

# Contraceptive methods and knowledge of sexually transmitted diseases in nursing students. Results from a survey conducted at the University of Palermo

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## ABSTRACT

**Background:** The main purpose of the study was to evaluate sexual habits, sexual relations and knowledge of sexually transmitted infections (STIs) among the students in the nursing science course of University of Palermo, and to evaluate the use of contraceptive methods.

**Methods:** In April 2019, a survey was provided to students who attend daily lessons in the nursing science course of University of Palermo, that investigate primarily about sexual habits, sexual relations and knowledge of sexually transmitted diseases. A multivariable logistic regression was performed.

**Results:** The sample size consists of 405 students. The average age of the sample is 21.65 years, 69.63% of the interviewees are women. In relation to the question "Do you think you are sufficiently informed to be able to avoid risks of infection from sexually transmitted diseases? No", the analysis shows that this independent variable is significantly associated with the following independent variables: female gender (aOR 3.11, 95% CI 1.01 - 9.65); "how would you define your knowledge about contraceptive methods? - Poor" (aOR 5.38, 95% CI 1.79 - 16.20); "have you ever received information on sex education and/or sexually transmitted diseases? - No" (aOR 11.59, 95% CI 2.26 - 59.42); "do you know the human papillomavirus (HPV) vaccination? - yes, but I'm not vaccinated" (aOR 3.09, 95% CI 1.12 - 8.51); "do you know that men can also undergo HPV vaccination? - No" (aOR 2.67, 95% CI 1.01 - 7.04).

**Conclusion:** Based on our findings, it is necessary to implement sexual education programs for the improvement of knowledge in terms of STIs and the promotion of health. Improving sexual health outcomes for young people is a priority for the public health.

*Key words:* Nursing Students, Sicily, Unsafe Sex, Sexually Transmitted Diseases, Mediterranean Region, Sexual Behavior

## INTRODUCTION

Sexually transmitted infections (STIs) represent an important public health problem that has a strong impact on society. The World Health Organization (WHO) estimates that there are 357 million new infections each year. A big problem is that most sexually transmitted infections have only mild symptoms and are sometimes asymptomatic and therefore may not be recognized as STIs [1].

About 70% of patients with STIs are included in the range of age between 15 and 24 years and the WHO estimates that one of twenty teenagers contracts a STI during their lifetime [1,2].

University students may be especially vulnerable, in addition they typically exhibit high levels of alcohol [3,4] and stress [5,6] use which is associated with high-risk sexual behaviour and STI diagnosis.

Therefore, it is interesting to understand the level of awareness and knowledge of STIs, protection methods and sexual practices within this group.

This public health problem is also increasing in Italy where, from 1991 to 2013, according to the STIs Surveillance System coordinated by the National Institute of Health (ISS), there were 103,028 new cases [2]. Similarly, from 2005 to 2013, there was a significant trend towards an increase in MTA notifications in Italy with an increase of more than 31% compared to the previous period. It has been suggested that the observed increases could be due, for example, to improvements in test methods, better access to testing and screening, to more complete surveillance [2].

In many cases they can manifest without symptoms and therefore can be transmitted unconsciously during unprotected sexual intercourse, therefore the early detection and treatment of sexually transmitted infections are important to prevent complications, such as pelvic inflammatory disease, infertility, tumors and perinatal damage. Although STIs are often underestimated and little known by young people, they constitute a serious public health problem due to the widespread diffusion and severity of complications. The main causes of their enormous diffusion are: poor perception of the risk of infection, failure to use prevention services and diagnosis and behavioral errors that increase the risk of transmission [2].

From the scientific literature it emerges that very often young adults do not have the necessary knowledge to correctly assess the risks of unprotected sexual relations [7,8] and in many cases have little knowledge of STIs and their methods of prevention [9,10].

In Italy, the population knows that the use of condoms is important to prevent STIs and young people have higher proportions of use. However, this is still far from satisfactory, especially since condom is used as a contraceptive and not as a means to prevent the occurrence of sexually transmitted infections, so their use becomes irregular when other contraceptives are used [11].

## OBJECTIVES

The main purpose of the study was to evaluate sexual habits, sexual relations and knowledge of sexually transmitted infections (STIs) among the students in the nursing science course of University of Palermo. Another aim was to evaluate the use of contraceptive methods.

## MATERIALS AND METHODS

It's a cross-sectional study. In the first week of April 2019 (1-5 April 2019), a survey was provided to students who attend daily lessons in the nursing science course of University of Palermo of the three years of course, accompanied by informed consent, daily lessons are mandatory to take the exams. The main questions of the questionnaire are shown in Table 1, the questions investigate on: personal information, sexual habits, sexual relations, knowledge of sexually transmitted diseases, the perception of the economic and health status, anti-HPV vaccination. We also investigated about Knowledge and use of contraceptive methods

For all variables absolute and relative frequencies have been calculated. A multivariable logistic regression was performed, considering it as a dependent variable "Do you think you are sufficiently informed to be able to avoid risks of infection from sexually transmitted diseases? No", in order to evaluate the role of all the variables of Table 1 (Description of the sample). The statistical significance level chosen for all analyzes was 0.05. The results were analyzed using the STATA statistical software version 14<sup>12</sup>. Results are expressed as adjusted Odds Ratio (aOR) with 95% Confidence Intervals (95% CI). This study was approved by the Ethical Committee of the University Hospital "P. Giaccone" of Palermo, Minutes No. 02/2019 (16. Studio MST3) of February 18, 2019.

## RESULTS

100% of the first-year students who received the questionnaire agreed to complete it. 100% of the second-year students who received the questionnaire agreed to complete it. 93.55% of the third-year students who received the questionnaire agreed to complete it, 6 students refused to complete the questionnaire. Other analysis will be reported in supplementary papers.

The sample size consists of 405 students that agreed to the informed consent and completed the questionnaire. The 69.63% of the interviewees are women, 100% were born in Italy, 46.42% are single, 72.59% report a low perceived economic status, 15.06% report a low perceived health status, 45.68% report to attend first year of study, 32.84% attend second year of study and 21.48 the third year. 36.05% were off-site students, 40.25%

were in-site students, 94.81% were heterosexual, 2.96% homosexual, 2.22% were bisexual, 12.84% haven't

ever had sex, 75.31% have had sex, 51.56% haven't occasionally had unprotected sex (without a condom),

**TABLE 1. Description of the sample**

Variables		N	%
Gender	Female	282	69.63
	Male	123	30.37
Contry of birth	Italy	405	100.00
	Other	0	0.00
Are you engaged or single?	Engaged	217	53.58
	Single	188	46.42
Perceivedeconomic status	Medium-high	111	27.41
	Low	294	72.59
Perceivedhealth status	Medium-high	344	84.94
	Low	61	15.06
Year of study	First	185	45.68
	Second	133	32.84
	Third	87	21.48
Are you a student off-site or in-site or commuter students?	In-site	163	40.25
	Commuterstudent	96	23.70
	Off-site	146	36.05
Sexualorientation	Heterosexual	384	94.81
	Homosexual	12	2.96
	Bisexual	9	2.22
Have you ever had sex?	No	52	12.84
	Yes, incomplete	48	11.85
	Yes, complete	305	75.31
Have you occasionally had unprotected sex (without a condom)?	No	182	51.56
	Yes	171	48.44
Do you permanently have unprotected sex (without a condom)?	No	228	67.46
	Yes	110	32.54
How would you define your knowledge of sexually transmitted diseases?	Good	183	45.19
	Poor	222	54.81
How would you define your knowledge about contraceptive methods?	Good	194	47.90
	Poor	211	52.10
Have you or have you ever had a sexually transmitted disease?	No	355	89.87
	Yes	40	10.13
Have you ever received information on sex education and/or sexually transmitted diseases?	Yes	385	95.06
	No	20	4.94
Do you think you are sufficiently informed to be able to avoid risks of infection from sexually transmitted diseases?	Yes	349	86.17
	No	56	13.83
Do you know the Human Papillomavirus (HPV) vaccination?	Yes, I'mvaccinated	190	46.91
	Yes, but I'm not vaccinated	197	48.64
	No	18	4.44
Do you know that men can also undergo HPV vaccination?	Yes	327	80.74
	No	78	19.26
Do you think that the sexual information provided by the institutions (school, health, ...) is:	Good	94	23.21
	Poor	311	76.79
Age		21.65 (SD ± 3.24)*	
Number of sexualpartners		3.33 (SD ± 3.72)*	
Age at first sexual intercourse		16.75 (SD ± 1.77)*	

\*mean (Standard Deviation)

67.46% have permanently unprotected sex (without a condom), only 23.21% think that the sexual information provided by the institutions (school, health) is good and 4.44% don't know the Human Papilloma Virus (HPV). The average age of the sample is 21.65 years (standard deviation  $\pm$  3.24). The number of sexual partners is 3.33 (standard deviation  $\pm$  3.72), the age at first sexual intercourse is 16.75 (standard deviation  $\pm$  1.77) (Table 1). In relation to the question "What contraceptive method do you know?", 99.75% of the sample replied condom, 52.97% Female condom, 96.29% birth control pill and 82.67% next day pill. In relation to the question "What contraceptives do you think protect against sexually transmitted diseases", 97.74% of the sample replied condom, 41.21% female condom, 7.54% birth control pill, 5.28% next day pill and 6.78% the spiral. In relation to the question "What contraceptive method do you use?", 78.38% replied condom, 17.30% birth control pill, 14.59% coitus interruptus, 10.54% don't use any contraceptive method (See Table 2).

Table 3 shows adjusted Odds Ratio (aOR). A multivariable logistic regression model was used based on 325 observations. Each independent variable has been adjusted for all the other independent variables. In relation to the question "Do you think you are sufficiently informed to be able to avoid risks of infection from sexually transmitted diseases? No", the analysis shows that this independent variable is significantly associated with the following independent variables: female gender (aOR 3.11, 95% CI 1.01 – 9.65,  $p=$  0.049); "how would you define your knowledge about contraceptive methods? – Poor" (aOR 5.38, 95% CI 1.79 – 16.20,  $p=$  0.003); "have you ever received information on sex education and/or sexually transmitted diseases? – No" (aOR 11.59, 95% CI 2.26 - 59.42,  $p=$  0.003); "do you know the human papillomavirus (HPV) vaccination? – yes, but I'm not vaccinated" (aOR 3.09, 95% CI 1.12 – 8.51,  $p=$  0.029); "do you know that men can also undergo HPV vaccination? – No" (aOR 2.67, 95% CI 1.01 – 7.04,  $p=$  0.047).

## DISCUSSION

This study investigated the knowledge of contraceptive methods and STDs in a sample of undergraduate nursing students in the city of Palermo.

Although the knowledge of most of the respondents would seem to be adequate about sexually transmitted diseases and contraceptive methods, the percentage of them claiming to have occasionally and permanently unprotected sex is worrying but consistent with the literature [13].

In a study by Hickey and Cleland [14], conducted among female college students ages 18 to 24, they found that over 75% of participants engaging in vaginal intercourse at least four times per week, condoms were

**TABLE 2. Knowledge and use of contraceptive methods.**

**2A-What contraceptive method do you know? (It is possible to give more answers). Based on 404 responses.**

	N	%
Condom	403	99.75
Female condom	214	52.97
Birth control pill	389	96.29
Nextdaypill	334	82.67
Spiral	281	69.55
Diaphragm	134	33.17
Transdermal patch	176	43.56
Vaginal ring	146	36.14
Coitus interruptus	253	62.62

**2B-What contraceptives do you think protect against sexually transmitted diseases? (It is possible to give more answers). Based on 398 responses.**

	N	%
Condom	389	97.74
Female condom	164	41.21
Birth control pill	30	7.54
Nextdaypill	21	5.28
Spiral	27	6.78
Diaphragm	17	4.27
Transdermal patch	12	3.02
Vaginal ring	13	3.27
Coitus interruptus	8	2.01
None of those listed	9	2.26

**2C-What contraceptive method do you use? (It is possible to give more answers). Based on 370 responses.**

	N	%
Condom	290	78.38
Female condom	2	0.54
Birth control pill	64	17.30
Nextdaypill	8	2.16
Spiral	0	0.00
Diaphragm	0	0.00
Transdermal patch	3	0.81
Vaginal ring	1	0.27
Coitus interruptus	54	14.59
Do not use any contraceptive method	39	10.54

only used by 57% of participants. The negligent use of condoms among university students is an alarming behavior that contributes to the spread of STDs and to the occurrence of unwanted pregnancies.

**TABLE 3. Multivariable logistic regression: information relating to the risk of infection from sexually transmitted diseases**

Independent Variables		Do you think you are sufficiently informed to be able to avoid risks of infection from sexually transmitted diseases? No	
		aOR (95% CI)	p-value
Gender	Male	1	
	Female	3.11 (1.01-9.65)	0.049
Perceived economic status	Medium-high	1	
	Low	2.26 (0.79-6.44)	0.127
Perceived health status	Medium-high	1	
	Low	1.39 (0.51-3.80)	0.519
Are you engaged or single?	Engaged	1	
	Single	2.07 (0.88-4.87)	0.097
Year of study	First	1	
	Second	0.81 (0.32-2.05)	0.660
	Third	1.54 (0.41-5.72)	0.520
Are you a student off-site or in-site or commuter students?	In-site	1	
	Commuter student	1.01 (0.35-2.84)	0.997
	Off-site	0.89 (0.35-2.30)	0.813
Sexual orientation	Heterosexual	1	
	Homosexual	(empty)	
	Bisexual	1.31 (0.18-9.40)	0.789
Have you occasionally had unprotected sex (without a condom)?	No	1	
	Yes	0.90 (0.37-2.18)	0.822
Do you permanently have unprotected sex (without a condom)?	No	1	
	Yes	1.98 (0.66-5.98)	0.224
How would you define your knowledge of sexually transmitted diseases?	Good	1	
	Poor	0.98 (0.35-2.73)	0.958
How would you define your knowledge about contraceptive methods?	Good	1	
	Poor	5.38 (1.79-16.20)	0.003
Have you or have you ever had a sexually transmitted disease?	No	1	
	Yes	0.96 (0.23-4.06)	0.957
Have you ever received information on sex education and/or sexually transmitted diseases?	Yes	1	
	No	11.59 (2.26-59.42)	0.003
Do you know the Human Papillomavirus (HPV) vaccination?	Yes, I'm vaccinated	1	
	Yes, but I'm not vaccinated	3.09 (1.12-8.51)	0.029
	No	2.14 (0.34-13.63)	0.421
Do you know that men can also undergo HPV vaccination?	Yes	1	
	No	2.67 (1.01-7.04)	0.047
Do you think that the sexual information provided by the institutions (school, health, ...) is:	Good	1	
	Poor	3.13 (0.82-11.91)	0.095
Number of sexual partners	1-unit increase	1.02 (0.89-1.17)	0.762
Age at first sexual intercourse	1-unit increase	0.82 (0.62-1.07)	0.138
Age	1-unit increase	0.66 (0.48-0.90)	0.010

Combining these statements with the date of onset to sex life around the age of 16 and the number of partners had (just over 3) in our sample, the young respondents represent a population that is exposed to a great risk both to their sexual health and to have an unexpected pregnancy. The literature explains how this subsection of the population is responsible for more than half of the twenty million new cases of sexually transmitted diseases (STDs) diagnosed each year [15]. The spread of STDs is also favored by the fact that the majority of sexual transmitted infections (STIs) have no symptoms or only mild symptoms that may not be recognized as an STIs [1].

To the question which contraceptive method is able to protect against STDs, although the vast majority of respondents agree on correct answers, a part of them also names the birth control pill (7.54%), next day pill (5.28%), diaphragm (4.27%), and coitus interruptus (2.01%). The students who report these wrong answers show by a part a poor knowledge of the STDs and on the other inevitably they expose themselves to risky behaviors. In this regard, it would be appropriate to intervene with sex education programs to improve knowledge in terms of STI and health promotion, whose importance is reported in the literature [16, 17].

The declaration of not having enough information to avoid STDs is significantly associated with the female gender, to consider their knowledge of poor contraceptive methods, and to never have received information on sex education or STDs, and not to know that HPV vaccination can also be dedicated to males. It is important to underline the gender connotation with respect to the STDs that emerge in our sample. There are many biological, cultural and social variables that can explain this difference [18, 19] and their analysis goes beyond the aim of this research. The other associated factors denounce a lack of information and education, and the role of sex education for young people by institutions, schools and universities emerges as fundamental, for example, introducing sex education in university courses as compulsory subjects and / or organizing informational and educational events [20].

The voluntary initiatives such as the 3 days "Marathon of Prevention" held in Palermo (Sicily) developed in the context of Hackathon Health Technology Assessment - Never Stop Learning [21], can be very effective in meeting youth basic needs.

### Limitations of the study

The results of this study must be evaluated in light of some limitations. Firstly, it is a cross-sectional study, that do not allow to draw any conclusions about causal relationships of the results. Secondly, this study provides a general overview of the sexual behaviors of the nursing university students and it

should not be considered as a complete description of the sexual behavior of all young people. For these reasons, although the results are in line with the literature, these should not be generalized to all university students.

## CONCLUSIONS

Based on our findings, it is necessary to implement sexual education programs for the improvement of knowledge in terms of STIs and the promotion of health. Improving sexual health outcomes for young people is a priority for the public health. The results of the study showed that the majority of students had quite adequate knowledge about sexually transmitted diseases and contraceptive methods. Although this affects the majority of respondents, the associated behaviors are not consistent with their knowledge and it expose this population to both sexually transmitted diseases and unexpected pregnancies.

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None.

### Competing interests

None declared.

### Ethical approval

This study was approved by the Ethical Committee of the University Hospital "Paolo Giaccone" of Palermo, Minutes No. 02/2019 (16. Studio MST3) of February 18, 2019.

### Authors' contribution

OES, SP and AF conceived, designed, coordinated and supervised the research project. OES performed the data quality control, optimized the informatics database, performed the statistical analyses and evaluated the results. All authors wrote, read and approved the final manuscript.

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