Prevalence and incidence of Human Papillomavirus in Peruvian women: a systematic review

Becerra Goicochea Lorena Judith

https://orcid.org/0000-0002-7116-9212, lbecerrag@unc.edu.pe

Universidad Nacional de Cajamarca. Facultad de Ciencias de la Salud, Escuela Académico Profesional de Obstetricia, Cajamarca – Perú.

Rosales Loredo Carlos Manuel

https://orcid.org/0000-0001-5112-4909, crosales@unc.edu.pe

Universidad Nacional de Cajamarca. Escuela de Biología y Biotecnología, Cajamarca – Perú.

Ugaz Burga Elena Soledad

https://orcid.org/0000-0002-8721-8007, eugaz@unc.edu.pe

Universidad Nacional de Cajamarca. Ciencias de la Salud, Escuela de Post Grado, Cajamarca – Perú.

Banda Medina José Eduard

bandampepe@gmail.com

Hospital Regional Docente de Cajamarca, Cajamarca – Perú.

Abstract

A documentary review was carried out on the production and publication of research papers on the study of the variables Prevalence and incidence of Human Papillomavirus in Latin America. The purpose of the bibliometric analysis proposed in this document is to know the main characteristics of the volume of publications registered in the Scopus database during the period 2016-2021, achieving the identification of publications in total. The information provided by the said platform was organized through tables and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics were described, the position of different authors regarding the proposed topic was referenced by employing a qualitative analysis. Among the main findings of this research, it is found that Brazil, with 7 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that country. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of Hybrid Educational Modalities and their impact on the Quality of Education was Social Sciences with 10 published documents, and the Type of Publication that was most used during the period indicated above was the Journal Article, representing 56% of the total scientific production.

Keywords: Human papillomavirus, Prevalence, Cervical cancer, cervical cancer.

DOI Number: 10.14704/nq.2022.20.9.NQ440078 **Neuro Quantology 2022; 20(9):702-713**

1. Introduction

The human papillomavirus is a sexual disease within which 100 varieties can develop cancer or not, this disease causes genital, anal and respiratory tract infections that do not necessarily end in an oncological process. For its prevention, it is necessary to take certain measures to prevent the spread of this disease, one of them is regular screening tests to determine if there is a possible risk of contracting this disease and determine the steps to follow to control their symptoms and regulate the spread of this. As a preventive method, vaccines are also applied to girls before starting their sexual life to create an immunity that allows lowering the risk levels or at the time of contracting the disease to mitigate the symptoms, giving a quality of life to the person who is affected by this disease.

However, it should be noted that these vaccines do not have a spectrum large enough to cover all oncological phenotypes present within the human papillomavirus. Regarding the prevalence of human papillomavirus in Latin America, it was found that it is one of the regions most affected by this disease, one of the main reasons is the few action plans presented by governments for the prevention of the disease, this is due to the social and economic context that prevails in these countries, in addition to population groups that are more likely to contract this disease, either sex workers or people with multiple sexual partners to be ranked as the most common sexual disease in people under 30 years.

In Peru, it was found that there is no relationship between infection levels and factors such as age, age at first sexual intercourse, promiscuity, number of vaginal births, cervical lesions, history of STIs, use of hormonal contraceptives, condom use and smoking (Iglesias-Osores & Serquén-López, 2020), so it does not depend on behavioral patterns that in Peru declare an alert about infection trends in population groups with specific behavioral characteristics.

Even so, it is very important to determine the prevalence of this virus as it is one of the causes of cervical cancer, which is the second leading cause of malignant neoplasia and death in women worldwide. This is why the Human Papilloma Virus is a public health issue in Peru and throughout Latin America, so it is mandatory for governments to strengthen prevention mechanisms such as the vaccine, and training to prevent misinformation does not allow this process to be carried out due to prejudices in the way of contracting this disease and how to perform a treatment.

2. General objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variable Prevalence and incidence of Human Papillomavirus during the period 2016-2021.

3. Methodology

Quantitative analysis of the information provided by Scopus under a bibliometric approach on the scientific production related to the study of Prevalence and incidence of Human Papilloma Virus is performed. Likewise, it is analyzed from a qualitative perspective, examples of some research papers published in the area of the study mentioned above, from a bibliographic approach to describe the position of different authors on the proposed topic.

The search is carried out through the tool provided by Scopus and the parameters referenced in Figure 1 are established.

3.1 Methodological design

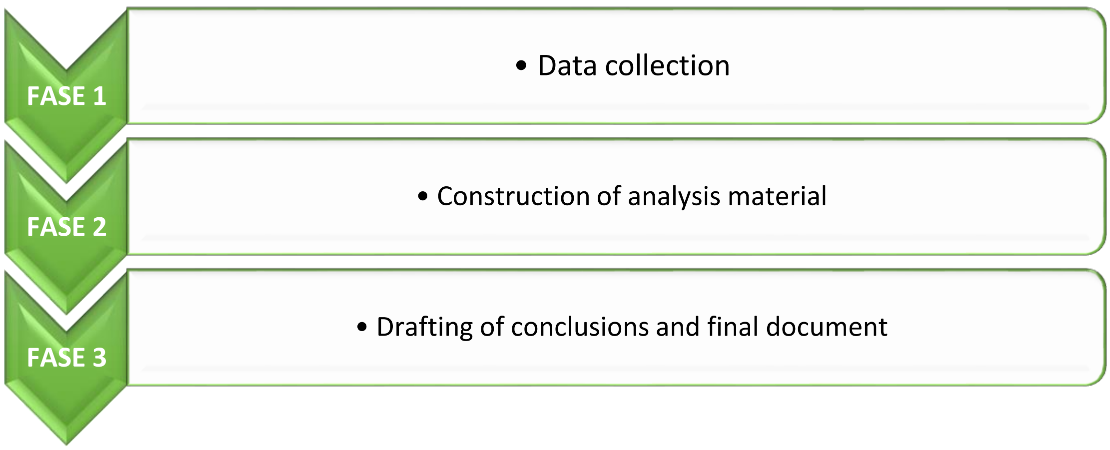

Figure 1. Methodological design

Source: Own elaboration

3.1.1 Phase 1: Data collection

Data was collected from the Scopus web page search tool, through which a total of 38 publications were identified. To this end, search filters were established consisting of:

- ✓ Published papers whose study variables are related to the study of the Prevalence and incidence of Human Papillomavirus.
- ✓ Limited to Latin American countries.
- ✓ Without distinction of the area of knowledge.
- ✓ Without distinction of the type of publication.

3.1.2 Phase 2: Construction of analysis material

The information identified in the previous phase is organized. The classification will be done using graphs, figures and tables based on data provided by Scopus.

- ✓ Co-occurrence of words
- ✓ Year of publication
- ✓ Country of origin of the publication
- ✓ Area of knowledge
- ✓ Type of publication

3.1.3 Phase 3: Drafting of conclusions and final document

After the analysis is carried out in the previous phase, the conclusions are drawn up and the final document is prepared.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

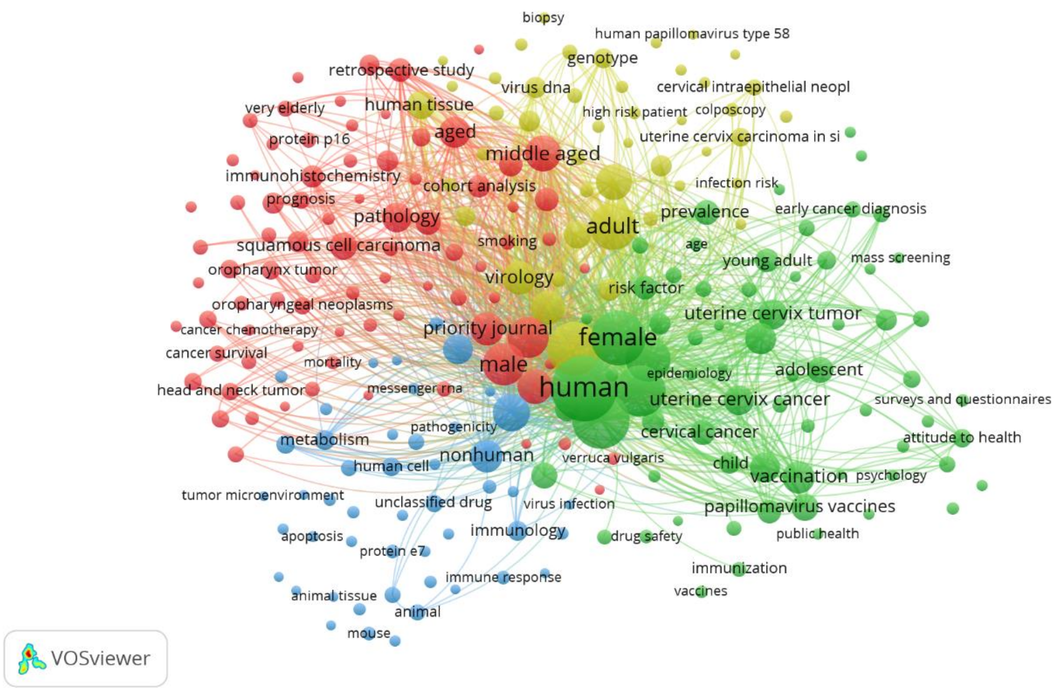

Figure 2. Co-occurrence of words

Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 2, the human component is the one with the highest co-occurrence in the research related to the variables under study due to the nature of this research, which is based on public health, as a system that seeks to promote the general welfare from the prevention and treatment of diseases that are frequent and affect the quality of life of populations. Within this component there is a vaccine against the human papillomavirus, immunology and adolescents which refer to the main preventive measure that governments have to mitigate the spread of this disease, applying this process to girls who have not started their sexual life to create immunology that allows that if at some point they are at risk or get it, the same organism rejects this virus. On the other hand, there are keywords such as young adults, high-risk patients and contagion factors, which refer to the population with the highest number of infections in Latin America, with a higher number of cases in people under 30 years of age. Even so, no behavioral patterns or factors have been found that determine a predisposition to contract this virus

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication, taking into account the period from 2016 to 2021.

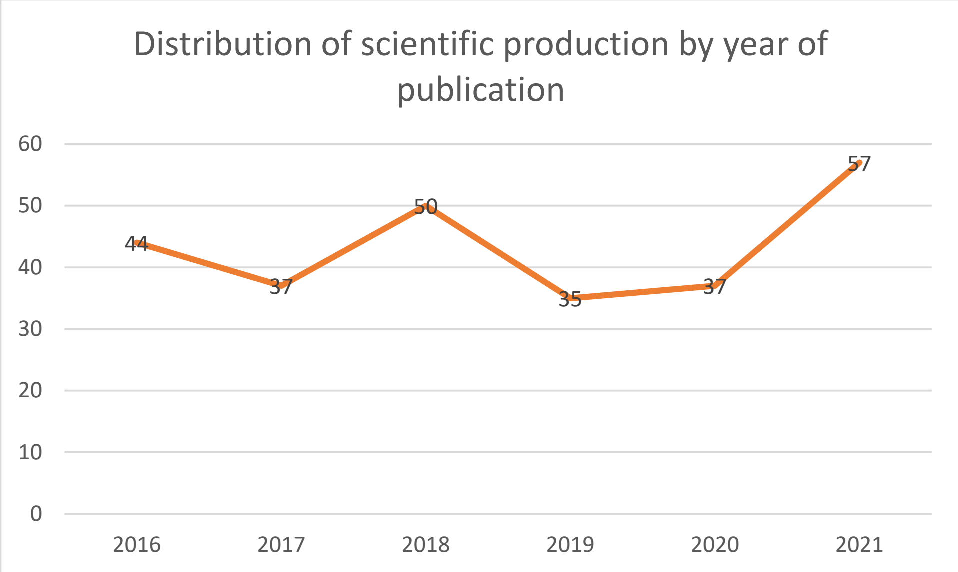

Figure 3. Distribution of scientific production by year of publication.

Source: Own elaboration (2022); based on data provided by Scopus.

2021 is the year with the highest number of publications related to the variables under study, presenting 57 documents among which we can find "Obstacles and facilitators perceived by nurses and teachers for the adoption of the vaccination program against human papillomavirus (HPV) in Iquitos, Peru: a qualitative study" (Llavall *et al.*, 2021). This paper has as its main objective to explore qualitatively the acceptance of vaccination through in-depth interviews with eleven nurses and ten teachers involved in the delivery of vaccines in Iquitos, Peru where it could be evidenced that the knowledge and attitudes of the people, the beliefs of the community, geography and policy level variables determined the acceptance of vaccination against human papillomavirus, geography and variables at the policy level determined the acceptance of the vaccine against the human papillomavirus, so as this is the key to primary prevention of cervical cancer, it is necessary to conduct training to raise awareness in society of the importance of access to these vaccines as the first preventive measure.

In second place is the year 2018 with 50 documents, within which we can find "New strategies for prevention and control of cervical cancer in Chile" (Ferreccio, 2018) this document aims to Discuss cervical cancer (CC), human papillomavirus (HPV), the CC control program and propose alternatives for Chile taking into account that The existing technical and economic conditions in Chile to achieve a substantial improvement so taking sufficient measures to prevent more women from contracting this disease is by educating about the importance of having the necessary vaccines to reduce any risk

4.3 Distribution of scientific production by country of origin.

Figure 4 shows the distribution of scientific production according to the nationality of the authors.

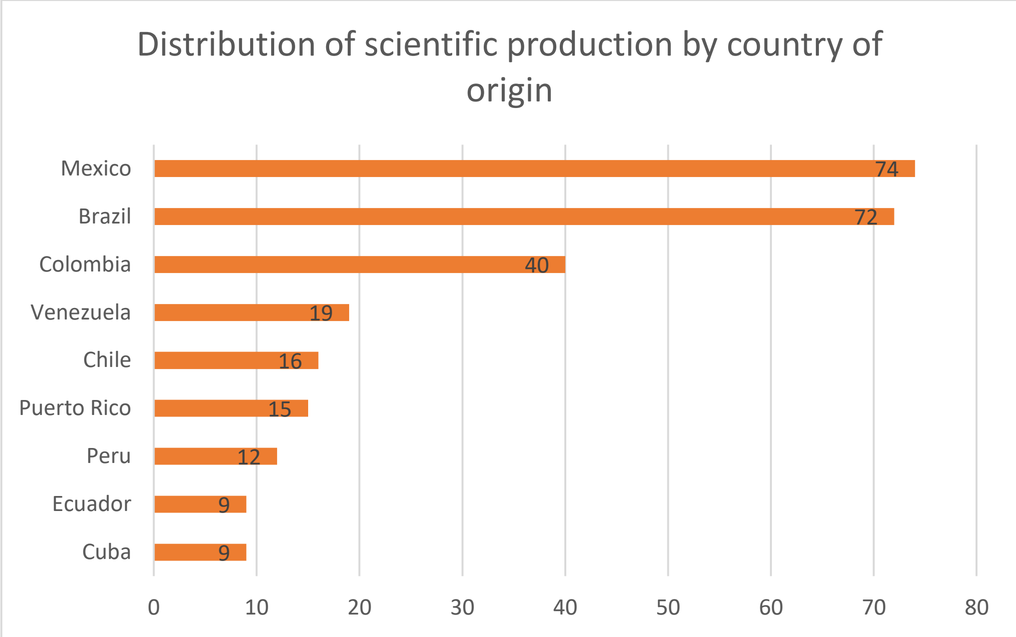

Figure 4. Distribution of scientific production by country of origin.

Source: Own elaboration (2022); based on data provided by Scopus.

Brazil is the Latin American country with the highest scientific production in the period 2016-2021 presenting 74 documents within which is the paper entitled "Awareness about human papillomavirus and cervical cancer as a predictor of attitudes towards the control of the virus in women carriers" (Guerra-Rodríguez *et al*., 2021). This document explains and analyzes the knowledge of Human Papillomavirus (HPV) and Cervical Cancer (CC) as predictors of the attitude towards the diagnosis and control of HPV in women. The study was carried out on women carriers of the human papillomavirus in Mexico to determine the factors that affect their acceptance and how women assimilate the disease, thus establishing the necessary measures to take care of their health without the need to deprive themselves of any activity they may feel inhibited about, so that a positive diagnosis can generate fatalistic thoughts. However, if the woman becomes aware of what this disease implies, her attitude and thoughts will be focused on the search for clinical symptoms and lead a daily life taking into account treatments and precautions.

At this point, it is worth noting that the production of scientific publications, when classified by country of origin, presents a special characteristic and that is the collaboration between authors with different affiliations to both public and private institutions, and these institutions can be from the same country or different nationalities so that the production of an article with co-authorship of different authors from different countries of origin allows each of the countries to add up as a unit in the general publications. This is best explained in Figure 4, which shows the flow of collaborative work from different countries.

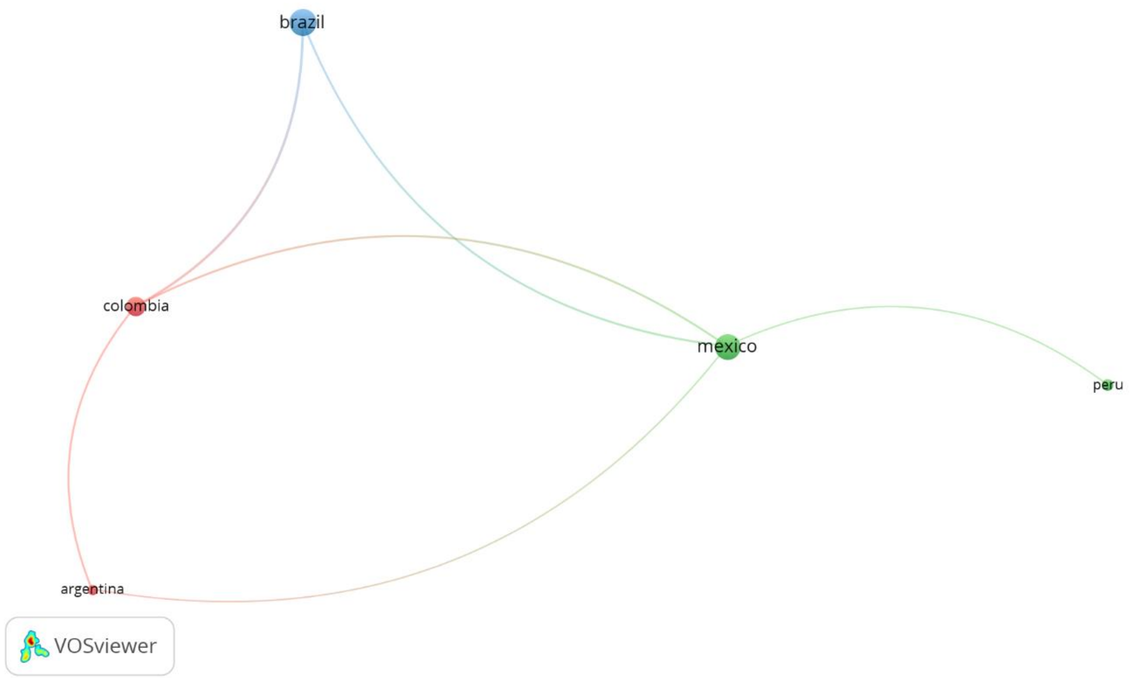

Figure 5. Co-citations between countries.

Source: Own elaboration (2022); based on data provided by Scopus.

As mentioned above, Mexico is the Latin American country with the greatest contribution to research related to the variables under study, presenting studies with Peru and Argentina carrying out comparative studies in the analysis of the Human Papillomavirus in Latin America. In second place is Brazil with 72 documents among which is the title "Prevalence of oral HPV infection in unvaccinated young adults in Brazil" (Bidinotto *et al*., 2021). This study reports the national prevalence of oral HPV infection among unvaccinated women and men aged 16 to 25 years who used public primary care services by conducting surveys of young adults and interviews with health personnel. Through this study, it was determined that the Human Papillomavirus in Brazil does not present associations between age, sex, sociodemographic characteristics, drug use or sexual behavior and the prevalence of the Human Papillomavirus, so it does not obey behavioral patterns and therefore its sociodemographic damage is low. Even so it is necessary to take measures to prevent infection such as vaccines which are the main tool to prevent this disease, so the government plays an important role in both prevention and training and awareness of the disease to avoid future infections and people who have this disease can lead a normal life, free of prejudice which is very common when society is unaware of the main information of disease.

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

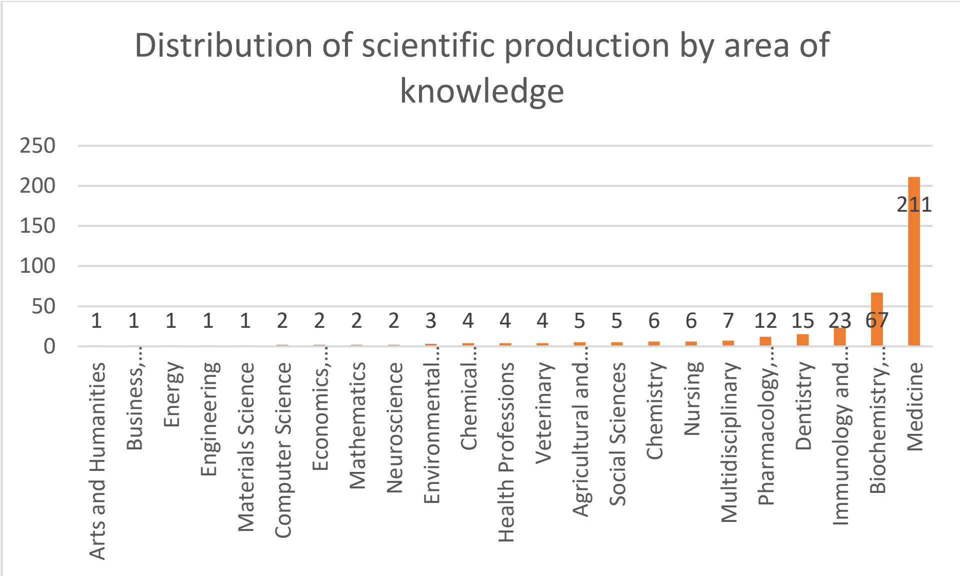

Figure 6. Distribution of scientific production by area of knowledge.

Source: Own elaboration (2022); based on data provided by Scopus.

Medicine was the area of knowledge with the greatest influence at the time of carrying out research concerning the study of the Prevalence of Human Papilloma Virus presenting 211 publications, among which is the paper entitled "Detection of papillomavirus by a polymerase chain reaction in women treated in northern Peru" (Iglesias-Osores *et al.*, 2021). This paper aims to determine the incidence of patients with human papillomavirus infection with unknown cytology using the polymerase chain reaction technique in a hospital in northern Peru. For this study, samples from 243 patients with an average age of 44 years were analyzed, where it was possible to prove that in Peru there is not a high prevalence of this virus, so it does not respond to behavioral patterns or incidences with factors related to the sexual life of patients, so in this case, people should be made aware of the importance of continuous check-ups that allow them to know the current state of their health.

In second place is Biochemistry where 67 documents were written following the guidelines of the topics related to this area, among these documents is "Trends in the research of human papillomavirus in Latin America compared to high-income countries" (Moya-Salazar & Rojas-Zumaran, 202 - 217). This document presents as main objective to present the trends in the research of Human Papillomavirus (HPV) in Latin America, compared to high-income countries. For this study, a bibliographic analysis of the scientific production in Latin America regarding the prevention and treatment of human papillomavirus and cervical cancer was carried out, where it was found that the scientific production in Latin America presents certain limitations for scientific development in this region in comparison with high-income countries, and this is reflected in the prevalence of the disease and vaccination rates.

4.5 Type of publication

Figure 7 shows how the bibliographic production is distributed according to the type of publication chosen by the authors.

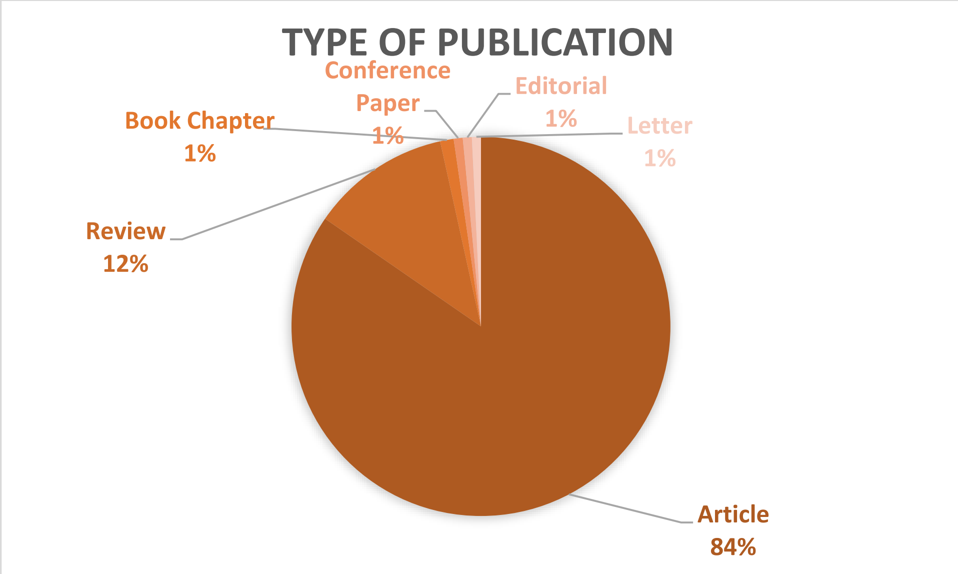

Figure 7. Type of publication

Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 7, within the different types of publications, 84% of the total number of documents identified through Phase 1 of the Methodological Design, correspond to journal articles, among which is the one entitled "PCR-RFLP and FTIR-based detection of high-risk human papillomavirus for the detection and prevention of cervical cancer" (Alves Melo *et al.*, 2021). This paper has as its main objective to determine the efficiency of Fourier transform infrared spectroscopy (FTIR) of cervical fluid in patient risk stratification reported by PCR so 91 samples from routine Pap smear screening were analyzed, detecting 36 of these with human papillomavirus and within these 36 were 9 at high risk, thus evidencing how these tests (FTIR) help in the initial risk stratification of cervical cancer followed by detailed PCR-RFLP investigations for suspicious cases.

In second place are the reviews which represent 12% of the total number of documents registered in this study, within which is the document named "Prevalence of human papillomavirus infection, cervical intraepithelial neoplasia and cervical cancer in women deprived of liberty worldwide: Systematic review and meta-analysis" (Escobar & Plugge, 2020). This paper presents its main objective to analyze the current evidence on the prevalence of human papillomavirus (HPV) infection, cervical cancer and precancerous lesions in women in prison worldwide and to compare these rates with the general population. For this study, 5,353,333 incarcerated women were analyzed and it became evident that these women are more prone to contract cervical cancer than the general population, so it is necessary to control risk factors and develop more effective cervical screening programs.

5. Conclusions

Thanks to the bibliometric analysis carried out in this article, it is possible to determine that the main characteristics in the volume of scientific production regarding the study of Prevalence and incidence of Human Papillomavirus in Women have a good research flow, especially in Latin American countries, so it is established that Mexico was the country with the highest number of reports through its institutions to Scopus with a total of 74 documents registered during the period 2016-2021. Due to the nature of the study, which seeks to Determine the Prevalence and incidence of Human Papillomavirus in Women, it is established that Medicine was the area of knowledge with the greatest influence on the research identified, since 211 of the 225 publications related to the present analysis, actively participate with theories framed in that area of knowledge.

Similarly, and following the nature of the study and the educational component, biochemistry also played a fundamental role in the execution of 267 publications. It should be noted that within the analysis presented regarding the position of different authors concerning the study of the topic proposed in this research, it can be concluded that there is a prevalence of human papillomavirus in Peru, and in Latin America in general, being necessary to strengthen projects that seek to prevent the spread of this disease starting from vaccines as the method to immunize women before starting their sexual life and training to raise awareness of the importance of this preventive means and clarify doubts about different prejudices that are held with people who suffer from this disease. It is, therefore, necessary to generate more scientific content on this topic of public health, however, it is expected that from bibliographic and bibliometric reviews such as the one proposed in this document, the current situation of the literature on the subject is taken into account and that educators and the educational community help in the generation of new knowledge in this regard to have more and more scientific material to determine the prevalence and incidence of Human Papillomavirus in Women.

References

Alves Melo, I. M., Pereira Viana, M. R., Pupin, B., Bhattacharjee, T. T., & de Azevedo Canevari, R. (2021). PCR-RFLP and FTIR-based detection of high-risk human papilloma virus for cervical cancer screening and prevention. *Biochemistry and Biophysics Reports*.

Bidinotto, A. B., Kops, N. L., Bessel, M., Maranhão, A. G., Moreno, F., Pereira, G. F., . . . Wendland, E. M. (2021). Prevalence of oral HPV infection in unvaccinated young adults in Brazil. *Oral Oncology*.

Escobar, N., & Plugge, E. (2020). Prevalence of human papillomavirus infection, cervical intraepithelial neoplasia and cervical cancer in imprisoned women worldwide: A systematic review and meta-analysis. *Journal of Epidemiology and Community Health*, 95 - 102.

Ferreccio, C. (2018). New strategies for the prevention and control of cervical cancer in Chile. *Salud Publica de Mexico*, 713 - 721.

Guerra-Rodríguez, G. M.-R., Moreno-Monsiváis, M. G., Gil-Vázquez, H. M., Guerra-Ordóñez, J. A., Flores-Arias, M. L., & Esparza-Dávila, S. P. (2021). Awareness of the Human Papilloma Virus and cervical cancer as predictor of attitudes towards virus control in female carriers. *Metas de Enfermeria*, 7 - 14.

Guerra-Rodríguez, G. M.-R., Moreno-Monsiváis, M. G., Gil-Vázquez, H. M., Guerra-Ordóñez, J. A., Flores-Arias, M. L., & Esparza-Dávila, S. P. (2021). Awareness of the Human Papilloma Virus and cervical cancer as predictor of attitudes towards virus control in female carriers. *Metas de Enfermeria*, 7 - 14.

Iglesias-Osores, S., & Serquén-López, L. M. (2020). Virus papiloma humano y factores asociados en pacientes con citología desconocida atendidas en el norte de Perú. *Revista Peruana de Ginecología y Obstetricia*.

Iglesias-Osores, S., Serquen-Lopez, L. M., Saavedra-Muñoz, D., LuzVásquez-Fernández, M., & Vidaurre, T. (2021). Detección del virus del papiloma mediante reacción en cadena de la polimerasa en mujeres atendidas en el norte del Perú. *Revista de Obstetricia y Ginecologia de Venezuela*, 33 - 38.

Llavall, A. C., de Wildt, G., Meza, G., Tattsbridge, J., & Jones, L. (2021). Nurses' and teachers' perceived barriers and facilitators to the uptake of the Human Papilloma Virus (HPV) vaccination program in Iquitos, Peru: A qualitative study. *PLoS ONE*.

Moya-Salazar, J. J.-S., & Rojas-Zumaran, V. A. (202 - 217). Human papillomavirus research trends in Latin American compared to high income countries. *Revista Colombiana de Obstetricia y Ginecologia*, 2017.

Alves Melo, I. M., Pereira Viana, M. R., Pupin, B., Bhattacharjee, T. T., & de Azevedo Canevari, R. (2021). PCR-RFLP and FTIR-based detection of high-risk human papilloma virus for cervical cancer screening and prevention. Biochemistry and Biophysics Reports.

Bidinotto, A. B., Kops, N. L., Bessel, M., Maranhão, A. G., Moreno, F., Pereira, G. F., . . . Wendland, E. M. (2021). Prevalence of oral HPV infection in unvaccinated young adults in Brazil. Oral Oncology.

Escobar, N., & Plugge, E. (2020). Prevalence of human papillomavirus infection, cervical intraepithelial neoplasia and cervical cancer in imprisoned women worldwide: A systematic review and meta-analysis. Journal of Epidemiology and Community Health, 95 - 102.

Ferreccio, C. (2018). New strategies for the prevention and control of cervical cancer in Chile. Salud Publica de Mexico, 713 - 721.

Guerra-Rodríguez, G. M.-R., Moreno-Monsiváis, M. G., Gil-Vázquez, H. M., Guerra-Ordóñez, J. A., Flores-Arias, M. L., & Esparza-Dávila, S. P. (2021). Awareness of the Human Papilloma Virus and cervical cancer as predictor of attitudes towards virus control in female carriers. Metas de Enfermeria, 7 - 14.

Guerra-Rodríguez, G. M.-R., Moreno-Monsiváis, M. G., Gil-Vázquez, H. M., Guerra-Ordóñez, J. A., Flores-Arias, M. L., & Esparza-Dávila, S. P. (2021). Awareness of the Human Papilloma Virus and cervical cancer as predictor of attitudes towards virus control in female carriers. Metas de Enfermeria, 7 - 14.

Iglesias-Osores, S., & Serquén-López, L. M. (2020). Virus papiloma humano y factores asociados en pacientes con citología desconocida atendidas en el norte de Perú. Revista Peruana de Ginecología y Obstetricia.

Iglesias-Osores, S., Serquen-Lopez, L. M., Saavedra-Muñoz, D., LuzVásquez-Fernández, M., & Vidaurre, T. (2021). Detección del virus del papiloma mediante reacción en cadena de la polimerasa en mujeres atendidas en el norte del Perú. Revista de Obstetricia y Ginecologia de Venezuela, 33 - 38.

Llavall, A. C., de Wildt, G., Meza, G., Tattsbridge, J., & Jones, L. (2021). Nurses' and teachers' perceived barriers and facilitators to the uptake of the Human Papilloma Virus (HPV) vaccination program in Iquitos, Peru: A qualitative study. PLoS ONE.

Moya-Salazar, J. J.-S., & Rojas-Zumaran, V. A. (202 - 217). Human papillomavirus research trends in Latin American compared to high income countries. Revista Colombiana de Obstetricia y Ginecologia, 2017.

Ablanedo-Terrazas, Y., Romero-Mora, K., Gómez-Palacio, M., Alvarado-de la Barrera, C., Ruiz-Cruz, M., Hernández-Juan, R., & Reyes-Terán, G. (2018). Prevalence and risk factors for oral human papillomavirus infection in mexican HIV-infected men. Salud Publica De Mexico, 60(6), 653-657. doi:10.21149/9834

Acosta-Guevara, C., Calderón-Carvajal, L., Torres, L., & Rosselli, D. (2017). Penis cancer and sex with animals: Presentation of a case. [Cáncer de pene y sexo con animales: a propósito de un caso] Urologia Colombiana, 26(2), 144-147. doi:10.1016/j.uroco.2016.10.003

Acosta-Rios, M. P., Sauer-Ramírez, E., Castro-Muñoz, L. J., García-Solís, M., Gómez-García, C., Ocadiz-Delgado, R., . . . Perez-Ishiwara, D. G. (2017). Effect of dialyzable leukocyte extract on chronic cervicitis in patients with HPV infection. Journal of Medicine and Life, 10(4), 237-243. Retrieved from www.scopus.com

Aguiar, H., González, F., Pacheco, C., Correia, H., & Herrera, F. (2018). Distribution of human papillomavirus genotypes among women in aragua st, venezuela. [Distribución de genotipos del virus de papiloma humano en mujeres del edo. Aragua, Venezuela.] Revista De Obstetricia y Ginecologia De Venezuela, 78(1), 5-12. Retrieved from www.scopus.com

Aguilar, L., Bulla, F., Motta, A., & González, L. F. (2018). Refractory subungual wart: More than a human papilloma virus infection. [Verruga viral subungueal recalcitrante: más que una infección por el virus del papiloma humano] Piel, 33(4), 275-277. doi:10.1016/j.piel.2017.08.014

Allende, G., Surriabre, P., Ovando, N., Calle, P., Torrico, A., Villarroel, J., . . . Rodriguez, P. (2020). Evaluation of the effectiveness of high-risk human papilloma self-sampling test for cervical cancer screening in bolivia. BMC Infectious Diseases, 20(1) doi:10.1186/s12879-020-04963-2

Almeida, J. F., Breyner, N. M., Mahi, M., Ahmed, B., Benbouziane, B., Boas, P. C. B. V., . . . Chatel, J. -. (2016). Expression of fibronectin binding protein A (FnBPA) from staphylococcus aureus at the cell surface of lactococcus lactis improves its immunomodulatory properties when used as protein delivery vector. Vaccine, 34(10), 1312-1318. doi:10.1016/j.vaccine.2016.01.022

Alvarado-Ruiz, L., Martinez-Silva, M. G., Torres-Reyes, L. A., Piña-Sanchez, P., Ortiz-Lazareno, P., Bravo-Cuellar, A., . . . Jave-Suarez, L. F. (2016). HOXA9 is underexpressed in cervical cancer cells and its restoration decreases proliferation, migration and expression of epithelial-to-mesenchymal transition genes. Asian Pacific Journal of Cancer Prevention, 17(3), 1037-1047. doi:10.7314/APJCP.2016.17.3.1037

Alves Melo, I. M., Pereira Viana, M. R., Pupin, B., Bhattacharjee, T. T., & de Azevedo Canevari, R. (2021). PCR-RFLP and FTIR-based detection of high-risk human papilloma virus for cervical cancer screening and prevention. Biochemistry and Biophysics Reports, 26 doi:10.1016/j.bbrep.2021.100993

Angermeyer, A. M., Montenegro, S., Liempi, S., Moreno, S., Barra, T. L., Guzmán, P., . . . Fonseca-Salamanca, F. (2019). Frequency of cervical cytological alterations and human papilloma virus in a sample of university students in temuco, chile. [Frecuencia de alteraciones citológicas cervicales y virus papiloma humano en una muestra de estudiantes universitarias en Temuco, Chile] Revista Chilena De Infectologia, 36(4), 421-427. doi:10.4067/S0716-10182019000400421

Arellano-Ortiz, A. L., Salcedo-Vargas, M., Vargas-Requena, C. L., López-Díaz, J. A., De la Mora-Covarrubias, A., Silva-Espinoza, J. C., & Jiménez-Vega, F. (2016). DNA methylation of cellular retinoic acid-binding proteins in cervical cancer. Genetics and Epigenetics, 8, 53-57. doi:10.4137/GEG.S40847

Arellano-Ortiz, A. L., Salcedo-Vargas, M., Vargas-Requena, C. L., López-Díaz, J. A., de la Mora-Covarrubias, A. D., Silva-Espinoza, J. C., & Jiménez-Vega, F. (2016). DNA methylation of cellular retinoic acid-binding proteins in cervical cancer. Genetics and Epigenetics, 1(8), 53-57. doi:10.4137/GEG.S40847.

Armijos, L. D. E., Guarquila, M. R. S., Arroyo, A. C. P., Avila, N. J. P., Vásquez, L. C. J., & Pérez, R. C. P. (2020). Relationship of knowledge and practice on the timely detection of cervical uterine cancer. [Conocimiento y práctica de la detección oportuna del cáncer cérvico uterino] Investigacion Clinica (Venezuela), 61, 190-198. Retrieved from www.scopus.com

Arredondo-Galvez, C. G., Acuna-Gonzalez, D., Cantu-De-Leon, D., Chanona-Vilchis, J. G., Aviles-Salas, A., Gonzalez-Enciso, A., . . . Barquet-Munoz, S. A. (2021). Association of p16 and ki-67 with risk of recurrence in previously treated cervical high-grade squamous intraepithelial lesions. Gynecologic and Obstetric Investigation, 86(3), 293-298. doi:10.1159/000515894

Atkinson, A., Studwell, C., Bejarano, S., Castellón, A. M. Z., Espinal, J. A. P., Deharvengt, S., . . . Tsongalis, G. J. (2018). Rural distribution of human papilloma virus in low- and middle-income countries. Experimental and Molecular Pathology, 104(2), 146-150. doi:10.1016/j.yexmp.2018.03.001

Augustovski, F., Colantonio, L. D., Galante, J., Bardach, A., Caporale, J. E., Zárate, V., . . . Kind, P. (2018). Measuring the benefits of healthcare: DALYs and QALYs – does the choice of measure matter? A case study of two preventive interventions. International Journal of Health Policy and Management, 7(2), 120-136. doi:10.15171/ijhpm.2017.47

Avila, L. A., Aps, L. R. M. M., Ploscariu, N., Sukthankar, P., Guo, R., Wilkinson, K. E., . . . Tomich, J. M. (2016). Gene delivery and immunomodulatory effects of plasmid DNA associated with branched amphiphilic peptide capsules. Journal of

Controlled Release, 241, 15-24. doi:10.1016/j.jconrel.2016.08.042

Ayala-Calvillo, E., Mojica-Vázquez, L. H., García-Carrancá, A., & González-Maya, L. (2018). Wnt/p-catenin pathway activation and silencing of the APC gene in HPV-positive human cervical cancer-derived cells. Molecular Medicine Reports, 17(1), 200-208. doi:10.3892/mmr.2017.7853

Bachelet, V. C. (2016). Two doses and not three for the human papilloma virus vaccine in chile. Medwave, 16(1), e6373. doi:10.5867/medwave.2016.01.6373

Baena-Acevedo, J. D., Adriana, D., Cid-Arregui, G. -. A., Aristizábal-Gutiérrez, F., & Castañeda-Peláez, D. A. (2021). SFRP1, possible biomarker in the progression or regression of cervical pre-neoplastic lesions associated with human papilloma virus. [SFRP1, Posible biomarcador en la progresión o regresión de lesiones de cérvix asociado al Virus del Papiloma Humano] Infectio, 25(4), 270-275. doi:10.22354/in.v25i4.959

Barbosa, L. O., Neto, J. O. B., Teixeira-Júnior, A. A. L., Nogueira, L. R., de Ribamar Calixto, J. R., Cunha, I. W., . . . Silva, G. E. B. (2021). Pseudoangiosarcomatous squamous cell carcinoma: First case report on penis. Translational Andrology and Urology, 10(4) doi:10.21037/tau-20-1234