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## ORIGINAL ARTICLE

# Psychological and socio-demographic variables associated with sexual risk behavior for sexually transmitted infections/HIV

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### KEYWORDS

Sexual behavior;  
Worry;  
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Ex post facto study

**Abstract** New diagnoses of sexually transmitted infections (STIs) and HIV are rising in the adult population. The main objective of this study was to analyze whether knowledge of STIs/HIV, worry about STIs/HIV and pregnancy, and self-efficacy to refuse sex are predictors of sexual risk behaviors among Spanish young and adults. The study sample was composed of 1,106 young and adults of both sexes aged between 17 and 55 years. Results showed that being single, homosexual, having been tested for HIV, having previously contracted an STI, having a college education and earning a monthly income of €900 or more were the characteristics associated with higher scores in knowledge of STIs/HIV. Self-efficacy to refuse sex predicted most vaginal and anal sexual behaviors (i.e., age at vaginal and anal sex initiation and the number of couples that have remained vaginal sex). We also found that participants with greater knowledge of STIs/HIV reported older age at vaginal sex initiation and higher condom use in the first vaginal sexual contact. We consider that these findings can be useful for the development of STI/HIV prevention programs.

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### PALABRAS CLAVE

Conducta sexual;  
Preocupación;  
Autoeficacia;  
Conocimiento sobre el  
ITS/VIH;  
Estudio ex post facto

**Resumen** La población adulta es un grupo ascendente en los nuevos diagnósticos de las infecciones de transmisión sexual (ITS) y el VIH. El objetivo principal es analizar si el conocimiento sobre el ITS/VIH, la preocupación por las ITS/VIH y el embarazo y la autoeficacia para rechazar relaciones sexuales son predictoras de las conductas sexuales de riesgo en jóvenes y adultos españoles. Participaron 1.106 jóvenes y adultos de ambos sexos, entre los 17 y los 55 años. Los resultados mostraron que ser soltero, homosexual, haberse hecho la prueba del VIH, haber tenido una ITS, tener estudios universitarios e ingresos económicos mensuales de 900 a más de 1.200 euros tenían las puntuaciones más altas en el conocimiento sobre el ITS/VIH. La autoeficacia predijo gran parte de las conductas sexuales vaginales y anales (la edad de inicio del sexo

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vaginal y anal y el número de parejas con las que se ha mantenido sexo vaginal). Además, se halló que a mayor conocimiento sobre ITS/VIH, mayor edad de inicio del sexo vaginal y mayor uso del preservativo en la primera relación sexual vaginal. Se espera que estos resultados sean útiles para el desarrollo de programas de prevención de ITS/VIH.

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According to the Joint United Nations Programme on HIV/AIDS (UNAIDS, 2012), 34 million people worldwide lived with HIV/AIDS in 2011. In Spain, 2,763 new cases of HIV were reported in 2011. The most frequent transmission route of HIV/AIDS is sexual contact (Plan Nacional sobre el SIDA, 2012). As regards sexually transmitted infections (STIs), 1,944 cases of gonococcal infection and 2,909 cases of syphilis were reported in 2012. STIs predominantly affect adults between the ages of 25 and 34 (Área de vigilancia del VIH y conductas de riesgo, 2012).

New diagnoses of HIV infection are rising in the adult population due to individuals' engagement in sexual risk behaviors (UNAIDS, 2012). Such behaviors refer to sex without condoms, sexual involvement with multiple partners and early sexual debut, which contribute to unwanted pregnancies and the spread of STIs, including HIV (Bermúdez, Castro, Madrid, & Buéla-Casal, 2010).

One of the most important cognitive variables that influence individuals' engagement or not in sexual risk behaviors is knowledge of STIs and HIV/AIDS. This variable refers to the information individuals have on the prevention, infection, causes and consequences of HIV/AIDS and other STIs (Nwezeh, 2010). Such knowledge contributes to the reduction of sexual risk behaviors (Bermúdez et al., 2012; Fernández, 2012; Ramiro, Teva, Bermúdez, & Buéla-Casal, 2013).

Another variable that has been found to be associated with sexual risk behaviors is worry about STIs/HIV and pregnancy. It is understood as the feeling of concern, fear, uneasiness or anguish related to the possibility of contracting HIV or another STI and/or having an unwanted pregnancy (Crosby et al., 2001; Smith & Watkins, 2005). In fact, previous studies have found a relationship between greater worry about STIs/HIV and higher condom use (Sales et al., 2009; Smith & Watkins, 2005). Moreover, in a recent study conducted by the Spanish Interdisciplinary AIDS Society (SEISIDA-Sociedad Española Interdisciplinaria del Sida, 2012), 90% of participants considered themselves unlikely or extremely unlikely to become infected with HIV and only 30% had ever been tested for HIV.

An additional relevant variable in the prediction of sexual risk behaviors is self-efficacy to refuse sex, that is, individuals' perception of their own ability to refuse sexual intercourse (Seth, Rajji, DiClemente, & Rose, 2009). In this regard, previous studies have found that individuals with higher self-efficacy to refuse sex tend to report higher frequency of condom use and healthy sexual behaviors (DiClemente et al., 2004).

Considering the above-mentioned points, our study had the following objectives: 1) Analyze the relationship between socio-demographic variables and individuals'

knowledge of STIs/HIV, worry about STIs/HIV and pregnancy, and self-efficacy to refuse sex; and 2) analyze whether knowledge of STIs/HIV, worry about STIs/HIV and pregnancy, and self-efficacy to refuse sex are predictors of sexual risk behaviors. To the extent possible, we followed the recommendations made by Hartley (2012).

## Method

### Participants

The sample was composed of 1,106 Spanish young and adults – 60% females and 40% males – aged between 17 and 55 years ( $M = 27.99$  years;  $SD = 8.86$ ). The socio-demographic characteristics of the sample are shown on Table 1.

### Instruments

- *Cuestionario aspectos sociodemográficos y conducta sexual* (Questionnaire on socio-demographic aspects and sexual behavior, Teva, Bermúdez, & Buéla-Casal, 2009). The questionnaire includes 23 questions on participants' socio-demographic characteristics (i.e., age, sex, marital status, sexual orientation, education level and monthly income). We also included the following questions on the HIV test: whether participants had been tested for HIV; whether they had ever contracted an STI; and whether they were planning to get tested for HIV. We also included questions on participants' sexual behavior: age at vaginal sex initiation; number of coital partners in their lifetime and in the past two months; and frequency of protected vaginal intercourse (i.e., using condoms) in the past two months. We asked similar questions on anal sexual behaviors.
- HIV Risk Behavior Knowledge Scale (Sikkema et al., 2000). It includes sixteen questions (e.g., "*No puedes infectarte con el virus del SIDA a través de un corte en la piel*" (You cannot become infected with the AIDS virus through a skin cut). The response format is "*verdadero*" (true), "*falso*" (false) and "*no sé*" (don't know). Scores ranged from 0 to 16 and Cronbach's alpha was .62.
- Scale used to measure worry about STIs/HIV and pregnancy (Crosby et al., 2001). It is composed of ten items (e.g., "*Tú podrías coger el virus del SIDA*" (You could contract the AIDS virus); "*Tú podrías coger una enfermedad de transmisión sexual (ETS)*" (You could contract a sexually transmitted disease [STD]); "*Tu pareja podría quedarse embarazada*" (Your partner could get pregnant). Four items assess worry about STIs (0-12 score range); four

**Table 1** Socio-demographic characteristics of participants.

<i>Characteristic</i>	<i>(N = 1,106)</i>	<i>%</i>
<i>Sex</i>		
Male	444	40
Female	662	60
<i>Marital status</i>		
Single	807	73
Married	132	11.9
Cohabiting	121	10.9
Separated or divorced	44	4
Widowed	2	0.2
<i>Education level</i>		
No education	49	4
Primary education	111	10
Secondary education	329	30
College education	617	56
<i>Sexual orientation</i>		
Heterosexual	908	82
Homosexual	198	18
<i>Monthly income</i>		
Less than €600	335	30
€600-€900	143	13
€900-€1,200	188	17
More than €1,200	440	40
<i>Age</i>		
17-29	705	63
30-42	308	29
43-55	93	8
<i>Previous STI</i>		
Yes	105	9.5
No	1,001	90.5
<i>Has been tested for HIV</i>		
Yes	222	20.1
No	884	79.9
<i>Plans to get tested for HIV</i>		
Yes	108	12.3
No	772	87.7

items assess worry about HIV (0-12 score range); and the two remaining items assess worry about pregnancy (0-6 score range). Each item has four response options ranging from "*nunca me preocupo*" (I never worry about this) to "*siempre me preocupo*" (I always worry about this). Cronbach's alphas of the present study were as follows: .86 for worry about HIV/AIDS, 0.89 for worry about STIs and .62 for worry about pregnancy.

- Scale of self-efficacy to refuse sex (Seth et al., 2009). This scale has seven items (e.g., "*¿Cómo de seguro/a estás de que serías capaz de decir "NO" a tener relaciones sexuales con alguien que has conocido hace pocos días?*") (How sure are you that you would be able to say NO to having sex with someone you have recently met?). Response options range from "*Nada seguro/a de poder decir no*" (Not at all sure) to "*Muy seguro/a de poder decir no*" (Very sure). Scores range from 0 to 21. In the present study, Cronbach's alpha was .87.

## Design

We conducted an ex post facto study using cross-sectional surveys.

## Procedure

The research was approved by the Ethics Committee of the University of Granada, Spain. To compile data, we randomly selected young and adults in various public places of the city of Granada (e.g., shopping malls, the bus station, association headquarters, parks). Questionnaires were individually applied by the same researcher once participants had been duly informed about the study. Participants were all provided the same instructions. Responses were anonymous and confidentiality was guaranteed. Participants had twenty minutes to respond to the questionnaires.

## Results

### Socio-demographic variables and their relationship with knowledge of sexually transmitted infections/HIV, self-efficacy to refuse sex, and worry about pregnancy and sexually transmitted infections/HIV

We calculated the means and standard deviations of worry about STIs/HIV and pregnancy, knowledge of STIs/HIV and self-efficacy to refuse sex as a function of socio-demographic variables (see Table 2). As regards participant sex, female participants reported greater worry about STIs ( $t_{(1104)} = 2.59$ ,  $p < .05$ ) and pregnancy ( $t_{(1104)} = 4.29$ ,  $p < .05$ ) and higher self-efficacy ( $t_{(1104)} = 11.59$ ,  $p < .05$ ) than male participants.

As regards sexual orientation, we found significant differences as a function of this variable in all the other variables analyzed: worry about HIV/AIDS ( $t_{(1104)} = -5.85$ ,  $p < .05$ ), STIs ( $t_{(1104)} = -4.64$ ,  $p < .05$ ) and pregnancy ( $t_{(1104)} = 5.30$ ,  $p < .05$ ); knowledge of STIs/HIV ( $t_{(1104)} = -4.20$ ,  $p < .05$ ); and self-efficacy to refuse sex ( $t_{(1104)} = 3.88$ ,  $p < .05$ ). As shown on Table 2, heterosexual participants reported greater worry about pregnancy and higher self-efficacy than homosexual participants. By contrast, homosexual participants reported greater worry about HIV/AIDS and STIs and greater knowledge of STIs/HIV than heterosexual participants.

As regards age groups, we found statistically significant differences between them in worry about STIs ( $F_{(2, 363.75)} = 7.42$ ,  $p < .05$ ) and pregnancy ( $F_{(2, 536)} = 12.40$ ,  $p < .05$ ) and knowledge of STIs/HIV ( $F_{(2, 1103)} = 8.82$ ,  $p < .05$ ). The 17-29 year age group reported greater worry about STIs ( $p < .05$ ) than the 43-55 age group and greater worry about pregnancy than the 30-42 age group ( $p < .05$ ) and the 43-55 age group ( $p < .05$ ). Adults in the 30-43 age group expressed greater worry about pregnancy ( $p < .05$ ) than those in the 43-55 age group and greater knowledge of HIV/AIDS than those in the 43-55 age group ( $p < .05$ ) and the 17-29 age group ( $p < .05$ ).

The analyses revealed significant differences in worry about HIV/AIDS ( $F_{(3, 1100)} = 3.34$ ,  $p < .05$ ), STIs ( $F_{(3, 286.82)} = 17.80$ ,  $p < .05$ ) and pregnancy ( $F_{(3, 1100)} = 2.97$ ,  $p < .05$ ), knowledge of STIs/HIV ( $F_{(4, 1100)} = 5.07$ ,  $p < .05$ ) and self-efficacy to refuse sex ( $F_{(4, 241.26)} = 6.33$ ,  $p < .05$ ) as a function of marital status. Single participants reported greater

**Table 2** Means and standard deviations of worry about STIs/HIV and pregnancy, self-efficacy to refuse sex and knowledge of STIs/HIV as a function of socio-demographic variables.

Socio-demographic variables	Worry about HIV/AIDS		Worry about STIs		Worry about pregnancy		Self-efficacy		Knowledge of STIs/HIV	
	<i>n</i> (%)	<i>Mean (SD)</i>	<i>n</i> (%)	<i>Mean (SD)</i>	<i>n</i> (%)	<i>Mean (SD)</i>	<i>n</i> (%)	<i>Mean (SD)</i>	<i>n</i> (%)	<i>Mean (SD)</i>
<i>Sex</i>										
Male	566 (40)	3 (3.53)	566 (40)	2.66 (2.94)	566 (40)	1.21 (1.57)	566 (40)	10.36 (5.69)	566 (40)	7.89 (3.01)
Female	699 (60)	2.23 (2.8)	699 (60)	2.9 (3.41)	699 (60)	1.55 (1.53)	699 (60)	13.93 (4.5)	699 (60)	8.2 (2.8)
<i>Sexual orientation</i>										
Heterosexual	908 (82)	1.72 (2.3)	908 (82)	2.14 (2.58)	908 (82)	1.48 (1.46)	908 (82)	12.78 (5.2)	908 (82)	7.91 (2.91)
Homosexual	198(18)	2.83 (2.92)	198(18)	3.12 (3.21)	198(18)	0.88 (1.37)	198(18)	11.18 (5.56)	198(18)	8.85 (2.67)
<i>Age</i>										
17-29	705 (63)	2.02 (2.58)	705 (63)	2.54 (2.84)	705 (63)	1.50 (1.45)	705 (63)	12.75 (5.03)	705 (63)	7.95 (2.85)
30-42	308 (29)	1.71 (2.18)	308 (29)	1.91 (2.45)	308 (29)	1.25 (1.53)	308 (29)	12.07 (5.91)	308 (29)	8.59 (2.81)
43-55	93 (8)	1.86 (2.39)	93 (8)	1.95 (2.62)	93 (8)	0.83 (1.11)	93 (8)	11.97 (5.11)	93 (8)	7.33 (3.16)
<i>Marital status</i>										
Single	807 (73)	2.07 (2.57)	807 (73)	2.61 (2.85)	807 (73)	1.35 (1.44)	807 (73)	12.26 (5.21)	807 (73)	8.22 (2.84)
Married	132 (11.9)	1.57 (2.27)	132 (11.9)	1.45 (2.31)	132 (11.9)	1.38 (1.50)	132 (11.9)	14.52 (5.32)	132 (11.9)	7.44 (2.76)
Cohabiting	121 (10.9)	1.54 (2.01)	121 (10.9)	1.4 (2.03)	121 (10.9)	1.71 (1.60)	121 (10.9)	12.26 (5.8)	121 (10.9)	7.82 (3.07)
Separated/divorced	44 (4)	1.61 (2.02)	44 (4)	2.18 (2.23)	44 (4)	1.04 (1.16)	44 (4)	11.11 (4)	44 (4)	8.32 (2.98)
Widowed	2 (0.2)	NA	2 (0.2)	NA	2 (0.2)	NA	2 (0.2)	NA	2 (0.2)	NA
<i>Education level</i>										
None	49 (4)	1.48 (1.94)	49 (4)	1.32 (1.79)	49 (4)	0.71 (1.00)	49 (4)	10.28 (6.55)	49 (4)	7.71 (3.24)
Primary	111(10)	1.84 (2.43)	111(10)	2.04 (2.7)	111(10)	1.21 (1.46)	111(10)	11.82 (6.04)	111(10)	7.28 (3.06)
Secondary	329 (30)	1.89 (2.47)	329 (30)	2.06 (2.74)	329 (30)	1.21 (1.38)	329 (30)	11.6 (5.55)	329 (30)	7.81 (2.87)
College	617 (56)	1.99 (2.5)	617 (56)	2.32 (2.73)	617 (56)	1.53 (1.51)	617 (56)	13.27 (4.76)	617 (56)	8.39 (2.79)
<i>Monthly income</i>										
Less than €600	335 (30)	1.76 (2.58)	335 (30)	1.93 (2.83)	335 (30)	1.21 (1.46)	335 (30)	11.18 (6.1)	335 (30)	7.22 (2.95)
€600-€900	143 (13)	1.99 (2.49)	143 (13)	2.27 (2.74)	143 (13)	1.43 (1.46)	143 (13)	12.6 (5.5)	143 (13)	7.82 (3.08)
€900-€1,200	188 (17)	2.20 (2.7)	188 (17)	2.42 (2.77)	188 (17)	1.31 (1.34)	188 (17)	12.79 (4.81)	188 (17)	8.56 (2.88)
More than €1,200	440 (40)	1.91 (2.25)	440 (40)	2.58 (2.6)	440 (40)	1.51 (1.51)	440 (40)	13.34 (4.56)	440 (40)	8.6 (2.61)
<i>Tested for HIV</i>										
Yes	222 (20)	2.63 (2.59)	222 (20)	3.21 (2.85)	222 (20)	1.37 (1.42)	222 (20)	13.11 (5.04)	222 (20)	9.54 (2.51)
No	884 (80)	1.75 (2.4)	884 (80)	2.09 (2.65)	884 (80)	1.38 (1.47)	884 (80)	12.34 (5.36)	884 (80)	7.71 (2.82)
<i>Previous STI</i>										
Yes	105 (9.5)	2.7 (2.54)	105 (9.5)	3.55 (2.99)	105 (9.5)	1.43 (1.68)	105 (9.5)	12.08 (4.8)	105 (9.5)	8.99 (2.56)
No	1001(90.5)	1.84 (2.44)	1001 (90.5)	2.19 (2.67)	1001 (90.5)	1.37 (1.44)	1001 (90.5)	12.54 (5.35)	1001 (90.5)	7.98 (2.9)
<i>Plans to get tested for HIV</i>										
Yes	108 (12)	3.48 (3.09)	108 (12)	4.01 (3.41)	108 (12)	1.67 (1.59)	108 (12)	13.02 (4.2)	108 (12)	8.3 (2.56)
No	772 (88)	1.51 (2.19)	772 (88)	1.83 (2.42)	772 (88)	1.34 (1.45)	772 (88)	12.27 (5.5)	772 (88)	7.62 (2.9)

Note. *SD* = standard deviation; NA = not applicable.

worry about HIV/AIDS than those who were cohabiting with a partner ( $p < .05$ ). As regards worry about STIs, single participants expressed greater worry than married partners ( $p < .05$ ) and cohabiting partners ( $p < .05$ ). Single participants also reported having greater knowledge of STIs/HIV than married participants ( $p < .05$ ). As regards pregnancy, cohabiting participants reported having greater worry about pregnancy than separated or divorced participants ( $p < .05$ ). Married participants reported having higher self-efficacy than single participants ( $p < .05$ ), cohabiting participants ( $p < .05$ ) and separated or divorced participants ( $p < .05$ ).

As regards education level, we found significant differences in worry about STIs ( $F_{(3, 1100)} = 3.34, p < .05$ ), worry about pregnancy ( $F_{(3, 457.81)} = 8.97, p < .05$ ), knowledge of STIs/HIV ( $F_{(3, 1102)} = 6.46, p < .05$ ) and self-efficacy to refuse sex ( $F_{(3, 239.54)} = 8.79, p < .05$ ). Participants with college education reported having greater worry about STIs ( $p \leq .05$ ) and higher self-efficacy than participants with no education ( $p < .05$ ) and participants with secondary education ( $p < .05$ ). Participants with college education reported having greater worry about pregnancy than those who had no education ( $p < .05$ ) or had secondary education ( $p < .05$ ). Participants with college education had greater knowledge of STIs/HIV than those with primary education ( $p < .05$ ) or secondary education ( $p < .05$ ). As regards worry about pregnancy, participants with primary education ( $p < .05$ ) or secondary education ( $p < .05$ ) reported greater worry than participants with no education.

When we considered monthly income, we found significant differences between groups in worry about STIs ( $F_{(3, 785.36)} = 3.73, p < .05$ ), knowledge of STIs/HIV ( $F_{(3, 726.11)} = 16.54, p < .05$ ) and self-efficacy to refuse sex ( $F_{(3, 764.75)} = 10.84, p < .05$ ). Specifically, participants with an income over €1,200 reported greater worry about STIs ( $p < .05$ ) and self-efficacy ( $p < .05$ ) than those who earned €600 to €900 and greater knowledge of STIs/HIV ( $p < .05$ ) than those who earned less than €600. By contrast, those who earned €900 to €1,200 reported higher self-efficacy ( $p < .05$ ) and knowledge of STIs/HIV ( $p < .05$ ) than those who earned less than €600.

Participants who had been tested for HIV reported greater worry about HIV ( $t_{(1104)} = 4.82, p < .05$ ) and STIs ( $t_{(1104)} = 5.50, p < .05$ ), higher self-efficacy ( $t_{(357)} = 2.00, p < .05$ ) and greater knowledge of STIs/HIV ( $t_{(1104)} = 8.75, p < .05$ ) than those who had never been tested for HIV. Those who had previously contracted an STI reported greater worry about STIs ( $t_{(1104)} = 4.92, p < .05$ ) and HIV/AIDS ( $t_{(1104)} = 3.43, p < .05$ ) and greater knowledge of STIs/HIV ( $t_{(1104)} = 3.42, p < .05$ ) than those who had never had an STI. Participants who reported that they planned to get tested for HIV expressed greater worry about HIV ( $t_{(878)} = 8.27, p < .05$ ), STIs ( $t_{(878)} = 8.30, p < .05$ ) and pregnancy ( $t_{(878)} = 2.12, p < .05$ ) and greater knowledge of STIs/HIV ( $t_{(878)} = 2.34, p < .05$ ) than those who did not plan to get tested for HIV.

### **Knowledge of sexually transmitted infections/HIV, self-efficacy to refuse sex and worry about pregnancy and sexually transmitted infections/HIV as predictors of sexual risk behaviors**

We conducted hierarchical linear regressions to analyze whether worry about STIs/HIV and pregnancy, knowledge

of STIs/HIV and self-efficacy to refuse sex predicted sexual risk behaviors. The effect of socio-demographic variables was controlled for (see Table 3).

### **Predictive value with regard to risky vaginal sexual behaviors**

The model was significant regarding age at vaginal sex initiation ( $F_{(5, 1009)} = 3.81; p < .05$ ) and explained 1% of the variance. More specifically, participants with high self-efficacy to refuse sex and knowledge of STIs/HIV reported older age at vaginal sex initiation. The number of lifetime vaginal sexual partners of participants was significant ( $F_{(5, 1006)} = 3.85; p < .05$ ) and explained 1% of the variance. Participants with lower self-efficacy reported a higher number of lifetime vaginal sexual partners. Finally, the model obtained for the number of vaginal sexual partners in the past two months ( $F_{(5, 857)} = 382; p < .05$ ) was significant and explained 2% of the variance. Specifically, participants with lower self-efficacy had had a higher number of vaginal sexual partners in the past two months than participants with higher self-efficacy (see Table 3).

### **Predictive value with regard to risky anal sexual behaviors**

We found significant results in age at anal sex initiation ( $F_{(5, 317)} = 3.17; p < .05$ ), which explained 4% of the variance. Participants with higher self-efficacy and lower worry about pregnancy reported older age at anal sex initiation. As regards the number of lifetime anal sexual partners of participants ( $F_{(5, 315)} = 6.38; p < .05$ ), the model was significant and explained 8% of the variance. Participants who reported less worry about pregnancy and greater worry about HIV/AIDS had had a higher number of lifetime anal sexual partners (see Table 3).

### **Predictive value with regard to condom use in the first vaginal and anal sexual contact**

Finally, we conducted hierarchical logistical regression analyses regarding condom use in the first vaginal and anal sexual contact (see Table 4). We found significant results only for vaginal sexual contact ( $\chi^2_{19} = 134.20; p < .05, R^2 = .17$ ). Participants with greater knowledge of STIs/HIV ( $p < .05$ ) reported higher condom use in their first vaginal sexual contact.

## **Discussion**

Regarding the first objective of this study, we found significant differences between socio-demographic variables and knowledge of STIs/HIV, worry about STIs/HIV and pregnancy, and self-efficacy to refuse sex. Being a woman, being homosexual, being aged between 17 and 29 years, being single, having college education, having been tested for HIV or planning to be tested for HIV and having previously contracted an STI were the characteristics associated with greater worry about STIs/HIV. Females are physiologically more vulnerable to STIs than males, which may explain their greater worry. Another explanation may

**Table 3** Summary of the hierarchical linear regression analyses conducted for vaginal and anal sexual behaviors.

Predictor	B	Standard error	Beta	t	p
Constant	16.08	0.31		51.46	.000
Worry about HIV/AIDS	0.01	0.06	0.01	0.18	.85
Worry about STIs	0.02	0.05	0.02	0.37	.71
Worry about pregnancy	-0.01	0.06	-0.01	-0.04	.97
Self-efficacy	0.05	0.02	0.09	2.80	.01
Knowledge of STIs/HIV	0.08	0.03	0.09	2.69	.01
Dependent variable: <i>Age at vaginal sex initiation</i>					
Constant	18.22	0.86		21.10	.000
Worry about HIV/AIDS	-0.22	0.15	-0.14	-1.56	.17
Worry about STIs	0.14	0.15	0.09	0.97	.35
Worry about pregnancy	-0.33	0.17	-0.11	-1.93	.05
Self-efficacy	0.14	0.04	0.18	3.25	.01
Knowledge of STIs/HIV	0.12	0.08	0.08	1.37	.17
Dependent variable: <i>Age at anal sex initiation</i>					
Constant	10.89	2.06		5.30	.000
Worry about HIV/AIDS	0.16	0.40	0.02	0.40	.69
Worry about STI	-0.10	0.36	-0.02	-0.29	.77
Worry about pregnancy	-0.13	0.42	-0.01	-0.31	.76
Self-efficacy	-0.45	0.11	-0.13	-4.15	.000
Knowledge of STIs/HIV	0.30	0.20	0.05	1.54	.12
Dependent variable: <i>Number of vaginal sexual partners (lifetime)</i>					
Constant	5.68	2.69		2.11	.03
Worry about HIV/AIDS	1.25	0.51	0.23	2.45	.01
Worry about STIS	0.08	0.46	0.01	0.17	.87
Worry about pregnancy	-2.08	0.54	-0.22	-3.82	.000
Self-efficacy	-0.02	0.13	-0.01	-0.17	.86
Knowledge of STIS/HIV	0.16	0.27	0.03	0.59	.85
Dependent variable: <i>Number of anal sexual partners (lifetime)</i>					
Constant	2.40	0.27		8.94	.000
Worry about HIV/AIDS	0.05	0.05	0.05	0.87	.39
Worry about STIs	0.01	0.05	0.01	0.16	.87
Worry about pregnancy	-0.09	0.05	-0.06	-1.73	.08
Self-efficacy	-0.05	0.01	-0.12	-3.53	.000
Knowledge of STIS/HIV	-0.01	0.03	-0.01	-0.32	.75
Dependent variable: <i>Number of vaginal sexual partners (past 2 months)</i>					
Constant	8.45	2.70		3.12	.15
Worry about HIV/AIDS	0.86	0.51	1.68	0.40	.10
Worry about STIs	-0.97	0.45	-2.40	-0.33	.20
Worry about pregnancy	-0.95	0.58	-1.65	-1.73	.11
Self-efficacy	-0.36	0.14	-2.68	-0.53	.30
Knowledge of STIS/HIV	0.51	0.28	1.90	0.32	.17
Dependent variable: <i>Number of anal sexual partners (past 2 months)</i>					

be that the young/adults described above are more worried about STIs/HIV because they do not have a stable affective relationship and have more frequent sexual contact with different people. Having had an STI, having been tested for HIV or planning to be tested for HIV seems to imply greater awareness of HIV infection and therefore greater worry. Yet, the fact that most HIV prevention programs have been aimed at homosexuals and that the pandemic was initially associated to this population (UNAIDS, 2012) may explain the greater worry about HIV/AIDS among this group. In this

regard, previous studies have shown that homosexuals and individuals who have been tested for HIV were considerably worried about STIs/HIV (see Fernández-Dávila, Lupiáñez-Villanueva, & Lorca, 2012; Raymond et al., 2013).

Women, heterosexuals, participants in the 17-29 and the 30-42 age groups, cohabiting participants, participants with primary and higher education and those who planned to be tested for HIV showed the greatest worry about pregnancy. These results may be due to the fact that women can get pregnant and therefore are likely to be

**Table 4** Summary of the hierarchical logistic regression analyses conducted for condom use in the first vaginal and anal sexual contact.

Predictor	B	Standard error	Wald	p	Odds ratio	Confidence interval 95%	
						Lower	Higher
Worry about HIV/AIDS	0.06	0.05	1.27	.26	1.12	0.96	1.18
Worry about STIs	-0.04	0.05	0.60	.44	0.89	0.87	1.06
Worry about pregnancy	0.03	0.05	0.29	.59	0.92	0.87	1.08
Self-efficacy	-0.01	0.01	0.43	.51	0.98	0.96	1.02
Knowledge of STIs/HIV	0.08	0.03	10.09	.01	0.93	0.87	0.97
Dependent variable: <i>Condom use in the first vaginal sexual contact</i>							
Worry about HIV/AIDS	-0.10	0.08	1.68	.19	0.90	0.77	1.05
Worry about STIs	0.04	0.07	0.41	.52	1.05	0.91	1.20
Worry about pregnancy	0.03	0.08	0.15	.70	1.03	0.88	1.22
Self-efficacy	0.01	0.02	0.43	.51	1.01	0.97	1.05
Knowledge of STIS/HIV	-0.07	0.04	2.67	.10	0.93	0.86	1.01
Dependent variable: <i>Condom use in the first anal sexual contact</i>							

more worried about pregnancy than men. In addition, it is logical to expect that the fact of cohabiting with a partner and being in the 17-29 or the 30-42 age groups - the most fertile years for women - leads them to be more worried about pregnancy. Such participants may also have expressed greater worry due to lack of contraceptive use in all their sexual relations.

Being a homosexual, being in the 30-42 age group, being single, having college education and a monthly income of €900 or more, and having been tested for HIV was associated with the highest scores in knowledge of STIs/HIV. Indeed, some studies have shown a relationship between 1) greater knowledge on STI/HIV transmission routes and prevention and 2) income (Fernández, 2012; Nwezeh, 2010); some studies have also revealed that high education level was a predictor of greater knowledge of HIV/AIDS (Berhan & Berhan, 2013; Fernández, 2012). Along these lines, homosexual participants and those with college education have been found to have significant knowledge of HIV/AIDS (Fernández-Dávila et al., 2012; Nwezeh, 2010).

Finally, women, heterosexuals, married participants, participants with college education, those with an income of €900 or more, and those who had been tested for HIV reported the highest self-efficacy to refuse sex. These results are consistent with those of most studies reviewed, which concluded that women had higher self-efficacy (Ballester, Gil-Llario, Ruiz-Palomino, & Giménez-García, 2013; Rodríguez et al., 2011). The higher self-efficacy to refuse sex reported by heterosexuals compared to homosexuals may be due to the fact that the population of homosexuals is smaller than that of heterosexuals; this may make it more difficult for the former to find sexual partners and therefore lead them to perceive themselves as being less able to refuse sexual risk behaviors. Married are also likely to have less difficulty refusing sex because they have stable sexual partners.

The second objective of this study was to analyze whether cognitive variables (i.e., worry about STIs/HIV and pregnancy, self-efficacy to refuse sex and knowledge of STIs/HIV) predicted vaginal and anal sexual risk behaviors.

Self-efficacy predicted most vaginal and anal sexual behaviors (i.e., age at vaginal and anal sex initiation as well as number of vaginal sexual partners in their lifetime and in the past two months). Higher self-efficacy predicted an older age at vaginal and anal initiation. In addition, participants with lower self-efficacy to refuse sex had a higher number of vaginal sexual partners. These results are important because they highlight the predictive power of self-efficacy to refuse sex in sexual risk behaviors. This suggests the need to consider this cognitive variable in prevention programs addressed to young and adults and to develop related skills promoting safer sexual behaviors (e.g., sexual assertiveness, condom use negotiation). Moreover, these results agree with those of previous studies that have underlined that participants with higher self-efficacy to refuse sex reported fewer sexual risk behaviors for STIs/HIV infection (Ballester et al., 2013; Seth et al., 2009).

Greater knowledge of STIs/HIV predicted older age at vaginal sex initiation and higher condom use in the first vaginal sexual contact. These results are consistent with those of most studies reviewed, which concluded that knowledge of STIs/HIV contributed to reducing sexual risk behaviors (Bermúdez et al., 2012; Fernández, 2012; Ramiro et al., 2013). Importantly, however, such studies point out that knowledge of STIs/HIV was a necessary but not sufficient factor for preventing sexual risk behaviors (Nwezeh, 2010; Sikkema et al., 2000).

Finally, we found that participants less worried about pregnancy reported older age at anal sex initiation and a higher number of lifetime anal sexual partners. These results may be due to participants' use of contraceptives, which is likely to decrease their worry about pregnancy. Another explanation could be that engaging in anal sex reduces individuals' worry about pregnancy. Yet, it will be up to future studies to clarify these results, as the present study cannot be used to draw causal relationships. Participants with higher levels of worry about HIV/AIDS reported a higher number of lifetime anal sexual partners. An explanation to these results may be that having several

anal sexual partners leads to greater worry. As highlighted above, we used a cross-sectional design, so it is not possible to infer any cause-and-effect relationships.

The results of this study can contribute to promoting safe sexual behaviors in two ways. First, they reveal the existence of socio-demographic profiles in the cognitive variables assessed. Second, they show that self-efficacy to refuse sex, knowledge of STIs/HIV and worry about STIs/HIV and pregnancy are important predictors of sexual risk behaviors. We suggest that efforts aimed at reducing sexual risk among young and adults should consider the above-mentioned socio-demographic profiles and variables.

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