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Use of condoms during sexual intercourse: a population-based study

ABSTRACT

OBJECTIVE: To describe characteristics associated with failure to use condoms during sexual intercourse by women.

METHODS: A cross-sectional population-based study was conducted with 1,026 women aged 20-60 years living in the urban area of a city in Southern Brazil, in 2003. Cluster sampling was carried out by randomly selecting 40 of the city's 270 census sectors. Logistic regression analysis of failure to use condoms in relation to socioeconomic, demographic, obstetric, and health care usage variables was performed.

RESULTS: Among studied women, 867 (84.5%) reported being sexually active; of these, 252 (29.1%) wore condoms during sexual intercourse. Logistic regression showed that the most vulnerable groups were women who were married or in stable partnerships, and women aged more than 40 years. No associations with the other variables explored was found.

CONCLUSIONS: Prevalence of condom use was low; we were able to identify a group of women that needs to be targeted by health policies and services in order to improve perception of the risk of acquiring sexually transmitted diseases.

KEYWORDS: Condoms, utilization. Sexual behavior. Sexually transmitted diseases, prevention & control. Epidemiologic factors. Socioeconomic factors. Primary prevention. Cross-sectional studies.

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INTRODUCTION

The Brazilian Ministry of Health information system provides epidemiological data on AIDS since 1980. In Brazil, the incidence of AIDS cases peaked in 1998, with 19.5 cases per 100,000 population. Numbers have decreased slightly since 1998, incidence in 2003 being of 18.2 cases per 100,000. In the state of Rio Grande do Sul, in Southern Brazil, incidence showed an increasing trend, peaking at 33.0 per 100,000 in 2002, and with an incidence in 2003 of 31.3 per 100,000. Rates notified in Rio Grande do Sul are higher than those notified in other Brazilian states.*

Data on AIDS mortality in Brazil have been available in the information system since 1983. Mortality rates were on the rise until 1996, when they reached 9.6 per 100,000 population. This rate subsequently fell to 6.3 per 100,000 in 2002. In Southern Brazil, mortality rates are also increasing, having reached 9.0 per 100,000 in 2003. In 2002, in the state of Rio Grande do Sul, the mortality coefficient for all ages was 16.7 per 100,000 among males and 7.5 among females.**

The profile of the AIDS epidemic has evolved throughout the years, with the epidemic affecting countless population groups. Different groups have shown greater susceptibility to the disease at different times, leading to changes in epidemiological profile. The changes observed have modified behaviors in certain situations, reducing individual susceptibility. These include sexual behavior, use of injectable drugs, and blood transfusions or accidents with contaminated biological materials.

Currently, the epidemic is showing an important increase among women, mostly in the lower income strata, and with a trend towards greater increase in medium-sized cities.[1,8,14]

The number of female cases has grown to such an extent that the male/female ratio for AIDS cases, which was 23.2 in 1985, is currently at 1.5.*** In addition, the increase of the number of cases among women has led to concerns regarding a potential increase in mother-to-child transmission.

Clinical management of HIV infection has changed since the beginning of the epidemic. The improvement in the quality of life of HIV-infected individuals began with the introduction of antiretroviral therapy. There was a progressive change in the profile of morbidity and mortality, with reductions in the number of deaths and of up to 80% in the appearance of opportunistic infections, leading to reduction in hospital admissions and increase in patient survival and quality of life.[6]

In Brazil, AIDS treatment is based on antiretroviral drugs made available by the Ministry of Health, and 100% of individuals that fulfill the established criteria for AIDS diagnosis have access to treatment.**** However, prevention by condom use in all sexual intercourse is still the most efficacious and recommended agent for controlling the dissemination of AIDS by the sexual route. This will require a change in the sexual habits of individuals, given that most persons are not in the habit of using condoms.[7,12]

Thus, sexual behavior has been a major topic in several studies, given its close relationship with sexually transmitted diseases and AIDS.[12] Information on the sexual habits of the population become important in this context, since they provide evidence regarding risk and protective factors. The knowledge generated by epidemiological studies may aid in the formulation and implementation of policies aiming to reduce and control risk of acquiring the disease.

Therefore, the present study was aimed at investigating characteristics associated to the non use of condoms by sexually active women.

METHODS

The present cross-sectional study is part of a research project***** conducted in 2003, which was intended to characterize the health of women in the 20-60 years age group living in the urban area of São Leopoldo, state of Rio Grande do Sul.

Sample size was estimated based on the outcomes requiring the greatest number of subjects, to obtain 95% confidence intervals assuming 80% power, a non-

*Ministério da Saúde. Secretaria de Vigilância em Saúde. *Bol Epidemiol Aids/DST* 2004;28(1). Disponível em http://www.aids.gov.br/services/DocumentManagement/FileDownload.EZTSvc.asp?DocumentID={A6749630-58F8-4E1A-A778-23F453F27EFD}&ServiceInstUID={B8EF5DAF-23AE-4891-AD36-1903553A3174} [acesso em 13 dez 2004]

**Secretaria da Saúde do Estado do Rio Grande do Sul, Núcleo de Informações em Saúde. Estatísticas de saúde: mortalidade 2002. Porto Alegre: Secretaria da Saúde do Rio Grande do Sul; 2003.

***Ministério da Saúde. Secretaria de Vigilância em Saúde. *Bol Epidemiol Aids/DST* 2004;28(1), Disponível em http://www.aids.gov.br/services/DocumentManagement/FileDownload.EZTSvc.asp?DocumentID={A6749630-58F8-4E1A-A778-23F453F27EFD}&ServiceInstUID={B8EF5DAF-23AE-4891-AD36-1903553A3174} [acesso em 13 dez 2004]

****Ministério da Saúde. Programa Nacional de Combate a Aids. Disponível em http://www.aids.gov.br/final/dados/aids.htm [acesso em 13 de dez 2004]

*****Projeto de Pesquisa "Condições de Saúde das Mulheres: Estudo de Base Populacional na Região do Vale do Rio dos Sinos", realizado pela Universidade do Vale do Rio dos Sinos, em 2003. [dados inéditos]

exposed to exposed ratio of 1:3 (based on the social class distribution found in another municipality (Pelotas),[5] and a prevalence ratio of 2,0. We added a further 10% for losses and refusals and 15% for confounder control during data analysis.

Cluster sampling was carried out by using as units the 270 census sectors in the city of São Leopoldo. We randomly selected 40 sectors and visited 36 homes in each sector. The starting point in each sector was defined by random selection of an initial street block and household.

At the end of fieldwork, we recruited to the study 1,026 women. Fifty-eight women (5.6%) were considered as losses or refusals.

The women included in the study answered pre-tested standardized, pre-coded questionnaires. Interviewers were trained to administer questionnaires and collect certain measures. Quality control of data collection was performed for 10% of the sample through the administration of a simplified version of the questionnaire, composed of variables not likely to show alteration across short time periods.

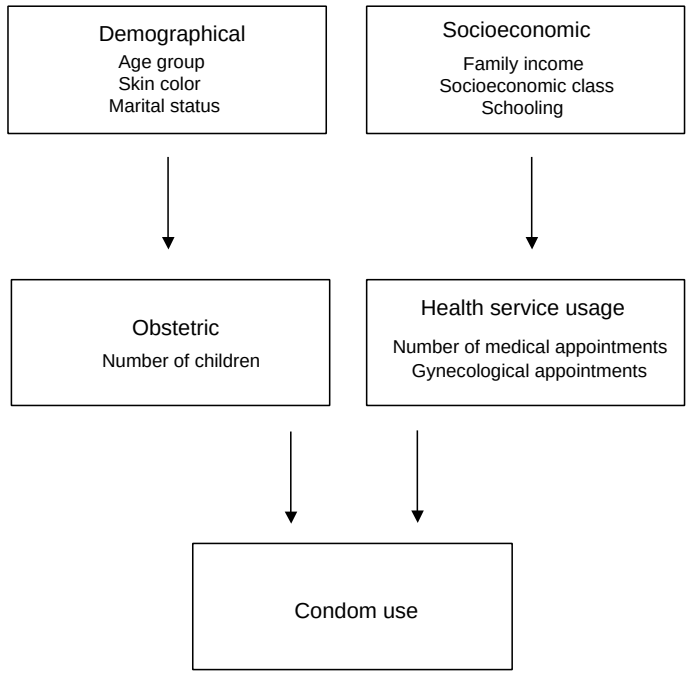

Figure - Hierarchic model of variables used in analysis Southern Brazil, 2003.

The dependent variable was collected among women who reported being sexually active. The question was included in a section on use of contraceptives.

The remaining variables included for the characterization of women who did not use condoms were age, skin color (assessed by the interviewer), marital status, schooling, per capita family income in minimum wages, socioeconomic class according to the *Associação Brasileira de Empresas e Pesquisa* (ABEP - Brazilian Association of Market Research Companies),* number of children, and number of gynecological appointments in the twelve months prior to the date of the interview.

The ABEP socioeconomic classification is constructed based on a score that considers ownership of material goods, schooling of the head of household, and presence of a maid or domestic servant.

The database was compiled using Epi Info 6.0 software. Data were entered twice in order to reduce mistakes. Bivariate and multivariate analysis were carried out using SPSS software. We calculated the prevalence of non-use of condoms in sexual intercourse, prevalence rations, confidence intervals, and significance levels using the Chi-square test. For multivariate analysis, we used logistic regression based on the hierarchic model[17] described in Figure. In this model, demographic and socioeconomic variables were placed in the distal level and obstetric and health service usage variables in the second level, all variables determining the outcome "condom use during sexual intercourse". The inclusion of variables into the model is based on obtaining significance in bivariate analysis, whereas there permanence in regression depends on obtaining a significance level of around 20%.

The protocol for the present study was approved by the Research Ethics Committee of the *Universidade Federal de Pelotas* Medical School.

RESULTS

Among the women included in the study, 867 (84.5%) reported being sexually active. Of these, 252 (29.1%) used condoms.

Regarding demographic variables, most women were in the 40-49 years age group (n=252; 29.1%) and had white skin (n=734; 84.7%). The majority of women were married or in stable relationships, with 638 (73.6%) references. Regarding socioeconomic vari-

*Associação Brasileira de Empresas de Pesquisa (ABEP). Critério de Classificação Econômica Brasil. Disponível em http://www.abep.org.br [acesso em 27 jun 2006]

ables, 377 women (43.5%) had up to seven years of schooling, and 671 women (77.4%) reported earning less than three minimum wages; 580 (67.0%) women were included in social classes B e C; and 589 (67.9%) had between one and three children. Mean and median number of appointments per year were 4.5 and three, respectively; 604 women (69.7%) had had a gynecological appointment in the previous year (Table 1).

Table 1 also shows the distribution of condom use according to the characteristics of the sample. Our data show a direct linear association (p<0.0001) with age, i.e., the use of condoms decreased as age increased. These differences were statistically significant, and 95% confidence intervals showed the same effect (Table 1).

As to marital status, there were statistically significant differences showing that widows and divorced or single women used condoms more frequently than married women or women in stable relationships. Skin color was not associated with condom use (Table 1).

The analysis of socioeconomic characteristics showed significant differences with respect to schooling (p<0.001). Women with 12-14 years of schooling used condoms more frequently when compared to the reference category. However, confidence intervals included the unit (Prevalence ratio = 0.86; 95% CI: 0.73-1.01). Results were not significant with respect to other socioeconomic variables (ABEP socioeconomic class and per capita family income in minimum wages) (Table 1).

We found an inverse, statistically significant linear association with number of children (p=0.0001), women with no children reporting condom use more frequently. As the number of children increased, condom use decreased (Table 1).

There was no significant association with presence of medical or gynecological appointments in the previous year (Table 1).

In multivariate analysis by logistic regression, the

Table 1 - Socioeconomic, demographic, obstetric, and health service usage variables among women who do not use condoms. Southern Brazil, 2003.

Variable	N	Non-use of condoms (%)	Prevalence ratio	95% CI	p
Skin color					0.58
White	734	518 (70.6)	1.0		
Nonwhite	133	97 (72.9)	1.03	0.92-1.16	
Age group (years)					<0.001
20 to 29	249	143 (57.4)	1.0		
30 to 39	232	167 (72.0)	1.25	1.10-1.43	
40 to 49	252	189 (75.0)	1.31	1.15-1.49	
50 to 60	134	116 (86.6)	1.51	1.33-1.71	
Schooling (years)					<0.001
More than 15	103	73 (70.9)	1.0		
12 to 14	244	149 (61.1)	0.86	0.73-1.01	
8 to 11	143	103 (72.0)	1.02	0.87-1.19	
5 to 7	208	161 (77.4)	1.09	0.95-1.26	
0 to 4	169	129 (76.3)	1.08	0.93-1.25	
Marital status					<0.001
Married or in partnership	638	520 (81.5)	1.0		
Widows, divorced, single	229	95 (41.5)	0.51	0.43-0.60	
Per capita income (MW)					0.68
More than 10.1	31	20 (64.5)	1.0		
6.01 to 10	43	30 (69.8)	1.08	0.78-1.50	
3.01 to 6	122	86 (70.5)	1.09	0.82-1.45	
1.10 to 3	351	258 (73.5)	1.14	0.87-1.49	
<1.01	320	221 (69.1)	1.07	0.82-1.40	
Socioeconomic class*					0.87
Class A	67	51 (76.1)	1.0		
Class B	231	165 (71.4)	0.94	0.80-1.10	
Class C	349	243 (69.9)	0.91	0.79-1.06	
Class D	209	148 (70.8)	0.93	0.79-1.09	
Class E	9	6 (66.7)	0.88	0.54-1.42	
Number of children					<0.001
None	165	86 (52.1)	1.0		
1 to 3	589	439 (74.5)	1.43	1.23-1.67	
≥4	113	90 (79.6)	1.53	1.28-1.82	
Medical appointments					0.37
None	125	83 (66.4)	1.0		
1 to 4	474	335 (70.7)	1.22	0.78-1.90	
>4	266	195 (73.3)	1.39	0.85-2.26	
Gynecologist in last year					0.38
Yes	604	423 (70.0)	1.0		
No	263	192 (73.0)	1.04	0.95-1.14	

MW: minimum wages
*According to criteria established by the *Associação Brasileira de Empresas de Pesquisa*

Table 2 - Logistic regression (adjusted model) for socioeconomic, demographic, and obstetric variables and their association with non-use of condoms. Southern Brazil, 2003.

Variable	Odds ratio	95% CI	p
Schooling* (years)			0.72
More than 15	1.0		
12 to 14	0.84	0.48-1.47	
8 to 11	1.04	0.56-1.93	
5 to 7	1.16	0.64-2.09	
0 to 4	1.04	0.57-1.91	
Marital status*			<0.001
Married or in partnership	1.0		
Widows, divorced or single	0.19	0.13-0.27	
Age group* (years)			<0.01
20 to 29	1.0		
30 to 39	1.33	0.86-2.03	
40 to 49	1.58	1.04-2.40	
50 to 60	2.97	1.63-5.41	
Number of children**			0.53
None	1.0		
1 to 3	1.09	0.68-1.74	
≥4	1.48	0.72-3.05	

*Variables included in the first level
**Values adjusted for variables in the first level

effects of variables *age* and *marital status* were maintained, showing that increase in age reduced the probability of condom use, and that women who were married or in stable relationships were also less likely to use this protective device (Table 2).

DISCUSSION

Population-based prevalence studies have the advantage of being representative, and allowing for estimates to be made of the epidemiological behavior of the community in which they were conducted. Confidence intervals for age distribution were similar to those obtained for the city of São Leopoldo in the 2000 General Census, allowing results to be extrapolated to the city's general population.

Prevalence of condom use was 29.1% (95% CI: 26,0-32,1), with 104 women (12,0%) referring the use of condoms as a contraceptive method, and 148 women (17,1) referring additional use of condoms for protection during sexual intercourse.

Other studies conducted in Brazil have investigated the use of condoms as a contraceptive or as protection against sexually transmitted diseases. Although the prevalence of condom use is low, an increasing trend in use can be observed.[7,10,12,16]

A survey carried out in 1992 in a community in the neighboring State Capital, Porto Alegre, showed that only 0,2% of women (n=100) used condoms as a contraceptive method.[16] In the same year, in the city of Pelotas, also in Southern Brazil, a population based survey including 677 women aged 20-49 years reported 4.0% prevalence of condom use.[3] Another population-based cross-sectional study carried out in the same city in 1995, including a representative sample of 3,002 women aged 15-49 years showed that 7.5% of women that were married or in stable relationships used condoms during sexual intercourse.[11] Between December 1999 and April 2000, another study was conducted with 766 women, showing prevalence of condom use of 10.5%.[4] Finally, in 2000, another population-based cross-sectional study including women aged 15-49 years showed that 72% of women did not use condoms.[12] A national survey conducted in 2004, including subjects of both sexes aged 15-54 years, showed that 25.3% of the sexually active population used condoms regularly.[15] Therefore, the prevalence found in the present survey, although low, was the highest among the studies used for comparison.

We did not find statistically significant differences for variables that attempted to express socioeconomic conditions (income, economic class, and schooling). However, in other studies, significant differences were found in this regard: there was greater risk of acquiring sexually transmitted diseases among subjects of lower socioeconomic status,[10] low socioeconomic class insertion,[15] and with low income.[13]

In the present study, women of older age and in stable relationships showed greater probability of not using condoms. Such reduction in condom use with age was not found in a study conducted in Pelotas.[11] However, the national survey conducted by Szwarcwald et al[15] detected a decrease in the regular use of condoms with increasing age, regardless of type of relationship. The condom distribution policy of the Brazilian Ministry of Health has given priority the younger population.* It is possible that condom use

*Ministério da Saúde. Secretaria de Políticas de Saúde. Política de distribuição do preservativo masculino na prevenção ao HIV/Aids e DST no Brasil. Brasília (DF): Ministério da Saúde; 2002.

is easier for younger generations. An epidemiological survey of 14-19 year old students in the city of Pelotas showed that 64% of boys and 42% of girls had used a condom in their last sexual intercourse.[2]

The negative effect of stable domestic partnership was maintained even after controlling for age. The greater vulnerability to AIDS among women who are married or in stable relationships is likely to be due to unprotected sexual behavior related to trust in their partners.[10,12] Gender issues involving partners must be taken into consideration, given that women are still at a disadvantage at the moment of the choice of whether or not to use condoms during sexual intercourse.

Thus, the results of the present study show low use of condoms as protection against sexually transmissible diseases and AIDS, reinforcing the notion that older women living in stable domestic partnerships are more vulnerable to the disease.

There is evidence that a greater number of medical appointments leads to improved coverage of health measures included in the Women's Integral Health Care Program (*Programa de Atenção Integral à Saúde da Mulher*).[5,18] However, the present analysis showed no influence of health care on condom use. Health care services should be alerted about this finding, as a means of stimulating condom use. Health workers must be familiar with the reality of their settings in order to better understand, and therefore attempt to modify, the customs and habits of individuals. Changes in the community originate in changes in structure, health care team, and work process. Thus, the underlying logic of the welfare model must overcome the dichotomy between individual and collective care, especially when in defense of life.[9]

A number of important aspects were not included in the present investigation due to logistic factors. The effective use of condoms during the last intercourse and the amount/diversity of sexual partners can be cited as variables that could contribute to the present analysis and increase its contribution to further studies.

The present study allowed us to become acquainted with the reality of condom use among women living in São Leopoldo. Policies aimed at women who are married or in stable partnerships must be monitored and compared in terms of effectiveness and coverage in the community.

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