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Chapter 5

ADAPTATION AND EXPLORATORY FACTOR ANALYSIS OF THE QUESTIONNAIRE ERRORS/PROBLEMS IN THE MALE CONDOM USE (CUES)

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ABSTRACT

In México, the Human Immunodeficiency Virus (HIV) is contracted mainly in youth since it presents a rate of 3.3 cases per 100.000 young people between 15 and 29 years of age, in this sense the development of new prevention technologies such as HIV vaccines and microbicides continue to advance, but condoms continue to be the main means of prevention, currently there are few instruments that help measure errors and problems in the use of the male condom.

The objective of the present study was to determine the factorial structure of the adaptation of the questionnaire errors/problems in the use of the male condom (CUES) in 143 young users of a non-governmental organization dedicated to the diagnosis and prevention of HIV in the city of Monterrey Nuevo León, México, for which a calculation of Bartlett and Kaiser-Meier Olkin (KMO) sphericity coefficients was conducted, using a Varimax rotation calculation between items, in addition to determining internal consistency using Cronbach's alpha. The results indicated that the condom use error/problem questionnaire (CUES) reported a Barlett sphericity statistic with $X2 = 965.8$ df = 120 $p < 0.001$ that suggests a high linear correlation between the items analyzed and an adequacy test of KMO of 0.83 referring to a high correlation and sample adequacy. Cronbach's alphas reported greater adjustment between factors than in their global score. It is suggested to continue analyzing the CUES towards a confirmatory analysis to determine the adjustment in order to confirm the number of factors to achieve an acceptable validity in the Mexican population.

INTRODUCTION

In México, HIV is acquired mainly in youth between the ages of 15 and 29, because the percentage of HIV/AIDS in the young population is 30% of the total registered cases. National statistics show that the main means of HIV transmission is through the sexual route in 95.2% of cases according to the National Center for the Prevention and Control of HIV and AIDS (CENSIDA 2017). Young people start sexual relations from the age of 17, recent studies in México have reported that the use of condoms the 46% of men mentioned that they do not like to use any contraceptive method and

38% of the women reported not agreeing to use them, which leads to risky sexual behavior (Folch et al. 2015; Isaac Uribe Alvarado et al. 2015).

In this sense, risky sexual behavior refers to the individual's exposure to a situation that can cause harm to their health or to the health of another person, especially through the possibility of acquiring a sexually transmitted infection (STI), or generate an unwanted pregnancy situation (García-Vega et al. 2012). According to the Joint United Nations Program on HIV/AIDS (UNAIDS) it is vitally important to reliably measure errors and problems in condom use in young people since condom use is currently the best strategy to counteract HIV infection, it is important to know if young people use condoms, but it is even more important if we can quantify if they do it correctly and consistently, since only in this way can actions that impact errors and problems be carried out, that young people present when using a condom (UNAIDS 2015).

In this order of ideas in Europe a sexually active person acquires approximately 16 condoms per year, while in México only four condoms per person have been quantified, the main reason why Mexicans do not like to use the condom is due to the belief that it "does not feel the same" and this is found empirically because condom preferences are more inclined towards those of thin or sensitive type as they are called by the same manufacturers as reported by the Federal Consumer Office (PROFECO 2011; CDC 2015).

In some studies it is clear that some of the main mistakes in young people to use the male condom is the slippage and rupture of the same (Coyle et al. 2012; Tarkang 2013). In addition it has been reported that young people experience changes in condom adjustment, pleasure, decreased libido, even some studies reported that young people have a low self-efficacy in the use and negotiation of condom (Oppong Asante, Osafo, and Doku 2016). It is worth mentioning that knowledge is a necessary condition when performing the correct placement of the condom to have a protection at 99% or close to this percentage (Benavides Torres et al. 2013; PROFECO 2011).

The situation of condom use in México is relevant because HIV has been identified as being concentrated in vulnerable groups composed of: Men who have sex with men, transgender people living with HIV, injecting drug users and sexual workers. All of these groups have a risk condition that is

the inconsistency in condom use (CENSIDA 2017). In the face of this situation the literature reports an important development of models that provide a theoretical framework to predict, prescribe and explain the use of the condom, even the same risky sexual behavior in the young population, however, from the perspective of measurement there is an obvious lack in scales that help to reliably measure and affordably the use of condoms in young people. These models are the theory of planned behavior, social cognitive theory and the information-motivation-Behavior Skills (Espada et al. 2016; Glanz, Rimer, and Viswanath 2008).

Therefore, in response to the HIV/AIDS problem in young people, international and national agencies promote actions such as the Global Strategy Project of the Health Sector against HIV (González 2016), which clearly proposes to combat the problem since prevention, however there are few scales to be able to reliably measure the errors and problems in the use of the condom in young people (Eggers et al. 2016) so the objective of this study was to determine the factorial structure of adaptation (CUES) in a sample of young users from a non-governmental organization (NGO) in Monterrey Nuevo León, México, which is primarily engaged in HIV screening services through rapid testing.

METHODS

Design

With a quantitative approach to a cross-sectional descriptive study design was conducted an exploratory factorial analysis study of an adapted instrument is presented, this study was approved by the ethics committee of the School of Nursing of the Universidad Autónoma de Nuevo León with number 19CEI024201141127, The study was carried out in an NGO mainly dedicated to HIV screening through the rapid test.

Participants

The sampling was a simple random with 143 men calculated with the statistical program Epidat 3.1 for Windows, the procedure for the selection was made based on random numbers determined by the same program, the inclusion criteria were: voluntarily go to apply for the rapid HIV test, men between 18 and 25 years old and young people who do not live with their sexual partner, all participants were given informed written consent and were made to respect their rights as provided by the general health law in health research, in care Chapter I, on the ethical aspects of human research (SSA 1987).

Instrument

The CUES (Crosby et al. 2015; Fisher 2011) which contains sixteen items with four response options ranging from never to three times, which are graded from 0 to 3, as a result, scores can be quantified between 0 and 48. Scores are handled dimensionally, without a cut-off point, the higher the errors and problems in condom use. Three reverse-rated items to avoid bias in responses to the same pattern. This data was considered so that it did not affect the analysis of the instrument, the adaptation to the place where the scale was used and the Mexican context consisted of two bilingual persons separately performing the translation into Spanish, subsequently and through a priori meetings some discrepancies were agreed mainly by the population of interest in the NGO, these differences were resolved and it was observed that the instrument achieved a equivalence to the english version (see appendix).

Statistical Analysis

A factor analysis (domain number) was conducted by exploratory analysis of the core components. Bartlett's sphericity coefficient calculation

was conducted to obtain a linear correlation of the items and the suitability coefficient of Kaiser-Meier Olkin (KMO) with the task of showing that there is correlation between items when the remaining items are reduced influence on them (Hair 2014). A Varimax rotation was performed as the factors are considered to be related. The degree of correlation between the item and the assumed construct evaluated, only factorial loads with values greater than .50 as recommended for factorial analysis (Velicer and Fava 1998). The Cronbach alpha coefficient was used to calculate the internal consistency or degree of correlation between items on the total scale. Statisticians were estimated in the statistical program for social sciences (SPSS) for Windows.

RESULTS

Demographic

The average age was 22 years (SD = 2.21; min = 18, max = 25) 14 years was the average formal education (SD = 3.05; min = 6, max = 20). 46.2% were engaged in working as the main occupation. Most identified with 51.7% homosexual orientation. Participants on average started active sex life at age 17 (SD = 2.28; min = 10, max = 23), on average they had 10 sexual partners in life (SD = 19.96; min = 1, max = 150), and 25.9% said they had had an STI previously.

Table 1. KMO test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.832
Bartlett's test of sphericity	Approx. Chi-square	965.876
	df	120
	Sig.	.000

In Table 1, the results indicated that the condom use error/problem questionnaire (CUES) reported a Barlett sphericity statistic with $X^2 = 965.8$ df=120 $p < 0.001$ which suggests a high linear correlation between the items

analyzed and a KMO adequacy test of 0.83 that refers to a high correlation and sample adequacy.

Table 2. Measures of explained variance

Factor	extraction amounts of loads squared			extraction amounts of loads squared		
	Total	% variance	% accumulated	Total	% variance	% Accumulated
I	5.991	37.447	37.447	2.736	17.103	17.103
II	1.722	10.763	48.210	2.633	16.454	33.557
III	1.416	8.853	57.063	2.604	16.277	49.834
IV	1.056	6.601	63.664	2.213	13.829	63.664

Table 3. Matrix of significant correlations with CUES Varimax rotation technique

No.	Item	Factor I	Factor II
2	During the last three times you used a condom during sex, did you put it on the wrong side up and have to turn it around?	0.685	0.476
12	During the last three times you used a condom, didn't you break during intercourse?	0.704	-0.067
13	During the last three times you used a condom during intercourse, did you slip during intercourse?	0.576	0.266
14	During the last three times you used a condom during intercourse, did the condom slip out when you were removing your penis from vagina/anus or rectum?	0.595	0.112
15	For the last three times that they used a condom during sex, did you know if you have a problem with the way in which this adjusts or fits	0.613	0.189
5	During the last three times you used a condom during sex, do you lose or begin to lose your erection while placing it?	.0241	0.710
6	During the last three times you used a condom during sex, did you use a condom without a water-based lubricant, such as jelly or spermicide cream	0.228	0.745
7	During the last three times you used a condom during sex, do you also use an oil-based lubricant, such as vaseline jelly or baby oil, with the condom?	0.339	0.561
8	During the last three times you used a condom during sex, do you lose or begin to lose your erection after the relationship had started while using the condom?	-0.046	0.596
16	During the last three times you used a condom during sex, did you or your partner have a problem with the way it felt?	0.008	0.657

In Table 2, Factor 1 reached its own value of 5.99 and accounted for 37.44% of the variance. For its part, factor II showed its own value of 1.72 which explained 42.21% of the variance. Subsequently, an orthogonal rotation of factors was performed with the varimax procedure, so that the interpretation of the factors is facilitated by identifying variables that have high loads on the same factor, which can be interpreted in terms of variables that have loads above r = .560

Table 3, a reduction of data was performed to identify the appropriate variables for each factor, which shows the correlations of each component with technique varimax, from which a total of 10 variables were obtained that enter each of the two factors. CUES reported an overall Cronbach alpha coefficient of 0.68; factor I was called errors (consisting of items 2,12,13,14 and 15) and reported an alpha of 0.73; while factor II was called problems (consisting of items 5,6,7,8 and 16) reported an alpha of 0.80. Indicating an acceptable correlation between items.

Table 4. Matrix of non-significant correlations with CUES varimax rotation technique

No	Item	Factor I	Factor II
1	During the last three times you used a condom for intercourse: penis-vagina or penis-anus, do you verify that the condom has no visible damage to the packaging before opening it?	.095	.044
3	During the last three times you used a condom during sexual intercourse, did you left space on the tip of the condom when it is placed?	-0.68	.053
4	During the last three times you used a condom during sex, do you squeeze the air after you put it on?	.056	.029
9	During the last three times you used a condom during sex, is the condom in contact with nails, jewelry, objects that can pierce them, or uses your teeth at any time before or during sexual intercourse?	-.159	-.134
10	During the last three times you used a condom during sexual intercourse, begins to have sex without a condom and then used later and continued the sexual relationship?	.020	-.021
11	For the last time you used a condom for sexual intercourse, have you start having sex with him and then remove it and continues to have sex without a condom?	.094	-.149

In Table 4. It is observed that the reduction of variables composed of items 1, 3, 4, 9, 10 and 11, did not report coefficients with adequate factorial load using the varimax rotation technique.

In Table 5, Cronbach alpha values are displayed if the item is omitted, as outstanding data it was found that some of the items that did not result with significant factorial load greater than .050 as items 1.2 and 3, when these items were omitted the alpha value of Cronbach was greater than 0.64 which may suggest that exploratory factorial reduction may present a better fit in the CUES.

Table 5. Item, correlation with total corrected score and Cronbach Alpha from CUES

Item	α if the item is omitted	Correlation ítem score	Average	ED
1	0.73	-0.12	2.30	1.120
2	0.65	0.48	0.69	1.076
3	0.74	-0.15	2.27	1.102
4	0.74	-0.13	2.23	1.185
5	0.63	0.59	0.50	0.879
6	0.65	0.41	0.43	0.835
7	0.63	0.60	0.39	0.831
8	0.65	0.50	0.36	0.756
9	0.66	0.42	0.27	0.702
10	0.65	0.52	0.24	0.556
11	0.65	0.49	0.28	0.621
12	0.66	0.39	0.21	0.542
13	0.65	0.64	0.18	0.512
14	0.66	0.36	0.27	0.630
15	0.66	0.38	0.24	0.593
16	0.68	0.24	0.34	0.742

DISCUSSION

A characteristic feature to highlight in this study is that the participants were young people of high risk in the face of HIV and this can be explained by the characteristics and context where the recruitment of the same was carried out as mentioned by national agencies in Mexico the highest proportion of cases with HIV/AIDS are concentrated in high-risk population such as men who have sex with men and workers of commercial sex among

others (CENSIDA 2017). Studies such as Eggers et al. (2016). Mention an added value in this idea of the importance of studies similar to this addressing populations that actually have the problem that is intended to be studied, this study included participants with real problems in terms of problems and errors in condom use and as an irrefutable fact is that they have voluntarily applied for the HIV quick test, this act was able to ensure that participants have come to the NGO due to the perception of HIV risk due to a conflicted situation with condom use.

In addition to conducting exploratory analyses with key populations or that actually have the problem being studied, it is necessary to base the studies focus on theoretical models for their development, as Mentioned by Espada et al. (2016). A position for future studies is to include qualitative approaches to first identify knowledge needs or identify needs in the face of condom use in target populations.

With respect to the reliability criteria of this exploratory factor analysis of the CUES, the sample for this study is considered to have been correct due to general recommendations for this type of studies (Hair 2014), even though the sample size is not greater than 200 subjects, this study is consistent with what was found by other authors where they refer that samples greater than 100 subjects for exploratory analysis are an adequate approximation to identify the most prevalent factors in instrument or scale analysis (Winter, Dodou, and Wieringa 2009).

CUES reported good internal consistency and a bifactorial structure that explains 48.21% of the variance in young users of an NGO in the Metropolitan area of the city of Monterrey, Nuevo León. The factorial solution shown in this study is mostly acceptable in factors I and II which, compared to its overall structure, may even explain the value of the internal consistency determined with the alpha values of Cronbach since factor I obtained a value of 0.73 and for factor II a value of 0.80 because overall the scale reported a value of O.68.

One weakness of this study is that the observations are only eigth cases per variable with respect to the size of the sample and according to the 16 items of the CUES however a strength could be that the result of the factors in the CUES obtained values well defined where items 2,12,13,14 and 15

correspond to the error dimension and items 5,6,7,8 and 16 correspond to the problem dimension, this was consistent with what was mentioned by MacCallum et al. (2001).

CONCLUSION

In this study, exploratory factorial analysis was appropriate to achieve the objective of this study. Therefore it can be said that the CUES was adapted appropriately to the place where it was used because the CUES finally reported a good fit in two dimensions which are the errors and problems in the use of the condom, it can be concluded that the values in factors I and II obtained a better internal consistency confirmed by the results of Cronbach alpha, so for future studies it is recommended to consider the reduction of factors found in this study and consider a substantial increase in the sample so that it is continue with a confirmation factorial analysis of the CUES.

APPENDIX: CONDOM USE ERRORS/PROBLEMS SURVEY MEN (CUES) CROSBY ET AL. 2015

1. During the last three times you used a condom for intercourse: penis-vagina or penis-anus, do you verify that the condom has no visible damage to the packaging before opening it? ___ no

if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions?

___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on all 3 occasions

2. During the last three times you used a condom during sex, did you put it on the wrong side up and have to turn it around? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

3. During the last three times you used a condom during sexual intercourse, did you left space on the tip of the condom when it is placed? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

4. During the last three times you used a condom during sex, do you squeeze the air after you put it on? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

5. During the last three times you used a condom during sex, do you lose or begin to lose your erection while placing it? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions

___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

6. During the last three times you used a condom during sex, did you use a condom without a water-based lubricant, such as jelly or spermicide cream? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

7. During the last three times you used a condom during sex, do you also use an oil-based lubricant, such as vaseline jelly or baby oil, with the condom? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

8. During the last three times you used a condom during sex, do you lose or begin to lose your erection after the relationship had started while using the condom? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

9. During the last three times you used a condom during sex, is the condom in contact with nails, jewelry, objects that can pierce them, or uses your teeth at any time before or during sexual intercourse? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

10. During the last three times you used a condom during sexual intercourse, begins to have sex without a condom and then used later and continued the sexual relationship? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

11. For the last time you used a condom for sexual intercourse, have you start having sex with him and then remove it and continues to have sex without a condom? ___ no

___ if yes, did you do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did it on 1 occasion ___ I did it on 2 occasions ___ I did it on 3 occasions

12. During the last three times you used a condom, didn't you break during intercourse?

___ no

___ if yes, did it do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ it did it on 1 occasion ___ it did it on 2 occasions ___ it did it on 3 occasions

13. During the last three times you used a condom during intercourse, did you slip during intercourse? ___ no

___ if yes, did it do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ it did it on 1 occasion ___ it did it on 2 occasions ___ it did it on 3 occasions

14. During the last three times you used a condom during intercourse, did the condom slip out when you were removing your penis from vagina/anus or rectum? ___ no

___ if yes, did it do it on 1 occasion, on 2 occasions, or on all 3 occasions? ___ it did it on 1 occasion ___ it did it on 2 occasions ___ it did it on 3 occasions

15. For the last three times that they used a condom during sex, did you know if you have a problem with the way in which this adjusts or fits ___ no

___ if yes, did I on 1 occasion, on 2 occasions, or on all 3 occasions? ___ I did on 1 occasion ___ I did on 2 occasions ___ I did on 3 occasions

16. During the last three times you used a condom during sex, did you or your partner have a problem with the way it felt? ___ no

___ if yes, did it happen on 1 occasion, on 2 occasions, or on all 3 occasions? ___ it happened on 1 occasion ___ it happened on 2 occasions ___ it happened on 3 occasions.

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