH needs in the development cycle of the family. These scales are also useful for parents' self-evaluation of their success in ARH education during their children's secondary sexual development and emotional changes. Therefore, as a system, families can strengthen their family structure (including communication, power, roles, and values) to optimize their family functioning (including affective, healthcare, socialization, economic, and reproduction functions) in ARH. FSF-ARH scales are important for facilitating positive family functional effects on ARH based on Indonesian social culture and religion through family coaching and guidance interventions. Thus, advanced practice nurses responsible for ARH must also establish positive youth development interventions with parents or other primary caregivers to facilitate family function through FSF-ARH psychometric evidence-based health-care services.

## **LIMITATIONS**

FSF-ARH appears to be a reliable and valid instrument for assessing of family structure and family function in ARH as a new psychometric scale; however, several limitations should be noted. First, the lower reliability of subscales reflects the difficulty in ARH education in the Indonesian context. Therefore, in a future study, the test should be repeated to improve the reliability of subscales. Second, the sample was restricted to parents with educational backgrounds as senior high school graduates and higher due to limitations and difficulties of ARH education among parents with lower educational backgrounds in Indonesian society and culture. These factors limit the generalizability of the study.

Therefore, these scales is particularly useful for Indonesian parents based on their social and cultural norms and the religion of Islam. Third, the cross-sectional nature of the study design results in associations between the variables of the results rather than causal conclusions. Finally, the halo effect is a possible limitation of this study due to the use of a self-reporting questionnaire, in which researcher observing closely over a short period of time may tend to influence specific ratings (Polit & Beck, 2006). It is possible that participants' responses reflected socially desirable responses rather than personal truths.

## CONCLUSION

In conclusion, FSF-ARH demonstrated satisfactory validity and reliability for measuring family structure and family function in ARH issues. In this study, we identified nine subscales; five subscales have been identified in the previous studies—communication, roles, values and norms, decision making, and affective—while four subscales—economic, socialization, reproductive, and health care—were not previously identified. Therefore, FSF-ARH as a scale assessment offers a unique measurement of family functioning in ARH regarding parents' care of their children during the life cycle of adolescent development. The survey instrument provides a tool for future research to collect population-level data to measure and monitor FSF in ARH in Indonesia, although some subscales exhibited moderate internal consistency, demonstrating the need for further research to retest the scales and subscales.

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## APPENDIX

### FAMILY STRUCTURE AND FAMILY STRUCTURE TOWARD ADOLESCENT REPRODUCTIVE HEALTH (FSF-ARH)

**APPENDIX TABLE 1. Directions: Please rate the following statements based on what you did to your children on puberty period? Please choose one of the following points that best describes your situation.**

No	Code	Items	Response			
			1	2	3	4
1	FSF10	Parents allocate special time for teens to discuss reproductive health issues				
2	FSF11	Parents agree that the topic of conversation is completed along with teen				
3	FSF12	Parents do two-way discussions to discuss reproductive health issues				
4	FSF13	Parents give praises when teens tell reproductive health issues				
5	FSF7	Parents do consensus in addressing adolescent reproductive health issues				
6	FSF8	Parents value the opinions of teenagers when discussing issues of adolescent reproductive health				
7	FSF9	Parents overcome/solve the adolescent reproductive health problems wisely to be implemented together in the family				
8	FSF15	Parents monitor the growth and development of adolescents, especially with regard to reproductive health				
9	FSF16	Parents set rules that are run by each member of the family based on the involvement of the whole family				
10	FSF14	Parents set the moral and ethical standards in the family in accordance with the development of children in the family				
11	FSF17	Parents instill religious beliefs and social norms in the family to run by every member of the family				
12	FSF1	Parents give affection and love so that family members have a sense of belonging to one another				
13	FSF2	Parents create an atmosphere of mutual grindstones, compassionate, and foster within the family				
14	FSF3	Parents provide care and support to children in any family environment development				
15	FSF4	Parents watch media information in studying adolescent reproductive health problems				
16	FSF5	Parents give teens freedom along with peers in the family and school environment				

No	Code	Items	Response			
			1	2	3	4
17	FSF6	Parents engage youth in social activities as media development teenage life				
18	FSF26	Parents pay attention to the activities of teenagers in the family, school, and neighborhood				
19	FSF27	Parents believe it is the duty of parents for providing reproductive health education in adolescents				
20	FSF28	Parents accompany youth in consultations on reproductive health issues in schools or health clinics nearest health-care facility				
21	FSF19	Parents provide reproductive health education as teens start experiencing puberty				
22	FSF21	Parents are concerned about the needs of menstruation for girls or wet dreams for boys				
23	FSF22	Parents organizing relations and association and their consequences when teenagers start puberty				
24	FSF23	Parents meet the basic needs of children and families				
25	FSF24	Parents are able to facilitate the educational needs of children				
26	FSF25	Parents are able to balance between revenue, processes, and expenditure, family				

*Note.* Item no. 1 – 4: Communication; 5 – 7: Power; 8 – 9: Role; 10 – 11: Value; 12 – 14: Affective; 15 – 17: Socialization; 18 – 20: Healthcare; 21 – 23: Reproduction; and 24 – 26: Economic.

Response. 1: Never; 2: Not reley; 3: Almost; and 4: Always

