DEVELOPMENT OF A SCALE FOR ATTITUDE TOWARD CONDOM USE FOR MIGRANT WORKERS IN INDIA

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ABSTRACT

BACKGROUND: The propaganda for the use of condoms remains one of the mainstay for prevention of human immunodeficiency virus (HIV) transmission. In spite of the proven efficacy of condom, some moral, social and psychological obstacles are still prevalent, hindering the use of condoms. AIMS: The study tried to construct a short condom-attitude scale for use among the migrant workers, a major bridge population in India. SETTINGS AND DESIGN: The study was conducted among the male migrant workers who were 18–49 years old, sexually active and had heard about condoms and were engaged in nonformal jobs. We recruited 234 and 280 candidates for Phase 1 and Phase 2 respectively. MATERIALS AND METHODS: Ten items from the original 40-item Brown's ATC (attitude towards condom) scale were selected in Phase 1. After analysis of Phase 1 results, using principal component analysis six items were found appropriate for measuring attitude towards condom use. These six items were then administered in another group in Phase 2. Utilizing Pearson's correlations, scale items were examined in terms of their mean response scores and the correlation matrix between items. Cornbach's alpha and construct validity were also assessed for the entire sample. RESULTS: Study subjects were categorized as condom users and nonusers. The scale structure was explored by analyzing response scores with respect to the items, using principal component analysis followed by varimax rotation analysis. Principal component analysis revealed that the first factor accounted for 71% of the variance, with eigenvalue greater than one. Eigenvalues of the second factor was less than one. Application of screen test suggests only one factor was dominant. Mean score of six items among condom users was 20.45 and that among nonusers was 16.67, which was statistically significant (P < 0.01). Cornbach's alpha coefficient was 0.92. CONCLUSION: This tailor-made attitude-toward-condom-use scale, targeted for most vulnerable people in India, can be included in any rapid survey for assessing the existing beliefs and attitudes toward condoms and also for evaluating efficacy of an intervention program.

Key words: Attitude, condom, India, migrants, scale

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INTRODUCTION

The 2006 estimates released by the National AIDS Control Organization (NACO), supported by UNAIDS and WHO, indicate that national adult HIV prevalence in India is approximately 0.36%, which corresponds to an estimated 2 million to 3.1 million people living with HIV in the country.[1] Heterosexual transmission is the leading means of transmitting human immunodeficiency virus (HIV) in India (NACO).[2] The majority of the cases come from urban areas, mostly fuelled by commercial sex workers (CSWs) and their customers and heterosexual spread beyond them to others. Migrant workers are major customers of CSWs.[3]

Health authorities, voluntary organizations and governments have developed and recommended strategies for the promotion of the use of condoms as a preventive measure against HIV/ AIDS.[4-6] Researchers showed that various misconceptions about condoms and their use persist among key populations. Still, there exist wide and various gaps in condom programming.[7] The main reason cited for nonuse of condom in the literature includes lack of spontaneity, reduction of sexual pleasure and the understanding that such sexual intercourse is not 'natural.'[8,9] Knowledge of HIV must certainly have influence on condom use, but knowledge is not the only factor involved in choice.[10]

Despite the importance of condom use in the fight against HIV, only five condom-attitude measures have been reported in the literature – namely, UCLA multidimensional condom attitude scale,[11] 22-item condom use barriers scale developed for Nigerian University students,[12] 57-item condom attitude scale (CAS) developed for American University students,[13] adolescent version of CAS[14] and Brown's attitude toward condoms (ATC) scale.[10] Measures that have demonstrated reliability and validity in one population are not necessarily generalized to other populations, necessitating the testing of instruments in a particular type of population.[6] This study proposed to develop and validate a scale to assess attitude toward condom use with respect to a subset of items from a previously tested scale (Brown's ATC scale), in a sample of migrant workers in India.

MATERIALS AND METHODS

There is no uniform standardized condom-attitude scale for the Indian population – especially for migrant workers, who are considered a major 'bridge population' in India. We found, on exploration of questionnaires used by different researchers for assessing condom-use behavior, that most researchers used Brown's ATC scale. The Brown's ATC scale was developed as an assessment instrument for use in research directed toward promotion of barrier methods of contraception. The resulting 40-item Likert-type scale was found to have an internal consistency reliability coefficient of 0.93, with an average inter-item correlation of 0.34. However, majority of researchers used 10 items from this scale with or without modifications in different combinations. One recent study among migrant workers in Kolkata, India, adopted 10 items from this scale to measure perception of, attitude towards, and intention behind, condom use among the study population.[15] We took these 10 items as our primary tool. Before applying to

the participants, we translated these 10 items into local dialect as a standard guideline (back translation). We used the Likert five-point scale as used in the original scale. The study area comprised of seven adjacent municipal wards of Kolkata Municipal Corporation. These seven wards are located in central Kolkata, where terminal railway station, bus terminus, business places and offices are located. We selected this area as majority of the migrant workers engaged in nonformal jobs are found in this area.

The study was approved by the Institutional Review Board of Indian Council of Medical Research, Kolkata.

Sample selection method
Phase 1:
The 10-item scale was then piloted among 234 randomly selected male migrant workers from one municipal ward who were 18-49 years old, sexually active and had heard about condoms and were engaged in nonformal jobs.

From the given responses, we computed individual-item mean score and summary score for all items, with reverse coding of the items wherever applicable. We calculated internal consistency (Cornbach's alpha) for these 10 items, which was 0.8. The score could range from 10 to 50 (10 = strongly negative perception; 25 = neither negative nor positive perception; and 50 = strongly positive perception). Mean score for all items was 23.2. Item-wise mean score varied from 2.16 to 2.76. It reflected that most of them had neither negative nor positive perception, beliefs towards condom use.

We performed principal component analysis of these 10 items. Analysis yielded two principal components, with the first component explaining 49% of the variance and the second component explaining 13% of the total variance [Table 1]. Items *'Would have no objection if my partner suggests use of condoms'* and *'I do not think condoms can interfere with enjoyment'* had more positive loading with component 2. All other items loaded strongly with component 1, which explains maximum variance. We tried to find a unifactorial short-item scale that strongly denotes attitudes towards condom use. We deleted the two above-mentioned items and redid the factorial analysis. Principal component analysis with 8 items showed improvement of variance explained by component 1 (54%), but high loading of another two items was found in the second component. We deleted those two items (*'I would be comfortable suggesting that my partner and I use condom'* and *'I would avoid using condom if possible'*). Again, we did the factorial analysis with the remaining 6 items. Seventy-one percent of the total variance can be explained by component 1 in these 6 items and 7% by component 2. Moreover, all the six items strongly loaded on component 1. So this 6-item scale can give us a unifactorial scale.

Table 1: Component matrix of 10-item condom scale

Items	Component	
	1	2
Condoms are uncomfortable	0.81	-0.09
The idea of using condoms doesn't appeal to me	0.82	-0.06
Proper use of condoms can enhance sexual pleasure	0.78	-0.21
I intend to try condoms	0.84	-0.17
I would be comfortable suggesting that my partner and I use condom	0.62	0.52
I would avoid using condoms if possible	0.53	0.23
Using condom makes sex un-enjoyable	0.85	-0.2
In my opinion condoms are too much trouble	0.83	-0.22
I don't think condoms interfere with enjoyment of sex	0.21	0.44
I would have no objection if my partner suggested that we use a condom	0.11	0.78

Cornbach's alpha for internal consistency also improved with the 6-item scale (0.92). We took these 6 items for the next phase of study.

Phase 2:
Sample selection:
We selected the required sample from the study area by two-stage cluster survey with probability to proportionate to size (PPS). This six-item attitude-toward-condom-use scale was then incorporated in a proposed risk behavior study among migrant workers. These migrant workers, who have migrated from the neighboring states, mostly live alone or with their co-workers in Kolkata.

Statistical analysis
Descriptive statistics were used to describe the study sample in terms of selected demographic characteristics. Utilizing Pearson's correlations, scale items were examined in terms of their mean response scores and the correlation matrix between items. Cornbach's alpha to test reliability was assessed for the entire sample. Construct validity was assessed utilizing 'condom use with partner' variable, testing the significance in the difference between the user and nonuser group. Principal component analysis was done utilizing a varimax rotation, to confirm its unifactorial structure.

RESULTS

Phase 1
From Phase 1 of the study, we selected six items for phase 2 study for measuring attitude towards condom use. These six items were then incorporated in a questionnaire for assessing behavior, risk and condom use among the study population.

Phase 2
We recruited 447 participants for a survey among migrant workers through PPS from the study area. For this analysis, from among these 447 participants we took 280 participants who had heard about condom. As depicted in Table 2, about 45% of participants were aged between 25 and 29 years, followed by 28% in the '30–34 years' age group. Among them, 37% were illiterate and 20.6% had education up to 'above class IV.' Over two-thirds were Hindu by religion; and the rest were Muslims, excepting 5 participants. All of them were engaged in nonformal jobs. About half of them (46.8%) were rickshaw- or van–pullers, and another 27.5% were engaged in selling vegetables on streets. About one-third of them (36.8%) had used condom with their sex partners. We did not find any association of 'ever used condom'

Table 2: Socio-demographic characteristics of participants (*n* = 280)

Characteristics	No	%
Age (yrs)		
18-24	48	17.1
25-29	127	45.4
30-34	78	27.9
35-39	13	4.6
40 and above	14	5
Educational level		
Illiterate	104	37.1
Literate	71	25.4
Class IV	50	17.9
Class VIII	28	10
Above class VIII	27	9.6
Job type		
Rickshaw/Van puller	131	46.8
Street Seller	77	27.5
Labor	72	25.7
Income (Rs. per week)		
0-299	53	18.9
300-399	82	29.3
400-499	77	27.5
500 and above	68	24.3
Religion		
Hindu	199	71.1
Muslim	76	27.1
Others	5	1.8
Ever used condom with sex partner		
Yes	103	36.8
No	177	63.2

with income or education.

Responses with respect to six items

Mean score: Mean score of the six-item scale was 18.06, and standard deviation was 5.04. Mean score of each item varied from 2.91 to 3.08. Mean score of six items among condom users was 20.45 and that among nonusers was 16.67. About 70% of participants opined 'strongly agree' and 'agree' that condoms are uncomfortable. Similarly, 72% of participants 'strongly agreed' or 'agreed' with the statement that using condom makes sex unenjoyable.

Reliability analysis

Reliability was determined by use of the 'analysis of item and test homogeneity' procedure, which yields Cornbach's alpha and also applies the Spearman-Brown formula to yield an index of the average inter-correlation between items. Mean of each of the scale's items and scale means are also presented in Table 3. Cornbach's alpha coefficient was 0.92. Item-total correlation ranged form 0.72 to 0.83. The majority of correlations were found to be above the recommended value of 0.2.[13]

Scale structure

The scale structure was explored by analyzing response scores with respect to the items, using principal component analysis followed by varimax rotation analysis. The first factor accounted for 71% of the variance, with eigenvalue greater than one [Table 4]. Eigenvalue of the second factor was less than one. Application of scree test suggests only one factor was dominant [Table 5].

Validity analysis

To examine the construct validity, we compared the differences in mean scores of six-item scale between 'condom-using' and 'never used' participants. Mean score of the user group was 20.5 and that of the 'never user' group was 16.7. This difference was statistically significant ($P = 0.01$).

DISCUSSION

As there was no uniform standardized condom-attitude scale for the Indian population, this study attempted to construct a short condom-attitude scale for use among the 'bridge population' in India. To determine the number

Table 3: Item-wise mean score and summary score of scale

Statements	Mean	Std error
Condoms are uncomfortable	3.0	0.09
Idea of using condoms is not appealing	3.0	0.1
Proper use of condoms can enhance sexual pleasure	3.1	0.09
condoms make sex unenjoyable	3.0	0.1
I intend to try condoms	2.9	0.1
Would be comfortable suggesting my partner about using condoms	3.0	0.08
Summary score	18.1	0.35

Table 4: Summary of principal component analysis of six-item condom scale

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.65	71.86	71.86	3.65	71.86	71.86
2	0.58	7.25	79.11	0.58	7.25	79.11
3	0.53	6.55	85.66	-	-	-
4	0.51	5.44	91.10	-	-	-
5	0.4	4.94	96.04	-	-	-
6	0.31	3.96	100.00	-	-	-

Extraction method: Principal component analysis

Table 5: Component matrix of six-item condom scale

Item	Component	
	1	2
Condoms are uncomfortable	0.82	-0.02
The idea of using condoms doesn't appeal to me	0.83	-0.34
Proper use of condoms can enhance sexual pleasure	0.8	0.53
I intend to try condoms	0.86	0.06
Using condom makes sex un-enjoyable	0.87	-0.06
In my opinion condoms are too much trouble	0.87	-0.13

of principal components, we used the Kaiser-Guttman rule (to select only those factors for which eigenvalues are greater than one). This criterion is best used when principal component analysis is used as a technique to extract components.[16] Factorial analysis provided us a one-factor solution. Based on the above findings, this scale satisfies the criteria – high internal consistency and high item-item correlations. Construct validity also appears to be satisfactory. Condom users had high mean scores than the 'never user' group, which was also statistically significant.

As there was no way to recall study participants, we could not do test-retest reliability test for this study. However, other means of reliability test strongly favored its reliability. Second, there might be a possibility of measurement error as condom-use behavior and the scale were measured at the same time. The interviewer might be biased during recording of the responses. To avoid this, two interviewers worked on two parts of the interview – one collected socio-demographic and condom-use history and the other recorded condom scale items' responses. Last, our participants were migrant workers engaged in nonformal jobs. This may limit the viability of generalization of our results to other populations. But majority of the HIV-infected people are young and clients of sex workers, barely literate and poor. The intention toward a specific behavioral target is largely determined by two distinct, albeit related, factors – namely, the individual's instrumental attitude and the individual's instrumental norm concerning the behavior in question. With respect to this theoretical frame, this study mainly addressed attitude towards condoms. In spite of these limitations, the scale is a unique short, reliable and valid instrument to assess attitude towards condom use.

CONCLUSION

This six-item tailor-made attitude-toward-condom-use scale would be valuable not only for assessing existing beliefs and attitudes toward condoms but also for evaluating efficacy of attitude-change techniques directed toward encouraging condom use.

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