Title: Developing a scale for measuring barriers to condom use in Ghana

Kwankye, S.O., Badasu, D.M., and Sanuade, O.A. (Regional Institute for Population Studies, University of Ghana, Legon)

Abstract

This study attempts an evaluation of the reliability and validity a scale developed for measuring barriers to condom use in Ghana. It uses a sample of 3,407 respondents 12-59 years in all 10 regions in Ghana. The Barriers to Condom Use Scale was made up of 32 items. A principal component analysis with Varimax Rotation which produced the dimension of differentiation was used in confirming the scale construct validity and its reliability assessed using Cronbach's alpha.

All six dimensions of the scale of barriers: partner, sexual experience, motivational, access, misconception and, social and religious barriers were reliable, with a Cronbach's alpha of 0.91, 0.85, 0.73, 0.75, 0.59 and 0.53 respectively. It concludes that the scale was valid and reliable in measuring condom use barriers in all 10 regions in Ghana. Consequently, the scale provides a good basis for exploring the factors contributing to barriers to condom use in Ghana.

Background

Barriers to condom use are multidimensional and have been studied through the use of micro and macro level health theories (Bah, Sow, Minani, Morin, & Alary, 2008; Boer & Mashamba, 2007; Bosompra, 2001; Cort & Modeste, 2007; S. Hounton, H. Carabin, & N. Henderson, 2005; Sennen H. Hounton, Hélène Carabin, & Neil J. Henderson, 2005; Jemmott et al., 2007a; Mashegoane, Moalusi, Ngoepe, & Peltzer, 2004;Schaalma, 2009). Identifying these barriers is a prerequisite to developing appropriate interventions (Sunmola, 2001). Barriers can be internal or external and can cover different areas such relationship dynamics, access and availability, psychosocial factors, sexual satisfaction, norms, etc.

Partner relationships have proved to hinder condom use (Amaro H., 1995; Heise & Elias, 1995; International Council of AIDS Service Organizations, 2009; Mellors S., 2005). For some, various types of stigma associated with condom use such as trust and fidelity (Bedimo, Bennett, Kissinger, & Clark; International Council of AIDS Service Organizations, 2009; Moore, Dahl, Gorn, & Weinberg, 2006; Varga, 1997) act as barriers. For others, the absence of constructive communication and the inability to negotiate condom use serve as barriers (Heise & Elias, 1995; International Council of AIDS Service Organizations, 2009; Jemmott et al., 2007a; Varga, 1997). In addition, gender power imbalance also serves as a major barrier to condom use (Amaro H., 1995; Heise & Elias, 1995; International Council of AIDS Service Organizations, 2009; Mellors S., 2005). Furthermore, real or perceived attitude of partners and society towards the use of condoms also influences its use (Aheto & Gbesemete, 2005).

Collins' (2005) study on MSM indicates the societal negative influence on the ability of the young MSM to purchase condoms for use. A study by the Population Council (2008) on the female condom in Ghana also indicates that societal poor attitude and adherence to myths about

the female condom and bottlenecks in the supply of the product account for its negligible prevalence rate. In general, access to and availability of condoms influence its use. Lack of access and the resulting non-use or inconsistent use of condoms can be attributed to financial constraints also (Sarkar, 2008).

Within Ghana and other sub-Saharan African countries, several psychosocial barriers to condom use have been hinted at and explored using micro level health theories such as the Health Belief model and the Theory of Planned Behaviour (Bah et al., 2008; Boer & Mashamba, 2007; Bosompra, 2001; Cort & Modeste, 2007; Sennen H. Hounton et al., 2005; Jemmott et al., 2007a; Mashegoane et al., 2004; Herman Schaalma, 2009). Constructs relevant to condom use include perceived levels of susceptibility, severity, barriers, self-efficacy/behavioural as well as attitudes towards behaviour and normative beliefs.

Another important barrier to condom use identified in sub-Saharan Africa and elsewhere is the effect (perceived or actual) of condom use on sexual satisfaction (Chakrapani V., Newman P., Shunmugam M., & Dubrow R., 2010; Mufune, 2005; Okunlola, Morhason-Bello, Owonikoko, & Adekunle, 2006; A. M. Sunmola, 2005). Despite the identification of reduced sexual satisfaction as a barrier, it is worth noting that condom use for contraception is a stronger predictor of use than sexually transmitted disease prevention (Fleisher, Senie, et al., 1994). Additional factors associated with failure to use condoms during high risk sex include a general aversion to condom, consumption of alcohol/drug use prior to intercourse, and anxiety and depression (Sarkar, 2008).

Finally, in sub-Saharan Africa and in Ghana, education has emerged from an obscure risk factor for HIV infection to a widely accepted social vaccine against infection (Baker, Collins, & Leon, 2008; de Walque, Nakiyingi-Miiro, Busingye, & Whitworth, 2005; Gregson, Waddell, &

Chandiwana, 2001; Kelly M.J., 2000; Peters, 2010). However, the exact mechanism via education through which increased use of condoms occurs requires further study. This is because basic acquisition of facts and the inculcation of positive attitudes about HIV infection produce only a weak influence on condom use (Baker et al., 2008).

Quite clearly, barriers to contraceptive use in general and condom use in particular have been found in several studies to vary. This may depend on geographical, behavioural, social and cultural settings within which the study is conducted. In Ghana, no study has been done on coming up with a scale that can adequately identify the barriers to condom use nationwide. Yet, with condom standing as the main method that could prevent the HIV infection and spread during high risk sexual activity among sexually active individuals, a study which focuses on developing barriers to condom use scale is not only important but timely against the background of Ghana's renewed efforts towards the fight against HIV and other sexually transmitted infections (STIs) especially among the most economically productive segment of the Ghanaian population. This study describes the development of Barriers to condom use scale in Ghana and tests the validity and reliability of the scale.

DATA AND METHODS

The quantitative approach involved the selection of a representative sample from all 10 regions in the country. A sample of 3,200 households was randomly selected for survey of females 12-49 years and males 12-59 years in all 10 regions in Ghana. The analysis was limited to 3407 respondents who have ever had sex.

Data Analysis

The Barrier to Condom Use Scale is made up of 32 items. Respondents were asked about condom use and their responses vary from strongly agree (5), agree (4), indifferent (3), disagree (2), to strongly agree (1). A higher score indicates higher barrier to condom use. The data was

analysed using STATA 12. Factor analysis was performed using a principal component factor analysis. A principal component analysis with Varimax Rotation which produced the dimension of differentiation was used in order to confirm the scale construct validity. The reliability of the scale was assessed using Cronbach's alpha. The evaluation of the reliability of the scale was possible by Cronbach's α (Cronbach, 1984), which is considered to be the most important reliability index and is based on the number of the variables/items of the questionnaire, as well as on the correlations between the variables (Nunnally, 1978).

Results

The goal of this study is to develop barriers to condom use scale among Ghanaians. A total of 3407 respondents were randomly sampled in Ghana. The socio-demographic characteristics of the respondents are shown in Table 1. More than half (67.2%) were females and almost equal proportion lived in rural and urban areas (49.3% and 50.7% respectively). Further, in terms of level of education, a larger proportion (32.9%) had middle/JHS education. Many of the respondents were between ages 20-39 years (72.3%) and the mean age was 32.13 ± 11.87 years. More than seven out of ten (71.9%) were Christians and a larger proportion of the Christians belonged to Charismatic denominations. However, less than 20% (17.5%) were Muslims. About one-fifth (21.3%) were never married and more than sixty percent (62.9%) were currently married. As regards ethnicity, about one out of four respondents (40.1%) were Akan and the least were Guan (3.7%).

Table 1 Socio-demographic Characteristics of Respondents

Background characteristics	Number = 3407	Percentage
Place of residence		
Rural	1679	49.3
Urban	1728	50.7
Sex		
Male	1119	32.8
Female	2288	67.2
Level of education		
No education	927	27.2
Primary	610	17.9
Middle/JHS	1123	32.9
Secondary/SHS	379	11.1
Vocational/Technical	91	2.7
Higher	277	8.1
Age Group		
<15	11	0.3
15-19	253	7.4
20-24	614	18.0
25-29	653	19.2
30-34	637	18.7
35-39	560	16.4
40-44	460	13.5
45-49	105	3.1
50-54	69	2.0
55-59	45	1.3
Religion		
No religion	196	5.8
Catholic	486	14.3
Protestant/Anglican	623	18.3
Charismatic/Pentecostal	1024	30.1
Other Christian	312	9.2
Muslim	596	17.5
Traditional/spiritualist/Other	167	4.9
Marital status		
Never married	724	21.3
Currently married	2142	62.9
Living together	308	9.0
Formerly married	233	6.8

Ethnic group		
Akan	1365	40.1
Ga-dagme	253	7.4
Ewe	549	16.1
Mole-dagbani	733	21.5
Guan	125	3.7
Other Ghanaian	382	11.2

Validity

The relationship between the 32-item scores by all the respondents in this study was assessed using principal component factor analysis. Factor analysis examines correlation between scores on all items and creates groups or dimensions of items whose scores are most strongly correlated with each other. Factor analysis was carried out using principal component method extraction followed by orthogonal Varimax (Kaiser off) rotation. The results of the factor analysis are shown in Table 2.

Factors with an eigenvalues less than 1.0 were not retained in the factor loadings. Factors were also rotated (using orthogonal Varimax method) in order to identify clusters of variables that can be characterised predominantly in terms of single latent variable, and based on this, six factors were retained (Table 2). The scree plot also shows that from the seventh factor, the line is almost flat, meaning that each successive factor accounted for smaller amounts of the total variance (Figure 1). It is expected that items which belong to similar factors would be associated with other items in order for the scale to have validity. The likelihood ratio test showed that each of the six factors measured different aspects of barriers to condom use [Chi-Square= 496, P=0.000]. In terms of the explained variance, factor one explained 25.4%, factor two (10.9%), factor three (7.4%), factor four (4.9%), factor five (3.6%) and factor six (3.4%). Overall, all the six factors explained 55.5% of the variance in barriers to condom use.

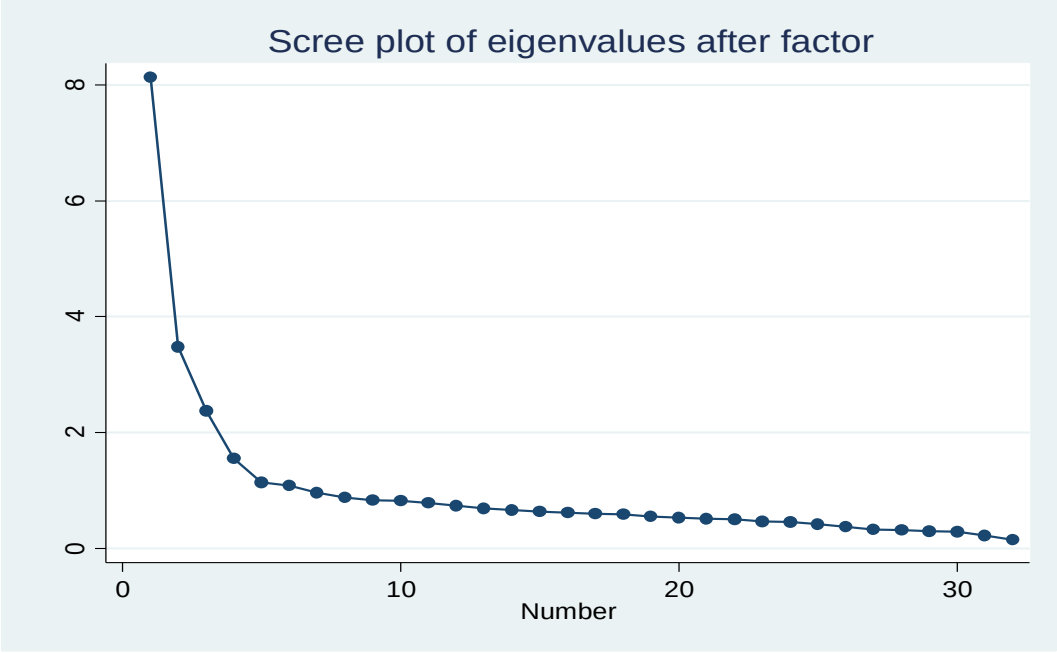
Table 2 Evaluation of barriers to condom use in Ghana: loading

Barriers to condom use in Ghana: list of scale items structured under six factors	Loading[a]
Factor one: Partner barriers to condom use	
My partner does not want us to use condoms	0.63
If I use a condom, My partner might get angry	0.79
If I use a condom, my partner might think I am cheating on him/her	0.84
If I suggested we use a condom, my partner would think I am accusing him/her of cheating	0.83
If I suggest to my partner we use condom, he/she might end the relationship	0.77
If I suggested my partner use a condom, he/she might think I am putting him/her down or insulting him/her	0.80
If I suggest my partner use a condom he/she might be turned off and lose interest in having sex	0.78
Factor Two: Sexual experience barriers to condom use	
Condoms rub and cause irritation (uncomfortable feelings	0.53
Condoms do not feel good	0.83
Condoms interrupt mood	0.84
Condoms feel unnatural	0.81
I feel closer to my partner without a condom	0.63
Condoms change the climax or orgasm	0.71
Factor Three: Motivational barriers to condom use	
I can never find a condom right before sexual intercourse	0.50
Most of the time neither of us has a condom available	0.69
I do not want my partner to put a condom on me	0.58
I usually forget about using condom	0.67
:I do not need to use a condom, I never get any STI and HIV	0.57
Factor Four: Access/availability dimension of barriers to condom use	
I would not know where to get /buy a condom	0.78
Condoms cost too much	0.74
I do not have transport to buy or get a condom	0.77
Factor Five Misconception barriers	
Female condoms make too much noise	0.33
I do not use a condom, I use another method	0.57
I do not know how to use condom very well	0.84
My partner does not know how to use condom very well	0.82
Factor Six: Social and religious barriers	
Condoms are against my religious values	0.55
I would be embarrassed to buy condoms or ask for them	0.71
It is up to the man to provide a condom	0.66

Factor one: Partner barriers to condom use

Seven items loaded on factor one and they are being referred to partner barriers to condom use (Table 2). The questions are: 1) My partner does not want us to use condoms; 2) If I use a condom, My partner might get angry; 3) If I use a condom, my partner might think I am cheating on him/her; 4) If I suggested we use a condom, my partner would think I am accusing him/her of cheating; 5) If I suggest to my partner we use condom, he/she might end the relationship; 6) If I suggested my partner use a condom, he/she might think I am putting him/her down or insulting him/her, and; 7) If I suggest my partner use a condom he/she might be turned off and lose interest in having sex. The Cronbach's alpha was 0.91 and this indicates that this dimension of barriers to condom use is reliable (Table 3).

Figure 1 Scree Plot Showing the Eigenvalues against the Factor Number



Factor two: Sexual experience barriers to condom use

For factor two, six items loaded on this factor. These include: 1) Condoms rub and cause irritation (uncomfortable feelings; 2) Condoms do not feel good; 3) Condoms interrupt mood; 4)

Condoms feel unnatural; 5) I feel closer to my partner without a condom, and; 6) Condoms change the climax or orgasm. The Cronbach's alpha for the six items was 0.85.

Factor three: Motivational barriers to condom use

Five factors were loaded in factor three and their loadings are shown in Table 2. The items which loaded on this factor are: 1) I can never find a condom right before sexual intercourse; 2) Most of the time neither of us has a condom available; 3) I do not want my partner to put a condom on me; 4) I usually forget about using condom, and; 5) I do not need to use a condom, I never get any STI and HIV. The Cronbach's alpha showed that motivational dimension of barriers to condom use are reliable (Cronbach's alpha= 0.73).

Factor four: Access/availability dimension of barriers to condom use

Three items loaded on factor four and they are being referred to "access/availability dimension of barriers to condom use". The items are: 1) I would not know where to get /buy a condom; 2) Condoms cost too much, and; 3) I do not have transport to buy or get a condom. The Cronbach's alpha for these dimension of barriers to condom use was 0.75, indicating that the scale is reliable.

Factor five:

The results showed that four items loaded on factor five and they include: 1) Female condoms make too much noise; 2) I do not use a condom, I use another method; 3) I do not know how to use condom very well, and; 4) My partner does not know how to use condom very well. The Cronbach's alpha showed that the items in this dimension of barriers to condom use has low reliability (Alpha= 0.59).

Factor six:

Three items were loaded on factor six. These include: 1) Condoms are against my religious values; 2) I would be embarrassed to buy condoms or ask for them, and; 3) It is up to the man to

provide a condom. The result showed that the reliability for this dimension of barriers to condom use is 53% (Cronbach's alpha=0.53).

Table 3 Test-retest reliability

Factors	Cronbach's alpha
Factor one	0.91
Factor two	0.85
Factor three	0.73
Factor four	0.75
Factor five	0.59
Factor six	0.53

DISCUSSION

The aim of this study is to design and evaluate a scale for measuring barriers to condom use in Ghana. The validity of the scale was assessed using Principal Component factor analysis while the internal consistency was assessed by the use of Cronbach's alpha. The scale covered six different domains of barriers: partner barriers, sexual barriers, motivational barriers, access/availability dimension of barriers, misconception barriers and social and religious barriers. The data for the study was a nationally representative data from the 10 regions in Ghana. Hence, the findings from the scale can be generalized to the whole of Ghana.

Generally, the scale has a high validity and reliability. Specifically, the findings showed that partner barriers to condom use explained the highest variance in the scale and the least was social and religious barriers. Hence, this scale can be used to determine the factors that can promote or hinder the use of condom in Ghana during sexual relationship. Study also showed that the scale can be useful for projecting future condom use in sexual encounters (Sunmola, 2005).

Conclusion

This study showed that the scale is valid and reliable in determining barriers to condom use in Ghana. Since the development of the scale was based on a nationally representative sample of Ghanaians, this indicates that this scale can be used in different parts of the country.

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