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Análise comparativa entre *clusters* de uso de preservativo e comportamentos de risco em estudantes universitários portugueses

Comparative analysis between condom use clusters and risk behaviours among Portuguese university students

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Abstract

The research on condom use has been focused on high-risk individuals, paying less attention to those who have moderate risk or safe sexual conducts. In order to design accurate interventions, potential differences among the condom use behavior groups must be considered. The goal was to assess possible differences in individuals presenting different types of risk behavior. 140 heterosexual university students answered a self-reported questionnaire about their sexual history, condom use habits, sexual self-esteem, sexual satisfaction, sexual control, attitudes towards condoms, self-efficacy to condom use, and emotions and feelings during sexual intercourse. A cluster analysis was conducted using the results about condom use and risk behaviors. Three groups with different risk levels emerged, presenting differences over sexual self-efficacy, attitudes towards condoms, socio-demographic variables, and sexual history. The results suggest the condom use inconsistency is highly associated with other risk behaviors but the contrary does not necessarily happens. Condom use consistent users also presented risk behaviors as smoking and drinking. The group differences suggest the risks were more affected by the combination of lack of skills with a negative attitude toward condoms than by contextual or personal variables. These differences sustain the need of an intervention adjusted to the individual's risk levels, since they differ on skills and beliefs that may hinder or promote the adoption of health behaviors.
Keywords: Condom Use; Cluster Analysis; Sexual Health; Risk Behaviors.

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Resumo

A investigação sobre o uso do preservativo tem-se focado em indivíduos de elevado risco e fornecendo menos atenção aqueles com menor risco. De forma a desenhar intervenções eficazes devemos considerar potenciais diferenças entre grupos com diferentes comportamentos de uso do preservativo. Foi nosso objetivo avaliar possíveis diferenças entre indivíduos com diferentes tipos de comportamentos de risco. 140 estudantes universitários responderam a um questionário sobre a história sexual, uso do preservativo medidas sobre autoestima sexual, satisfação sexual, controle sexual, atitudes face ao preservativo, autoeficácia para o uso, emoções e sentimentos durante o ato sexual. Foi realizada uma análise de clusters com as medidas de uso do preservativo e outros comportamentos de risco medidos. Emergiram três grupos com diferentes níveis de risco que apresentavam diferenças na autoeficácia, na atitude face ao preservativo, em variáveis demográficas e na história sexual. Os resultados sugerem que o uso inconsistente está associado com outros comportamentos do risco; no entanto o contrário não é necessariamente verdade. Utilizadores consistentes também apresentam comportamentos de risco como beber e fumar. O risco é mais afetado pela combinação da falta de competências e uma atitude negativa face ao preservativo do que por variáveis contextuais ou sociodemográficas. Estas diferenças sustentam a ideia que uma intervenção ajustada a diferentes níveis de risco é necessária, já que os indivíduos parecem diferir em crenças e competências que podem aumentar ou diminuir a adoção de comportamentos de risco.

Palavras-chave: Uso do Preservativo; Análise de Clusters; Saúde Sexual; Comportamentos de Risco.

Introduction

WHO (2009) suggests consistent and correct use of condoms as a primary prevention action against the human immunodeficiency virus (HIV) and other sexually transmitted infections. In Portugal, 69% of the population uses condoms inconsistently (ISCSP, 2004). More specifically, the rate of condom use is about 80% among individuals up to 19 years and 39% among individuals between 20 and 24 years, showing a decrease of 40% within 5 years of an individual's life.

Most studies focusing on sexual health and sexual risk behaviour tend to have major concerns with high risk individuals, paying less attention to groups with medium or low risk (Mitchell et al., 2004). According to Ayres et al. (1999), every individual may be at risk at some point of her/his life and vulnerability to health risks is directly associated with cognitive, behavioural and social factors. Also, the definition of strict risk groups may lead to a biased study over sexual health, having a prejudicial effect on those who are considered as not at risk. This observation leads Ayres (2002) to refer to the importance of vulnerability for all individuals, instead of confining the approach to those classified as at risk in conceptual, abstract, and epidemiological terms. In fact, HIV infection rates keep rising in Europe among a not-so-classic risk group: heterosexual young adults. In Portugal, infection rates increase among individuals aged between 20 and 39 years, a tendency that prevails since 2004 (INS, 2013). This increase is due to inconsistent condom use (UNAIDS, 2008; WHO, 2009).

University students are among the groups that experience an increase in the infection rates. They are described in literature as being sexually active or initiating their sexual life during the course (Dorius; Heaton; Steffen, 1993; Miller et al., 1997). Studies with Portuguese university students show inconsistent condom use (Muñoz-Silva et al., 2007; Gomes; Nunes, 2011), they tend to prefer the birth control pill as a contraceptive method and decrease condom use as they grow older (Gomes; Nunes, 2011; Reis et al. 2013). This puts them at risk of HIV infection and other sexually transmitted diseases.

Therefore, intervention focusing on consistent

condom use is needed to prevent increased infection rates. In order to design adequate interventions, we must take into account individual differences regarding condom use, as well as personal characteristics that might play a role in these differences.

The theories explaining condom use have addressed the issue. Research has primarily focused on the Theory of Action Reaction (Fishbein; Azjen, 1975) and the Theory of Planned Action (Azjen; Madden, 1986), which claim that behaviour is predicted by the intention to behave. However, some people seem to act on their intention whilst others do not (Fishbein et al., 2003). Fishbein (2000) suggests that the difficulty to understand the gap between intention and behaviour lies on a lack of skills and/or environmental constrains that reduce condom use behaviour. For instance, De Visser and Smith (1999) and, more recently, Adebiyi and Asuzu (2009) have observed the impact that negotiation and agreement skills between partners had on condom use. Previously, Gebhardt, Kuyper and Greunsven (2003) have already identified that individuals who consistently use condoms have greater intimacy with their partners, better communication skills, a positive attitude towards condoms, and high condom use self-efficacy. Negotiation of safe sex has also been regarded as one of the best predictors to condom use (Muñoz-Silva et al., 2007; Schroeder; Jonhson; Wiebe, 2009).

Other variables, such as self-esteem, have been related to inconsistent condom use (Gullette; Lyons, 2006), particularly when associated with negative moods or emotions (MacDonald; Martineau, 2002). It seems that individuals who have a low self-esteem tend to use less condoms, particularly at times of negative mood. Condom use is also predicted by hedonistic beliefs about condoms (Heerem et al., 2009) and highly affected by loss of pleasure (Plummer et al., 2006), showing that condom use may also be affected by sexual satisfaction. These studies point out that individuals who believe condoms can enhance pleasure tend to use more condoms, but the opposite is also true. The individuals who believe condoms interfere with pleasure use less condoms, exactly as those who believe that condom use affects sexual satisfaction.

Situational constraints, such as alcohol and drug use, may also affect the individual's ability and intention to use condoms, prompting a change in the way how individuals evaluate the environment and act according to their intentions. Alcohol use has been described as decreasing anxiety and sexual fear, but increasing sexual risk behaviour (Stoner et al., 2007). It is also described as affecting the individual's assertiveness (Stoner et al., 2008). Drug use is also known to decrease condom use (Bertoni et al., 2009).

Several variables seem to affect the relation between intention and behaviour, despite the degree of vulnerability to risk. In fact, those in casual relationships sometimes seem to be at lower risk than those in stable relationships (Gomes; Nunes, 2011). A strategy to apprehend the variability of behaviours and the vulnerability of individuals is creating groups. Cluster analysis have proved to be an adequate approach to group individuals according to their behaviour and highlight possible differences that help identifying the reasons for condom use consistency and designing useful interventions, adapted to differences within the group (Mitchell et al., 2004). For instance, Shlay et al. (2004), by comparing individuals with regard to their condom use behaviour, observed that condom users reported more new sexual partners and multiple sexual partners than those who do not use condoms. Tassiopoulos et al. (2006) showed that inconsistent condom users had a higher number of sexual partners, better knowledge on condom use, and better acceptance of condom use than those who do not use condoms; however, they did not differ from consistent condom users regarding these issues.

So, this article aims to evaluate possible differences within groups with various types of risk behaviour (smoking, drinking, drug use, premature sexual intercourse, high number of sexual partners), in order to increase knowledge on the reasons that lead to inconsistent condom use, so that interventions can be designed.

Method

Participants

For this study, the population consisted of university students at the School of Human and Social Sciences

of the University of the Algarve (Portugal). An e-mail message was sent inviting them to participate in a study on human sexual behaviour. No counterparts were offered. We identified 176 university students eligible to participate in this study. The inclusion criteria were: being between 18 and 25 years old, having a heterosexual orientation, and having already had sexual intercourse. The final sample consisted of 140 university students and 90 (64.3%) were women.

Variables

A self-reported questionnaire was created to evaluate demographic data, sexual history, condom use consistency, and several variables affecting condom use behaviour. We assessed sexual self-esteem, which indicates how the individual regards him/herself as a sexual partner; sexual satisfaction; chance/luck sexual control and internal sexual control (Snell, 1998), which indicate how the individual deals with control in their sexual life; attitudes towards condoms (Brown, 1984), which indicates the affective, cognitive, and behavioural aspects of using condoms; condom use self-efficacy, which is a self--assessment regarding the competence to refuse unsafe sex and agree on condom use (Basen-Engquist et al., 1998); and emotions and feelings experienced during sexual intercourse (e.g. anxiety, happiness, excitement). Table 1 summarizes the variables. All scales were adapted from English to Portuguese by a translator. A pretest was performed to evaluate primary reliability, allowing us to use proper variables in this study. Only the variable named emotions and feelings experienced during sexual intercourse has been created by the authors. Several variables used a seven-point range and some of them consisted in dichotomized or open questions (see Table 1).

Procedure

The scientific council of the School of Human and Social Sciences authorized data collection, which took place with small groups, by means of a questionnaire handed out by the researcher to be filled by participants. All data was collected within a three--month period, in 2010. We complied with the ethical principles, as defined by the deontological and ethical code of the Portuguese Order of Psychologists (OPP, 2011). Participants were duly informed about the study rationale and its voluntary nature, and the anonymity and confidentiality of their answers were guaranteed. Their informed consent was requested. Finally, they were asked whether these instructions were understood and informed that withdrawal would not imply any negative consequences for them. After completion, students deposited the questionnaire in a sealed box within the room.

Results

The 140 participants who met the inclusion criteria had an average age of 20.79 years (SD = 1.980), they were mainly catholic (78.6%), and the majority was living alone or with colleagues (54.9%).

Participant's sexual and addictive behaviour were classified into categorical variables. The classification took place by using sample median values for each variable (Table 2).

After categorization, a cluster analysis was conducted in order to classify participants according to their behaviour. We used the Ward's method of linkage with the square Euclidean distance, to assign participants to clusters. The number of clusters to be retained was defined by the R-squared method. Cluster's solution varied from 2 to 9 clusters and we observed in which solution the highest variance was retained (Figure 1).

As shown by Figure 1, the variance increases according to the number of clusters. However, the highest variance gain is observed on the third cluster. Hence, we decided to work with three clusters, although the value of retained variance, since it is more suitable to explain possible results. Moreover, the previous categorizations already lead to information loss, which could explain the low variance values.

A chi-square test was performed to verify the association between clusters and the variables used (Table 3).

Cluster one was consisted of 35 participants who are significantly associated with first sexual intercourse at 17 years or older; less than 2 sexual partners; and a lower frequency of tobacco, alcohol, and drug use. This particular cluster did not have a significant association with condom use frequency and condom use during the last sexual intercourse.

Table 1 - Summary of variables measured in college students of the Faculty of Human and Social Sciences, University of Algarve, Portugal, 2010

Variable	Number of items	Sample	Reliability	Descriptive measures
Age	1	(open question)	____	M = 20.79; SD = 1.980
Age at first sexual intercourse	1	(open question)	____	M = 16.88; SD = 1.801
Partner's age at first sexual intercourse	1	(open question)	____	M = 18.20; SD = 2.448
Number of partners	1	(open question)	____	M = 3.77; SD = 4.48
Steady partner	1	Do you have a steady partner, at the moment? (dichotomized)	____	Mode = yes
Number of partners within the last 3 months	1	(open question)	____	M = 1.09; SD = 0.935
Condom use	2	How often do you use condoms during sexual intercourses?	____	M = 4.99; SD = 1.966
		Did you use a condom during your last sexual intercourse? (dichotomized)	____	Mode = yes
Attitudes	40	I would have no objection if my partner suggests to use condoms	α = 0.77	M = 4.87; SD = 0.967
Sexual self-esteem	4	I am proud of the way I handle my own sexual needs and desires	α = 0.88	M = 5.45; SD = 1.084
Sexual satisfaction	5	I am satisfied about the way my sexual needs have been met	α = 0.92	M = 5.33; SD = 1.310
Sexual internal control	3	My sexuality is something I am largely responsible for	α = 0.74	M = 6.04; SD = 0.766
Sexual external control	1	The sexual aspects of my life are mostly determined by chance	α = 0.87	M = 2.15; SD = 1.073
Self-efficacy to refuse sex	3	Imagine that you met someone at a party. He or she wants to have sex with you. Even though you are very attracted to each other, you are not ready to have sex. How sure are you to keep from having sex?	α = 0.59	M = 5.12; SD = 1.263
Self-efficacy to communicate	3	Imagine that you are having sex with someone you have just met. How sure are you to tell this person you want to use condoms?	α = 0.74	M = 6.43; SD = 0.930
Self-efficacy to use condoms	3	How sure are you to use condoms correctly or explain your partner how to use condoms correctly?	α = 0.50	M = 5.43; SD = 1.086
Emotions and feelings	6	Usually, during sexual intercourses, I tend to feel: anxious/not anxious	____	____

Table 2 - Cut values used for the variables categorization of college students of the Faculty of Human and Social Sciences, University of Algarve, Portugal, 2010

Variable	Median
Condom use frequency	6 (1 never – 7 always)
Condom use during the last sexual intercourse	Yes (yes/no)
Total number of partners	2 (open question)
Number of partners within the last 3 months	1 (open question)
Age at first sexual intercourse	17 (open question)
Tobacco use	3 (1 never – 7 always)
Alcohol use	1 (1 never – 7 always)
Drug use	1 (1 never – 7 always)

Figure 1 - Variables variances retained in each cluster

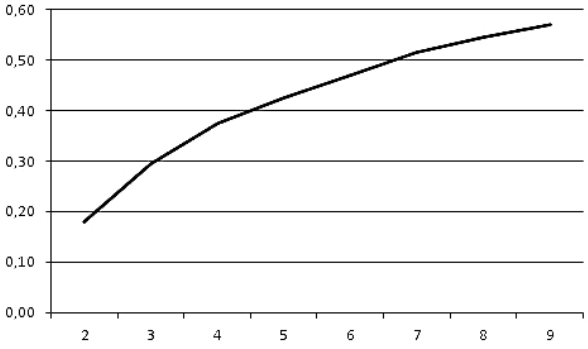

Table 3 - Chi-square statistics

Variable	Chi-square values
Condom use frequency	χ = 29.719, *df* = 2, *p* = 0.000
Condom use during the last sexual intercourse	χ = 43.195, *df* = 2, *p* = 0.000
Total number of partners	χ = 43.551, *df* = 2, *p* = 0.000
Number of partner within the last 3 months	χ = 5.660, *df* = 2, *p* = 0.059
Age at first sexual intercourse	χ = 22.669, *df* = 2, *p* = 0.000
Tobacco use	χ = 56.283, *df* = 2, *p* = 0.000
Alcohol use	χ = 65.918, *df* = 2, *p* = 0.000
Drug use	χ = 32.558, *df* = 2, *p* = 0.000

Cluster two gathers 62 participants and it was the largest cluster in study. It was significantly associated with: a larger number of sexual partners; a highest frequency of condom use; to the use of condoms in the last sexual intercourse. The age at first intercourse as well as tobacco, alcohol and drug consumptions are not significantly associated to this cluster.

The cluster three had 42 participants who are significantly associated with: a younger age at first sexual intercourse; a lower frequency of condom use (higher inconsistency); lack of condoms during the last sexual intercourse; higher alcohol, tobacco, and drug use. These individuals were not significantly associated with the number of partners. This cluster seems to have extreme risk behaviour, when compared to clusters two and one. Clusters' participants did not have significant differences regarding age (F = 1.597, p = 0.210), sex (χ = 4.956, p = 0.084), or parents' educational level (F_{mother} = 1.279, p = 0.282; F_{father} = 1.448, p = 0.239). However, they had significant differences at the level of religiosity (F = 4.231, p = 0.017) and religion (χ = 17.923, p = 0.022). Individuals from the first and second clusters were more religious than those from the third cluster ($M_{cluster1}$ = 3.71, $M_{cluster2}$ = 3.16, $M_{cluster3}$ = 2.68), although significant differences were found only between the first and third clusters. Also, individuals from the first cluster were significantly associated with agnostic beliefs, whilst the third cluster was significantly associated with not being catholic and not responding to the question deliberately.

To evaluate possible differences between these clusters regarding several variables that affect condom use, one-way ANOVA was used (Table 4).

Table 4 - ANOVA related to this data base

Variables	Sum of squares	*df*	Mean square	*F*	*P*
Attitude towards condoms	16.644	2	8.322	9.989	0.000
Sexually aroused[1]	1.787	2	0.894	0.923	0.400
Contented[1]	0.783	2	0.392	0.437	0.647
Entertained[1]	7.760	2	3.880	3.221	0.043
Anxious[1]	1.373	2	0.686	0.152	0.860
Depressed[1]	0.723	2	0.362	0.571	0.566
Excited[1]	1.383	2	0.691	0.662	0.518
Sexual self-esteem	2.414	2	1.207	1.019	0.364
Self-efficacy to refuse sex	20.947	2	10.473	7.472	0.001
Self-efficacy to communicate about condoms	10.971	2	5.486	6.910	0.001
Self-efficacy to use and buy condoms	3.557	2	1.778	1.509	0.225
Internal sexual control	0.342	2	0.171	0.300	0.741
External sexual control	3.866	2	1.933	1.751	0.178
Sexual satisfaction	2.187	2	1.093	0.634	0.532

The results of *post hoc* comparison (Bonferroni test) suggested that cluster three had a less positive attitude towards condoms (M = 4.35) when compared to clusters one (M = 5.12) and two (M = 5.10); they predicted more entertainment during the sexual intercourse than cluster two ($M_{cluster\ 3}$ = 6.55, $M_{cluster\ 2}$ = 6.00); they had less ability to refuse unsafe sex ($M_{cluster1}$ = 5.63, $M_{cluster2}$ = 5.23, $M_{cluster3}$ = 4.60); and they had less ability to agree on condom use ($M_{cluster1}$ = 6.73, $M_{cluster2}$ = 6.56, $M_{cluster3}$ = 6.01).

Discussion

Individuals who were younger at first sexual intercourse also showed an inconsistent condom use, they did not use condoms during the last sexual intercourse, and, simultaneously, had a higher consumption of tobacco, alcohol, and drugs. They were also those with a less positive attitude towards condoms, which predict more entertainment during sex, and they had less ability to refuse unsafe sex and to communicate about condom use with their partners. Contrary to the results obtained by Shlay et al. (2004) and Tassiopoulos et al. (2006), condom use behaviour did not have an association with the number of sexual partners.

As expected, the individuals at higher sexual risk were those with other health risks, such as tobacco, alcohol, and drug use. As observed in the literature, these individuals are at a higher risk to be infected with HIV, since they usually show an inconsistent condom use (Bertoni et al., 2009; Adefuye et al., 2009). However, it is worth noticing that individuals showing consistent condom use do not have an association with less alcohol, tobacco, or drug use. These results may suggest that other risk behaviours can also imply sexual risk behaviours, but condom use consistency may not be affected by the use of addictive substances. Leigh et al. (2008) observed that individuals tend to keep their condom use pattern despite alcohol use and, according to Velez-Blasini (2008), alcohol use loses its predictive effect on condom use inconsistency in the presence of personality traits and behavioural dimensions that have an effect on condom use. These individuals may be likely to take more risks due to their personality traits, as observed among those with traits of sensation seeking and impulsivity (Noar et al., 2006), which mask the effect of drug use on condom use.

These individuals also have inferior scores on self-efficacy to refuse unsafe sex and communicate about condoms. The ability to discuss condom use has been addressed in the literature, and it is related to consistent condom use (Hendriksen et al., 2007). Also, there is a lower probability of condom

use when partners feel or notice lack of openness to discuss condom use (Adebiyi; Asuzu, 2009). The results suggest that individuals who are less competent in these skills are also those who use condoms inconsistently. It also seems that they do not differ regarding self-efficacy to use and buy condoms, something which is usually associated with lower condom use rates (Farmer; Meston, 2006). Perhaps, these individuals do not lack skills to use condoms, but they lack skills to agree on condom use or refuse unsafe sex, and this must be a major concern of prevention programmes.

These individuals also have a higher mean regarding contentment during sexual intercourse, and this may reveal they are more pleasure-driven. Condoms are known to be rejected due to the belief they reduce pleasure and sexual satisfaction (Kaneko, 2007). However, when condoms are associated with hedonistic beliefs and they are not regarded as affecting pleasure, the motivation to use them increase (Hereen et al., 2009). Thus, prevention programmes may play a major role in order to change the beliefs about condoms and their interaction with pleasure among young adults.

The individuals with few sexual partners, older at first sexual intercourse, those who do not show drug or alcohol use, and those with a small frequency of tobacco use do not have a significant association with condom use frequency or the use of condoms during the last sexual intercourse. These results were not expected, since an older age at first sexual intercourse is usually associated with lower risk for sexually transmitted infections and other risk behaviours (Greenberg; Magder; Aral, 1992; Kaplan et al., 2013). However, due to the small number of sexual partners, there is a need to discuss the fact that these individuals have a steady partner; this is known to decrease condom use (Brooks et al., 2009), perhaps due to fidelity and trust beliefs, which tend to decrease awareness of sexual risk behaviours (Thorburn; Harvey; Ryan, 2005; Camargo; Bousfield, 2009).

Religious affiliation and religiosity also seem to have an effect on condom use behaviour and health risk behaviours. Individuals with religious beliefs seem to take less risk. However, the discussion about this topic shows that religion or religious beliefs do not affect condom use behaviour, although it has some relation with other issues, such as age at first sexual intercourse (Agha; Hutchinson; Kusanthan, 2006). Similarly, Burris, Smith and Carlson (2009) observed that religion and condom use are not associated, albeit the degree of spirituality is associated with condom use frequency. In this study, the clusters congregate condom use frequency and other variables that are associated with religion and religiosity. We may not claim that condom use is influenced by participants' religion or religiosity; but we may suggest that religion can affect condom use and other behaviours co-occurring and affecting that behaviour in a positive way.

Our results support the idea that one-model-fits--all is not suitable for condom use research. The differences found between clusters are grounded in the theoretical idea that skills and environment affect the relation between intention and behaviour (Fishbein, 2000). Analysing from the behavioural viewpoint, the volitional aspect of condom use seems to be affected by a myriad of variables, according to the degree and consistency of use. This may imply a significant degree of uncertainty when researchers try to predict behaviour through intention.

We must also focus on individuals who are vulnerable to HIV and to other sexually transmitted infections, despite belonging to risk groups. The results suggest that university students are, in fact, at risk for a sexually transmitted infections, according to data provided by epidemiological reports on HIV/AIDS (INS, 2013), mainly due to inconsistent condom use.

Some attention must be paid to the limits of this study affecting its external validity. Sample size does not allow a generalization of results to university students as a whole and further demographic measures are needed to characterize their socioeconomic profile, which is also known to affect health knowledge and behaviour. Besides, other variables, such as personality, may have increased interest in the study. Nevertheless, we believe that cluster analysis is effective to increase knowledge on condom use behaviour, since it allowed us to identify several differences and similarities between individuals showing different health behaviours. We can no longer expect that the same kind of interven-

tion meet the needs of individuals showing different behaviours, beliefs, and knowledge. We must have in mind the importance of interventions to promote consistent condom use, in order to protect individuals against HIV/AIDS, and university students, i.e. young adults, are at higher risk according to the Portuguese HIV reports (INS; 2013).

There is a need to identify which behavioural patterns a group of individuals tends to show, in order to design and deploy successful prevention programmes regarding consistent condom use among them.

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Authors' Contribution

Gomes was responsible for the study design, data collection, data analysis and text output. Nunes was responsible for study design, data analysis, and critical analysis of the text output.

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