







## Papanicolaou test and human papillomavirus: women's knowledge analysis

Exame de Papanicolau e papilomavírus humano: análise do conhecimento de mulheres

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### ABSTRACT

Human papillomavirus (HPV) is the most common sexually transmitted infection and occurs worldwide, especially in underdeveloped countries. It's also strongly associated with cervical cancer. Papanicolaou test is an important tool for early diagnosis of such cancer. Hence, our objective is to evaluate women's knowledge about Pap smear, as well as about HPV transmission and clinical manifestations. This literature integrative review used the following research platforms: PubMed/Medline, SciELO and Virtual Health Library (BVS). Among the articles analyzed there were a total of 7,441 women, which mean age was over 16 years. Twenty percent of those had only high school education. Regarding knowledge about HPV, only 22% of the participants knew about it and 27% reported knowing about the Papanicolaou exam. It is concluded that socioeconomic factors are extremely relevant because they influence the incidence of HPV in society, emphasizing that knowledge about the Pap test and its purpose directly influences women's acceptance to perform it.

**Keywords:** Human papillomavirus. Knowledge. Papanicolaou Test.

### RESUMO

O papilomavírus humano (HPV) é a infecção sexualmente transmissível mais comum e está presente no mundo todo, principalmente em países subdesenvolvidos, sendo o principal fator associado ao câncer de colo do útero. O exame de Papanicolau é importante para o diagnóstico precoce e detecção deste câncer. Desta forma, objetiva-se avaliar o conhecimento das mulheres a respeito do exame de Papanicolau, relacionado à transmissão e às manifestações clínicas do HPV. Trata-se de uma revisão integrativa de literatura, a qual englobou a busca nas seguintes plataformas de pesquisa: PubMed/Medline, SciELO e Biblioteca Virtual da Saúde (BVS). Dos artigos analisados, obteve-se um total de 7.441 mulheres que participaram do estudo com uma idade média maior que 16 anos, nas quais 20% das mulheres analisadas tinham apenas o nível médio. Com relação ao conhecimento sobre o HPV, apenas 22% das participantes sabiam sobre o tema e 27% relataram saber sobre o exame de Papanicolau. Conclui-se que os fatores socioeconômicos são de extrema relevância, pois influenciam na incidência do HPV na sociedade, ressaltando que o conhecimento sobre o teste de Papanicolau e sua finalidade influencia diretamente na sua aceitação em realizá-lo.

**Palavras-chave:** Conhecimento. Papilomavírus humano. Teste de Papanicolau.

## INTRODUCTION

Sexually transmitted infections (STI) occur through intimate contact or sexual intercourse (vaginal, anal, and/or oral) and are likely to interfere with people reproductive health, with potential effects in the female and male reproductive systems. Along with physical damages, STI also may affect psychological aspects and impair infected people self-esteem and lifestyle (Villegas-Castaño, 2016).

Since there a large amount of people affected, STI became a public health issue. Besides, there are difficulties for people to access adequate treatment, so it may be performed incorrectly or even not performed at all, which can lead to complications such as ectopic pregnancy, pelvic inflammatory disease (PID) and cancers (Pinto et al., 2018).

According to Magalhães et al. (2021), human papillomavirus (HPV) is the most common STI in the world, observed mainly in most developing countries. It affects people from 25 to 60 years old and is the main factor associated with cervical cancer (Cirino et al., 2010; Arbyn et al., 2020; Fontham et al., 2020).

In Brazil, cervical cancer is a significant disease, especially in the North and Northeast regions where mortality caused by this type of cancer hasn't decreased when compared to other Brazilian states. In the North, the occurrence was 11.07 deaths per 100,000 women; in the Northeast, it was 5.71 deaths per 100,000 women (INCA, 2019).

HPV is a double-stranded circular DNA virus capable of causing lesions in the skin and mucous membranes. There are more than one hundred types of this virus and they are classified as low oncogenic risk (HPV 6 and HPV 11) and high oncogenic risk (HPV 16 and HPV 18), the last one is the most prevalent in invasive cervical cancer cases. HPV infection occurs through skin abrasion, which creates microlesions in basal cells of cervix squamous epithelium where virus penetrates and release its DNA with viral proteins aid, initiating its replication (Santos et al., 2015).

Cervical epithelial cells undergo accelerated maturation and multiplication, which generates a benign neoplastic process. The exposure to the virus results in spontaneous resolution in most cases, but some infected individuals show virus retention, which may evolve to precursor lesions and cancer later. When clinical manifestations occur, warts or condyloma acuminata (known as “cockscomb”) are observed. In women they are found on the cervix, vagina, vulva, pubic region, perianal region and anus (INCA, 2016).

The cytopathological examination, commonly known as Pap smear or Pap test, screens for cervical cancer through a smear or scraping of exfoliated cells from the cervical vaginal epithelium and can be used for secondary prevention and pre-neoplastic lesions. The test has influence in cancer incidence, morbidity and mortality reductions, since early diagnosis is essential to combat this public health problem (Stumbar et al., 2019).

The presence of HPV alone is not entirely responsible for cervical carcinogenesis, but its persistence is associated with risk factors such as early initiation of sexual life, multiple sexual partners, individual's immune response, oral contraceptives usage duration, smoking, inadequate hygiene, as well as the presence of some other STI (Gonzaga et al., 2013).

The population's knowledge about HPV and Pap test can be affected due to socioeconomic factors, since individuals with lower purchasing power have, mostly, low schooling. In addition to other risk factors, such as early onset of sexual activity and multiple partners, it can negatively influence the search for prevention measures due to the difficulty in changing population lifestyle (Abreu et al., 2018).

Thus, the objective of this study is to evaluate women knowledge regarding Pap test and HPV transmission and clinical manifestations.

## MATERIAL AND METHODS

An integrative literature review was used to achieve the proposed objective, guided by the following question: “Are there differences in women's knowledge about Pap smear and human papillomavirus?”. The study has a retrospective and temporal character, since the data collection was carried out in October 2019 and referred to the last six years at the time of data collection. This period was determined for a better representation of the current reality. The research process included the search for articles in electronic journals accessed through the platforms PubMed/Medline, SciELO and Virtual Health Library (BVS), using descriptors “Papilomavírus Infecção e Conhecimento” in Portuguese, and its correlates in English “Papillomavirus infections and knowledge”.

The search and selection of articles were carried out independently by three reviewers and by a fourth reviewer whenever there was no consensus on the inclusion/exclusion of some work. Thus, the titles and abstracts of the articles were analyzed to exclude studies without relevance to the aim of the present study. Later, abstracts were systematized through a spreadsheet (Microsoft Excel 2013) according to the results obtained in the analyzed articles. After selecting the relevant abstracts, articles were read entirely to assess the inclusion criteria defined for this review. The selected articles were organized in a table considering author and year, country of study, number of participants, age, religion, education level and questions related to knowledge about HPV and Pap test.

Inclusion criteria considered articles that addressed the topic of HPV and women, level of knowledge about Pap test, transmission and clinical manifestations of the virus, as well as articles considered original, published in Portuguese, English and Spanish between 2014 and 2018. The exclusion criteria rejected publications in the form of thesis, dissertation, editorial, newspaper article, integrative or systematic literature review articles, letter to the editor, reflective study, and experience report, as well as studies that did not answer the guiding question of the integrative review.

## RESULTS AND DISCUSSION

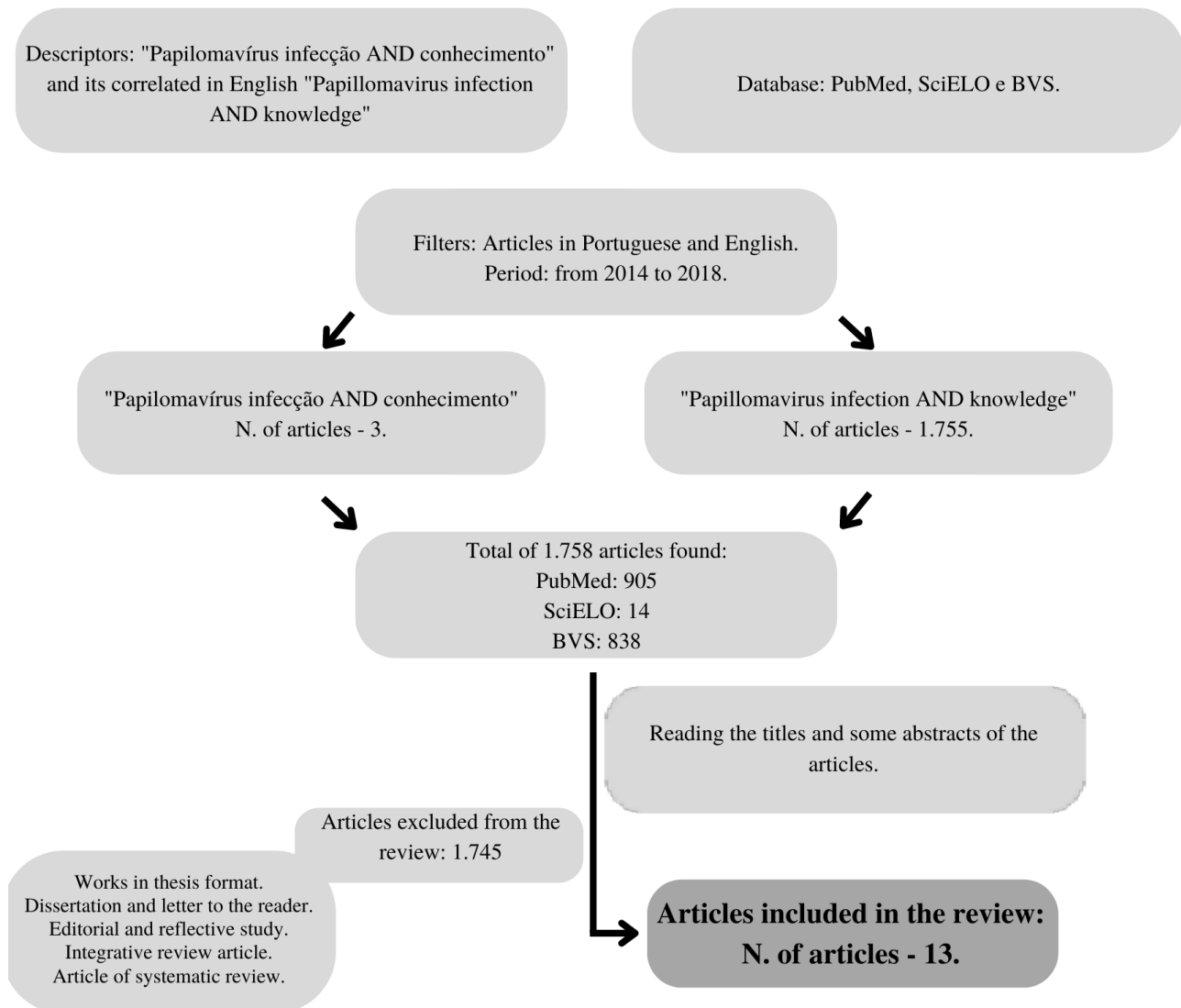
After the search carried out in different databases according to the previously established criteria, 13 articles were analyzed (Figure 1), from which a total of 7,441 women participants were accessed, with average age above 16 years.

Most studies were carried out in Brazil (47%), followed by India (11.7%) and other countries (Sudan, United Kingdom, Panama, South Africa, Nigeria, Tunisia, Haiti, and Gabon). Regarding religious beliefs, 28% of the 7,441 participants (2,120/7,441) were Hindu (Table 1).

Regarding the participants, it was found that 19% (1,448/7,441) had secondary education, 20% (1,481/7,441) were undergraduates and 7% (532/7,441) reported having only elementary education. Regarding knowledge about HPV, only 22% (1,686/7,441) had already heard about this virus and only 26% (1,945/7,441) reported having heard about cervical cancer, nevertheless 30% (2,265 /7,441) knew about the correlation between cervical cancer and HPV and 26% (1,950/7,441) knew that HPV is a STI. Among all participants, 2,0121 (27%) reported knowing about Pap smear exam, however, only 18% (1,380) knew about its real purpose (Table 1).

Table 2 shows that, among 6 articles that addressed questionnaire on transmission and clinical manifestations of HPV, only 74% the participants (2,301/3,093) knew about its forms of transmission, 22% (694/3,093) described HPV as asymptomatic and 5% (157/3,093) said that this virus causes warts.

Results demonstrate that most studies were carried out in underdeveloped countries, in which there is higher prevalence of HPV infection, proving what was stated by Rodrigues et al. (2014). It was also noted that participants' number varied substantially among studies, ranging from 2000 participants in Indian research (Sabeena et al., 2015) to 170 participants in a study carried out in the United Kingdom, which had a lower impact considering the territory where it took place (Sherman et al., 2015).



*Figure 1.* Flowchart of articles search and selection process.  
Source: The authors.

Regarding age range, there was a predominance of people aged 11 years and older observed in Albuquerque et al. (2014), Pimenta et al. (2014) and Ifediora et al. (2018). As highlighted by Gamaoun (2018), studies in earlier age groups address the rapid changes in lifestyle induced by globalization, given that women sexual behavior, especially among the younger ones, shows more liberal practices compared to previous generations. These changes may lead to an increase in STIs prevalence among younger populations.

In comparison, other studies, such as Sherman et al. (2015), Vamos et al. (2015) and Mofolo et al. (2018), interviewed participants aged at least 18 years, which still represents a sample of young women, despite not belonging to early age group.

According to Doshi et al. (2015), Sabeena et al. (2015) and Almobarak et al. (2016), in terms of religion, Middle Eastern countries had a greater predominance of Hindus and Muslims. In other countries, such as Brazil, religious beliefs were not informed (Albuquerque et al., 2014; Pimenta et al., 2014; Burlamaqui et al., 2017). We should recall the role of religious leaders in informing its congregation about sex education, the risks of cervical cancer and even prevention aspects, especially for those women who do not have the opportunity to attend schools or simply did not have access to sex education, as already highlighted by Ifediora et al. (2018). However, involving religious institutions as co-participants in the dissemination and awareness of care inherent to women's health does not exempt the government from its responsibility with human health.

**Table 1**  
General data of the articles qualified for the composition of the integrative review results.

Author / Year / Country	NP	Age	Religion	EL	A1	A2	A3	A4	A5
Almobarak et al. (2016) Sudão	500	14-58	95.8% Muslim	78.8% ES	87.8% (CC)	46.6%	1.4%	87.8%	NI
Sherman et al. (2015) Reino Unido	170	18-22	NI	16.5% EE	75% (HPV)	27%	21%	NI	NI
Sabeena et al. (2015) Índia	2.000	16-65	96.3% Hindu	26.6% EE	0% (HPV)	0%	0%	2.4%	NI
Doshi et al. (2015) Índia	233	17-24	83.3% Hindu	US	NI	65.24%	63%	NI	NI
Gamaoun (2018) Tunísia	500	18-62	NI	NI	38.7%	NI	NI	NI	68.1%
Burlamaqui et al. (2017) Brasil	194	NI	NI	ES	NI	91.2%	NI	NI	NI
Assoumou et al. (2015) Gabão	452	>16	NI	63.7% US	91.6% (CC); 8.8% (HPV)	65%	70%	65.1%	85.7%
Pimenta et al. (2014) Brasil	1.470	11-95	NI	44.7% EE	51% (HPV)	65.3%	81.5%	NI	NI
Albuquerque et al. (2014) Brasil	493	11-69	NI	NI	NI	NI	NI	94.5%	21.7%
McCarthy et al. (2017) Haiti	410	≥18	70% PC	64% more than EE	29% (HPV); 98% (CC)	4%	NI	37%	NI
Vamos et al. (2015) Panamá	324	18-44	NI	55.6% HS	70.1% (HPV)	60.7%	NI	73%	33.6%
Mofolo et al. (2018) África do Sul	373	18-25	NI	US	85.8% (CC); 62.5% (HPV)	15.4%	66.5%	80.9%	80.9%
Ifediora et al. (2018) Nigéria	321	13-25	NI	HS	41.8% (CC); 22% (HPV)	43.1%	NI	23.2%	43.1%

Source: The authors.

Notes: NP – Number of participants; EL - Educational level; A1 - Heard about Cervix cancer or HPV; A2 - Knew about the CC X HPV relationship; A3 – Knew about being an STI/STD; A4 - Knew about the PAP test; A5 - Knew the purpose of the PAP test; NI – Not informed; US – University students; EE – Elementary education; HS – High School; PC - Protestants or other Christian religions.

**Table 2**  
Results on the knowledge about HPV transmission and clinical manifestations.

Author/Year	Number of Participants	Transmission (Sexual relationship)	Clinical manifestations
Gamaoun (2018)	500	53.5%	Not informed.
Burlamaqui <i>et al.</i> (2017)	194	92.8%	88% (warts)
Vamos <i>et al.</i> (2015)	324	66.3%	65.1% (asymptomatic) 48.7% (genital warts)
Pimenta <i>et al.</i> (2014)	1.470	81.5%	Not informed.
Mofolo <i>et al.</i> (2018)	372	78.2%	84.6% (asymptomatic)
Doshi <i>et al.</i> (2015)	233	66.5%	Not informed.

Source: The authors.

As for schooling, a large percentage of people with a high school education was observed, and it is necessary to point out that the level of schooling is an important variable to be considered since the participants who did not have satisfactory knowledge about HPV had only 5 to 8 years of formal study, as reported by Pimenta et al. (2014). This corroborates the data presented by Mofolo et al. (2018), which reported that women attending higher education had greater knowledge about HPV.

Regarding knowledge about cervical cancer, Almobarak et al. (2016) presented a positive response since the participants were university students. On the other hand, Sabeena et al. (2015) showed that the participants had never heard about HPV and were not aware of its correlation with cervical cancer, as most of them had only primary school. Based on this, we can infer that women with higher levels of education have greater access to information and are more interested in seeking information from reliable sources, such as health professionals and scientific literature, in addition to adequately understand the information. As already highlighted by Abudukadeer et al. (2015), the understanding of the subject was lower in women with lower educational levels and with increasing educational level, the level of information increased.

This aspect is repeated according to Assoumou et al. (2015) and Doshi et al. (2015), as university women had more information about HPV, the correlation of this virus with cervical cancer and that it was considered a sexually transmitted infection, while participants with low education did not have as much knowledge on the subject. In addition, undergraduate participants had greater clarity regarding the form of transmission and clinical manifestations of HPV, following the same pattern demonstrated by Burlamaqui et al. (2017) and Mofolo et al. (2018). On the other hand, participants with a lower educational level were not able to provide information on this subject.

Regarding the Pap test, results show that most women did not know about the Pap smear and its purpose, once again emphasizing the importance of educational level for knowledge basis since education is associated with a greater awareness of the Pap smear. In addition, it was observed that women with a low level of education and living in rural areas had a low rate of knowledge about the test (Almobarak et al., 2016).

Another important fact observed was that the lower the level of education and socioeconomic profile of the women studied, the lower their acceptance of taking the test. Such results are noticeable in articles such as Assoumou et al. (2015) and Almobarak et al. (2016) in which women with a higher average age, who routinely underwent the Pap smear, and who had performed a greater number of gynecological exams, were characterized as women who lived in urban areas, specifically in the city center, and had a higher socioeconomic level, as well as a higher level of knowledge about the Pap smear, in addition to a higher educational level.

Pimenta et al. (2014), Doshi et al. (2015), Vamos et al. (2015), Burlamaqui et al. (2017), Gamaoun (2018) and Mofolo et al. (2018) found that the participants knew that HPV transmission occurs through sexual intercourse, however, it was not explained whether they knew that the virus infection does not only happen through intimate genital-genital contact but also through genital-anal and genital-oral contacts.

Based on this, complementing what McCarthy et al. (2017) exposed, the promotion of an early diagnosis of the infection, along with actions to control and prevent the disease, through campaigns and lectures for the population, especially women, is essential to develop the perception of this virus high risk, thus directly influencing the early detection of cervical cancer or its pre-neoplastic lesions and women's acceptance to take the exam, favoring intervention and/or treatment.

## CONCLUSION

We conclude that there are marked differences regarding the level of knowledge about HPV and Pap smear test associated with socioeconomic factors since women with higher purchasing power and educational level have more adequate information on the topic addressed. Hence, women with economic vulnerability and low levels of education need health promotion actions, mainly focused on the form of transmission and clinical manifestations of HPV, since there is extremely relevant



information, as they influence the incidence of HPV in society and the observance of Pap smear screen test. The main limitation of this review is the fact that most articles analyzed were carried out using scientifically non-standardized questionnaires, so the answers obtained could underestimate or overestimate the knowledge level about HPV and Pap smear.

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