









SURVEY ON THE RISK FACTORS FOR CERVICAL CANCER  
KNOWN BY BIOMEDICINE STUDENTS

Camila Aparecida Pinheiro Landim ALMEIDA<sup>1</sup> , Barbara Byanka Costa SILVA<sup>2</sup> ,  
Juliana Nascimento de SOUZA<sup>2</sup> , Antonio Luiz GOMES JÚNIOR<sup>2</sup> , Herica Emilia Félix de CARVALHO<sup>3</sup> ,  
Eliana Campêlo LAGO<sup>4</sup> , Rauriry Alencar de OLIVEIRA<sup>5</sup> , Ivonizete Pires RIBEIRO<sup>6</sup> 

<sup>1</sup> Institute of Health Sciences, Universidade Católica Portuguesa, Porto, Portugal.

<sup>2</sup> Department of Biomedicine, UNINOVAFAPI University Center, Teresina, Piauí, Brazil.

<sup>3</sup> Postgraduate Program in Fundamental Nursing, University of São Paulo, Ribeirão Preto, São Paulo, Brazil.

<sup>4</sup> Department of Health Sciences, State University of Maranhão, Caxias, Maranhão, Brazil.

<sup>5</sup> Department of Physiotherapy, UNINOVAFAPI University Center, Teresina, Piauí, Brazil.

<sup>6</sup> Professional Master's Program in Family Health, UNINOVAFAPI University Center, Teresina, Piauí, Brazil.

**Corresponding author:**

Camila Aparecida Pinheiro Landim Almeida

Email: clalmeida@porto.ucp.pt

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**Abstract**

The development of cervical cancer is related with human papillomavirus infection with greater intensity the subtypes 16 and 18. Considering that the lifestyle of women influences the development of this cancer, this study aimed to perform a survey on the risk factors for cervical cancer known by biomedicine students. Descriptive and exploratory research, with a quantitative approach was performed with 101 biomedical undergraduates. Data were collected from February to March 2018 through a questionnaire and analyzed in the Statistical Package for the Social Science program. Students in the age group of 18 to 24 years old (89.11%), single (93.07%), with family income between two and three minimum wages prevailed (43.56%). It also showed that participants started their sexual life early (average 16 years old), had more than one sexual partner throughout their lives, had no relation to smoking (100%), most were not alcohol consumers (66%), did not take the Papanicolaou preventive exam (61.39%), did not practice physical activity (55.45%) and had a low frequency in the use of condoms during sexual intercourse (22.08%). It is concluded that there is a need for educational campaigns in Higher Education Institutions, which provide more information about the prevention of Cervical Cancer and the prevention of associated risk factors.

**Keywords:** Cytopathology. Human Papilloma Virus. Neoplasia. Prevention.

**1. Introduction**

Cancer of the uterine cervix, also known as cervical cancer (CC), has become a public health problem throughout the world, where its highest morbidity and mortality rates are found mainly in developing countries. In Brazil, this is the fourth most frequent type of cancer amongst women, with an estimated 16,340 new cases in 2016, despite being a curable disease and with preventive and early detection actions available by the health system (Ribeiro and Andrade 2016).

According to Bermudez et al. (2015), the development of cervical cancer is closely correlated with persistent infection by oncogenic human papillomavirus (HPV) subtypes, especially HPV-16 and HPV-18. These viruses are transmitted sexually and account for about 70% of cervical cancers worldwide. Although HPV infection is very common, 80% of sexually active women will become infected with these viruses, only

a small number of infections will progress to cervical cancer, suggesting that HPV infection is a necessary but not enough factor for HPV infection. development of this type of cancer.

In addition to factors related to HPV, such as strain and viral load, single or multiple infection, factors linked to immunity, genetics and sexual behavior appear to be decisive for the regression or persistence of infection and, subsequently, the onset of cancer cervical. Thus, smoking, early sexual initiation, multiplicity of sexual partners, multiparity, use of oral contraceptives and age are considered risk factors for the development of CC (Rocha et al. 2014).

A study focused at the health care of adolescents and young people of a public university in the city of Belém do Pará, northern region of Brazil, showed a participation of 329 university students, presenting high rates of HPV infection among the students evaluated, with a statistically significant association with the (HSIL), age at menarche and the parity variable (Vieira et al. 2017). In the present study, the age of menarche with the highest prevalence of infection was among students over 14 years old ( $p = 0.0328$ ), differing from the literature that points to higher rates in women with menarche under 12 years old.

Vaccination against HPV is effective in 91.6% for incidental infection and up to 100% against persistent infections. Thus, prophylaxis using this vaccine is a strong candidate for prevention of CC morbidity and mortality (Santos and Souza 2013). In 2013, 5,430 women died due to complications of cervical cancer (SIM - Sistema de Informação sobre Mortalidade 2013; INCA - Instituto Nacional de Câncer 2016).

Considering that the woman's lifestyle influences significantly the development of CC, it was felt the need to identify possible risk factors for cervical cancer in biomedicine academics, to promote a reflection on the choices of behavior in this phase of women's lives. In this context, this study aimed to perform a survey on the risk factors for cervical cancer know by biomedicine undergraduates.

## 2. Material and Methods

A descriptive and exploratory study (Mesquita and Matos 2014), with a quantitative approach, developed in a private institution located in the city of Teresina, State of Piauí, Brazil.

The convenience sample consisted of 123 undergraduate students from the Biomedicine Course. After meeting the inclusion criteria: being regularly enrolled in the Biomedicine Course, being over 18 years old and being present at the higher education institution (HEI) in the period of data collection (February and March 2018). 17 students refused to participate in the study and 05 were on medical leave at the time of data collection. Therefore, 101 students participated in the study. Students were recruited through daily dissemination in all classes of that course and were invited to participate in the study during the afternoon shift at the HEI, after the end of classes or during the break. Data collection was performed only after the participants' consent and availability, with an average duration of 20 minutes.

In order to obtain the empirical material, a questionnaire was used to characterize the participants in relation to the sociodemographic aspects (gender, age, marital status, work status) related to academic training (period/course term of biomedicine, time spent to get to HEI, participation in academic activities: projects/scholarships/academic leagues, external work links, satisfaction with Biomedicine course) and regarding the possible risk factors for the development of CC (number of children, smoking, alcohol use, oral contraceptives, Pap smears, sex life, occurrence and number of abortions, Sexually Transmitted Infections (STIs), family cancers, and physical activity).

For the organization of the collected data, a database was developed in the Microsoft Excel Program, with double typing of the data, which were later imported into the SPSS Program "Statistical Package for the Social Science" (version 22.0 for Windows and Program R version 3.1.2) to perform the processing of the obtained data. The results were presented in tables using descriptive statistics.

The inclusion of the participants in this study was carried out obeying the ethical and legal recommendations that govern human research (Brasil 2012). All the women participants were informed about the purpose and methods of the study and signed the Informed Consent Form. The research was approved by the Research Ethics Committee, in compliance with Resolution 466/12 of the National Health Council, under the Certificate of Presentation and Ethical Assessment (CAAE) nº 56868216.4.0000.5210 and Opinion No. 1,613,758, June 29, 2016.

### 3. Results

The distribution of the 101 participants regarding sociodemographic aspects revealed that a majority of 89.11% (n = 90) were concentrated in the age range of 18-24 years, among them 93.07% (n = 94) singles, and 5.94% (n = 6) married, with a family income of 43.56% (n = 44) from 2 to 3 minimum wages, and 92.08% (n = 93) reported not working professionally (Table 1).

**Table 1.** Frequency (n) and percentage (%) of the sociodemographic aspects of the study participants (n = 101) (Teresina, PI, Brazil, 2018).

	Variables	n	%
Age	18 – 24	90	89.11
	25 - 31	8	7.92
	32 - 38	1	0.99
	39 – 45	2	1.98
	Single	94	93.07
Marital status	Married	6	5.94
	Widow	-	-
	Separated/divorced	-	-
	Consensual union	1	0.99
Family income	Less than 1 wage	13	12.87
	2 – 3 wages	44	43.56
	4 – 5 wages	21	20.79
	More than 5	23	22.77
Work	Yes	8	7.92
	No	93	92.08

Source: Direct research.

Regarding the participants' academic formation, 31.68% (n=32) were from the 3rd period of Biomedicine and 45.54% (n=46) took up to 20 minutes to reach the institution, 81.19% (n=82) reported that they did not participate in research groups, extension projects or academic leagues.

Regarding the scientific initiation programs, 99.01% (n=3) reported not been participating in any program and only 0.99% (n=1) participated in PIBIC, on the research grants available in the institution 78.22% (n=79) do not have a scholarship, and it should be noted that 21.78% (n=22) have student aid, amongst which the Educa Mais Brasil Program 52.52% (n=12) and University All (PROUNI) 45.45% (n=10).

A total of 84.16% (n=85) said that they did not have another technical/technical course, highlighting the appearance of a course as a technician in clinical analysis 12.50% (n=2), nursing 12.50% (n=2) and human resources 6.25% (n=1). As well as satisfaction on the achievement of the course 95.05% (n=96) of the participants of this research demonstrated that they are satisfied with the course, and the results of the research presented the reasons for the dissatisfaction as devaluation of the course 20% (n=1).

The research reveals that 18.81% (n=19) think about giving up the course by desire doing another course 36.84% (n=7), showing reasons such as: financial 26.32% (n=5), personal problems (n=1), non-conciliation with work, 5.26% (n=1).

Regarding the risk factors associated with the participants' lifestyles, they said that they did not have children 95.05% (n=96), they were not smokers 100%, and never used cigarettes (n=101). Amongst the participants, 66% (n=66) did not consume alcoholic beverages, and the others that made use of alcoholic beverages were: 58.82% (n=20) beer, 20.59% (n=7) distilled, 8.82% (n=3) wine and 32.35% (n=11) consumed all the options mentioned above.

The research showed that 79.21% (n=80) evidenced using oral contraceptives, with participants beginning their sexual life on average at 16 years of age, with the majority reported having on average 1 sexual partner in the last 3 months and an average of 6 sexual partners throughout their lives. The use of condoms in all sexes has been subdivided into 61.24% (n=47), using 22.08% (n=17) always use, 16.88% (n=3)

rarely use condoms. Of the study participants, 97.03% (n=98) were not pregnant at the time of data collection, 0.99% (n=1) was pregnant and 95.05% (n=96) reported never having undergone an abortion.

Data collection revealed that 98.02% (n=99) did not have Sexually Transmissible Infections (STI) and only 1.98% (n=2) reported having some type of STI, 60% (n=3) candidiasis and 40% (n=2) reported having herpes. Regarding the practice of physical activity, the study indicated that 55.45% (n=56) of the participants did not perform any kind of physical activity and those who practiced some physical exercise identified as walking, 22.77% (n=23) 15.84% body weight (n=16), sports 1.98% (n=2) on an average of 241 minutes per week.

Regarding the risk factors associated with the disease, a Pap smear was observed, in which 61.39% (n=62) never performed this test and only 38.61% (n=39) reported having performed on average 4 exams with the last test carried out 14 months ago.

It was identified that 35.64% (n=36) of the interviewed women did not have cases of cancer in the family, however 34.65% (n=35) reported having or already had some case of cancer in the family, highlighting kinship as: Grandparents 47.73% (n=21), Uncles/cousins 45.45% (n=20), father 4.55% (n=2) and siblings 2.27% (n=1). As to the location of cancer in cases of cancer in the family, the study revealed that 19.23% (n=10) were in the stomach, 13.45% (n=7) breast, 9.61% (n=5) cervix and 9.61% (n=5) in the liver with mean duration 73 months, the data were shown in table 2.

**Table 2.** Frequency (n), percentage (%) and mean of risk factors associated with disease (n = 101) (Teresina, PI, Brazil, 2018).

Variables	N	%	Mean(sd*)
Papanicolaou Exam	Yes	39	38.61
	No	62	61.39
Nº of exams			4±3.65
Last exam (Months)			14±8.26
	Yes	35	34.65
	No	36	35.64
	Don't know	30	29.70
	Mother	-	-
	Father	2	4.55
	Siblings	1	2.27
People with cancer	Uncles/Cousins	20	45.45
	Grandparents	21	47.73
	Cervix	5	9.61
	Breast	7	13.46
Cancer's place	Stomach	10	19.23
	Liver	5	9.61
	Others	25	48.09
	Total	52	100.00
Time with cancer (Months)			73±10.8

Source: Direct research. \*sd=standard deviation.

To the factors associated with death, the study pointed out that 36.63% (n=37) stated that they had cases of death due to cancer in the family, evidenced the relatives as: Grandparents 52.78% (n=19), uncle/cousins 44.44% (n=16) and father 2.78% (n=1). The cancer sites that led to death were 27.50% (n=11) in the stomach, 10% (n=4) in the cervix, 10% (n=4) in the breast, 10% in the liver and 42.50% (n=17) other sites, on average 93 months ago, according to table 3.

**Table 3.** Frequency (n), percentage (%) and mean of risk factors associated with death (n = 101) (Teresina, PI, Brazil, 2018).

Variables	N	%	Mean(sd*)
Death by cancer	Yes	31	30.69
	No	37	36.63
	Don't know	33	32.67
Persons who died by cancer	Mother	-	-
	Fathers	-	-
	Siblings	1	2.78
	Uncles/Cousins	16	44.44
	Grandparents	19	52.78
	Total	36	100.00
Cancers' place	Cervix	4	10.00
	Breast	4	10.00
	Stomach	11	27.50
	Liver	4	10.00
	Others	17	42.50
Total	40	100.00	
How long has been since the person died by cancer			93±8.42

Source: Direct research. \*sd=standard deviation.

#### 4. Discussion

As found in the sociodemographic characterization of the participants, it was observed that the age group of the students varied amongst women from 18 to 24 years of age. Research conducted by Silva et al. (2016a) showed that sexually active women aged between 18 and 30 years old are more common with HPV infection, and women aged 25 to 45 years old already had some type of lesion intraepithelial, and the incidence tends to decrease after 30 years of age. Although the risk increases rapidly until reaching its peak usually in the age group of 45 to 49 years.

In relation to marital status, there was a predominance of single women. Ribeiro et al. (2013) reported that the prevalence of single women is predictable, since it is a research conducted in a group of young people, in which academic activities and the greater interest for professional improvement, extend the plans for a possible marriage.

In this study, the predominant family income varies from 2 to 3 minimum wages. In another study conducted in Brazil, factors such as low family income, absence of health insurance and not having consulted with a doctor in the last 12 months have been associated with development of cervical cancer, showing that there are possible inequalities in the access and coverage of CC early detection strategies (Thuler et al. 2014).

Data analysis showed that 92.08% (n=93) of the participants in this study did not work. According to Ribeiro et al. (2015), new studies indicate that women who have some type of work present more adequate attitudes regarding CC prevention, such as going through more frequent Pap smears. Because they have a certain autonomy in making their decisions regarding their own health. Another positive point is that working women have greater access to information in the work environment with other women, which may stimulate preventive health practices.

Regarding condom use, the participants reported using it frequently in sexual relations, yet the study showed that some academics do not use condoms. In a study conducted in the city of Carmo da Mata, MG, in 2015, on the perception of women about the Pap smear, 36 women (38.7%) reported that they never use it in sexual intercourse. Therefore, the low condom use in sexual relations may make women more vulnerable and may increase the number of STIs, becoming a risk factor for cancer (Vasconcelos et al. 2017).

A study conducted by Dias et al. (2015), related to schooling and cervical cancer screening, showed that 45.45% (n=20) of the women in a health unit had incomplete primary education and only 9.09% (n=4) with complete higher education. In this study, only 38.61% (n=39) of women with incomplete higher education said they had already done so. However, 31.68% (n=32) of the participants were in the 3rd period of biomedicine, 45.54% (n=46) took up to 20 minutes to reach the institution, 18.81% (n=19) and 0.99% (n=1) participated respectively in research group and scientific initiation program, and 21.78% had some kind of student scholarship.

Regarding the obstetric characteristics, a number of gestations and abortions were observed, in which 64.6% (n=42) of the women had children and 20.0% (n=13) had abortions according to the data of the author Melo et al. (2009). In this study, 4.95% (n=5) had children, 0.99% (n=1) was pregnant at the time of data collection and only 4.95% (n=5) reported having suffered at least 1 miscarriage on average for 7 months, these are risk factors for the development of CCU associated with life habit.

The research on smoking showed that 100% (n=101) of the participants did not and never used cigarettes, another study points to the link between smoking and cervical cancer, which is confirmed by several studies (Rosa et al. 2009). While Duarte et al. (2011), corroborating this study, reported that none of the participants were found to be smokers.

A study conducted by Silva et al. (2016b) showed that people who were diagnosed with cancer chose healthier lifestyle habits, such as fruit and vegetable consumption and quit smoking, but they did not change. exercise and obesity, and the constant use of alcoholic beverages, was almost doubled. In the present study, many participants 66% (n = 66) stated that they did not consume any type of alcoholic beverage.

In this study, 79.21% (n=80) reported that they did not use contraception and 52.48% (n=53) never used contraception. Another study pointed out that 94.5% (n=34) of the women prisoners of the Female Penal Institute of the State of Ceara did not use oral contraceptive methods. When questioned about the antecedent use of this method, 70.5% (n=24) responded positively with an average of 46 months of use. An epidemiological study conducted in several countries has identified that women who use oral contraceptives for more than five years can double the risk of developing cervical cancer (Anjos et al. 2013).

Regarding the onset of sexual activity, the mean age of 16 years was obtained, which is considered an early age. In the study carried out by Botega et al. (2016), the average age of 16 years was found about the onset of sexual activity, with a minimum age of 10 years and a maximum of 36 years. In relation to the number of sexual partners, the average of 2 partners was obtained for each woman, with a minimum of 1 and a maximum of 10 partners.

Studies have corroborated this research by showing that in Brazil women are initiating their sexual life early, and this condition together with the occurrence of multiple sexual partners throughout life is considered as an important risk factor for the development of cervical cancer (Silva et al. 2016a).

In this study, 98.02% (n=99) did not have Sexually Transmissible Infections (STIs), of respondents who answered positively, 1.98% (n=2) cited herpes. According to Silva and Monteiro (2016), condom use is the main form of prevention against STIs, especially HPV, which is one of the main causes of precursor lesions of cervical cancer, prevalent in young women.

The practice of physical activity has numerous effects on cancer prevention, this is because it considerably increases the number of natural killer (NK) cells, which play a very significant role in innate immunity in addition to controlling body weight and avoiding sedentary lifestyle promoting well-being and health (Munhoz et al. 2016). It is important to note that in this study 55.45% (n=56) of the interviewees did not practice any type of physical activity, which makes this a worrying factor.

CC is deeply related to heredity especially in the first degree, significantly increasing the chances of developing cancer. Carvalho et al. (2015) reported that 53.69% (n=80) of the participants had cancer or had cancer cases in the family. Similar data were found in this study, showing that 34.65% (n=35) of the students said they had cases of cancer in the family, being 47.73% the grandparents, 45.45% (n=20) uncles / cousins, and of these 19.23% (n = 10) were in the stomach, 13.46 % (n = 7) in the breast and 9.61% (n=5) in the cervix. However, according to the same authors, the cancer was more frequent in the grandmothers 41.25% (n=10), followed by uncles 31.25% (n=25) and 12.50% (n=10) the mother, 50 % (n=5) of the cases located in the breast.

Rafael and Moura (2012) showed that 95.37% of the women had already performed the Pap smear and only 33.8% had not yet performed the exam in the last year, they also observed that the last exam was performed with superiority at shorter intervals than 1 year. In disagreement with the above data, the non-performance of the colposcycological examination was evident in 61.39% of the cases, and only 39% had already performed on average 4 exams, with the last examination on average 14 months ago.

Regarding the factors associated with death, the study revealed that 36.63% of the participants had cases of cancer death in the family, in which the predominance was by relatives at more advanced ages, such as grandparents, 52.78% (n=19), followed by uncles/cousins 44.44% (n=16). According to Machado et al. (2017), deaths are limited to women aged between 20 and 79 years, with morbidity and mortality being predominant in the fourth decade of life.

The data found in this study demonstrate the occurrence of cancer in the stomach, breast and cervix. Cases of death by cancer derived from the cervix location have shown a sharp decline almost everywhere in the last decades. This decrease was found in almost all the capitals, however, in the cities of the interior of the North and Northeast that there was an increase in cases of uterine cancer, this increase is justified due to the unfavorable financial situation of the women of these regions (Madeiro et al. 2016).

The limitations of this study have to do with the design itself that does not allow us to make a deeper approach to the participants, mainly to evaluate the pap smear exams. Another limitation was the refusals of the participants and the restriction of access to information, even when the researchers informed about the confidentiality of the information. However, there were important results when revealing that some risk factors addressed in the literature were also found through this research.

Knowledge of the risk factors for cervical cancer is essential for its prevention, especially in the young sexually active population. In the university context, according to the results of this study, there is a need to rethink the formation of the future health professional, its important role in articulating self-care attitudes and health promotion. Therefore, it appears that studies like this, aimed at future health professionals, can identify and change the direction of educational campaigns in higher education institutions, provide a reflection on the professional's own training and collaborate in the construction of quality education that will impact the practice of health care. Future works in this perspective are suggested, mainly those that can make a more in-depth analysis regarding the pap smear tests and trace a follow-up before, during and after educational intervention.

## 5. Conclusions

It is concluded that the Biomedicine students were in the range of 18 to 24 years old, were single and with family income of 2 to 3 minimum wages. It was possible to identify the early onset of sexual activity, multiple partners, the low frequency of condom use during all sexual intercourse, failure to perform the Papanicolaou preventive exam and lack of physical activity that are risk factors for the development of cervical cancer. It was also evidenced that the participants were not related to smoking, most did not use alcoholic beverages nor the use of oral contraceptives, and there were few reports of pregnancy and abortion.

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## References

ANJOS, S.J.S.B., et al. Fatores de risco para o câncer de colo do útero em mulheres reclusas. *Revista Brasileira de Enfermagem*. 2013, 66(4), 508-13. <https://doi.org/10.1590/S0034-71672013000400007>

- BERMUDEZ, A., BHATLA, N. and LEUNG, E. Cancer of the cervix uteri. *International Journal of Gynecology & Obstetrics*. 2015, **131**(2), 88-95. <https://doi.org/10.1016/j.ijgo.2015.06.004>
- BOTEGA, G.C.N., et al. A extensão universitária na prevenção do câncer de colo do útero em comunidades ribeirinhas no estado do Pará. *Revista Ciência em Extensão*. 2016, **12**(3), 22-36. [https://ojs.unesp.br/index.php/revista\\_proex/article/view/1285/1248](https://ojs.unesp.br/index.php/revista_proex/article/view/1285/1248)
- BRASIL. Ministério da Saúde. Conselho Nacional de Saúde. *Resolução nº 466, de 12 de dezembro de 2012*. Diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Diário Oficial da União da República Federativa do Brasil, 12 dez. 2012. Available from: [https://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466\\_12\\_12\\_2012.html](https://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html)
- CARVALHO, B.A., et al. Exame Papanicolaou: percepção de acadêmicas de enfermagem do Vale do Paraíba. *Revista Eletrônica de Enfermagem do Vale da Paraíba*. 2015, **1**(8), 43-62.
- DIAS, E.G., et al. Perfil socioeconômico e prática do exame de prevenção do câncer do colo do útero de mulheres de uma unidade de saúde. *Revista Saúde e desenvolvimento*. 2015, **7**(4), 135-46.
- DUARTE, S.J.H., et al. Fatores de risco para câncer cervical em mulheres assistidas por uma Equipe de Saúde da Família em Cuiabá, MT, Brasil. *Ciencia y Enfermeira*. 2011, **17**(1), 71-80. <http://dx.doi.org/10.4067/S0717-95532011000100008>
- INCA. Instituto Nacional de Câncer. *Estimativa 2016: incidência de câncer no Brasil*. Rio de Janeiro, RJ: INCA, 2016. Available from: <http://www.revistahcsm.coc.fiocruz.br/inca-lanca-a-estimativa-2016-de-incidencia-de-cancer-no-brasil/#:~:text=Para%202016%2C%20estima%2Dse%20a,a%2029%25%20do%20total%20estimado>
- MACHADO, H.S., SOUZA, M.C. and GONÇALVES, S.J.C. Câncer de colo de útero: análise epidemiológica e citopatológica no município de Vassouras-RJ. *Revista Pró-Universidade SUS*. 2017, **8**(1), 55-61.
- MADEIRO, A., et al. Tendências da mortalidade por câncer do colo do útero no Piauí, 2000-2011. *Cadernos Saúde Coletiva*. 2016, **24**(3), 282-85. <https://doi.org/10.1590/1414-462x201600030026>
- MELO, S.C.C.S., et al. Alterações citopatológicas e fatores de risco para a ocorrência do câncer de colo uterino. *Revista Gaúcha Enfermagem*. 2009, **30**(4), 602-8. <https://doi.org/10.1590/S1983-14472009000400004>
- MESQUITA, R.F. and MATOS, F.R.N. A abordagem qualitativa nas ciências administrativas: aspectos históricos, tipologias e perspectivas futuras. *Revista Brasileira de Administração Científica*. 2014, **5**(1), 7-22. <https://doi.org/10.6008/SPC2179-684X.2014.001.0001>
- MUNHOZ, M.P., et al. Efeito do exercício físico e da nutrição na prevenção do câncer. *Revista Odontológica de Araçatuba*. 2016, **37**(2), 9-16.
- RAFAEL, R.M.R. and MOURA, A.T.M.S. Exposição aos fatores de risco do câncer do colo do útero na estratégia de saúde da família de Nova Iguaçu, Rio de Janeiro, Brasil. *Cadernos Saúde Coletiva*. 2012, **20**(4), 499-505. <https://doi.org/10.1590/S1414-462X2012000400014>
- RIBEIRO, J.A., et al. Perfil sociodemográfico e clínico de mulheres com câncer do colo do útero. *Revista Eletrônica Gestão & Saúde*. 2015, **6**(2), 1367-81.
- RIBEIRO, J.C., and ANDRADE, S.R. Vigilância em saúde e a cobertura de exame citopatológico do colo do útero: revisão integrativa. *Texto & Contexto Enfermagem*. 2016, **25**(4), 1-12. <https://doi.org/10.1590/0104-07072016005320015>
- RIBEIRO, K.F.C., et al. Conhecimento, atitude e prática de acadêmicas de enfermagem sobre o exame de Papanicolaou. *Texto & Contexto Enfermagem*. 2013, **22**(2), 460-67. <https://doi.org/10.1590/S0104-07072013000200023>
- ROCHA, J.M., SANTOS, V.L.O. and CUNHA, K.J.B. Câncer do colo do útero: desafios para o diagnóstico precoce. *Revista Saúde em Foco*. 2014, **1**(2), 60-71.
- ROSA, M.I., et al. Papilomavírus humano e neoplasia cervical. *Cadernos de Saúde Pública*. 2009, **25**(5), 953-64. <https://doi.org/10.1590/S0102-311X2009000500002>
- SANTOS, U.M. and SOUZA, S.E.B. Papanicolaou: diagnóstico precoce ou prevenção do câncer cervical uterino? *Revista baiana de saúde pública*. 2013, **37**(4), 941-51. <https://doi.org/10.22278/2318-2660.2013.v37.n4.a420>
- SILVA, E.O., COELHO, M.C.V. and ATHAYDE, L. A. Alterações citológicas associadas a infecção pelo Papilomavirus Humano em mulheres atendidas em um hospital. *Revista Eletrônica Gestão & Saúde*. 2016a, **7**(1), 52-64.
- SILVA, G.A., et al. Modos de vida entre pessoas que tiveram câncer no Brasil em 2013. *Ciência & Saúde Coletiva*. 2016b, **21**(2), 379-388. <https://doi.org/10.1590/1413-81232015211.24722015>
- SILVA, G.M. and MONTEIRO, D.L.M. Nível de conhecimento dos acadêmicos de medicina sobre o HPV e o câncer do colo uterino. *Revista Hospital Universitário Pedro Ernesto*. 2016, **15**(4), 328-35. <https://doi.org/10.12957/rhupe.2016.31610>
- SIM. Sistema de Informação sobre Mortalidade (SIM). *Estimativas 2013: Incidência de câncer no Brasil*. Brasília: SIM, 2013. Available from: <https://www.inca.gov.br/campanhas/dia-nacional-de-combate-ao-cancer/2013/estimativa-2014-incidencia-de-cancer-no-brasil>
- THULER, L.C.S., AGUIAR, S.S. and BERGMANN, A. Determinantes do diagnóstico em estágio avançado do câncer do colo do útero no Brasil. *Revista Brasileira de Ginecologia e Obstetrícia*. 2014, **36**(6), 237-42. <https://doi.org/10.1590/S0100-720320140005010>
- VASCONCELOS, L.C., et al. Conhecimento de Mulheres a Respeito do Exame Papanicolaou. *Revista Uniciências*. 2017, **21**(2), 105-109. <https://doi.org/10.17921/1415-5141.2017v21n2p105-109>



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