



DEVELOPMENT AND VALIDATION OF THE SEXUAL ABSTINENCE SCALE (SAS)

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ABSTRACT

The Sexual Abstinence Scale (SAS) is designed to assess healthy sexual behaviour among adolescents as a way to reduce the incidence of HIV and other sexually transmitted diseases. This cross sectional study took place in two phases. The first phase comprised of 1030 adolescents randomly selected from senior classes in secondary schools in three out of five local government areas within Ibadan municipality. The second phase had 250 participants also randomly selected from senior secondary classes. Items generated for the scale were obtained from an extensive literature review. The content validity of the instrument was confirmed through peer reviews of experts in the field of adolescent sexuality. The internal consistencies for the six sub-scales were .8430 for knowledge of sexual abstinence sub-scale, .8170 for perceived risk of sexual abstinence sub-scale, .6310 for attitude towards sexual abstinence sub-scale, .9380 for perceived benefits of sexual abstinence sub-scale, .7910 for sexual abstinence self-efficacy sub-scale, .8030 sexual abstinence education sub-scale and .8860 for the full scale. The relevance of this scale to stakeholders in adolescent's reproductive health behaviour, counsellors, researchers as well as the limitations are discussed.

Key words: *Sexual abstinence, Scale, Adolescents, Development, Validation*

INTRODUCTION

Premarital sexual activities among adolescents are increasing in the countries around the world. Many of these sexual activities are risky, unplanned (Adhikari & Tamang, 2009; McManus & Dhar, 2008), and unprotected (Adhikari & Tamang, 2009; Gubhaju, 2002; UNAIDS 2008). Among Nigerian adolescents too, premarital sexual activities are on the rise (Federal Ministry of Health, 2005). Such activities make adolescents one of the most vulnerable groups for HIV infection worldwide (Iriyama, Nakahara, Jimba, Ichikawa & Wakai, 2007; Regmi, Simkhada & Van Teijlingen, 2008). Sexual abstinence has become the primary response to adolescent pregnancy and sexually transmitted infection (STI) prevention (Felice, Feinstein, Fisher, Kaplan, Olmedo, Rome, Stagers, 1999; American Medical Association, 1997).

The Nigerian National Policy on health and development of adolescents and young people encourage abstinence programmes as key intervention for promoting healthy sexual behaviour in young people (Federal Ministry of Health, 2007). Religious, socio-economic and logistic impediments have continued to greet the wake of the promotion of condom usage among young unmarried people (Araoye & Fakeye, 1998; Isiugo-Abanihe & Oyediran, 2004; Adedimeji, Omololu & Odutolu, 2007). This heightens the need to both develop and increase support for comprehensive programmes that strengthen the practice of abstinence among the unmarried youths. However, evidences from systematic reviews conducted in developed and developing countries suggest that abstinence programmes to prevent HIV infection do not effectively encourage abstinent behaviour (Underhill, Montgomery & Operario, 2007; O'Reilly, Medley, Dennison & Sweat, 2006). This could be because most abstinence programs are based on adult ideas of abstinence, and not much is known about how adolescents themselves conceptualize sexual abstinence. In order to develop effective and comprehensive sexuality interventions for young people in Nigeria, there is need to understand adolescents' conceptualization of the term 'sexual abstinence' as well as the belief in their ability to sexually abstain. The need to identify the factors and the social context that influence adolescents' decision to adopt abstinence has also been emphasised (Iyanwura, Daniel & Adelowo, 2007).



The most strongly related factors associated with sexual behaviour in teens are beliefs, attitudes, and skills (Kirby 2001). Given the finding that most adolescents are not sure about what sexual abstinence really means and sometimes confuse the term with similar sounding words (Ott, Pfeiffer & Fortenberry, 2006), the adolescents' knowledge base about what abstinence is or is not; the benefits or risks of abstinence as well as their beliefs of who or where to teach abstinence education could go a long way in determining whether adolescents will adopt sexual abstinence (both primary and secondary) behaviour or not.

Several instruments have been believed to abstinence behaviours. For instance, a study examined *reasons for* abstinence such as fear of adverse consequences, perception of peer's normative behaviour, and perception of the benefits to waiting (Loewenson, Ireland & Resnick, 2004). The Sexual Ideology Instrument (SII) provides measurement of *attitudes toward* the sexual abstinence (Lottes, 1983a; 1983b; 1998). Also Quadagno's (1998) the Age, Gender, and Sexual Motivation Inventory (AGSMI) addresses several dimensions of motivation for sexual activity such as physical, emotional, and fear of relationship status with partner. These instruments however fail to assess adolescents' conceptualisation of sexual abstinence or adolescents' perception of risks that may be involved in abstinence.

In light of the importance of ensuring sexual abstinence among unmarried adolescents and the observed weaknesses in existing abstinence scale it seems useful to develop an instrument that would assess adolescents knowledge about sexual abstinence, their perceptions about its possible benefits and risks, their attitude towards sexual abstinence, their self-rated sexual abstinence self-efficacy as well as their opinion on who and where to teach sexual abstinence education. The goal of this study therefore, is to develop and validate a psychometrically sound sexual abstinence scale that could be used both for clinical and research purposes.

Procedure

Schwab (1980) has suggested that the development of measures have three basic stages. Stage 1 is item development which involves the generation of individual items. Stage 2 is scale development, or the manner in which items are combined to form scales. Stage 3 is scale evaluation, or the psychometric examination of the new measure.

Content validity was assessed through experts in adolescents' sexual behaviour. Reliability of the scores was assessed through two methods: computation of coefficient alphas for each factor, and testing split-half reliability. Although a test-retest reliability assessment would have been optimal to measure error (or stability of scores) over time (Selltiz, Wrightsman, & Look, 1976), split-half reliability was employed instead for convenience and economy of time.

Item Development

Items were developed based on logic and extensive review of literature on adolescents' sexual behaviour. In order to ensure content validity, items for the instrument needed to be drawn from representative sample of a universal pool (Cronbach as cited in Thorndike, 1971). Sexual abstinence has been conceptualized as the avoidance and restraint from sexual intercourse or other sexual acts considered to be precursors to sexual intercourse and/or the internalization of traits, skills or characteristics consistent with an abstinent lifestyle (Goodson, Suther, Pruitt, & Wilson, 2003). The domains of interest were highlighted to guide the construction and generation of sample items that represented the concept under consideration. 74 items were initially generated to assess different domains of adolescents'



sexual behaviour and given unedited to experts in adolescents' sexual behaviour to appraise. The domains addressed include: adolescents' knowledge of what sexual abstinence means, adolescents' perceived risk of sexual abstinence, adolescents' attitude to sexual abstinence, adolescents' perceived benefits of sexual abstinence, adolescents' sexual abstinence self-efficacy and who adolescents believe should teach sexual abstinence education. The items were not categorised into their different domains but were mixed. Participants were expected to respond to the items using a 5-point likert format ranging from strongly disagree (1) to strongly agree (5).

Understanding adolescents' perception of the meaning of sexual abstinence is important as they may be carrying out some behaviours believing it is sexual abstinence while it is not. For instance Sanders and Reinisch (1999) reported that 60% of a sample of college students did not consider oral sex alone to be "having sex." Assessing perceived risk of abstaining from sex is to enable counsellors identify factors that would likely encourage adolescents to engage in sex rather than abstain. Attitude plays an important role in determining behaviour, hence assessing the adolescents' attitude to sexual abstinence is important to give an informed guess of their tendency for abstinent behaviour. Adolescents perceived benefits of sexual abstinence are assessed to have ideas of factors that will motivate adolescents to abstain. Assessing adolescents' sexual abstinence self-efficacy is important to ascertain if adolescents believe they have the ability to control their sexual urges and so postpone sexual gratification. Self-efficacy is a proximal and direct predictor of intention and of behavior. According to Social Cognitive Theory (SCT; Bandura, 1997), a personal sense of control facilitates a change of health behavior. Finally assessing who adolescents believe should teach sexual abstinence education is important in order to pass sexual abstinence education through the media adolescents will readily accept as credible and in order.

The feedback from the experts revealed that one item was duplicated and another item was removed outright. Some of the remaining 72 items were re-phrased to remove ambiguity after which it was administered in the first phase of the validation exercise.

Phase 1

The first phase of the development and validation of the sexual abstinence scale involved 1,030 students randomly selected from senior classes in secondary schools in three out of five local government areas within Ibadan municipality. The sample comprised 649 males and 381 females. 79.0% of the respondents were in the 15-20 age brackets, 19.2% in the 10-14 age brackets and 1.7% were in the greater than 20 age bracket.

Each of the subscales of the sexual abstinence scale was subjected to principal component analysis (PCA) to determine if items on each subscale defined single component. It has been suggested that item loadings >0.30 are considered significant, >0.40 are more important, and >0.50 are considered very significant (Hair, Anderson, & Tatham, 1992). Since there are no accepted "absolute" standards, a cut-off point of 0.40 for item loadings and eigenvalue above 1 was used for this study. PCA was run on the items, the results generated were examined and items that did not meet the loading cut-off or loaded on more than one component were eliminated. This process was repeated until it all generated items meet the loading cut-off and loaded only within a specific component.

All subscales had Kaiser-Meyer-Olking (KMO) statistic greater than 0.600 and the Bartlett's test for each was significant ($p < .05$). KMO is used for assessing sampling adequacy and evaluates the correlations and partial correlations to determine if the data are likely to coalesce on components (i.e. some items highly correlated, some not). The Bartlett's test evaluates whether or not the correlation matrix is an identity matrix (1 on the entire diagonal & 0 on all the off-diagonal). This tests the null hypothesis that the correlation matrix is an identity matrix. The regression scores for components in each subscale were generated



and no relationship was found between the components (regression scores) of each subscale which implies the need to use an orthogonal rotation strategy. VARIMAX rotation strategy, which is a form of orthogonal rotation, was used.

Items on all the subscales did not initially load as single components, the items generated for each subscales were written out and given unedited to experts who work in the area of adolescents' sexual behaviour and PhD students who were researching on adolescents' sexual behaviour for further scrutiny. They were asked to remove items that do not seem to perfectly fit into each subscale or indicate items that may need re-wording. Only items jointly retained were used to develop a second shorter scale used for the second phase of the study.

Based on the feedback obtained, 6items were retained for the Knowledge of Sexual Abstinence subscale, 7items for the Abstinence Risk Perception subscale, 5items for the Attitude to Abstinence subscale, 12items for the Benefit of Abstinence subscale, 4items for the Abstinence Self-Efficacy subscale and 7 items for the Who to Teach Abstinence Education subscale.

Phase 2

In the second phase the items generated at the end of phase 1 were organised into subscales and administered to 250 randomly selected senior secondary school students. Using the extraction method of the principal component analysis, one component was extracted for knowledge of sexual abstinence sub-scale made up of 6items. In the perceived risk of abstinence domain, two components were initially extracted but when the item 'Abstinence does not help build relationship' was removed, because it loaded on the two components which shouldn't be, the system extracted one component made up of 6items. Attitude towards sexual abstinence domain loaded two components but when the item 'Abstinence can be maintained over time' was removed because it loaded with <0.4 on component 1, the items loaded as a single component made up of 5items. The benefit of sexual abstinence domain loaded as one component made up of 12items. The sexual abstinence self-efficacy domain loaded as one component made up of 4items. Finally, the who to teach abstinence education sub-scale initially loaded as two components but when the item 'There are no programmes to teach sexual abstinence to people' was removed because it loaded poorly on component 1, items loaded as one component made up of 6items.

The 39 item Sexual Abstinence Scale emerged made up of 6items for knowledge of abstinence subscale, 6items for risk perception subscale, 5items for attitude towards abstinence, 12items for perceived benefit of abstinence, 4items for abstinence self-efficacy and 6items for who to teach abstinence education. Having obtained subscales with single components, it became necessary to assess the internal consistency values of each subscale. This is presented under results

Results

The analysis for the validation of the developed items in the sexual abstinence scale was run through the computer using SPSS 17.0. Spearman-Brown and Guttman statistical tools for measuring the co-efficient values of the items. Tables 1 to 6 show the internal consistency values of the six sub-scales that make up the sexual abstinence scale.

Table 1: Internal consistency indices of the knowledge of sexual abstinence

Items	Inter-Item Correlations R.I. (T-I)
1	.749
2	.775
3	.612
4	.827



5	.768
6	.753

Equal length Spearman-Brown = .8360
 Unequal length Spearman-Brown = .8360
 Guttman Split-Half = .8350
 Coefficient Alpha = .8430

All the items loaded substantially and significantly on factor 1 (Knowledge of sexual abstinence)

Table 2: Internal consistency values of perceived risk of sexual abstinence

Items	Inter-Item Correlations R.I. (T-I)
1	.6520
2	.7850
3	.7340
4	.7840
5	.5700
6	.6710

Equal length Spearman-Brown = .7920
 Unequal length Spearman-Brown = .7920
 Guttman Split-Half = .7890
 Coefficient Alpha = .8170

All the items loaded substantially and significantly on factor 2 (Perceived risk of sexual abstinence)

Table 3: Internal consistency values of Attitude to sexual abstinence

Items	Inter-Item Correlations R.I. (T-I)
1	.5910
2	.5790
3	.6450
4	.6540
5	.575

Equal length Spearman-Brown = .5850
 Unequal length Spearman-Brown = .5920
 Guttman Split-Half = .5780
 Coefficient Alpha = .6310

All the items loaded substantially and significantly on factor 3 (Attitude to sexual abstinence)

Table 4: Internal consistency estimates of perceived benefits of sexual abstinence

Items	Inter-Item Correlations R.I. (T-I)
1	.7240
2	.7570
3	.8100
4	.7780
5	.7590
6	.7740
7	.8000
8	.7640
9	.7980
10	.7920
11	.7200
12	.7800

Equal length Spearman-Brown = .908
 Unequal length Spearman-Brown = .908



Guttman Split-Half = .908
Coefficient Alpha = .9380

All the items loaded substantially and significantly on factor 4 (Perceived benefits of sexual abstinence)

Table 5: Internal consistency matrixes of sexual abstinence self-efficacy

Items	Inter-Item Correlations R.I. (T-I)
1	.6430
2	.7300
3	.6380
4	.7910

Equal length Spearman-Brown = .309 .825
Unequal length Spearman-Brown = .324 .825
Guttman Split-Half = .284 .751
Coefficient Alpha = .791

All the items loaded substantially and significantly on factor 5 (sexual abstinence self-efficacy)

Table 6: Internal consistency values of sexual abstinence education

Items	Inter-Item Correlations R.I. (T-I)
1	.7190
2	.7590
3	.5440
4	.7180
5	.7140
6	.7080

Equal length Spearman-Brown = .8090
Unequal length Spearman-Brown = .8090
Guttman Split-Half = .8090
Coefficient Alpha = .8030

All the items loaded substantially and significantly on factor 6 (sexual abstinence education)

Table 7: Summary of Reliability analysis for the sub-scales and the scale as a whole

Sub-Scales of the scale	Reliability Coefficient for each
Knowledge of sexual abstinence	.8430
Perceived risk of sexual abstinence	.8170
Attitude to sexual abstinence	.6310
Perceived benefits of sexual abstinence	.9380
sexual abstinence self-efficacy	.7910
sexual abstinence education	.8030
Sexual Abstinence Scale (SAS)	.8860

Discussion

The results obtained have demonstrated the reliability and validity of the sexual abstinence scale as a multidimensional scale with reliable sub-scales. The coefficient alpha values for each of the sections of the scale: knowledge of sexual abstinence, perceived risk of sexual abstinence, attitude to sexual abstinence, perceived benefits of sexual abstinence, sexual abstinence self-efficacy and sexual abstinence education were .8430, .8170, .6310, .9380, .7910 and .8030 respectively. These coefficient alpha values strongly attest to the reliability of the scale.



Validity of scores is necessary for an instrument to be useful. Instruments are evaluated based on whether they are capable of generating valid scores, while scores are evaluated based on the truth/validity of the data (Thompson, 2003; 2004). Valid scores provide assurance that scores from a measurement tool measure what it is intended to be measured (Thompson, 2003). Based on the definition of the characteristic being measured, validity is the amount of correspondence between the properties being measured within the instrument and the characteristic itself (Ghiselli, Campbell & Zedeck 1981). A panel of experts on the instrument topic is useful within survey construction, to assess whether items are measuring what they are supposed to be measuring, or establishing content validity (Smith, Steen, Spaulding-Givens & Schwendinger 2003). A set of experts in adolescents sexual behaviour assessed the sexual abstinence scale and established that it has content validity

In a theorists workshop, it was concluded that perceived benefit, perceived social norm, perceived self-efficacy, perceived consistency with self-standards, and emotional reaction often affect intentions when making a behaviour choice (Fishbein, Bandura, Triandis, Kanfer, Becker, & Middlestadt, 1992). Items within the subscales correspond to some of these factors, further validating this scale as important for sexual abstinent behaviour. For example, an adolescent is more likely to intend to remain sexually abstinent if he/she believes that there are benefits in waiting ('Abstinence protects the most delicate sex organ, the mind'); believes that important people such as the parents feel the same way ('Abstinence provides opportunity to make parents proud'), has perceived self-efficacy to refuse sexual advances ('I know how to practice sexual abstinence') and wants to avoid a negative emotional reaction ('Abstinence from sexual intercourse is the only sure way to avoid out of wedlock (and all) pregnancies as well as sexually transmitted diseases'). The development of sexual abstinence programs should focus on these factors given the theoretical and empirical support they enjoy.

Possible Application of the Sexual Abstinence Scale

This scale could be applied both for clinical and research purposes. It could be used to screen and manage sexual behaviour problems. It could also be used for selection into religious organisations that uphold chastity as a requirement for entry into such organisations. This scale will be useful in abstinence skill training acquisition; i.e., training for acquisition of self control. It will also be used as a research instrument among adolescents as a way to prevent STI /HIV among the group.



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