Developing a scale for measuring the barriers to condom use in Nigeria

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Objective To describe the development of a scale for measuring the barriers to condom use in Nigeria and to evaluate its content, feasibility, reliability, and validity.

Methods The scale consists of 22 items and is structured on three dimensions: condom sexual satisfaction; condom health hazard; and condom sexual interest. It was evaluated on a sample of 786 students attending the University of Ibadan, Nigeria.

Findings The scale appears to be easy to use, and is acceptable and reliable.

Conclusion The scale appears suitable for obtaining estimates of personal experiences of sexual and reproductive condom use. Further, it may be employed for assessing factors that hinder condom use in sexual relationships and is useful for determining the predisposition of individuals to use condoms in future sexual encounters.

Keywords Condoms/utilization; Sex behavior; Students; Research design; Nigeria (*source: MeSH*).

Mots clés Condom/utilisation; Comportement sexuel; Etudiant; Projet recherche; Nigéria (*source: INSERM*).

Palabras clave Condones/utilización; Conducta sexual; Estudiantes; Proyectos de investigación; Nigeria (*fuente: BIREME*).

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Introduction

Any obstacles to the use of condoms in heterosexual relationships can interfere with their frequent and consistent employment as a means of preventing acquired immunodeficiency syndrome (AIDS) and sexually transmitted diseases (STDs), and for family planning purposes (*1–4*). Although some of the specific barriers to condom use in Africa have been elucidated (*5–11*), a method of measuring an individual's barriers to their use has still to be identified. Measuring and explicating the potential barriers to condom use represents an important step in promoting the effectiveness of a strategy for improving their use (*12*). This paper examines how such a method, with a scale for assessment, contributes to the understanding and measurement of the barriers in Nigeria. The findings are of relevance also for other African countries.

Need for condom use and its promotion in Nigeria

Heterosexual intercourse is the leading means of transmitting human immunodeficiency virus (HIV) in Nigeria. The first case of HIV/AIDS involving a sexually active teenage girl was identified in the country in 1984 (*13*). About 10 years later, close to 1000 cases had been identified and some 500 000 people were estimated to be HIV positive (*13, 14*). It was thus believed that a major HIV/AIDS epidemic might be under way in the country. In Nigeria, heterosexual contacts with long distance truck drivers (*15*) and commercial sex workers (*16*) are the major vector for the spread of the AIDS virus through diverse population groups. There are severe implications of a large-scale HIV/AIDS epidemic in the country, including the likelihood of demographic changes due to deaths, resulting in a reduction in the productive workforce. Furthermore, national budgets may be confronted with having to allocate more funds for health to cope with the increase in HIV/AIDS cases. This may worsen the current levels of national poverty and adversely affect the basic welfare of the population.

Greater attention needs to be directed towards measures that will reduce the risk of HIV infection in Nigeria, and since 1984 several approaches have been used by various governmental and nongovernmental agencies to protect the public from HIV/AIDS infection. The major focus of the efforts to encourage condom use has been advocacy through radio and television broadcasts, as well as other popular media channels, and within counselling relationships. Rational and self-evident as these messages may be, most Nigerians are only aware of condom use as birth control and sexual diseases protective measures. These efforts have not pro-

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duced significant practical use of condoms in sexual relationships (16–20).[a]

Prospects for the measurement of barriers to condom use

One reason for the minimal effects of the existing advocacy methods for condom use in Nigeria is that most interventions do not incorporate mechanisms to control the barriers that inhibit condom use in sexual relationships. In so far as some knowledge of the nature of such barriers exists (5, 17, 21–24), interventions should commence by identifying these barriers and proceed to controlling them through use of an appropriate strategy.

The method of measurement that was used in the present study includes identifying the adverse experiences associated with condom use in sexual relationships. Furthermore, the measurement identifies individuals who give and do not give priority to using condoms and the type of condom use intervention. Finally, the measurement scale employed is suitable for addressing critical issues that surround low rates of condom use, and facilitates their increased use in various populations. For example, in sub-Saharan Africa condom use is reported by only 1% of women in the reproductive age group and by a slightly higher percentage of men (25). One suggestion for this is that condom use interferes with the sexual functioning of these groups of people (26), perhaps because sexual intercourse is not so enjoyable when a condom is used or because some guilt feelings are experienced. Resistance to condom use with their marital partners can be expected among men in sub-Saharan Africa, where condoms are mainly employed in extramarital relationships (27, 28).

Materials and methods

A scale for the measurement of barriers to condom use

The scale consists of 22 items, each one worded in a short statement (Table 1), and is structured on three dimensions: condom sexual satisfaction; condom health hazard; and condom sexual interest. The items concerning condom sexual satisfaction examine the tendency for an individual to report a reduction in sexual urge and satisfaction, inability to enjoy orgasm, messy and boring sexual intercourse, lack of opportunity to enjoy sexual foreplay, and experience of lack of trust by one's sexual partner due to use of a condom in the sexual relationship. Those dealing with condom health hazard assess the tendency for an individual to report itching caused by the condom and skin irritation after sexual intercourse, as well as such experiences as the condom hurting, bursting,

leaking fluid, or slipping off during sexual intercourse. Finally, those concerned with condom sexual interest measure the tendency for an individual to report embarrassment in buying a condom, repulsive smell of the condom, inability to discuss condom use with the sexual partner, tedious process of wearing a condom, and feelings of guilt due to condom use.

In the measuring instrument each of the above items can be answered in four possible ways, based on a respondent's experience with condom use, as follows (with the points scored for each answer):[b]
(a) "I have the experience all the time" (3 points), or
(b) "I have the experience often" (2 points), or
(c) "I have the experience occasionally" (1 point), or
(d) "I do not have the experience at all" (0 points).
The total score is the sum of the points for the items in each of the three dimensions of the scale. Consequently, an individual respondent obtains a composite score for each of the three dimensions of the scale of measurement. The higher the score, the greater the reported barriers with condom use.

Individuals are required to place a mark on any response option that best describes their experience during the two-month period immediately preceding the time of the enquiry. The two-month time frame is appropriate because a pilot investigation, conducted earlier, suggested that the recall of sexual activity that occurred more than two months previously declined sharply, but that it was long enough to average out brief periods of greater or lesser sexual activity.

Respondents

All 654 second- and third-year psychology and law students as well as all 143 postgraduate psychology students at the University of Ibadan, Nigeria, were asked to take part in this study. The choice of university students is appropriate in view of their relatively high level of sexual activity (22). Further, the students are generally knowledgeable about the use of condoms to prevent sexual risks and would have used them in their past sexual relations (29). We attempted to include all the students during the entire period of the study; however, 11 were unwilling to take part — 7 of them reporting no history of sexual intercourse, and 4 claiming that they had not used a condom in sexual intercourse. Consequently, the following groups of subjects were studied: group 1: 309 psychology students (mean age, 20.6 $\pm$ 2.8 years); group 2: 334 law students (mean age, 22.7 $\pm$ 3.1 years); and group 3: 143 postgraduate psychology students (mean age, 29 $\pm$ 3.9 years).

The total of 786 students consisted of 353 (44.9%) females (mean age, 23.5 $\pm$ 4.1 years) and 433 (55.1%) males (mean age, 24.7 $\pm$ 4.4 years). There were 133 (17%) married students, the rest (83%) being single. The students came from the following ethnic groups: 417 (53%) were Yoruba,

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[a] In the studies that report differences between condom knowledge and use in Nigeria, the respondents tend to have adequate information about the benefits of condom without corresponding use in sexual encounters.

[b] The use of a multiple-choice response format is considered more appropriate than the dichotomous format since the former, more than the latter, allows respondents greater intensity and wider latitude of expression of condom use behaviour experience.

Table 1. Barriers to condom use in Nigeria: list of scale items structured under three factors

Factor 1: Condom sexual satisfaction
Condom use does not give desired sexual satisfaction
Condom use makes sexual intercourse boring
Condom use reduces the sexual urge
Condom use causes delay in reaching orgasm
Condom use causes one's partner to have lack of trust
Condom use does not allow one to enjoy orgasm
Condom is too oily and it makes sexual intercourse messy
I don't enjoy condom use because my partner does not enjoy it
When I use a condom, I do not feel relaxed during intercourse
Condom use does not allow one to enjoy play before sexual intercourse

Factor 2: Condom health hazard
Condom causes itching after use in a sexual relationship
Condom burst during sexual intercourse
Germs are carried in the process of fixing the condom on the male's sexual organ
Condom allows fluid from my partner to enter my sexual organ
Condom use causes skin irritation after sexual intercourse
Condom use causes pain during sexual intercourse
Condom slips into the sexual organ of the female during intercourse

Factor 3: Condom sexual interest
It is embarrassing buying condoms
Due to religious faith, one feels guilty using a condom during sexual intercourse
The smell of the condom reduces my interest during sexual intercourse
It is difficult to discuss the possibility of condom use with my partner
The process of wearing a condom reduces one's sexual interest

215 (27.4%) were Ibo, 17 (2.2%) were Hausa, and the remaining 137 (17.4%) were Isan, Itsekiri, Ijaw, or Efik. The majority of the students were Christians (63%), with the rest being Muslims (37%).

Design of the measurement instrument

Selection of items. The first goal was to develop a scale to measure the barriers to condom use. Since a suitable scale was not found in the literature, one employing two consecutive steps was used. In the first step, a group of 120 female and male students from the arts, science, and pharmacy faculties in the university were selected at random. This group was considered to resemble the population that later participated in the final study. Further, they were a fairly large and heterogeneous group, who could have diverse views about how their sexual behaviours and functions had influenced their use of condoms.

These 120 participants were asked to indicate three behaviours and experiences which, they thought, impeded and frustrated condom use during their sexual relationships, as well as three which facilitated and promoted condom use. These views yielded 62 descriptions, which were clarified and elaborated through in-depth interviews with the participants. The outcome was later assembled and supplemented with information derived from a literature review. It was thus possible to construct items, each anchored by a 4-point Likert-type scale (*30*). The scale was administered to a second pilot sample of 40 females and males from another faculty

— education — in the university, who were asked to indicate (on a 4-point scale) to what extent they thought each experience impeded condom use in sexual relationships. The instrument also included sections where the respondents could make unsolicited comments and suggestions as well as identify special circumstances when such experiences take place. Five university lecturers with research interests in reproductive behaviour were also asked to provide their reactions to the instrument. From the data gathered during this phase, individual items in the scale were modified to make them simpler and clearer and to increase their meaning and relevance in quantifying the barriers to condom use. The rewriting of the items was intended to reduce measurement error in each item and in the scale as a whole, as well as to increase the precision of the final instrument.

Item analysis. The instrument that emerged was composed of 24 items (see Table 2).[c] The items were randomly ordered to reduce the chance of scores on one item influencing the scores on related neighbouring items. Each of the items was followed by four possible responses, as described above. In order to investigate how homogeneously the scale items might describe the barriers to condom use, we examined the relationship between the respondents' scores on each of the items and the total scores. The 24-item self-report scale was administered to a random sample of 100 students of economics, sociology, and civil engineering. The data gathered were analysed using the item–remainder correlation procedure. A total of 22 of the 24 items correlated significantly with remainder scores, and these formed the final scale for assessing the barriers to condom use (see Table 2).

Statistical procedures. Data were analysed using Pearson's product-moment correlation coefficients, Spearman–Brown prophecy formula, and Student's *t*-test using the Statistical Packages for the Social Sciences (SPSS-Version 5.0, 1992). Factor analysis was performed using the exploratory factor analysis (*31*). Other procedures that were used included Bartlett's test of sphericity and the Kaiser–Meyer–Olkin measure of sampling adequacy.

There is no general rule for the degree of correlation required to support or refute the reliability and validity of a scale; however, it is desirable to follow Nunnally's recommendation in this regard (*32*). Thus, coefficients of correlation greater than 0.7 were taken to strongly support reliability; and coefficients of validity greater than 0.6 were take to indicate validity, since validity estimations are bound at their upper limit by the reliability of the item. Theoretically, validity coefficients are not expected to be greater than the reliability coefficients. Correlation coefficients may also be evaluated by estimating their statistical significance.

[c] The items and response options were constructed to reflect respondent's actual sexual experiences and not sexual attitudes, feelings, and beliefs.

Results

Feasibility

The 309 respondents in group 1 and 143 respondents in group 3 each completed the instrument on two occasions. The mean completion time was 3.1 ± 1.9 min for respondents in group 1, and 2.9 ± 1.5 min for respondents in group 3 (differences in mean times not statistically significant).

Reliability

The reliability of the scale items was assessed by administering the items to the same group of respondents on two occasions, separated by an interval of several days or weeks (33). The test–retest reliability coefficient was obtained by calculating the correlation between the scores on the two occasions, a procedure that takes into account errors produced by differences in the conditions of administration, and the level of motivation or attentiveness of the respondents at the time of administration. In this way, the reliability of each of the scale items on condom use barriers was assessed by asking the 334 respondents in group 2 to complete the instrument on two occasions, separated by two weeks. The coefficients of correlation between the scores obtained are shown in Table 2. For 20 of the items, correlation coefficients greater than 0.70 were obtained, while the remaining two items had coefficients in the range 0.60–0.70.

The split-half reliability method was used to assess the reliability of the whole scale. The instrument was administered to the 334 respondents in group 2, and separate scores assigned to every respondent on two selected halves of the scale. Each respondent was given one score on the odd-numbered items and a second score on the even-numbered items. Since there was no statistically significant difference between the means and variances of the two halves, the reliability of the whole scale was estimated by the Spearman–Brown prophecy formula. The estimated reliability of the whole scale was 0.88.

Validity

Ideally, validity would be established if the scale (predictor) were compared with a measure of actual condom use barriers (criterion), with the scale scores predicting the criterion scores. In the absence of such a criterion, however, we adopted two indirect methods for evaluating validity.

Correlations between scores for items within the scale (factor analysis). The relationship between the item scores by all the respondents in this study was assessed using factor analysis. This method 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 maximum-likelihood extraction followed by oblique rotation (direct oblimin, delta = 0). Since eigenvalues with cut-offs of >1 lead to

Table 2. **Results of item–remainder analysis and of test–retest reliability**

Item	r^a	r^b
Condom use does not give the desired sexual satisfaction	0.59	0.81
Condom use makes sexual intercourse boring	0.64	0.83
Condom use reduces the sexual urge	0.63	0.83
Condom use causes delay in reaching orgasm	0.52	0.76
Condom use causes one's partner to have lack of trust	0.64	0.79
Condom use does not allow one to enjoy orgasm	0.65	0.77
Condom is too oily and it makes sexual intercourse messy	0.66	0.80
It is embarrassing buying condom	0.41	0.73
Due to religious faith, one feels guilty using a condom during sexual intercourse	0.54	0.75
I don't enjoy condom use because my partner does not enjoy it	0.52	0.74
The smell of condom reduces my interest during sexual intercourse	0.65	0.77
Condom causes itching after use in a sexual relationship	0.55	0.75
Condom burst during sexual intercourse	0.52	0.75
Germs are carried in the process of fixing the condom on the male	0.41	0.67
Condom allows fluid from my partner to enter my sexual organ	0.46	0.71
It is difficult to discuss the possibility of condom use with my partner	0.53	0.76
When I use a condom, I do not feel relaxed during intercourse	0.68	0.73
Condom use causes skin irritation after sexual intercourse	0.53	0.76
Condom use causes pain during sexual intercourse	0.58	0.71
Condom slips into the female organ during intercourse	0.47	0.64
The process of wearing a condom reduces one's sexual interest	0.53	0.71
Condom use does not allow one to enjoy play before intercourse	0.57	0.78
Condoms are not readily available to buy	0.22	–
Condoms are expensive to buy	0.22	–

^{a} Item–remainder correlation coefficients are highly significant, $P<0.001$, except those for the last two items in the list ($P>0.05$).

^{b} Test–retest correlation coefficients are significant, $P<0.001$. The last two items in the list were omitted from subsequent analysis because of low item-remainder correlation coefficients.

over-extraction in sexually-related instruments, it was appropriate to carry out a scree test, rotating to the maximum number of factors which provided factors with three or more loadings ≥0.30 (34). On this criterion, three factors were extracted. Bartlett's test of sphericity showed that the entire sample population correlation matrix was not an identity (37771.3, $P<0.00001$). The Kaiser–Meyer–Olkin measure of sampling adequacy was relatively high (0.89); only 3.9% of elements of the anti-image correlation matrix were >0.09, which suggests that factor analysis was appropriate for these data. Table 3 shows the results of the factor analysis. The first factor extracted was described as the condom sexual satisfaction factor, the second as the condom health hazard factor, and the final was the condom sexual interest factor.

If the scale has validity, we would expect that the items which belong to similar factors would be more associated with other items in the same category and less associated with items in other categories. Calculation of the correlations among all the items of the scale indicated that there were high intercorrelations among the items of the same factor (mean intercorrelations were 0.73, 0.77, 0.72, respectively, for the items of factor 1, factor 2, and factor 3), suggesting convergent validity, whereas the intercorrelations among items of different factors

Factor 1: Condom sexual satisfaction	Loading[a]
Condom use does not give the desired sexual satisfaction	0.84
Condom use makes sexual intercourse boring	0.80
Condom use reduces the sexual urge	0.83
Condom use causes delay in reaching orgasm	0.70
Condom use causes one's partner to have lack of trust	0.63
Condom use does not allow one to enjoy orgasm	0.68
Condom is too oily and it makes sexual intercourse messy	0.49
I don't enjoy condom use because my partner does not enjoy it	0.47
When I use a condom, I do not feel relaxed during sexual intercourse	0.58
Condom use does not allow one to enjoy play before sexual intercourse (58.8% of variance)	0.61
Factor 2: Condom health hazard	0.69
Condom causes itching after use in a sexual relationship	
Condom burst during sexual intercourse	0.57
Germs are carried in the process of fixing the condom on the male organ	0.69
Condom allows fluid from my partner to enter my sexual organ	0.68
Condom use causes skin irritation after intercourse	0.77
Condom use causes pain during sexual intercourse	0.63
Condom slips into the female organ during intercourse (7.1% of variance)	0.48
Factor 3: Condom sexual interest	
It is embarrassing buying condom	0.75
Due to religious faith, one feels guilty using a condom during intercourse	0.68
The smell of the condom reduces my interest during intercourse	0.64
It is difficult to discuss the possibility of condom use with my partner	0.57
The process of wearing a condom reduces one's sexual interest (5.1% of variance)	0.53

[a] All loadings >0.4.

were generally moderate in size, suggesting discriminant validity. The correlation coefficients lay in the range 0.42–0.57 ($P<0.05$), indicating that each of the factors measured different aspects of barriers to condom use, although with some overlapping characteristics.[d]

Calculation of the factor scores on the three dimensions showed that there were significant sex differences on all the scales. Males scored significantly higher ($P<0.01$) than females on each of the scales. Factor analysis of the barriers to the condom use scale was therefore re-calculated for each sex separately to examine the effect of sex on the previous factor dimensions obtained. The factor loadings and dimensions thus obtained were similar to those shown on Table 3, and the general conclusions were not altered by the additional analysis.

Comparison with scores obtained by the alternative method. In addition to the condom use barriers scale, we included an item — "I dislike condom use in sexual relationships" — related to the overall condom use barriers scores. There were four possible response options to this item: (a) All the time, (b) Often, (c) Occasionally, (d) Not at all. If the scale

[d] The moderate size intercorrelation coefficients observed among items of different factors were consistent with the results of factor intercorrelations.

on barriers to condom use is valid, there should be an association with the scores obtained on this additional item. This was evaluated by asking all the respondents in group 3 to respond to both the scale items and the additional item. The respondents' scores on each of the scale dimensions correlated with the weighted scores obtained on the additional item (r range, 0.53–0.57; $P<0.01$).

Discussion

The aim of this study was to design and evaluate a scale for measuring the barriers to condom use in sexual relationships. The items selected for inclusion into the scale covered important aspects of the experience in using condoms and also focused on important problem of condom use in sexual encounters. The study data were obtained from samples of university students in Nigeria, using an analytical technique that was appropriate and robust for this sample. Although it is difficult to generalize and to apply the findings to non-university-educated Nigerians, there are nevertheless some implications both for the use of the scale cross-culturally and for its utilization in programmes to prevent HIV and other STDs, as well as unplanned pregnancies in Nigeria.

First, the assessment of the design of the measuring instrument was encouraging. Respondents found it to be quick and acceptable. Evidence from both expert judges and respondents suggested that the scale covered the most important barriers to condom use. Reliability assessments for each item and the overall scale were acceptable.

Second, there is strong support for the validity of the measurement scale. In the absence of an established method of assessment to serve as a criterion, indirect methods of validation were used. The factor analysis indicated that three dimensions were inherent in the scale. They were appropriately labelled. Correlation coefficients obtained from comparison of factor structures indicated that the factors were different, but with some overlapping, as discussed above.

Third, the data collected have implications for the prevention of HIV and STD transmission, as well as unplanned pregnancies, in Nigeria and other countries with a similar cultural background. These data indicate that the prediction of an individual's susceptibility to HIV or STD infection, or even sexual relations that result in an unplanned pregnancy, can be made by assessing the individual for condom use barriers. Such predictions can be made based on the height of an individual's barriers to condom use, which can be obtained from the scores on each of the three dimensions of the scale relative to the norm scores for the group of persons to which the individual belongs.

This method of assessing the barriers to condom use may be considered to be adequate. Although the data are based entirely on self-

reporting, the method is suitable for obtaining estimates of personal experiences with condoms that were used for sexual and reproductive purposes. Furthermore, the method may be used to assess factors that hinder or promote condom use in sexual relationships. The scale has also been judged to be useful for assessing the predisposition of individuals to use condoms in future sexual encounters.

In conclusion, these results show that the scale is a reliable and valid index of the barriers to condom use in the study population. Individuals who respond to the questions on the scale are given points on each of the scale items and on the three dimensional factor structure. In addition, the scale appears appropriate for general descriptive purposes, and our findings shows that quantitative measurement of some aspects of the barriers to condom use is possible with relatively simple methods. It is desirable to expand the scope of the results of this study to cover a wider population. Further evaluations of the scale need to be conducted on other population groups in the country, with the aim of improving and refining the method. This should provide additional information, especially on the scale's reliability and validity. ■

Conflicts of interest: none declared.

Résumé

Elaboration d'une échelle de mesure des obstacles à l'utilisation du préservatif au Nigéria

Objectif Décrire l'élaboration d'une échelle de mesure des obstacles à l'utilisation du préservatif au Nigéria et en évaluer le contenu, l'applicabilité, la fiabilité et la validité.

Méthodes L'échelle comprend 22 rubriques et est structurée selon trois aspects de l'utilisation du préservatif : préservatif et plaisir sexuel, préservatif et dangers pour la santé, préservatif et intérêt sexuel. Elle a été évaluée sur un échantillon de 786 étudiants de l'Université d'Ibadan (Nigéria).

Résultats L'échelle s'avère facile à utiliser, acceptable et fiable.

Conclusion L'échelle semble convenir pour avoir une estimation de l'expérience personnelle des sujets interrogés en matière d'utilisation du préservatif y compris dans un but de contraception. De plus, elle peut être employée pour évaluer les facteurs qui font obstacle à l'utilisation du préservatif lors des rapports sexuels et est utile pour déterminer la propension du sujet à recourir au préservatif lors de futures rencontres.

Resumen

Escala de medición de los obstáculos al uso de preservativos en Nigeria

Ojetivo Describir el desarrollo de una escala de medición de los obstáculos al uso de preservativos en Nigeria y evaluar su contenido, viabilidad, fiabilidad y validez .

Métodos La escala consta de 22 temas, relacionados con tres aspectos principales: grado de satisfacción sexual al usar el preservativo, riesgos para la salud asociados al uso del preservativo, e interés sexual por emplear este método. La escala se evaluó en una muestra de 786 estudiantes de la Universidad de Ibadan, Nigeria.

Resultados La escala es de fácil manejo y resulta aceptable y fiable.

Conclusión La escala parece idónea para obtener estimaciones de las experiencias personales de uso sexual o anticonceptivo del preservativo. Se puede emplear además para evaluar los factores que obstaculizan el uso del preservativo en las relaciones sexuales, y es una valiosa herramienta para determinar la predisposición de los individuos a emplearlo en futuros encuentros sexuales.

References

1. **Adih W K, Alexander CS.** Determinants of condom use to prevent HIV infection among youth in Ghana. *Journal of Adolescent Health*, 1999, **24**: 63–72.

2. **Estrin D.** In Ghana, young men's condom use is linked to lack of barriers: perceived susceptibility to HIV infection. *International Family Planning Perspectives*, 1999, **25** (2): 106–07.

3. **Meekers D.** *Côte d'Ivoire condom consumer profile survey.* Washington, DC, Population Services International (PSI), Research Division, 1998.

4. **Ford N, Koetsawang S.** A pragmatic intervention to promote condom use by female sex workers in Thailand. *Bulletin of the World Health Organization*, 1999, **77**: 888–894.

5. **Kisekka M.** Socio-cultural beliefs and practices related to condom acceptability among Hausa in Nigeria and Baganda in Uganda. Paper presented at: *Seminar on Condom Acceptability in Africa, sponsored by the Task Force for Social Science Research on Reproductive Health of the WHO Special Programme in Human Reproduction, Kampala, 3–7 June 1991.*

6. *Condoms — now more than ever.* Baltimore, MD, Baltimore Centre for Communications Programs, The Johns Hopkins University, 1990 (Population Information Program, Vol. 18, no. 3)

7. **Sekadde-Kigondu C et al.** Condom acceptability and use among long distance truck drivers and their assistants. Paper presented at: *Seminar on Condom Acceptability in Africa, sponsored by the Task Force for Social Science Research on Reproductive Health of the WHO Special Programme in Human Reproduction, Kampala, 3–7 June 1991.*

8. **Bond V, Dover P.** Men, women, and the trouble with condoms: problems associated with condom use by migrant workers in rural Zambia. *Health Transition Review*, 1997, **7**: 377–391.

9. **Preston-Whyte E.** Reproductive health and condom dilemma: identifying situational barriers to HIV protection in South Africa. In: Caldwell JC et al., eds. *Resistances to behavioural change to reduce HIV / AIDS infection in predominantly heterosexual epidemics in Third World countries.* Canberra, Australian National University, National Centre for Epidemiology and Population Health, Health Transition Centre, 1999: 139–155.

10. **Mnyika KS, Kvale G, Klepp KL.** Perceived function of and barriers to condom use in Arusha and Kilimanjaro regions of Tanzania. *Aids Care*, 1995, **7** (3): 295–305.

11. **Abdool Karim SS et al.** Reasons for lack of condom use among high school students. *South African Medical Journal*, 1992, **82** (2): 107–110.

12. **Knodel J, Pramualratana A.** Prospects for increased condom use within marriage in Thailand. *International Family Planning Perspectives,* 1996, **22**: 97–102.

13. **Federal Ministry of Health and Human Services.** Focus on AIDS. *Nigeria Bulletin of Epidemiology,* 1992, **2**: 1.

14. *WHO/AIDS surveillance report.* Geneva, World Health Organization, Epidemiology and Surveillance Unit, 1993.

15. **Orubuloye IO, Caldwell P, Caldwell JC.** The role of high-risk occupations in the spread of AIDS: truck drivers and the itinerant market women in Nigeria. *International Family Planning Perspectives,* 1993, **19**: 43–48 and 71.

16. **Esu-Williams E.** Sexually transmitted diseases and condom interventions among prostitutes and their clients in Cross River State. *Health Transition Review*, 1995, **5** (suppl.): 223–228.

17. **Makinwa-Adebusoye P.** Sexual behaviour, reproductive knowledge and contraceptive use among young urban Nigerians. *International Family Planning Perspectives,* 1992, **18** (2): 66–70.

18. **Orubuloye IO, Caldwell JC, Caldwell P.** Diffusion and focus in sexual networking identifying partners and partners' partners. *Studies in Family Planning*, 1992, **23** (6): 343–351.

19. **Akinnawo EO.** Sexual networking, STDs and HIV/AIDS transmission among Nigerian police officers. *Health Transition Review*, 1995, **5** (suppl.): 113–121.

20. **Owuamanam DO.** Sexual networking among youth in south-western Nigeria. *Health Transition Review*, 1995, **5** (suppl.): 57–66.

21. **Campbell T.** How can psychological theory help to promote condom use in sub-Saharan African developing countries? *Journal of the Royal Society of Health*, 1997, **117** (3): 186–191.

22. **Nichols D et al.** Sexual behaviour, contraceptive practice and reproductive health among Nigerian adolescents. *Studies in Family Planning*, 1986, **17** (2): 100–106.

23. **Boroffice OB.** Women's attitudes to men's sexual behaviour. *Health Transition Review*, 1995, **5** (suppl.): 67–79.

24. **Olayinka O.** Male and female contraceptive knowledge, practice among sample students of Benin. *Studies in Family Planning*, 1992, **20**: 201–212.

25. **Gardner R, Blackburn RD, Upadhyyay UD.** Closing the condom gap. *Population Reports H*, No. 9. Baltimore, MD, John Hopkins University School of Public Health, Population Information Program, 1999.

26. **Mbizvo M, Adamchak D.** Condom use and acceptance: a survey of male Zimbabweans. *Central African Journal of Medicine*, 1989, **35**: 519–523.

27. **Hulton L, Falkingham J.** Male contraceptive knowledge and practice: what do we know? *Reproductive Health Matters,* 1996, **7**: 90–100.

28. **Fapounda B, Ruternberg N.** *Expanding men's participation in reproductive health in Kenya.* Nairobi, African Population Policy Research Center, 1999.

29. **Oloko BA, Omoboloye AO.** Sexual networking among some Lagos State adolescent Yoruba students. *Health Transition Review,*1993, **3** (suppl.): 151–158.

30. **Selltiz C, Wrightsman LS, Cook SW.** *Research methods in social relations*, 3rd ed. New York, Holt, Rinehart & Winston, 1976.

31. **Goreskog K G, Solbom D.** *EFAP-II, Exploratory Factor Analysis Program.* Uppsala, University of Uppsala, Department of Statistics, 1978.

32. **Nunnally JC.** *Psychometric theory*, 2nd ed. New York, McGraw-Hill, 1978.

33. **Aiken IR.** Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement,* 1985, **45**: 131–142.

34. **Arrindelli WA, Ross MW, Bridges KR et al.** Fear of AIDS: the replicable, invariant questionnaire dimension. *Advances in Behavior Research Therapy,* 1989, **11**: 69–115.