



# Factors associated with young women's adequate attitudes toward external condom use

*Fatores associados à atitude adequada de mulheres jovens sobre o uso do preservativo externo*

*Factores asociados a la actitud adecuada de mujeres jóvenes hacia el uso del condón externo*

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## ABSTRACT

**Objective:** to identify factors associated with young women's appropriate attitudes toward external condom use. **Method:** cross-sectional, with Random Forest analysis, using the infinite population proportion method to define sample size: 95% significance; 0.5% margin of error. Data were collected remotely from March to August 2022 using a structured questionnaire. Young women aged 18 to 29 years old, who reported being sexually active and literate, participated in the study. The study was approved under n° 5,289,396. **Results:** the sample consisted of 159 women, 51% of whom were mixed race, and 83% were childless. The variables for appropriate attitudes were: whether they considered that external condom use is always necessary during anal sex, and their understanding of aspects such as expiration date, storage, and decreased effectiveness of external condoms. **Conclusion and implications for practices:** sociodemographic factors associated with young women's appropriate attitude regarding external condoms were identified, thus highlighting the need for sexual educational strategies, with nurses being essential promoters in health education, family planning and sexually transmitted infections prevention.

**Keywords:** Attitude; Women; Condoms; Reproductive Health; Sexual Health.

## RESUMO

**Objetivo:** identificar os fatores associados à atitude adequada de mulheres jovens sobre o uso do preservativo externo. **Método:** estudo transversal, com análise por *Random Forest*, com método de proporção em população infinita para definir o tamanho da amostra: significância de 95%; margem de erro de 0,5%. Os dados foram coletados de março a agosto de 2022, de forma remota, por meio de questionário estruturado. Participaram 159 mulheres jovens de 18 a 29 anos, que declararam início de vida sexual e alfabetização. Pesquisa aprovada sob protocolo n° 5.289.396. **Resultados:** das 159 mulheres, 51% eram pardas e 83% não tinham filhos. As variáveis associadas à atitude adequada foram: considerar que durante o sexo anal é sempre necessário o uso do preservativo, em todas as relações sexuais, além de apresentarem ideia adequada sobre os aspectos como validade, armazenamento e diminuição da eficácia do preservativo externo. **Conclusão e implicações para a prática:** identificaram-se fatores sociodemográficos associados à atitude adequada de mulheres jovens sobre o preservativo externo, desse modo, destaca-se a necessidade de estratégias educativas sexuais, sendo o enfermeiro um promotor essencial na educação em saúde, planejamento reprodutivo e prevenção de infecções sexualmente transmissíveis.

**Palavras-chave:** Atitude; Mulheres; Preservativos; Saúde Reprodutiva; Saúde Sexual.

## RESUMEN

**Objetivo:** identificar los factores asociados con las actitudes apropiadas de las mujeres jóvenes hacia el uso del condón externo. **Método:** estudio transversal, *Random Forest*, con el método de proporción poblacional infinita para definir el tamaño de la muestra: 95% de significancia; 0.5% de margen de error. Los datos se recolectaron de forma remota de marzo a agosto de 2022 mediante un cuestionario estructurado. Mujeres jóvenes de 18 a 29 años, que reportaron ser sexualmente activas y alfabetizadas, participaron en el estudio. El estudio fue aprobado bajo el n° 5.289.396. **Resultados:** la muestra consistió en 159 mujeres, 51% de las cuales eran de raza mixta y 83% no tenían hijos. Las variables para las actitudes apropiadas fueron: si consideraban que el uso del condón externo siempre es necesario durante el sexo anal y su comprensión de aspectos como la fecha de vencimiento, el almacenamiento y la disminución de la efectividad de los condones externos. **Conclusión e implicaciones para la práctica:** se identificaron factores sociodemográficos asociados a la actitud adecuada de las mujeres jóvenes frente al condón externo, destacando la necesidad de estrategias de educación sexual, siendo las enfermeras promotoras esenciales en la educación en salud, planificación familiar y prevención de infecciones de transmisión sexual.

**Palabras-clave:** Actitud; Mujeres; Condones; Salud Reprodutiva; Salud Sexual.

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Submitted on 07/19/2025.

Accepted on 11/20/2025.

DOI: <https://doi.org/10.1590/2177-9465-EAN-2025-0103en>

## INTRODUCTION

Historically, women's health care has been predominantly focused on reproductive and maternal aspects. Even today, there is still a reductionist view that associates women's health exclusively with their reproductive function, neglecting the biopsychosocial aspects of sexual and reproductive health.<sup>1</sup>

Reproductive rights encompass the creation of policies that promote family and reproductive planning, which involves a set of actions and information designed to ensure the increase or limitation of offspring through equal rights for women, men, and couples, addressing issues related to conception and contraception.<sup>2</sup> Family planning focuses on the role of women and men, empowering them to choose the best method based on their needs.<sup>3</sup>

The most widely used and encouraged contraceptive methods in reproductive planning are barrier methods, particularly external condoms. This fact can be justified by their wide accessibility and, above all, their effectiveness in preventing Sexually Transmitted Infections (STIs), including Human Immunodeficiency Virus (HIV). However, their use needs to be coordinated with structural and behavioral interventions to promote resolvability regarding adherence and proper use.<sup>4</sup>

The use of condoms is associated solely with contraception.<sup>5</sup> Protection against STIs is rarely mentioned, and condoms are constantly associated with reduced sexual pleasure, the length of the relationship with the partner, and the type of emotional and sexual relationship.<sup>6</sup> A study based on data from the 2019 National Health Survey revealed that most participants did not use condoms in any of their sexual encounters in the last 12 months, with a higher prevalence among women. Moreover, the study showed that the main reason cited for not using condoms in the last sexual encounter was that they trusted their partner.<sup>7</sup>

In Brazil, Law No. 12,852, dated August 5, 2013, which establishes the Youth Statute, considers young people to be all citizens between the ages of 15 and 29, and their rights include access to health policies.<sup>8</sup> Early and immature sexual initiation in young women can lead to risks related to sexual health, and some behaviors experienced at this stage of life can influence the adoption of risky behaviors, making people in this age group more vulnerable to STIs and unplanned pregnancy.<sup>9</sup>

It is therefore necessary to promote reproductive and sexual education strategies that take into account young women's real lives, contributing to a change in attitudes among this population. Analyzing young women's attitudes toward external condoms is essential to support the development of educational strategies and public policies that promote safer and healthier sexual practices, in line with the sociocultural specificities and experiences of this group.

The importance of nurses in planning and managing young women's sexual and reproductive health, by providing support and qualified care in various care settings, is fundamental. The implementation of intervention strategies by these professionals aims to foster knowledge building and the consequent

empowerment of these young women, with proper consideration for their unique characteristics and contexts, acting mainly in Primary Health Care, within the scope of the Ministry of Health's programs, as this is the level that coordinates care and offers the ideal environment for the development of prevention and promotion actions.<sup>10</sup>

Based on the above, the objective is to identify the factors associated with young women's appropriate attitudes toward the use of external condoms.

## METHOD

This is a cross-sectional, exploratory study with a quantitative approach, organized according to the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).<sup>11</sup> The infinite population proportion method was used to define the sample size, considering the following parameters: 95% significance level; 0.5% margin of error; and expected prevalence of 50% of women with an adequate attitude, totaling 159 participants. Young women aged between 18 and 29 who self-reported having initiated sexual activity and were literate were included. Participants who did not respond to the questionnaire promptly for the study, who responded incompletely, or who had any comorbidity that prevented them from responding to the remote questionnaire were excluded.

Data collection took place between March and August 2022, remotely, using a questionnaire consisting of two sections: the first, referring to sociodemographic data, and the second, corresponding to the survey to identify young women's attitudes toward external condoms, which was developed by the research team. The survey was disseminated via the internet (WhatsApp, Facebook, Instagram, and via e-mail), without any preference; thus, no specific group, whether religious, racial, or socioeconomic, was expected to predominate.

All participants signed a Free and Informed Consent Term (FICT), agreeing to participate in the study. The variables were analyzed descriptively, calculating the relative and absolute frequency of categorical variables, and the calculation of the mean and standard deviation of continuous variables. A Random Forest model was constructed,<sup>12</sup> with attitude as the response variable and socioeconomic data, responses from the Knowledge Domain, and responses from the Attitude Domain as predictor variables.

Missing responses were imputed using the k-nearest neighbors method with  $k = 5$ . Next, the sample was randomly divided and stratified into training data (70% of observations) and test data (30% of observations), ensuring the attitude classes were proportional. To build the Random Forest model, 10-fold cross-validation was adopted: the training set was subdivided into 10 parts, with nine parts used to train the model and one part for internal validation in each repetition. During the process, 500 decision trees were generated, with the kappa metric being used to optimize hyperparameters and evaluate performance. The importance of the predictor variables was

calculated based on the average reduction in accuracy and the reduction in Gini impurity after class-specific permutation, then multiplied by 1,000 to facilitate visualization in tables. The final model, defined with 38 predictors evaluated per node, was tested on the test sample, generating a confusion matrix for analysis of accuracy, sensitivity, and specificity. The research was approved by the Research Ethics Committee (REC) of the Universidade Federal de Pernambuco (UFPE), under protocol No. 5,289,396.

## RESULTS

Among the 159 women participants, most were mixed race ( $n = 81$ ; 50.94%), had incomplete Higher Education ( $n = 90$ ; 56.6%), were single ( $n = 96$ ; 60.38%), were students ( $n = 63$ ; 36.62%), were Christians ( $n = 132$ ; 83.02%), had a family income of one to less than three minimum wages ( $n = 71$ ; 44.65%), had no children ( $n = 132$ ; 83.02%) (Table 1), and with a mean age of 24.14 years (standard deviation = 2.88; importance for inappropriate attitude = -11.83; importance for appropriate attitude = 0.11). Among the sociodemographic variables, the most notable were family income below one minimum wage (using five wages or more as a reference; importance = 0.26) and belonging to the Christian religion (using agnostic as a reference; importance = 0.16) (Table 1). Regarding attitude, 152 women (95.60%) had an appropriate attitude, and only seven (4.40%) had an inappropriate attitude.

Concerning the responses in the Knowledge Domain, most knew or had heard about external condoms ( $n = 158$ ; 99.37%), knew the function of external condoms ( $n = 158$ ; 99.37%), knew the correct way for their partner to use external condoms ( $n = 157$ ; 98.74%), knew the correct order for using external condoms ( $n = 138$ ; 86.79%), knew the advantages of correct external condom use ( $n = 156$ ; 98.11%), knew that using two external condoms at the same time does not increase their effectiveness ( $n = 119$ ; 74.84%), knew that the expiration date and storage conditions of external condoms affect their effectiveness ( $n = 151$ ; 94.97%), that external condoms should be used during all sexual intercourse ( $n = 148$ ; 93.08%), that external condoms should be used throughout sexual intercourse ( $n = 147$ ; 92.45%), that the use of external condoms cannot be dispensed with when the relationship is no longer casual ( $n = 138$ ; 86.79%), that external condoms are necessary even when another contraceptive method is used ( $n = 142$ ; 89.31%), and all knew that external condoms should not be reused ( $n = 159$ ; 100%) (Table 2).

Regarding responses related to Attitude Domain, most believed that the external condom should not be used exclusively at the partner's initiative ( $n = 155$ ; 97.48%). Furthermore, most considered it important to use external condoms during all sexual intercourse ( $n = 152$ ; 95.6%). As for the external condom use, 156 (98.11%) considered that during vaginal sex the external condom is always necessary; 113 (71.07%) considered that during oral sex the external condom is always necessary; and

154 (96.86%) considered that during anal sex the external condom is always necessary (Table 3).

The Random Forest model demonstrated high predictive performance, with an accuracy of 97.87% (95% CI = 88.71%; 99.95%) and a kappa index of 0.79, indicating substantial agreement between predictions and observed values. Specificity was 100%, indicating that no actual cases in the "inadequate" category were misclassified as "adequate." Sensitivity was 97.78% for the adequate attitude class, correctly identifying almost all cases relevant to the study objective. However, the percentage of negative predictions for the inadequate attitude class was 66.7%.

Therefore, both sociodemographic variables and questionnaire items related to knowledge and attitude were among the five most important variables for predicting appropriate attitude. The most important questionnaire items were: whether they considered that external condoms are always necessary during anal sex (importance = 11.12) (Table 3), whether they considered the use of external condoms important in all sexual intercourse (importance = 3.35) (Table 3), and whether they considered that aspects such as validity and storage methods can reduce external condom effectiveness (importance = 0.31) (Table 2).

## DISCUSSION

Considering the need to use an external condom during anal sex in all sexual intercourse was the most important variable (importance = 11.12) associated with the appropriate attitude among young women. This fact may be related to women's search for preventive practices and their ability to discuss these desires with their partners.<sup>11</sup> A study identified the prevalence of external condom use during vaginal sex, followed, to a lesser extent, by the use during anal sex. During oral sex, however, condom use is nonexistent or sporadic.<sup>13</sup>

Data revealed much lower rates of condom use during anal sex among heterosexuals when compared to homosexuals. These indices can be applied based on the perception of safety. After all, it does not result in pregnancy, because it is not considered sex, due to a lack of knowledge about the risks associated with anal sex, and in pursuit of personal pleasure. The last one is a motivator for anal sex from the women's perspective, who often want to satisfy their partners, even if it results in painful consequences for them.<sup>14</sup>

Recognizing the importance of condom use in all sexual intercourse was also an important variable (importance = 3.35) associated with appropriate attitudes. Condom use among young people is sometimes seen as the most appropriate form of contraception in the case of sexual intercourse with a new partner, and can be a difficult topic to discuss with a regular partner. There is also a perception of caring for one's partner when using this protection, recognizing both the risks of STIs and pregnancy.<sup>15</sup>

Factors related to external condom effectiveness, such as storage, expiration date, and how to use it correctly, can affect

**Table 1.** Absolute and relative frequencies of sociodemographic variables and importance for inappropriate and appropriate attitudes multiplied by 1,000.

Variables	N (%)	Importance	
		Inappropriate	Appropriate
<b>Age</b>			
<b>Color</b>			
Yellow	6(3.77)	Reference	
White	53(33.33)	-1.83	-0.04
Indigenous	2(1.26)	0.00	0.00
Mixed race	81(50.94)	2.83	0.05
Black	17(10.69)	0.00	0.00
<b>Education</b>			
Complete High School	20(12.58)	Reference	
Incomplete Higher Education	90(56.6)	0.00	-0.05
Complete Higher Education	49(30.82)	0.00	0.00
<b>Marital status</b>			
Married	36(22.64)	Reference	
Divorced	4(2.52)	0.00	0.00
Single	96(60.38)	1.33	0.00
Common-law marriage	9(5.66)	2.00	0.00
Living together (cohabiting)	14(8.81)	0.00	0.00
<b>Employment status</b>			
Student	63(39.62)	Reference	
Not working	15(9.43)	2.83	-0.10
Working	60(37.74)	-3.67	0.16
Working and studying	21(13.21)	0.00	0.00
<b>Religion</b>			
Agnostic	7(4.4)	Reference	
Candomblé	1(0.63)	0.00	0.00
Christian	132(83.02)	0.00	0.16
No religion	19(11.95)	0.00	0.00
<b>Income range</b>			
Five minimum wages or more	26(16.35)	Reference	
From one to less than three minimum wages	71(44.65)	-0.67	-0.10
From three to less than five minimum wages	44(27.67)	-5.67	-0.05
Less than one minimum wage	18(11.32)	0.00	0.26
<b>Has children</b>			
No	132(83.02)	0.00	
Yes	27(16.98)	-0.05	

the reliability of this contraceptive method. Fears of unpleasant consequences may be reasons for inconsistent condom use,

requiring health education with an emphasis on safe condom selection and step-by-step instructions for use, to increase this

**Table 2.** Absolute and relative frequencies of responses in the knowledge and importance domain for inappropriate and appropriate attitudes multiplied by 1,000.

Variables	n(%)	Importance	
		Inappropriate	Appropriate
<b>Know or have heard about external condoms</b>			
No	1(0.63)		
Yes	158(99.37)	0.00	0.00
<b>Know the external condom function</b>			
No	1(0.63)		
Yes	158(99.37)	0.00	0.00
<b>Know the correct order that the partner should use external condoms</b>			
No	2(1.26)		
Yes	157(98.74)	0.00	0.00
<b>Correctly identified the order of external condom use</b>			
No	21(13.21)		
Yes	138(86.79)	-0.67	0.15
<b>Know the advantages of correct external condom use</b>			
No	3(1.89)		
Yes	156(98.11)	-1.00	-0.15
<b>Think that using two condoms at the same time increases the effectiveness</b>			
No	40(25.16)		
Yes	119(74.84)	0.00	0.00
<b>Think that aspects such as expiration date and storage conditions can reduce the effectiveness of external condoms</b>			
No	8(5.03)		
Yes	151(94.97)	1.00	0.31
<b>Think that reusing the same external condom during consecutive sexual intercourse is recommended</b>			
No	0(0.00)		
Yes	159(100)	0.00	0.00
<b>Think that external condoms should be used in all sexual intercourse</b>			
No	11(6.92)		
Yes	148(93.08)	-4.00	-0.06
<b>Think that external condoms should be used all the time during sexual intercourse</b>			
No	12(7.55)		
Yes	147(92.45)	1.00	0.00

Table 2. Continued...

Variables	n(%)	Importance	
		Inappropriate	Appropriate
<b>Think that external condom use can be discontinued when a relationship is no longer casual</b>			
No	21(13.21)		
Yes	138(86.79)	-3.67	0.00
<b>Think that external condom use is unnecessary during sexual intercourse when another contraceptive method is used</b>			
No	17(10.69)		
Yes	142(89.31)	0.00	0.00

Table 3. Absolute and relative frequencies of responses in the attitude and importance domain for inappropriate and appropriate attitudes multiplied by 1,000.

Variables	n(%)	Importance	
		Inappropriate	Appropriate
<b>Believes that the initiative to use external condoms should come exclusively from their partner</b>			
No	4(2.52)		
Yes	155(97.48)	0.00	-0.06
<b>Considers the use of external condoms important in all sexual intercourse</b>			
No	7(4.4)		
Yes	152(95.6)	28.83	3.35
<b>Considers that external condoms are always necessary during vaginal sex</b>			
No	3(1.89)		
Yes	156(98.11)	0.00	0.00
<b>Considers that external condoms are always necessary during oral sex</b>			
No	46(28.93)		
Yes	113(71.07)	21.67	-0.09
<b>Considers that external condoms are always necessary during anal sex</b>			
No	5(3.14)		
Yes	154(96.86)	190.00	11.12

method's reliability for preventing STIs and unplanned pregnancy.<sup>16</sup> Technical knowledge can thus reinforce trust in the method, with understanding of the relationship between validity/storage and condom effectiveness (importance = 0.31), as well as knowledge about the correct order of use (importance = 0.15), being important variables associated with the appropriate young women's attitude.

There is a direct relationship between cultural and social patterns, which influence choices, individual behavior, and those related to health. The results show that this behavior is constructed and, at times, socially expected, impacting self-assessment of care, health status, and exposure to the risk of illness. Factors

such as race, gender, and socioeconomic inequality reveal greater vulnerability to society.<sup>17</sup>

Gender inequality within heterosexual relationships places men in a position of power, often being responsible for decisions related to pleasure and male condom use. Male domination is influenced by social norms regarding the understanding of masculinity, such that women with less relational power find it more difficult to negotiate condom use. This power imbalance is also influenced by women's fear of confronting their partners on issues seen as male decisions, to avoid discomfort or other negative reactions that could harm them or the relationship.<sup>18</sup>

A meta-analysis evaluated psychosocial variables associated with condom use. Knowledge about safe sex did not show a significant average correlation with condom use. Therefore, knowledge alone does not guarantee safe behavior. Race/color also did not show a significant correlation; other factors, such as intention to use, communication with the partner, and condom use during the first sexual intercourse, are more decisive for condom adoption than skin color alone.<sup>19</sup>

Sociodemographic variables showed lower levels of importance in association with appropriate attitudes when compared with variables related to condom use during anal sex, use during all sexual intercourse, and validity/storage of external condoms. This method is distributed free of charge by the Unified Health System (UHS), being widely accessible and low-cost. Thus, people in economically vulnerable situations may prioritize external condom use due to its accessibility through the UHS,<sup>20</sup> which could explain the association of the family income variable below minimum wage (importance = 0.26) with appropriate attitudes.

Even with the use of external condoms, there is debate about the regularity of their use. After all, the belief that they interfere with sexual pleasure or that they should only be used in casual sexual intercourse, as well as alcohol consumption, can be factors that prevent the regular use of external condoms. Furthermore, user dissatisfaction with condoms distributed by the UHS, perceived as interfering with personal pleasure, can also lead to inconsistent use.<sup>20</sup>

Religiousness (importance = 0.16) and employability (importance = 0.16) were variables associated with appropriate attitudes. Religious beliefs can influence attitudes toward condom use. A recent study showed that non-Christian women are less likely to use condoms consistently. In relation to active employment, women may be more likely to use condoms regularly due to the autonomy, financial independence, and empowerment that come with female employment in the labor market. On the other hand, financial dependence, on the other hand, can be a vulnerability factor that affects women's autonomy, leading to risks associated with not using external condoms.<sup>21</sup>

## CONCLUSION AND PRACTICAL IMPLICATIONS

The study showed that most of the women participants had an appropriate attitude toward external condom use. Factors such as the need to use external condoms during anal sex and in all sexual intercourse, knowledge about condom validity and storage, family income below the minimum wage, belonging to the Christian religion, employment status, and mastery of the correct way to use condoms were associated with this attitude.

Despite these findings, there is a clear need to expand sexual and reproductive education initiatives aimed at this group, especially given the persistence of sociocultural norms based on "hegemonic machismo". Access to reliable information

is essential for women to begin their sexual lives safely and autonomously.

The results, therefore, reinforce the importance of encouraging health services to implement innovative educational strategies aimed at preventing STIs and unplanned pregnancies, recognizing nurses as key players in strengthening the sexual and reproductive autonomy of young women.

Limitations of this study include the cross-sectional design, which prevents causal inferences from being made; the imputation of missing data using the k-nearest neighbors method; and the low number of women with inappropriate attitudes, which causes an imbalance in the data for classification in Random Forest models and, possibly, the model's low sensitivity for detecting these cases. Future studies with larger and more diverse samples, as well as longitudinal methods, are needed to investigate causality among the most important variables identified here.

Furthermore, administering the questionnaire remotely may have introduced biases, since there is no control over the environment in which it was answered, including factors such as haste or distractions. This method may have made it difficult to clarify doubts, since, despite the contact details for support being included on the form, no participant sought guidance while completing it.

The research may support health intervention strategies, especially in Nursing practice, by highlighting the need to empower young women regarding external condom use. Understanding their dual function, contraceptive and preventive against STIs/HIV, combined with the identification of factors that influence appropriate attitudes, can guide more effective educational actions based on equity, service access, and the promotion of sexual and reproductive health for this specific group.

This understanding of its contraceptive and preventive function, combined with identifying factors that influence appropriate attitudes, can guide effective educational actions and inform public policies aimed at promoting sexual and reproductive health, considering condoms as a simple, accessible, and low-cost method.

## ACKNOWLEDGMENTS

No acknowledgments.

## FINANCIAL SUPPORT

No funding.

## DATA AVAILABILITY RESEARCH

The content underlying the findings of this study is contained in the article.

## CONFLICT OF INTEREST

No conflict of interest.

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