



PARENTS' AND ADOLESCENTS' KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO IMMUNIZATION IN ADOLESCENCE: SYSTEMATIC REVIEW

Conhecimento, atitudes e práticas de adolescentes e pais sobre imunização na adolescência: revisão sistemática

Conocimiento, actitudes y prácticas de adolescentes y padres sobre la inmunización en la adolescencia: revisión sistemática

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ABSTRACT

Objective: To describe the factors associated with parents' and adolescents' knowledge, attitudes and practices related to immunization in adolescence. **Methods:** Systematic review of the literature carried out from March 2017 to March 2018 through three search strategies in the CAPES Portal and VHL using the descriptors: adolescent, immunization, health knowledge, attitudes and practices, vaccination and communicable disease control. The eligibility criteria used were: Scientific articles published in English, Portuguese and Spanish from 2008 to 2018. After the searches, 23 articles were included in the final analysis. **Results:** The factors directly associated with immunization in adolescence were: sex, religion, race/ethnicity, age, place of residence, beliefs about vaccine efficacy and safety, fear of adverse effects, private health insurance and recommendation by health professionals. In Brazil, some factors differ from those found in other countries, such as higher rates of vaccination against HPV among girls and Hepatitis B among those with lower per capita income. This can be explained by the fact that Brazil has economic and social realities and a health system that differ from what is observed in other countries. **Conclusion:** Socio-demographic factors such as sex, race/ethnicity, religion and age were associated with knowledge, attitudes and practices related to immunization in adolescence. Socioeconomic and psychosocial factors, such as insecurity, fear, concerns about the cost of the vaccine, having received advice and guidance on vaccination by a health professional were also associated.

Descriptors: Adolescent; Vaccination; Immunization; Health Knowledge, Attitudes and Practice; Communicable Disease Control.

RESUMO

Objetivo: Descrever os fatores associados aos conhecimentos, atitudes e práticas de adolescentes e seus pais frente à imunização na adolescência. **Métodos:** Revisão sistemática da literatura, realizada nos meses de março de 2017 a março de 2018, por meio de três estratégias de busca no Portal CAPES e BVS, através dos descritores: adolescente; imunização; conhecimentos; atitudes e práticas em saúde; vacinação e controle de doenças transmissíveis. Os critérios de elegibilidade utilizados foram: artigos científicos publicados nos idiomas inglês, português e espanhol, nos anos de 2008 a 2018. Após as buscas, incluíram-se 23 artigos na análise final. **Resultados:** Verificaram-se os seguintes fatores diretamente associados à imunização na adolescência: sexo; religião; raça/etnia; idade, local de residência; crenças sobre a eficácia e segurança da vacina; medo dos efeitos adversos; possuir convênio privado de saúde e recomendação pelos profissionais de saúde. No Brasil, alguns fatores diferem dos outros países, como a maior vacinação contra o HPV entre as meninas e contra a Hepatite B entre aqueles com menor renda per capita. Isto pode ser explicado porque o Brasil tem uma realidade econômica, social e um sistema de saúde diferente do que se observa nos demais países. **Conclusão:** Fatores sociodemográficos como sexo, raça/etnia, religião e idade foram associados ao conhecimento, atitudes e práticas acerca da imunização na adolescência. Fatores socioeconômicos e psicossociais, como insegurança, medo, preocupações com o custo da vacina, ter recebido recomendação e orientação sobre vacinação por um profissional de saúde também demonstraram associação.

Descritores: Adolescente; Vacinação; Imunização; Conhecimentos, Atitudes e Prática em saúde; Controle de Doenças Transmissíveis.



RESUMEN

Objetivo: Describir los factores asociados con los conocimientos, actitudes y prácticas de adolescentes y sus padres sobre la inmunización en la adolescencia. **Métodos:** Revisión sistemática de la literatura realizada en los meses entre marzo de 2017 y marzo de 2018 a través de tres estrategias de búsqueda en el Portal CAPES y BVS y con los descriptores adolescente; inmunización; conocimientos; actitudes e prácticas en salud; vacunación y control de enfermedades transmisibles. Los criterios de elegibilidad utilizados fueron: artículos científicos publicados en los idiomas inglés, portugués y español en los años entre 2008 y 2018. Se han incluido 23 artículos en el análisis final. **Resultados:** Se verificaron los siguientes factores directamente asociados con la inmunización en la adolescencia: el sexo, la religión; la raza/etnia; la edad; el local de vivienda; las creencias sobre la eficacia y la seguridad de la vacuna; los miedos de los efectos adversos; el hecho de tener seguro privado de salud y recomendación de los profesionales sanitarios. En Brasil algunos factores son distintos de otros países como, por ejemplo, la mayor vacunación contra el Virus del Papiloma Humano (VPH) entre las niñas y contra la Hepatitis B entre aquellos con menor renta per cápita. Eso se puede explicar porque Brasil tiene una realidad económica, social y un sistema de salud distinto de los demás países. **Conclusión:** Los factores sociodemográficos como el sexo, la raza/etnia, la religión y la edad se asociaron con el conocimiento, las actitudes y las prácticas de la inmunización en la adolescencia. Los factores socioeconómicos y psicosociales como la inseguridad, el miedo, las preocupaciones con el coste de la vacuna y el hecho de haber recibido recomendación y orientación sobre vacunación por un profesional sanitario también demostraron asociación.

Descriptores: Adolescente; Vacunación; Inmunización; Conocimientos, Actitudes y Práctica en Salud; Control de Enfermedades Transmisibles.

INTRODUCTION

Adolescence is influenced by several social, psychological, environmental and economic factors, which are important for transforming the adolescent into a social being. Despite government efforts to focus on adolescent health care, the morbidity and mortality profile of this population group could be avoided through health promotion and disease prevention measures. Among these prevention measures, immunization through vaccines stands out as an effective way to prevent vaccine-preventable disease⁽¹⁾.

Some of the vaccines recommended for adolescents by the Centers for Disease Control and Prevention (CDC) are: influenza, dTpa (diphtheria, tetanus and pertussis), HPV (Human Papilloma Virus) and meningococcal quadrivalent vaccines⁽²⁾. In Brazil, the HPV vaccine is provided by SUS to girls aged 9 to 15 years and boys aged 11 to 15 year. The serogroup C meningococcal vaccine is provided to adolescents aged 12 and 13 years^(3,4). In addition to the two previously mentioned vaccines, there are also: the Hepatitis B vaccine, the triple viral vaccine, and the dT (adult diphtheria and tetanus) vaccine, which must be administered every 10 years; the influenza vaccine, which is administered annually and provided by SUS only to risk groups; and the yellow fever vaccine, which is administered to travelers and people living in areas recommended by the Ministry of Health⁽⁵⁾.

Despite government recommendations and efforts to improve vaccination adherence and coverage among adolescents, these factors are influenced by historical aspects that have been present since the first vaccines in the world, which received numerous criticisms and little acceptance among the population. Among these historical factors, there is concern about the safety of vaccines, which is greater than the recognition of the benefits that protection through vaccination can have⁽⁶⁾.

With regard to the HPV vaccine, which has been available in Brazil since 2014, the concern with its safety, especially in relation to adverse events, is one of the factors that influence and justify its low coverage. Statistical data confirming such low adherence show that approximately 5.5 million Brazilian girls have an incomplete HPV vaccination scheme⁽⁷⁾.

The combination of scientific and popular knowledge about immunization is critical because beliefs can influence attitudes towards vaccination. In this regard, health education actions, including those implemented in the school environment, would assist in the adoption of good practices. Thus, it is necessary to know which factors strongly influence immunization in adolescence so that health promotion actions can be implemented⁽⁸⁾.

The objective of the present study was to describe the factors associated with parents' and adolescents' knowledge, attitudes and practices related to immunization in adolescence.

METHODS

A systematic review of the literature was carried out from March 2017 to March 2018 through a search on the Journals Portal of the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES*) and on the Virtual Health Library (VHL).

Three search strategies were used: the first, in the CAPES Portal, was the use of the following descriptors: 1- adolescent AND vaccination. The second strategy was used in the VHL (MEDLINE and LILACS) and consisted of the following descriptors: 2-adolescent AND vaccination AND communicable disease control. The third strategy consisted of the following descriptors: 3- adolescent AND immunization AND health knowledge, attitudes, practice. The following research question was considered: What are the factors associated with the adolescents' and parents' knowledge, attitudes and practices related to vaccination in adolescence?

The following eligibility criteria were used: scientific articles published in English, Portuguese and Spanish from 2008 to 2018. Inclusion criteria were: scientific studies of individuals aged 10 to 19 years and that answered the research question. Exclusion criteria were: articles without an abstract, review articles, qualitative studies, questionnaire validation studies and studies not carried out with adolescents and/or their parents.

The three search strategies yielded 1912 articles. After applying the filters, only 1534 articles remained. After reading the titles and abstracts, 50 articles were selected for full reading. Of these, 23 were included in the final sample for review. Figure 1 shows the synthesis of the article search and selection process. The selection of the articles was independently performed by two researchers. Divergences regarding the selection of the articles for analysis were jointly discussed by the researchers.

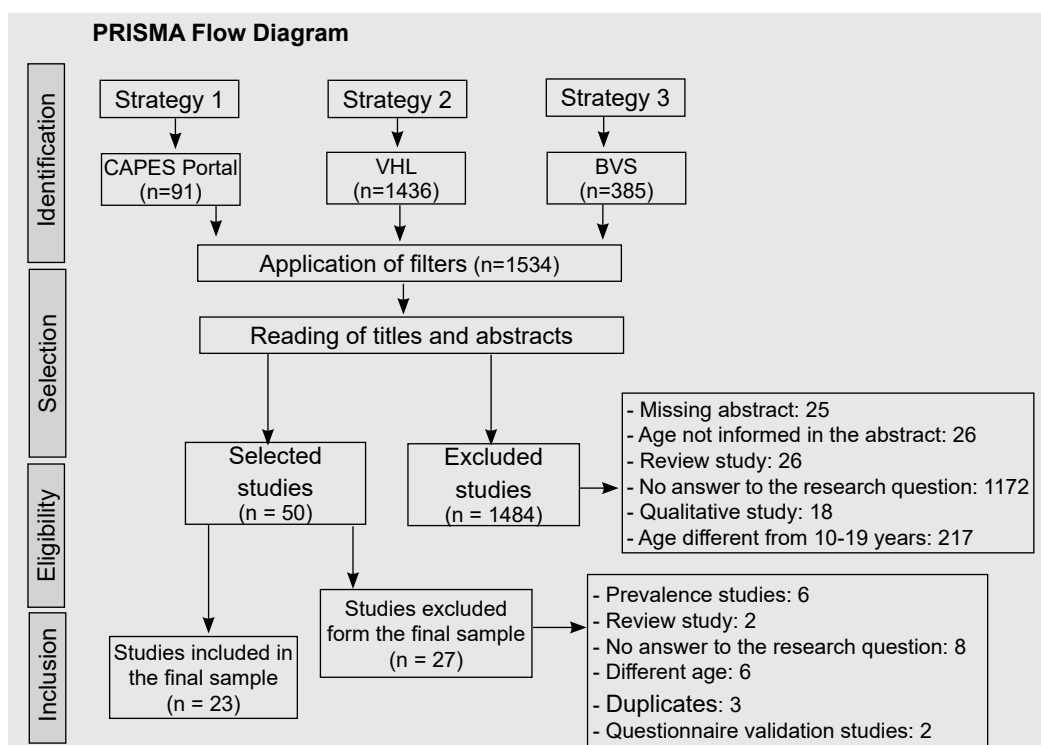


Figure 1- Study selection flow diagram.

Odds Ratio (OR), prevalence ratio (PR) and p value measure using the chi-squared test were used to check for associations between the factors analyzed and the knowledge, attitudes and practices related to immunization.

RESULTS

The 23 articles selected for analysis were published between 2009 and 2017, and the majority was published in English – only two were published in Portuguese. Most of the studies were carried out in the United States (eight). However, other countries were also identified: Brazil, Netherlands, Italy, Greece, China, Turkey, Belgium, India and Sweden. Most studies were cross-sectional (22 articles) and the majority was carried out with adolescents (Chart I).

Chart I - Distribution of the analyzed studies by target population, author/year, sample, age, country.

Target population	Author (Year)	Sample n	Age	Country
Adolescents' parentes	Zhang et al., 2013 ⁽⁹⁾	2895	11-17	China
	Gilkey et al., 2016 ⁽¹⁰⁾	1495	11-17	United States
	Coyne-Beasley et al., 2013 ⁽¹¹⁾	1281	11-17	United States
	Mukherjee et al., 2015 ⁽¹²⁾	778	11-15	India
	Seven et al., 2015 ⁽¹³⁾	368	10-13	Turkey
	Reiter et al., 2014 ⁽¹⁵⁾	2786 parents of girls	13-17	United States
	Bianco et al., 2014 ⁽¹⁴⁾	566 parents of boys	10-14	Italy
	Taylor et al., 2014 ⁽¹⁷⁾	758 parents of boys	11-17	United States
Parents/children	Donahue et al., 2014 ⁽¹⁶⁾	779 parents of boys	11-17	United States
	Kester et al., 2013 ⁽²⁸⁾	501 mothers and girls	14-17	United States
	Van Keulen et al., 2014 ⁽²⁶⁾	642 girls and 952 mothers	13-14	Netherlands
	Shao et al., 2015 ⁽³¹⁾	101 boys and 35 fathers	13-19	United States
Adolescents	Choi et al., 2014 ⁽²⁹⁾	2017 mothers and 2167 girls	11-18	China
	Francisco et al., 2015 ⁽²³⁾	702	11-19	Brazil
	Friedrich et al., 2016 ⁽¹⁸⁾	390	11-18	Brazil
	Kreuger et al., 2017 ⁽²⁰⁾	390	12-17	Brazil
	Gottvall et al., 2009 ⁽¹⁹⁾	608	14-19	Sweden
	Vaidakis et al., 2017 ⁽²¹⁾	4507	17	Greece
	Devroey et al., 2013 ⁽²²⁾	186	14-17	Belgium
	Mollers et al., 2014 ⁽²⁷⁾	2989 girls	16-17	Netherlands
	Reiter et al., 2013 ⁽³⁰⁾	1951 girls	14-17	United States
	Giambi et al., 2014 ⁽²⁴⁾	1738 girls	16-17	Italy
Bowyer et al., 2014 ⁽²⁵⁾	650 girls	16-18	England	

Eight articles analyzed immunization only in female adolescents, four assessed immunization only in male adolescents, and eleven articles analyzed immunization in adolescents of both sexes. In studies that assessed parents' knowledge, attitudes and practices, there was a greater participation of mothers⁹⁻¹⁷. Although the article search considered immunization in general, nineteen of the twenty-three studies assessed only the vaccine against HPV.

Sex was associated with knowledge about vaccination – male adolescents had less knowledge about HPV vaccine than female adolescents^(13,8-20). The areas in which adolescents lived were also associated with knowledge about vaccination as adolescents who lived in urban areas had more knowledge about the subject⁽²¹⁾. Other factors associated with knowledge about the HPV vaccine were: high levels of parental education, receipt of information from health professionals, parents of adolescents aged 16 and 17, studying in private schools, and having private health insurance (Chart II).

Chart II - Distribution of the analyzed studies according to factors associated with greater knowledge about immunization by author/year, odds ratio (OR), significance value (p) and type of vaccine.

Factors associated with greater knowledge about immunization	Author/year	OR	p	Type of vaccine
Low levels of parental education	Bianco et al., 2014 ⁽¹⁴⁾	1.71	-	HPV
	Giambi et al., 2014 ⁽²⁴⁾	3.76	-	HPV
Receipt of information from physicians	Bianco et al., 2014 ⁽¹⁴⁾	1.71	-	HPV
Residents of urban áreas	Vaidakis et al., 2017 ⁽²¹⁾	1.45	-	HPV
Parents of adolescents aged 16-17 years	Coyne-Beasley et al., 2013 ⁽¹¹⁾	1.82	-	Meningococcal
Studying in a private school	Coyne-Beasley et al., 2013 ⁽¹¹⁾	1.95	-	Meningococcal
Having a private health insurance	Coyne-Beasley et al., 2013 ⁽¹¹⁾	1.90	-	Meningococcal
Female sex	Seven et al., 2015 ⁽¹³⁾	-	<0.05	HPV
	Friedrich et al., 2016 ⁽¹⁸⁾	-	0.000	HPV
	Kreuger et al., 2017 ⁽²⁰⁾	-	<0.05	HPV
	-	-	<0.001	HPV

HPV: Human Papillomavirus; OR: odds ratio

The factors associated with attitudes and practices related to immunization most frequently cited by the studies were: sex, religion, race and ethnicity, monthly income, high levels of parental education, knowledge about the vaccine, vaccination recommendation by a health professional, private health insurance, and cost of the vaccine (Chart III).

Chart III - Distribution of the analyzed studies according factors associated with immunization attitudes and practices by author/year, odds ratio (OR), significance value (p), prevalence ratio (PR) and type of vaccine.

Factors associated with best immunization attitudes and practices	Author (year)	OR	p	PR	Type of vaccine
Contact with/recommendation from a health care professional	Zhang et al., 2013 ⁽⁹⁾	2,47	-	-	HPV
	Gilkey et al., 2016 ⁽¹⁰⁾	9,31	-	-	HPV
	Coyne-Beasley et al., 2013 ⁽¹¹⁾	3,03	-	-	Meningococcal
	Mukherjee et al., 2015 ⁽¹²⁾	2,34	-	-	Vaccines in general
	Bianco et al., 2014 ⁽¹⁴⁾	1,49	-	-	HPV
	Reiter et al., 2014 ⁽¹⁵⁾	1,70	-	-	HPV
	Taylor et al., 2014 ⁽¹⁷⁾	2,22	-	-	HPV
	Francisco et.al., 2015 ⁽²³⁾	-	-	2,27	Hepatitis B
	Bowyer et al., 2014 ⁽²⁵⁾	-	0,02	-	HPV
	Van Keulen et al., 2013 ⁽²⁶⁾	-	<0,001	-	HPV
	Kester et al., 2013 ⁽²⁸⁾	-	0,013	-	HPV
	Reiter et al., 2013 ⁽³⁰⁾	4,07	-	-	HPV
Shao et al., 2015 ⁽³¹⁾	2,5	-	-	HPV	
Religion					
Hinduism	Mukherjee et al., 2015 ⁽¹²⁾	1,00	-	-	Vaccines in general
Christianism	Bowyer et al., 2014 ⁽²⁵⁾	-	0,002	-	HPV
Not being Protestant Catholic	Van Keulen et al., 2013 ⁽²⁶⁾	-	<0,001	-	HPV
	Mollers et al., 2014 ⁽²⁷⁾	1,2	-	-	HPV
Ethnicity/Race					
Non-Hispanic/Afro American	Coyne-Beasley et al., 2013 ⁽¹¹⁾	2,17	-	-	Meningococcal
Black	Taylor et al., 2014 ⁽¹⁷⁾	2,08	-	-	HPV
White	Kester et al., 2013 ⁽²⁸⁾	-	<0,001	-	HPV
Sex					
Male	Seven et al., 2015 ⁽¹³⁾	-	<0,05	-	HPV
Female	Kreuger et.al., 2017 ⁽²⁰⁾	-	<0,05	-	HPV
Monthly income					
Low income	Francisco et.al., 2015 ⁽²³⁾	-	-	1,16	Hepatitis B
High income	Choi et al., 2014 ⁽²⁹⁾	1,63	-	-	HPV
Having a private health insurance	Mukherjee et al., 2015 ⁽¹²⁾	2,20	-	-	Vaccines in general
	Reiter et al., 2014 ⁽¹⁵⁾	3,00	-	-	HPV
	Reiter et al., 2013 ⁽³⁰⁾	3,67	-	-	HPV
Parents' high levels of education	Mollers et al., 2014 ⁽²⁷⁾	1,3	-	-	HPV

HPV: Human Papillomavirus; OR: odds ratio; PR: prevalence ratio

As for the other analyzed vaccines, such as the meningococcal vaccine, the factors associated with knowledge and acceptability are not different from those reported for the HPV vaccine^(11,12,22,23).

DISCUSSION

Regarding the sociodemographic factors associated with knowledge about vaccination, male adolescents had less knowledge about the HPV vaccine than female adolescents in studies carried out in Greece, Sweden and Brazil⁽¹⁸⁻²¹⁾. As for the sex of parents of adolescents in Turkey, mothers had more knowledge about the vaccine than fathers; however, in the present study, both mothers and fathers had a very low level of knowledge⁽¹³⁾.

These findings demonstrate greater knowledge among women (either female adolescents or mothers), which is probably related to women's greater interest in health issues in Brazil and in other countries.

Another sociodemographic factor presented in one of the studies was the place of residence, i.e., adolescents who lived in urban areas had more knowledge about the HPV vaccine⁽²¹⁾. Additionally, parents with high levels of education had more knowledge about the vaccine as well^(14,24).

As for the factors associated with the meningococcal vaccine, parents of adolescents who studied in private schools and had private health insurance presented better knowledge about the vaccine. In addition, age was also associated, i.e., parents of older adolescents (16-17 years old) had more knowledge than parents of younger adolescents⁽¹¹⁾.

With regard to the sociodemographic factors associated with the intention and practice of vaccination, religion was addressed in different ways in several studies. While one study found a greater vaccination coverage among Christian adolescents, another study in the Netherlands showed that non-Protestants were more likely to be vaccinated^(25,26). Still in the Netherlands, another study showed that the majority of adolescents vaccinated against HPV were Catholic and the minority were Protestants⁽²⁷⁾. On the other hand, a study in India found that Hinduism was more associated with completeness of adolescents' immunization schedule; however, this result may have been influenced by the country where the study took place, in which the majority of the population follows Hinduism⁽¹²⁾.

Race/ethnicity was also associated with attitudes and practices related to vaccination – Black ethnicity related to non-vaccination against HPV in adolescents^(25,28). In contrast, a study carried out in the United States with parents of male adolescents demonstrated that Black and Hispanic parents were more likely to initiate vaccination schedule in their children than White parents⁽¹⁷⁾.

The sample size and the analysis of the aforementioned studies were similar. The only difference was related to the characterization of the sample. The studies that found an association between Black ethnicity and non-vaccination were carried out with female adolescents, and the study that presented different results was carried out with male adolescents^(17, 25,28).

Thus, race seemed to influence both sexes differently. The studies that found White adolescents more likely to have received the vaccine argue that this is because access to the vaccine and knowledge about the subject are greater among these people and are influenced by socioeconomic factors. The discrepancy between the findings may suggest that the reasons for non-vaccination are different between the sexes so that the level of knowledge and the socioeconomic status seem to exert less influence among the parents of male adolescents^(17, 25,28).

Having or not having a private health insurance was associated with vaccination of adolescents in the studies. This is because in several countries, such as the United States, China, India and Turkey, the HPV vaccine and other vaccines are not provided for free by the government. The non-provision of vaccines for free may hinder adherence to vaccination in these countries, especially if the cost of the vaccine is high and/or if parents cannot afford it^(12,13,17). A study in Hong Kong also confirmed these results by demonstrating that families with a higher monthly income were more likely to accept the vaccine⁽²⁹⁾.

On the other hand, there is a higher prevalence rate of hepatitis B vaccination among adolescents with lower per capita household income in Brazil. This finding may suggest that because this vaccine is provided free of charge by SUS, people of low socioeconomic status have better access to vaccination in Brazil than in the other countries mentioned above. In addition, the most economically advantaged people in these countries may not think they are vulnerable to infectious diseases⁽²³⁾.

Concerns about safety and efficacy and fear of adverse events have been associated with attitudes related to the HPV vaccine and vaccination in general. Adolescents and their parents reported that these factors constitute a barrier to vaccination, thus suggesting that information disseminated in the media, in schools, and by lawmakers has not been sufficient to positively influence attitude towards immunization^(12,24-26,19, 23).

Another source of information that strongly influences parents' decision-making about whether or not to vaccinate their children is the health care professional. Ten of the 23 studies found an association of physicians' and other professionals' recommendation to vaccinate children with the attitude and practice related to vaccination. This finding shows that parents' lack of knowledge about vaccination leads to the need to seek information and recommendations from health care professionals. This fact suggests the strong influence that these professionals have on vaccination adherence. Thus, health care professionals should be encouraged and trained by the Ministry of Health to recommend completeness of the vaccination schedule and hence promote the health of adolescents^(11,12,14,17-20,29,30).

In contrast to the positive association of medical recommendations with vaccination, a study carried out in the United States with 101 male adolescents aged 13 to 19 years showed that those who visited a physician, were regularly tested, and used condoms regularly were less interested in the vaccine against HPV⁽³¹⁾. On the other hand, with regard to condom use, a study carried out in the Netherlands showed that adolescents who used such contraceptive

method were more likely to have received the vaccine⁽²⁷⁾. It should be noted that the samples in these two studies differ widely: the first study used a non-representative sample of the population of 101 male adolescents and the second study assessed 2,989 female adolescents. In addition to the sample size, the study of female adolescents was carried out in only one clinic.

The study carried out with a non-representative sample also showed that adolescents who had a previous diagnosis of sexually transmitted infection and who showed an increase in the number of sexual partners were more likely to be interested in receiving the vaccine⁽³¹⁾.

One barrier to HPV vaccination reported by parents in some studies was the belief that their daughters were too young to receive a vaccine that protects against a sexually transmitted infection, mainly because they believed that they have not yet started their sex life. Given that, the perception of risk was lower^(24,26,30).

In addition to parents, health care professionals also indicate less the vaccine when age is younger. These findings suggest that it is still not entirely clear to the population that the efficacy of the vaccine is greater when it is given prior to exposure to the virus, i.e., prior to sexual initiation. Therefore, the age for vaccination is defined to increase protection against virus⁽²⁸⁾. A study carried out in Belgium has shown that little information on the need for the vaccine and the lack of medical advice constitute a barrier to vaccination⁽²²⁾.

Although there is less information on the efficacy of the HPV vaccine among male adolescents, the vaccination of female adolescents has the most obstacles, as shown in a study carried out in the United States. Differences in the acceptance of sexual activity of male and female children are the main obstacle for parents. This is because these parents feel more comfortable discussing sexual health with their sons than with their daughters. Thus, the daughter's sex life initiation becomes a "taboo", which contributes to the low adherence to the HPV vaccine⁽¹⁷⁾.

On the other hand, more female adolescents have been vaccinated against HPV than male adolescents in Brazil⁽²⁰⁾. This can be explained by the fact that the SUS initiated the provision of this vaccine only to female adolescents and that only in 2017 male adolescents were included in the Ministry of Health Vaccination Schedule.

As a consequence of all the factors previously discussed, the results of the studies showed that the adolescents presented a low adherence to vaccination in general, with less than half of the sample having received one or all the doses of the vaccine. This result suggests the need to create new strategies to promote adolescent health and prevent diseases through immunization^(13,14,19,20-27).

To guide these health promotion strategies, it is important to realize which groups of people exhibit less knowledge about and less adherence to vaccination. Thus, health education actions should focus more on boys and those living in rural areas, for example. In addition, it is also important to promote health outside the walls of health care facilities, with the development of awareness-raising and information-sharing activities in churches, schools and other social spaces.

The main limitation of this review was the methodology used by the studies, which were mostly cross-sectional. In this type of study, all the variables are studied at the same time; therefore, it is not possible to infer causality, which can make interpretation difficult.

The results of the present study revealed the need for training strategies that can promote greater involvement of health care professionals in the immunization of adolescents through health education actions targeted at adolescents and their parents.

CONCLUSION

Sociodemographic factors (such as sex, race/ethnicity, religion, age, high levels of parental education) and socioeconomic and psychosocial factors (such as fear, concerns about the cost of the vaccine, private health insurance) were associated with knowledge about the vaccines, the intention to vaccinate and the completeness of the vaccination schedule. The factor associated with better attitudes and practices related to immunization most frequently cited in almost all the studies was the recommendation of vaccination by a physician or health care professional. Thus, it can be considered that these professionals are capable of positively influencing adolescents' vaccination coverage.

CONTRIBUTIONS

Alisse Maria Chaves de Lima Peixoto contributed to the design and implementation of the research; data collection, analysis and interpretation; and drafting and/or revision of the manuscript. **Paula Andréa de Melo Valença and**

Viviane Colares Soares de Andrade Amorim contributed to data analysis and interpretation and drafting and/or revision of the manuscript.

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