Sexual Socialization in Families with Adolescents (SSFA) in Thailand: Scale Development and Validation

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Abstract

Although studies have shown the positive effects that families have on adolescent sexual health, there are still problems with clarification and validation of sexual socialization, and the process by which parents integrate adolescents into society to promote appropriate sexual learning and sexual health of adolescents. This cross-sectional study aimed to develop a valid and reliable Sexual Socialization in Families with Adolescents Scale (SSFAS) based on a qualitative framework. The participants were 460 parents with adolescents aged 13-19 years old studying in secondary and vocational schools. Stratified multi-stage random sampling was used. Item analysis was carried out using an exploratory factor analysis (EFA). A confirmatory factor analysis (CFA) was performed to confirm the components of the SSFAS. The results showed that the content validity index (CVI), Cronbach's alpha coefficient, Kaiser-Meyer-Olkin measure of sampling adequacy, and Bartlett's test of sphericity were appropriate. The five components of the SSFAS were: 1) General Pattern, 2) Trusting Pattern, 3) Strict Pattern, 4) Exhausted Pattern, and 5) Flexible Pattern. The eigenvalues of the five SSFAS components were greater than 1. The CFA statistics were fitted to the model. The findings suggested that the SSFAS can help identify sexual socialization patterns in families and screen the risk pattern of sexual socialization.

Keywords

Adolescent; family; parent; scale development; sexual socialization

Introduction

Adolescents' sexually risky behaviors are an increasing global public health problem. Adolescents initiate sex at an early age, such as 14 and under (Kennedy et al., 2012); have sex with friends and multiple partners; increasingly contract sexually transmitted diseases (STIs); and have low condom use (Rokhmah & Khoiron, 2015). Early adolescent sex has unique predictive effects on a range of adverse young adult behaviors and outcomes (Prendergast et al., 2019). Earlier pubertal timing and more advanced pubertal status have been shown to be related to earlier and more sexual and sexually risky behaviors (Baams et al., 2015) as well as adolescent pregnancy and abortion. It was found that 22.9% of young women under 20 years of age, who had an abortion, had at least one previous pregnancy (McDaid et al., 2015). A recent study showed that 33.5% of adolescents had never had sex, 32.5% had multiple sexual partners, and only 26.2% reported using condoms during their last sexual intercourse (Kugbey et al., 2018).

Adolescent sexual experience has been shown to be associated with multiple factors, such as age, non-enrollment in school, alcohol use, and, among men, being a double orphan (Santelli et al., 2015). Factors associated with pregnancy included early sexual initiation, being raised by someone other than one's parents, alcohol use and binge drinking within the past month, community violence, and a deprived physical environment (Brahmbhatt et al., 2014). Adolescent social norms are associated with adolescent sexual behaviors. Adolescents' negative beliefs about contraception are associated with higher pregnancies and sexually transmitted infections (STIs) than with positive beliefs about contraception (James-Hawkins, 2019). Additional factors negatively associated with adolescent pregnancy included feeling close to others at school, receiving a high school diploma, enrolling in higher education, participating in volunteering or community service, and living in a two-parent home (Maness et al., 2016).

Sexual socialization is the interaction process where adolescents acquire understanding and internalize information from parents, peers, and particularly media about ideas, attitudes, norms, values, culture, and meanings towards sexuality. Adolescents experience sexual socialization through interaction at home with their parents since they were young (Shtarkshall et al., 2007).

As socialization agents, families transform newborns into social persons capable of interacting with others in society (Gerald, 2006). Children learn cultural norms, values, and ways of living through the process of socialization from their parents, being as parents transmit their standards of conduct, both directly through their parenting practices and indirectly through their observable behaviors. Moreover, mother-daughter communication facilitates knowledge and confidence in discussing sex and openness about sexual behaviors (Aronowitz et al., 2015). A healthy relationship and open communication about safe sex practices are associated with protection against sexually transmitted infections (STIs) and human immunodeficiency virus (HIV) for youth (Diamant-Wilson & Blakey, 2019). Parents can be a significant protective factor against adolescents' sexual experiences (Kugbey et al., 2018), and the influence of parents' monitoring can likewise reduce adolescents' risky sexual behaviors (Crosby et al., 2015). Good parent-child relationships and communication result in lower sexual risk behaviors in children, as children who had practical understanding, support, and care from parents can control themselves (Grusec, 2011). Remarkably, adolescents' perceptions of closeness with their fathers are associated with reduced dating violence and, among girls,

fewer sexual risk behaviors (Alleyne-Green et al., 2015). In addition, initial levels of parent-child communication and changes in parent-child communication over time are associated with child reports of safe sex (Padilla-Walker, 2018).

Adolescents' sexual behaviors are in transition and are increasingly influenced by friends and social media (Stevens et al., 2017). However, studies continue to show that parents have a significant effect on the sexual behaviors of their adolescent children, like with previous research that showed a negative association between adolescent pregnancy and living in a two-parent home (Maness et al., 2016). A survey by the Thai Family Matters Project, which adapted a U.S.-based family prevention program for Thai culture, indicated consistent significant positive direct and indirect associations of the spirituality of parents and teens within a family with the prevention of adolescent risk behaviors (Chamratrithirong et al., 2010).

The Parent-Teen Sexual Risk Communication III (PTSRC III) instrument illustrated components of parent-child communication regarding the management of the consequences of sexual risk factors and the prevention of sexual risk behaviors, comprising eight aspects: birth control; sexually transmitted diseases (STDs); HIV; HIV and STD prevention; condom use; postponing sex; the pressure to have sex; and how to respond to pressure to have sex (Hutchinson, 2007). In addition, a study found that parental socialization was dependent on cultural context and was classified into four patterns: authoritarian, authoritative, neglectful, and indulgent, throughout two dimensions: acceptance/involvement and strictness/imposition. These parental styles were ultimately related to the child's behavior (Martínez et al., 2017).
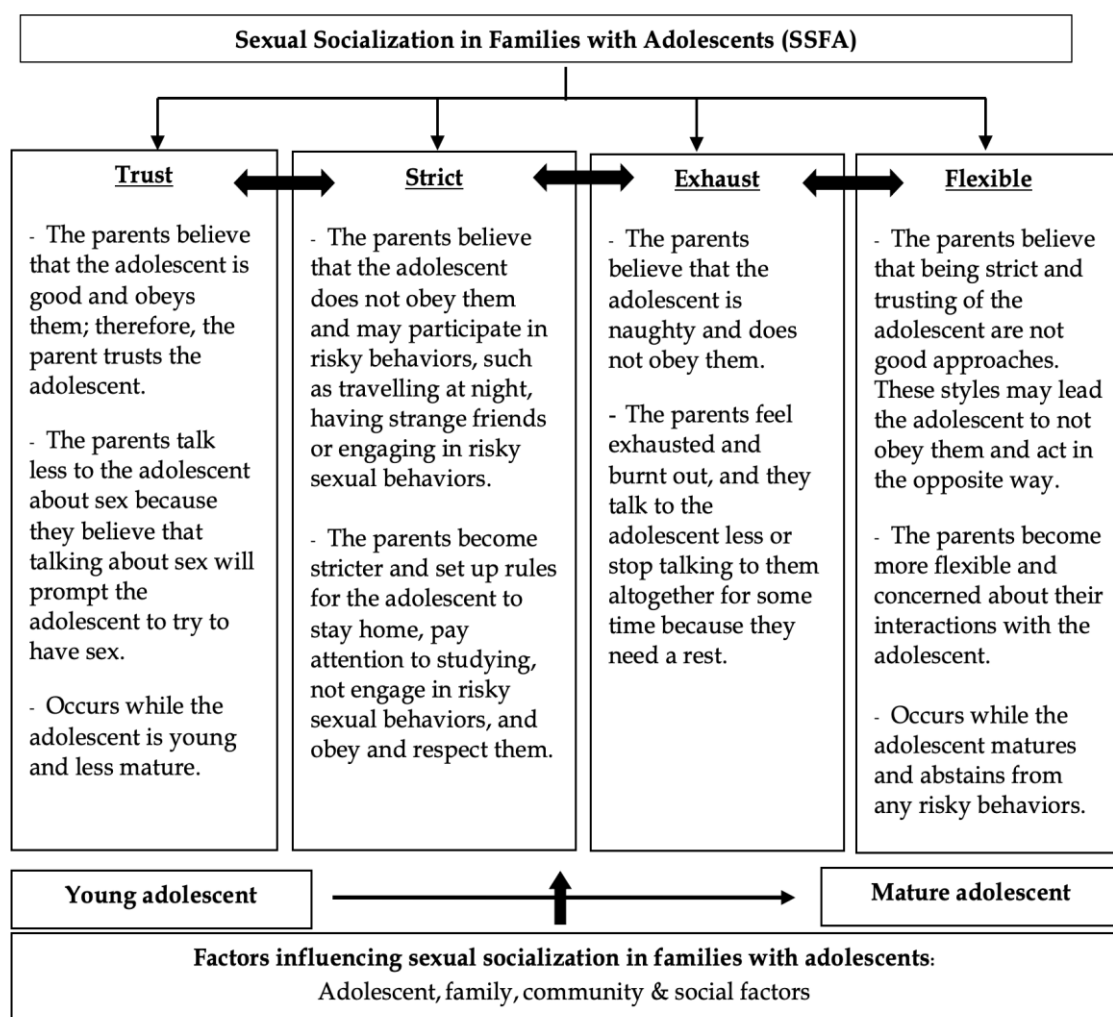
Exploring these integral parts within the Thai context showed that the sexual socialization process is dynamic, promoting adolescent sexual health characterized utilizing four configurations: trusting, strict, exhausted, and flexible patterns of sexual socialization. The study of this process revealed that sexual socialization in the family is dynamic, related to adolescents' behaviors, and can change, taking on various forms. The contents of the sexual socialization process include knowledge of physical changes; adolescents' roles and functions on behalf of themselves, their families, school, and society, such as sexual growth and development; care of the body and sexual organs; housework, studying, and schoolwork; friendships; travel at night with safety in mind; and engagement in sex, and safe sex (Saranrittichai, 2007). While studies have shown the positive impact of parent sexual socialization on adolescent sexual health (Saranrittichai et al., 2006), less is known about measuring sexual socialization. The objectives of this study were to develop and assess the validity and reliability of the Sexual Socialization in Families with Adolescents Scale (SSFAS) derived from a qualitative case study in Thailand, entitled "Sexual socialization and adolescent sexual health: A case study of rural Isan families" (Saranrittichai, 2007). This instrument could have the potential for family screening by classifying families into risk groups and could provide guidelines for health personnel to support families to appropriately teaching their children about sex.

Conceptual framework of the sexual socialization in families with adolescents (SSFA)

The conceptual framework of the SSFA by Saranrittichai (2007) was used in this study. Sexual socialization in families with adolescents, representing the functions of parents, is the interaction process between parents and adolescents. The goals of sexual socialization are to

contribute to adolescents' self-improvement, adaptation to society, becoming a useful member of society, and having a happy life. The SSFA process comprises four patterns: 1) trust pattern, 2) strict pattern, 3) exhaust pattern, and 4) flexible pattern. In general, the process of sexual socialization will move from trust to strict to exhaust to flexible from young adolescence to mature adolescence. However, the process of sexual socialization can move forward or backward at any time, depending on the interactions between parents and adolescents. The contents of sexual socialization in families are composed of: 1) taking care of the sexual organs and their function, 2) helping the family do housework, 3) making friends, 4) traveling and being conscious of dangers, and 5) sexual behavior. The Sexual Socialization in Families with Adolescents (SSFA) is therefore influenced by adolescents, family, community, and social factors. The conceptual framework of the SSFA is shown in Figure 1.

Figure 1: Sexual Socialization in Families with Adolescents (SSFA) conceptual framework

Note: Saranrittichai, 2007

Materials and methods

Design

This cross-sectional descriptive survey study investigated the factorial composition of a newly developed Thai SSFAS.

Participants

The participants were 460 parents in the rural and urban areas of Khon Kaen, a province in north-eastern Thailand. All participants had adolescent children aged 13 to 19 years of age currently studying in either secondary school (13 to 18 years of age) or vocational school (15 to 19 years of age). The secondary schools in Thailand provide both lower secondary education level (*Mattayomsuksa 1 to 3* in Thai) to early adolescents (13-15 years old) and upper secondary education level (*Mattayomsuksa 4 to 6* in Thai) to middle adolescents (>15-17 years old). The vocational schools provide basic vocational education level 'technical diploma' (*Por Wor Chor* in Thai) and upper vocational education level 'higher diploma' (*Por Wor Sor* in Thai) (>17 - 19 years old) to middle adolescents and late adolescents, respectively. All participants lived in urban or rural areas of Khon Kaen at the time of the study.

Sample size calculation

Comrey and Lee (2016) provided suggested sample sizes for factor analysis: 50 as very poor; 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1,000 as excellent. A guideline for the suggested sample size is approximately 10 cases per item for principal component analysis (PCA) and CFA, which is considered appropriate (Nunnally, 1978). Therefore, 10 cases were used for each of the 20 items, for a total of 200 cases. As 200 cases were considered adequate, we needed an appropriate general rule of thumb for factor analysis; thus, we needed a sample size of at least 400 parents. However, to account for subject withdrawal, we increased the sample size by 15%, for a total sample of 460 parents.
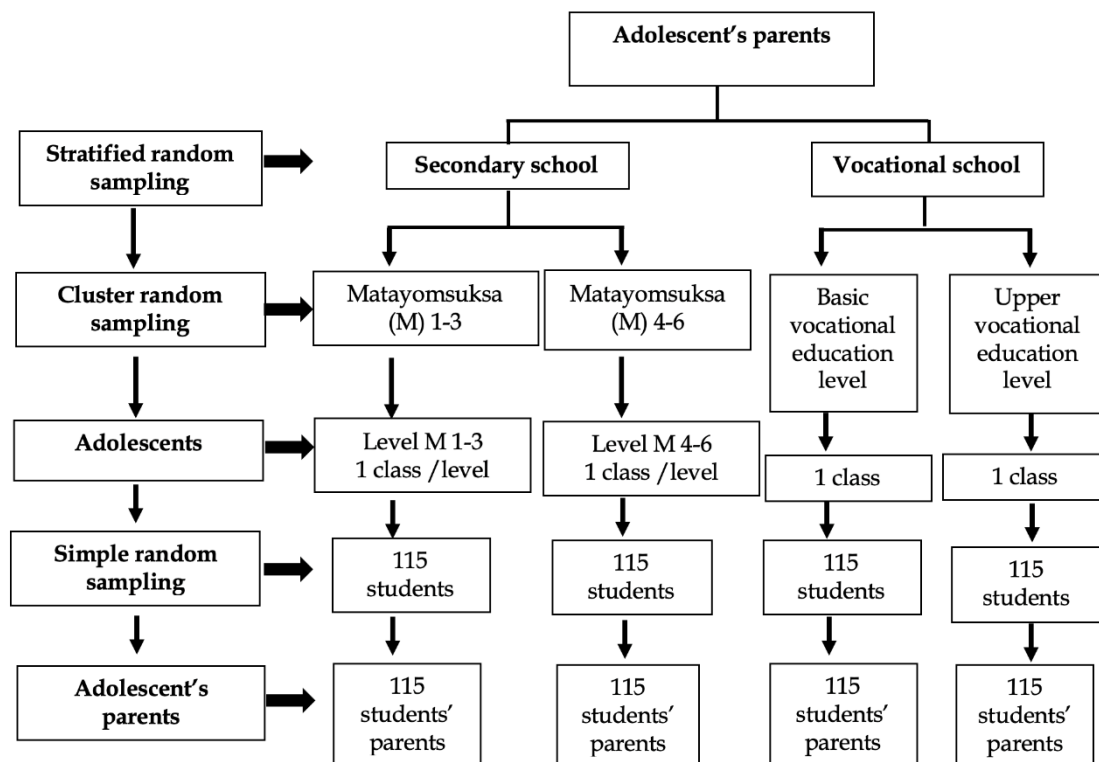
Sampling technique

The sampling technique was stratified cluster random sampling. The details are provided below:

1. Stratified random sampling was applied to two types of educational institutes: secondary schools and vocational schools in Khon-Kaen province.

2. Cluster random sampling was applied to obtain the target classes: Matayomsuksa 1 to 3 (13-15 years old, considered early adolescents) and Matayomsuksa 4 to 6 (>15-17 years old, considered middle adolescents), basic vocational education level (>15-17 years old, considered middle adolescents), and upper vocational education level (>17-19 years old, considered late adolescents).

3. Simple random sampling was applied to retrieve the target classes in each study level: Matayomsuksa 1 to 3, Matayomsuksa 4 to 6, basic vocational, and upper vocational education levels.

4. The target students were learners in the target classes who lived in the same house with their parents: 115 students in Matayomsuksa 1 to 3, 115 students in Matayomsuksa 4 to 6, 115 students in basic vocational level, and 115 students in upper vocational education level. The number of target students represents the number of parents.

5. Data were collected from a total of 460 parents.

The details of the sampling technique are shown in Figure 2.

Figure 2: Sampling technique

Survey questionnaire

The survey questionnaire contained three parts: 1) general family information, 2) general adolescent information, and 3) the SSFAS. The SSFA items were scored using a 5-point Likert-type scale: strongly agree (5), agree (4), somewhat agree (3), disagree (2), and strongly disagree (1). The SSFAS was composed of five components with a total of 20 items: 1) Sexual Socialization in Families with Adolescents Scale—general pattern (SSFAS-Ge) (5 items); 2) Sexual Socialization in Families with Adolescents Scale—trust pattern (SSFAS-Tr) (5 items); 3) Sexual Socialization in Families with Adolescents Scale—strict pattern (SSFAS-St) (4 items); 4) Sexual Socialization in Families with Adolescents Scale—exhaust pattern (SSFAS-Ex) (3 items); and 5) Sexual Socialization in Families with Adolescents Scale—flexible pattern (SSFAS-Fl) (3 items).

Data collection

The data were collected in a Matayomsuksa 1 to 6 secondary school, and a vocational school. The director of each school consented to the study. Teachers first gave students an overview of the study and then elicited students' verbal permission to participate. The researcher then provided the research details, and gained informed consent of the students and their parents. The informed consent forms and survey questionnaires were distributed to the students and their parents. The teachers then collected the questionnaires from students and passed the questionnaires to the researcher.

Data analysis

The general information of the families and parents was analyzed as follows:

1. Descriptive statistics (e.g., frequencies, percentages, means, and standard deviations) were used to present the family general information and scale scores.

2. A correlation matrix was performed to explore the relationships among variables (i.e., items or indicators). The dimension of the matrix can be reduced by looking at the correlations among variables. Variables with high intercorrelations can be grouped as one variable, which is called a factor.

3. Assessments of the suitability of the data for factor analysis by using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were performed. The KMO test, the indicator for the proportion of variance of items that might be caused by underlying factors, was used to measure the sampling adequacy. The KMO index ranges from 0 to 1, with a high value close to 1.0 being useful for factor analysis. Values more than 0.50 are considered to represent appropriate indexes. Bartlett's Test of Sphericity was used to explore the relationship among items deemed suitable for performing factor analysis by considering the correlation matrix to be an identity matrix and suitable for structure detection. Bartlett's Test of Sphericity indicated that factors suitable for analysis should be significant (p<0.05) (Hair et al., 1995).

4. Exploratory factor analysis (EFA) was conducted to identify the principal factor components and to examine the relationship between scale items to ensure unidimensionality, and to decrease redundant items by using PCA. Only the factors with eigenvalues greater than 1 were considered significant. All factors with eigenvalues less than 1 were deemed insignificant and were therefore eliminated. The explained variance was used to identify any discrepancy between a model and actual data. This variance was used as criteria for judging whether items in a scale load on one factor or not (Hair et al., 1995).

5. CFA was performed to confirm the relationship between the factor components and indicators, including the goodness of fit test. Construct validity was conducted by exploring convergent validity and discriminant validity. Convergent validity was used to test concepts or measurements that theoretically should be related or were related. In contrast, discriminant validity was used for considering whether those concepts or measures that were supposed to be unrelated were, in fact, unrelated. The factor loading of the indicator, composite

reliability or construct reliability (CR), and the average variance extracted (AVE) were used to consider convergent validity. The values ranged from 0 to 1. For adequate convergent validity, AVE values should be > 0.50 (Hair et al., 2016), and CR should be >0.60. A comparison between the square root of AVE and the correlation of latent constructs was conducted to compare the variance of its indicator and the variance of other latent constructs. The square root of each construct's AVE should have a greater value than the correlations with other latent constructs (Hair et al., 2016). The maximum shared variance (MSV) and the average shared squared variance (ASV) were established to determine discriminant validity. Furthermore, reliability was used to indicate the variance explained by the latent variable. The values ranged from 0 to 1. The appropriate values should be > 0.70 and deleted if values are < 0.40 (Hair et al., 2016).

The recommended cutoffs that indicate a good fit are CFI ≥.09, Tucker-Lewis index (TLI) ≥ 0.95, Root Mean Square Error of Approximation (RMSEA) < 0.08 (Hooper et al., 2008), and Standardized root mean squared residual (SRMSR) < 0.08 (Hu & Bentler, 1999).

6. SSFAS normative scores were calculated to clarify more, moderate, and less of each factor to explain patterns of sexual socialization based on the mean and standard deviation of each pattern.

Results

The results are presented in eleven sections: 1) scale development, 2) general family information, 3) sexual socialization in families with adolescents, 4) the appropriateness of the factor analysis, 5) factors and indicators of the SSFAS, 6) EFA of the SSFAS, 7) reliability of the SSFAS, 8) CFA of the SSFAS, 9) structural equation model (SEM) for CFA, 10) means and standard deviations of the SSFAS, and 11) SSFAS normative scores

Scale development

The SSFAS was developed using a three-step process as follows:

1. Item generation

    Twenty items for this current study were derived from prior qualitative research (Saranrittichai, 2007). The preceding study used interviews, focus group discussions, and participant observations with parents in 23 families to explore how parents socialized their adolescents about sex. The indicators used in this scale were generated from variables regarding Sexual Socialization in Families with Adolescents (SSFA) conceptual framework derived from the prior qualitative study.

2. Scale development

    The content validity was assessed by five experts in different areas of adolescent health services and education: an adolescent psychologist, a pediatrician, a child

health nurse, an adolescent nursing educator, and a sociologist. The experts reviewed the content, the relevance of each indicator in each theme, and the proportional number of indicators in each theme. To be accepted, an indicator needed to receive 3 or 4 marks out of 5, and be approved by at least 80% of the experts. The content validity index (CVI) was calculated as 0.89. The experts' suggestions on each SSFAS indicator were incorporated in the second round of editing. Before finalizing the SSFAS, five parents reviewed the language for comprehension. To test reliability, the SSFAS scale was administered to 30 parents and 30 adolescents, and the item reliability was calculated (r = 0.848) by using Cronbach's alpha coefficient.

3. Item analysis

   3.1 Exploratory factor analysis (EFA): The construct validity of the SSFAS was assessed by using EFA to explore the clustering of variables and principal factor components.

   3.2 Confirmatory factor analysis (CFA): A CFA was carried out to confirm the components of the SSFAS and test for construct validity. Construct validity was evaluated by exploring convergent validity and discriminant validity.

General family information

The participants were 460 parents who socialized and lived in the same house with their adolescents. The majority of families were from rural areas (71.74%); the parents were mostly in the 40- to 49-year age range (69.13%), and mothers were predominant (63.91%). Forty-seven percent of the parents had finished bachelor's degrees (47.39%). The parents mostly conducted sexual socialization in the general pattern (49.13%), followed by the trusting pattern (33.04%).

Sexual socialization in families with adolescents

Sexual socialization in families included communicating about sexual issues with their children and talking about other behaviors contributing to sexual behaviors. Sexual socialization in families mostly focused on teaching the adolescent about staying at home or doing housework (p5) ($\bar{x}$ = 4.59), followed by teaching the adolescent to respect people of the opposite sex (p8) ($\bar{x}$ = 4.57). A less often taught topic was safe sex, such as about how to have safe sex (p9) ($\bar{x}$ = 3.52). The most common methods that parents used for sexual socialization were closely observing the adolescent for problems and behaviors (p12) ($\bar{x}$ = 4.17); the least common aspects of sexual socialization that the parents reported were being tired of teaching adolescents or feeling exhausted (p17) [because adolescents did not obey their parents] ($\bar{x}$ = 2.23). More complete details are shown in Table 1.

Table 1: Sexual socialization in families with adolescents

Item	SSFAS	$\bar{x}$	SD
p1	Teaching the adolescent about bodily changes	3.82	1.06
p2	Teaching the adolescent about taking care of their body	4.01	1.07
p3	Teaching the adolescent about being friends with people of the same sex	3.97	1.05
p4	Allowing the adolescent to be friends with people of the opposite sex	4.23	0.94
p5	Teaching the adolescent about staying at home or doing housework	4.59	0.72
p6	Teaching the adolescent about focusing on their learning	4.17	1.03
p7	Teaching the adolescent about preserving their virginity	4.29	0.83
p8	Teaching the adolescent to respect people of the opposite sex	4.57	0.74
p9	Teaching the adolescent about how to have safe sex	3.52	1.23
p10	Setting up strict rules	3.93	1.06
p11	Blaming the adolescent when they disobey	4.07	.94
p12	Closely observing the adolescent for problems and behaviors	4.17	.85
p13	Helping the adolescent when they have a sexually transmitted disease	4.05	1.03
p14	Making friends	3.75	1.00
p15	Reducing the amount of teaching or caring	2.54	1.32
p16	Not taking things seriously and letting it be	2.62	1.28
p17	Being tired of teaching the adolescent or feeling exhausted	2.23	1.32
p18	Gaining more understanding of the adolescent	4.34	.91
p19	Gaining more understanding of your teaching	4.01	.93
p20	Being happy when the adolescent returns	4.34	.91

The appropriateness for the factor analysis

According to the correlation matrix, correlations among the SSFAS variables varied from weak to strong. The variables that had the strongest correlations were p1 and p2, followed by p1 and p3, which had correlation coefficients of .710 and .426, respectively. The variables that had did not have any correlations (correlation coefficients of 0.00) were p1 and p15. The correlation matrix is shown in Table 2.

The KMO measure of sampling adequacy and Bartlett's test of sphericity indicated the appropriateness of the factor analysis. The KMO measure of sampling adequacy was 0.810 (greater than 0.5 is useful for factor analysis, df = 190, $p < 0.000$); and Bartlett's test of sphericity was 2,777.062 with significant ($p < 0.000$).

Table 2: Correlation matrix of the SSFAS

	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10	p11	p12	p13	p14	p15	p16	p17	p18	p19	p20
p1	1	.710**	.426**	.217**	.256**	.101*	.316**	.273**	.348**	.172**	.109*	.197**	.389**	.185**	.000	-.076	-.024	.194**	.120*	.160**
p2	.710**	1	.413**	.251**	.257**	.212**	.344**	.289**	.287**	.160**	.125**	.190**	.347**	.164**	-.009	-.074	-.050	.183**	.146**	.174**
p3	.426**	.413**	1	.382**	.309**	.170**	.307**	.271**	.277**	.223**	.098*	.265**	.282**	.198**	-.001	-.112*	-.097*	.195**	.185**	.242**
p4	.217**	.251**	.382**	1	.239**	.209**	.375**	.394**	.295**	.165**	.108*	.194**	.178**	.213**	-.105*	-.064	-.059	.189**	.228**	.202**
p5	.256**	.257**	.309**	.239**	1	.455**	.458**	.330**	.170**	.280**	.241**	.304**	.179**	.147**	-.026	-.093*	-.185**	.139**	.192**	.172**
p6	.101*	.212**	.170**	.209**	.455**	1	.464**	.325**	.016	.201**	.206**	.274**	.110*	.090	-.078	-.119*	-.147**	.163**	.241**	.261**
p7	.316**	.344**	.307**	.375**	.458**	.464**	1	.440**	.226**	.168**	.209**	.339**	.285**	.137**	-.112*	-.102*	-.145**	.222**	.187**	.193**
p8	.273**	.289**	.271**	.394**	.330**	.325**	.440**	1	.187**	.130**	.073	.209**	.295**	.139**	-.119*	-.123**	-.141**	.230**	.176**	.152**
p9	.348**	.287**	.277**	.295**	.170**	.016	.226**	.187**	1	.253**	.149**	.140**	.314**	.235**	.092*	.151**	.106*	.191**	.183**	.162**
p10	.172**	.160**	.223**	.165**	.280**	.201**	.168**	.130**	.253**	1	.408**	.390**	.177**	.285**	.028	-.094*	.025	.193**	.139**	.119*
p11	.109*	.125**	.098*	.108*	.241**	.206**	.209**	.073	.149**	.408**	1	.366**	.163**	.189**	.029	-.058	.050	.103*	.119*	.135**
p12	.197**	.190**	.265**	.194**	.304**	.274**	.339**	.209**	.140**	.390**	.366**	1	.383**	.294**	-.098*	-.181**	-.130**	.200**	.242**	.218**
p13	.389**	.347**	.282**	.178**	.179**	.110*	.285**	.295**	.314**	.177**	.163**	.383**	1	.312**	.028	-.044	-.035	.276**	.187**	.277**
p14	.185**	.164**	.198**	.213**	.147**	.090	.137**	.139**	.235**	.285**	.189**	.294**	.312**	1	.038	.014	.078	.253**	.225**	.211**
p15	.000	-.009	-.001	-.105*	-.026	-.078	-.112*	-.119*	.092	.028	.029	-.098*	.028	.038	1	.600**	.516**	.022	-.057	-.126**
p16	-.076	-.074	-.112*	-.064	-.093*	-.119*	-.102*	-.123**	.151**	-.094*	-.058	-.181**	-.044	.014	.600**	1	.517**	.044	-.002	-.107*
p17	-.024	-.050	-.097*	-.059	-.185**	-.147**	-.145**	-.141**	.106*	.025	.050	-.130**	-.035	.078	.516**	.517**	1	-.036	-.059	-.120*
p18	.194**	.183**	.195**	.189**	.139**	.163**	.222**	.230**	.191**	.193**	.103*	.200**	.276**	.253**	.022	.044	-.036	1	.560**	.437**
p19	.120*	.146**	.185**	.228**	.192**	.241**	.187**	.176**	.183**	.139**	.119*	.242**	.187**	.225**	-.057	-.002	-.059	.560**	1	.603**
p20	.160**	.174**	.242**	.202**	.172**	.261**	.193**	.152**	.162**	.119*	.135**	.218**	.277**	.211**	-.126**	-.107*	-.120*	.437**	.603**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed),
  * Correlation is significant at the 0.05 level (2-tailed).
   Kaiser-Meyer-Olkin measure of sampling adequacy = 0.810, df = 190, p < 0.000
   Bartlett's test of sphericity = 2,777.062, p < 0.000

The factors and indicators of the SSFAS

After considering factor loading, there were a total of five factors and 20 indicators: *1) the general pattern of sexual socialization in families with adolescents (SSFAS-Ge)*, composed of five indicators (four content indicators and one method indicator); *2) the trusting pattern of sexual socialization in families with adolescents (SSFAS-Tr)*, composed of five indicators (four content indicators and one method indicator); *3) the strict pattern of sexual socialization in families with adolescents (SSFAS-St)*, composed of four indicators (four method indicators); *4) the exhausted pattern of sexual socialization in families with adolescents (SSFAS-Ex)* (exhausted indicates parents being tired of teaching adolescents), composed of three indicators (two content indicators and one method indicator); and *5) the flexible pattern of sexual socialization in families with adolescents (SSFAS-Fl)*, composed of three indicators (two content indicators and one method indicator). A total of five factors and 20 indicators are shown in Table 3.

Table 3: Factors and indicators of the SSFAS

Factors		Indicators	Factor loading
General	p1	Teaching the adolescent about bodily changes (content)	.835
	p2	Teaching the adolescent about taking care of their body (content)	.777
	p3	Teaching the adolescent about being friends with people of the same sex (content)	.596
	p9	Teaching the adolescent about how to have safe sex (content)	.544
	p13	Helping the adolescent when they have a sexually transmitted disease (method)	.547
Trusting	p6	Teaching the adolescent about focusing on their learning (content)	.765
	p7	Teaching the adolescent about preserving their virginity (content)	.704
	p5	Teaching the adolescent about staying at home or doing housework (content)	.688
	p8	Teaching the adolescent to respect people of the opposite sex (content)	.569
	p4	Allowing the adolescent to be friends with people of the opposite sex (method)	.408
Strict	p10	Setting up strict rules (method)	.745
	p11	Blaming the adolescent when they disobey (method)	.735
	p12	Closely observing the adolescent for problems and behaviors (method)	.651
	p14	Making friends (method)	.468
Exhausted	p16	Not taking things seriously and letting it be (feeling)	.855
	p15	Reducing the amount of teaching or caring (method)	.836
	p17	Being tired of teaching the adolescent or feeling exhausted (feeling)	.780
Flexible	p19	Gaining more understanding of your teaching (method)	.761
	p20	Being happy when the adolescent returns (feeling)	.854
	p18	Gaining more understanding of the adolescent (method)	.786

EFA of the SSFAS

After using a PCA as the extraction method, five factors with eigenvalues greater than 1 emerged. The eigenvalues of the five factors were 4.942, 2.243, 1.654, 1.490, and 1.304 (in PCA, an eigenvalue > 1 for each component or factor, was considered appropriate for the model). The SSFA model components explained 58.18% of the total variance in the Sexual Socialization in Families with Adolescents Scale. The results of the EFA for the SSFAS are shown in Table 4.

Table 4: Total variance explained the construct validity of the SSFAS

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.942	24.711	24.711	4.279	21.397	21.397	2.105	10.526	10.526
2	2.243	11.217	35.928	1.751	8.755	30.152	1.980	9.902	20.427
3	1.654	8.269	44.197	1.309	6.546	36.698	1.766	8.828	29.255
4	1.490	7.452	51.649	1.018	5.088	41.786	1.754	8.770	38.025
5	1.304	6.518	58.167	.779	3.893	45.679	1.531	7.654	45.679
6	.976	4.881	63.049						
7	.861	4.304	67.353						
8	.742	3.709	71.062						
9	.687	3.436	74.498						
10	.679	3.394	77.893						
11	.652	3.262	81.154						
12	.550	2.748	83.903						
13	.540	2.702	86.605						
14	.476	2.382	88.986						
15	.452	2.258	91.244						
16	.433	2.167	93.411						
17	.382	1.912	95.324						
18	.347	1.733	97.057						
19	.321	1.607	98.663						
20	.267	1.337	100.00						

Note: Principal Component Analysis was the Extraction Method. Five components had eigenvalues greater than 1.
KMO = 0.810, Bartlett test = 2777.062, (P < 0.00)

Reliability of the SSFAS

Reliability was used to indicate variance explained by the latent variable. The values mostly ranged from 0.73-0.78, and only one factor had a value of 0.65, which indicated an appropriate value and should not be deleted. The results of the reliability of five factors for the SSFAS are shown in Table 5.

Table 5: Reliability of the SSFAS

SSFA	Number of items (n=20)	Cronbach's alpha
General	5	0.75
Trust	5	0.73
Strict	4	0.65
Exhaust	3	0.78
Flexible	3	0.77

CFA of the SSFAS

A CFA was performed after the EFA to determine the relationship between factors (i.e., components) and indicators (i.e., items), including the goodness of fit test. The factor loading of indicators ranged between 0.408-0.855. All path loadings were significant at $p < 0.05$. AVE ranked from 0.329-0.548, showing that some values were lower than 0.50. CR ranged between 0.644-0.783, showing values > 0.6. MSV ranged between 0.047-0.149, and the average shared squared ASV ranged between 0.12-0.100. Both MSV and ASV showed lower than the AVE for all the constructs, indicating that the model has discriminant validity. In all factor loading, the AVE of each construct was higher than its correlation with other constructs and CR, indicating that the model has convergent validity. The standardized results of the CFA are shown in Table 6.

Table 6: CFA of the SSFAS

Factor	Indicator	Factor loading	CR	AVE	MSV	ASV
General	p1	.835	0.644	0.350	0.149	0.100
	p2	.777				
	p3	.596				
	p9	.544				
	p13	.547				
Trust	p6	.765	0.733	0.377	0.149	0.082
	p7	.704				
	p5	.688				
	p8	.569				
	p4	.408				
Strict	p10	.745	0.653	0.329	0.047	0.012
	p11	.735				
	p12	.651				
	p14	.468				
Exhaust	p16	.855	0.783	0.548	0.120	0.068
	p15	.836				
	p17	.780				
Flexible	p19	.761	0.783	0.547	0.129	0.075
	p20	.854				
	p18	.786				

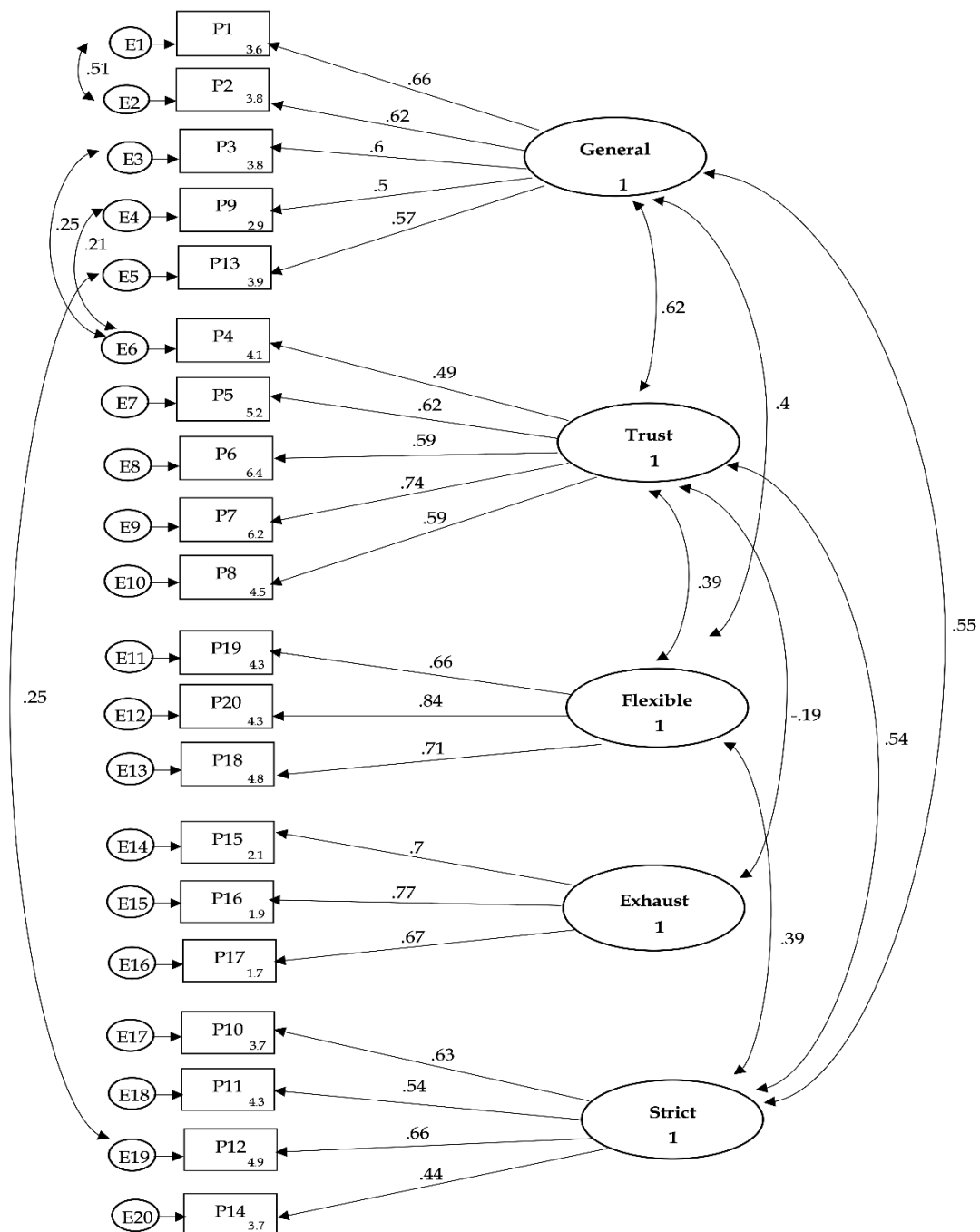*Note: LR test of model vs. saturated: chi2(159) = 379.70, Prob > chi2 = 0.0000*
Relative chi-square = 2.388, Prob>chi2 = 0.122
CFI = 0.916, TLI = 0.900, RMSEA = 0.055

Structural equation model (SEM) for CFA

The SEM model for CFA demonstrated factor loadings that ranged between 0.406 and 0.854, and the model fit was adequate, as evidenced by the overall RMSEA, which was 0.055. ($P < 0.000$, 90% CI 0.058 – 0.070). Values < 0.08 are considered acceptable. The comparative fit index (CFI) = 0.917, which is acceptable. The Tucker-Lewis index (TLI) = 0.901, which is slightly lower than 0.95. Values < 0.08 are acceptable. Relative chi-square = 2.388. All values are acceptable and indicated that the model is appropriate. The structural equation model (SEM) for CFA of SSFAS is shown in Figure 3.

Figure 3: SEM for CFA of SSFAS

Means and standard deviations of the SSFAS

The SSFAS had a total possible score range of 0-110. The total actual score range was 47-100, with an overall mean of 76.91 and a standard deviation of 9.01. The mean and standard deviation for each pattern of the SSFAS are shown in Table 7.

Table 7 Means and standard deviations of the SSFAS

SSFAS Pattern	Min	Max	Mean	SD
SSFA	**47**	**100**	**76.91**	**9.01**
SSFA-General	5	25	19.36	3.85
SSFA-Trusting	6	25	21.84	2.98
SSFA-Strict	7	20	15.93	2.70
SSFA-Exhausted	3	15	7.39	3.27
SSFA-Flexible	3	15	12.38	2.32

SSFAS normative scores

The results showed that the SSFA-General factor existed in every pattern of the SSFA, which meant that parents taught adolescents these contents and methods in all patterns of sexual socialization. The normative scores and descriptive labels for each SSFA pattern are shown in Table 8.

Table 8: The SSFAS normative scores

Pattern of the SSFAS	Descriptions
SSFAS-General	
16-23	-
SSFAS-Trusting	
> 24	More trusting
19-24	Moderately trusting
< 19	Less trusting
SSFA-Strict	
> 18	More strict
13-18	Moderately strict
< 13	Less strict
SSFA-Exhausted	
> 10	More exhausted
4-10	Moderately exhausted
< 10	Less exhausted
SSFA-Flexible	
> 14	More flexible
10-14	Moderately flexible
< 10	Less flexible

Discussion

This factor analytic study established five main factors (i.e., components) for the SSFAS: 1) a general pattern of sexual socialization in families with adolescents in general pattern; 2) a trusting pattern of sexual socialization in families with adolescents; 3) a strict pattern of sexual socialization in families with adolescents; 4) an exhausted pattern of sexual socialization in families with adolescents, which indicated that parents were tired of talking with their children about sexual issues; and 5) a flexible pattern of sexual socialization in families with adolescents. These patterns not only represent interactive patterns but also indicate that parents' mental health status contributes to their communication with their children about sexuality.

The strengths of this instrument are that the items were developed based on existing phenomena that best explain sexual socialization in families with adolescents. The instrument helps measure patterns throughout the process of sexual socialization in families with adolescents. The results show a difference from the earlier PTSRC III scale (Hutchinson & Cooney, 1998), which measured the frequency of communication about sexual content (e.g., having sex, condom use, family planning, STDs, and HIV/AIDS) while the SSFAS is about patterns of sexual socialization. In addition, the SSFAS focuses on adolescent behaviors that lead to engagement in sexually risky behaviors, such as paying little attention to studying, traveling at night, having a variety of friends, and disobeying parents or being obstinate. A previous study also measured feelings of awkwardness when parents talked with their adolescents about sex, particularly about having sex (Ogle et al., 2008), which might have characterized some of the parents' communications about sex, but not others. Family is a social determinant of adolescent sexual health (Saranrittichai, 2007), and cooperative and prosocial behaviors need to be emphasized (Chu & Chau, 2014); thus, factors that influence parents and adolescents need to be explored in terms of parent-adolescent interactions.

Conclusions

The results suggest that communication between parents and adolescents about sex can be classified into patterns. The Sexual Socialization in Families with Adolescents Scale (SSFAS) helps identify such patterns of sexual socialization in families and can be used for screening risk patterns of sexual socialization. Thus, specific interventions may be needed for each sexual socialization pattern to promote effective sexual communication and education, which contributes to adolescent sexual health. Further research could develop a health literacy-based program for particular patterns of sexual communication between parents and their adolescents, which could be utilized for effective sex education in families. Finally, an adolescent sexual health scale needs to be developed to determine the relationship between sexual socialization in families and adolescent sexual health. Socialization practices focused on young people's sexual socialization, or sexual communication are carried out mostly in the Global North; thus, the SSFA needs to be further tested in other cultures.

Acknowledgments

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