



ORIGINALES

Effect of an HPV Educational Video on Mexican Youth

Efecto de un video educativo sobre el VPH en jóvenes mexicanos

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ABSTRACT:

Objective: To evaluate the effect of an HPV educational video, based on Fisher and Fisher's information, motivation, and behavioral skills model, on young people over 18 years of age.

Materials and methods: A randomized, single-blind intervention clinical trial with randomization to a control group and an experimental group, under a model of repeated measurements. The sample consisted of young people over 18 years of age of both sexes that were users of social networks. The intervention consisted in viewing the video: "7 things you should know about HPV!", which is characterized by being a validated tool in the Mexican context. The empirical indicator used was the HPV knowledge questionnaire.

Results: After the online intervention, a statistically significant change in HPV knowledge was observed among the young people of the experimental group ($t = -2.44$; $CI = -4.722 - -.425$; $p = .020$).

Conclusions: The video based on the information, motivation, and behavioral skills model, and following the elements of persuasive communication, favors knowledge about HPV in a group of young people over 18 years of age.

Keywords: Papillomavirus Infections; Young Adult; Audiovisual resources; Clinical Trial; Health Education.

RESUMEN:

Objetivo: Evaluar el efecto de un video educativo sobre el VPH basado en el modelo de información, motivación y habilidades conductuales de Fisher y Fisher, en jóvenes mayores de 18 años.

Materiales y métodos: Ensayo clínico aleatorizado con intervención simple ciego y aleatorización a un grupo control y otro experimental, bajo un modelo de mediciones repetidas. La muestra estuvo conformada por jóvenes mayores de 18 años de ambos sexos, usuarios de redes sociales. La intervención consistió en la visualización del video: "¡7 cosas que debes saber sobre el VPH!", el cual

se caracteriza por ser una herramienta validada en el contexto mexicano. El indicador empírico utilizado fue el cuestionario de conocimiento acerca del VPH.

Resultados: Posterior de la intervención en línea se observa un cambio estadísticamente significativo en el conocimiento del VPH, entre los jóvenes del grupo experimental ($t = -2.44$; $IC = -4.722 - -.425$; $p = .020$).

Conclusiones: El video basado en el modelo de información, motivación y habilidades conductuales, así como bajo los elementos de la comunicación persuasiva, favorece el conocimiento sobre el VPH en un grupo de jóvenes mayores de 18 años.

Palabras-clave: Infecciones por Papillomavirus; Adulto Joven; Recursos Audiovisuales; Ensayo Clínico; Educación en Salud.

INTRODUCTION

Human papillomaviruses (HPVs) are a group of more than 200 viruses that are associated with both benign and malignant lesions ⁽¹⁾. These viruses are transmitted through oral, vaginal, or anal intercourse with an infected person, and it is thus considered a sexually transmitted infection, which is generally asymptomatic but over time can develop into some type of cancer ⁽²⁾.

It is estimated that 90% of people worldwide will be infected with HPV during their lifetime. In 2017 alone, there was a prevalence of 16.1% in Latin America and the Caribbean ⁽³⁾. In 2020, a total of 4,584 accumulated cases were reported in Mexico ⁽⁴⁾, with young people over 18 years of age showing the highest incidence ⁽⁵⁾. These young people are characterized by exhibiting risky sexual practices, such as unprotected sex, multiple sexual partners, and drug use during sexual intercourse ^(6,7), a situation that tends to increase due to, among other things, the lack of knowledge that young people have about the infection.

Related studies, on the one hand, report a lack of HPV knowledge regarding basic aspects, symptomatology, associated diseases, prevention, diagnosis, and treatment ⁽⁸⁾. This situation puts young people at higher risk of becoming infected, regardless of their educational level and sex ^(9, 10).

On the other hand, a systematic literature review has shown that online interventions through audiovisual media, such as instructional videos, have a significant effect on knowledge related to the prevention of sexually transmitted infections (STIs), such as HPV ^(11, 12). However, other studies still report limited information about the real impact related to the use of videos as a means to improve knowledge related to STIs, which makes clear the need for interventions with rigorous methodologies and valid instruments in order to ensure reliable results that can be standardized and compared over time ^(13, 14).

Considering the above, it is important to evaluate the effectiveness of the educational video: *"7 things you should know about HPV!"*, based on Fisher and Fisher's information, motivation, and behavioral skills model (IMB) ⁽¹⁵⁾. The video has been designed and validated for a young Mexican population following the theoretical precept that acceptance of preventive behavior is the result of increased knowledge, motivation, and skills related to prevention; in addition, learning processes can be changed through elements of persuasive communication ⁽¹⁶⁾. These are theoretical aspects that, in practice, have provided evidence of a positive change in the sexual health behaviors of people ⁽¹⁷⁾.

Thus, the objective of the present study was to evaluate the effect of the educational video: “7 things you should know about HPV!”, based on Fisher and Fisher’s information, motivation, and behavioral skills model, on young Mexicans over 18 years of age.

METHODOLOGY

The design of the study was a randomized, single-blind intervention clinical trial with randomization to a control group and an experimental group under a model of repeated measurements ⁽¹⁸⁾.

The sample consisted of young people over 18 years of age of both sexes that were users of social networks and were interested in participating in the study. Participants that were studying or had graduated from a degree in health science were excluded due to the possible bias that their academic background could have on their knowledge of HPV. We also excluded those who did not complete the required measurements (pre-test, post-test, and follow-up seven days after watching the video), as well as those who requested and received more information about the infection during the study; this was after having answered the questionnaire or watched the video. The sample was calculated using the statistical package n’Query Advisor version 4.0 ⁽¹⁹⁾ for an independent-samples Student’s t-test, with a confidence level of .05, a statistical power of .80, and an effect size of .30; obtaining an n=16 participants per group. However, it was rounded to n=20 per group in order to dampen the attrition of the research subjects.

The empirical indicator used was the HPV knowledge questionnaire from Xolocotzi, Marín, Gómez, Valenzuela ⁽²⁰⁾, which consists of 38 items with three response options (True, False, and Don’t know) and is divided into four dimensions: the first one evaluates the causal agent through three items (1, 2, 3), the second one assesses the risk factors with twelve items (4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15), the third one evaluates the signs and symptoms with five items (16, 17, 18, 19, and 20), and the fourth one addresses prevention, diagnosis, and treatment with 18 items (21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, and 38). For a better interpretation of the data, percentiles were used to obtain the cut-off points of the instrument: Percentile 1 (P1₂₅) = no knowledge, Percentile 2 (P2₅₀) = insufficient knowledge, Percentile 3 (P3₇₅) = fair knowledge, and Percentile 4 (P4₁₀₀) = adequate knowledge. The instrument has a Cronbach’s Alpha of .833 in the Mexican population ⁽²¹⁾. A reliability of .706 was obtained for the present study.

The recruitment was carried out during the months of June and July 2021 by four young people (2 men and 2 women) belonging to youth associations of Puebla City and Chiapas, who were trained to invite other young people to participate in the study through the application of WhatsApp. Once the sample was formed, the participants were numbered and then assigned to the control and experimental groups using a computer program of random numbers. Subsequently, the participants were individually sent a Google Forms link (unique and exclusive for each group) that contained the informed consent, the HPV knowledge questionnaire, and a logical algorithm to control the duplicity and impersonation of participants, which consisted in the identification of their email address, IP, and date and time of the survey. In

addition, the researchers kept an internal record in Excel format that contained: date sent, participant's name, phone number, and identification of the group to which they were randomized.

The intervention for the experimental group consisted in viewing the video: "*7 things you should know about HPV!*" through Google Forms, which contained a private link to a YouTube account with the platform's own online security protocols activated and records of the audience retention time, traffic source, geographic area, and number and date of viewing.

The video is characterized by being a validated tool in the Mexican context and shows two young people (a man and a woman) who answer in a clear and simple way seven questions about HPV, ending with a series of recommendations to prevent the infection and promote responsible sexuality, in a time of approximately three minutes⁽¹⁶⁾. This audiovisual resource was developed based on the assumptions of Fisher and Fisher's information, motivation, and behavioral skills model⁽¹⁵⁾ as well as the elements of persuasive communication⁽²²⁾, which is characterized by attempting to produce a positive change in people's health behaviors through: 1.- an attractive source and characters similar to the receiver, 2.- an organization of clear and rational messages, 3.- a direct visual-auditory communication channel, and 4.- a relaxed and pleasant context for the receivers⁽¹⁶⁾. These aspects have allowed to change some ideas and inspire healthy sexual behaviors in previous studies.^(17, 23)

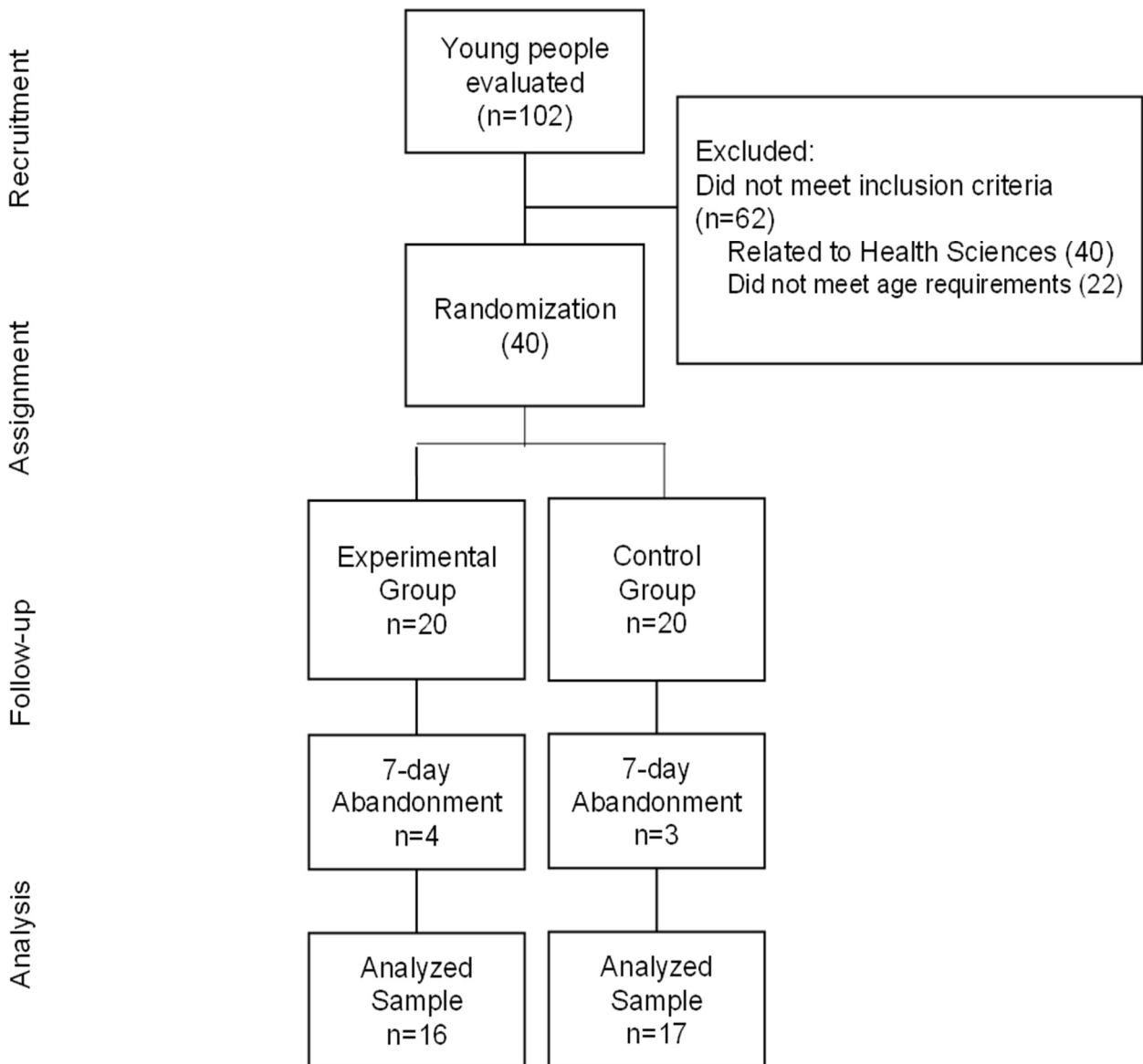
The statistical analysis was performed using the statistical package for social sciences SPSS version 24 for Windows. A Kolmogorov-Smirnov normality test with Lilliefors correction was applied to know the distribution of the variables. Group means were compared with an independent-samples Student's t-test. In addition, a repeated measures general linear model with a significance level of $<.05$ was used to compare the pre-test, post-test, and follow-up (seven days after viewing the video) measurements.

Finally, the present study adhered to the provisions of the Mexican general health law regarding research on human subjects⁽²⁴⁾. The study was approved and registered by the Academic Committee for Research and Postgraduate Studies of the Faculty of Nursing of the Benemérita Universidad Autónoma de Puebla (SIEP/033-A/2020). In addition, the informed consent of all the participants was obtained after having explained the purpose and procedures of the study, always ensuring their anonymity and confidentiality in the study.

RESULTS

A total of 102 young people entered the study, 62 of which were excluded; thus, 40 were randomized (20 to the experimental group and 20 to the control group). There were four losses in the experimental group and three in the control group because they did not respond to the follow-up survey. The progression of the intervention design is shown in Figure 1.

Figure 1. Desing process



Source: Created by the authors.

The characteristics of the participants were similar in both groups (Tables 1 and 2); most of them had started their sexually active life (f=30). There was also a high frequency of young people who reported having two or more partners (f=17), who used contraceptive methods during sexual intercourse (f=25).

Table 1. Characteristics of the participants

Characteristic		EG	CG	Total	<i>p</i>
Sex	Male	9	7	16	.387
	Female	7	19	17	
Sexually Active Life	Yes	15	15	30	.582
	No	1	2	3	
Sexual Partners	None	1	2	3	.157
	One partner	9	4	13	
	Two or more partners	6	11	17	
Contraceptive Methods	Yes	13	12	25	.609
	No	2	2	4	
	Occasionally	1	3	4	

Note: the data represent the absolute frequencies of each group; EG: Experimental Group; CG: Control Group; *p*: statistical significance per group and state; the values of X^2 are the results of the comparison between states.

Table 2. Age of the participants

Groups	\bar{X}	<i>SD</i>	<i>LL</i>	<i>UL</i>	<i>p</i>
EG	21.51	1.21	19	23	.402
CG	21.82	1.51	18	24	

Note: \bar{X} : mean; *SD*: standard deviation; *LL*: lower limit; *UL*: Upper limit; EG: Experimental Group; CG: Control Group.

Regarding the level of HPV knowledge, both groups had mainly fair knowledge at the beginning of the intervention (pre-test) (Experimental Group: 68.8%; $f=11$; vs Control Group: 76.5%; $f=13$).

For the comparison between groups, an independent-samples Student's t-test was performed after previously verifying the distribution of the data ($KS=.143$; $p=.086$) and the homoscedasticity of the variance ($p>.05$), finding no statistically significant differences in the values of the pre-test. This demonstrates that the groups were initially equivalent. In contrast, in the post-test and the follow-up, there was a difference in the experimental group after viewing the video (Table 3).

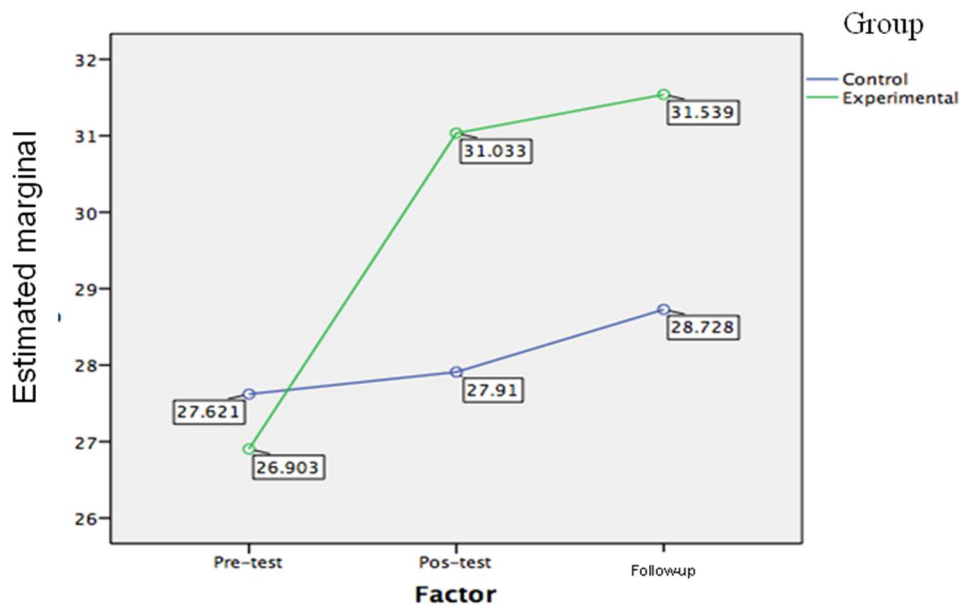
Table 3. Independent-samples Student's t-test

Measurement	HPV Knowledge		
	Experimental Group	Control Group	Independent-samples test
Pre-test	$\bar{x} = 27.06 \pm 4.12$	$\bar{x} = 27.47 \pm 2.67$	$t = .340$; IC= -2.04 - 2.86; $p = .737$
Pos-test	$\bar{x} = 30.75 \pm 2.32$	$\bar{x} = 28.18 \pm 3.55$	$t = -2.44$; IC= -4.72 - -.42; $p = .020$
Follow-up	$\bar{x} = 31.38 \pm 2.47$	$\bar{x} = 28.88 \pm 3.46$	$t = -2.36$; IC= -4.64 - -.34; $p = .024$

Note: The arithmetic means are shown \pm standard deviation; CI= 95% confidence intervals; df= 31.

The repeated measures general linear model, with the covariates of state or province, sex, onset of sexual activity, number of sexual partners, and use of contraceptive methods, confirmed the statistically significant difference in the post-test and follow-up measurements between the experimental and control groups. This result shows the effect of viewing the video on HPV knowledge across time (Wilks Lambda, $\lambda = 4.965$; $F = (.707) = 4.965$; $p = .016$) (Graph 1).

Graph 1.



Note: The covariates in the model are evaluated in the following values: State = 1.55, Sex = 1.52, Age = 21.67, Onset of sexual activity = 1.09, Number of sexual partners = 1.42, and Use of contraceptive methods = 1.36.

DISCUSSION

The present study shows the effect of the educational video: “7 things you should know about HPV!”, based on Fisher and Fisher’s information, motivation, and behavioral skills model ⁽¹⁵⁾, on young people over 18 years of age. This theoretical perspective affirms that the adoption of preventive behavior is a consequence of increased knowledge.

The results of the intervention are in agreement with Nuramalia ⁽¹¹⁾ and Garzón-Orjuela et al. ⁽¹²⁾, since an immediate positive effect can be observed as well as during the course of seven days after viewing the video, with a tendency to continue to increase. This could indicate that the effect could not only remain in a cognitive phase but also in an emotive-emotional phase, which probably drives the individuals to seek more information related to the acquisition of behavioral skills aimed at preventing HPV. This may confirm that cognitive learning processes can be modified through elements of persuasive communication ⁽¹⁶⁾.

The results of the level of HPV knowledge agree with that reported by Rico et al. ⁽⁸⁾, since there was a fair level of knowledge at the beginning of the study in both groups. This could be explained by the lack of awareness about the infection, which combined with an asymptomatic manifestation that can persist over the course of several years, could result in a low perception of risk and severity of HPV among the young population.

The findings on risky sexual practices agree with that reported by Carrión, Bravo, Izquierdo & Marrero ⁽⁶⁾, as well as what Méndez, Villegas, Guzmán & Santos mention ⁽⁷⁾, since there was a higher percentage of young people who had more than two sexual partners. This situation is a constant among the target population, which is likely due to the level of maturity and the search for new experiences; the latter being factors that could potentiate the low perception of risk and severity of the infection.

Finally, the results of the present study may be limited because it was conducted in a small sample of young Mexicans, where the level of concentration at which the participants viewed the video is unknown. However, this was compensated with the use of a valid and reliable instrument, as well as of mechanisms that prevented the impersonation and duplicity of participants. Thus, we suggest to continue to carry out interventions using videos validated in the Mexican context and with the theoretical perspective of the IMB model, which could be complemented with counseling and/or nursing consultation in order to increase the effect of the intervention.

CONCLUSIONS

The video “7 things you should know about HPV!”, based on Fisher and Fisher’s information, motivation, and behavioral skills model and using elements of persuasive communication, favored HPV knowledge in a group of young Mexicans over 18 years of age, immediately and seven days after watching the audiovisual resource.

REFERENCIAS

1. Instituto Nacional del Cáncer [Internet]. El virus del papiloma humano (VPH) y el cáncer. [Obtenido el 11 de septiembre de 2021]. Disponible en: <https://www.cancer.gov/espanol/cancer/causas-prevencion/riesgo/germenes-infecciosos/vph-y-cancer>.
2. Organización Mundial de la Salud [Internet]. Acerca del VPH. [Obtenido el 11 de septiembre de 2021]. Disponible en: https://www3.paho.org/hq/index.php?option=com_content&view=article&id=14718:about-hpv-vaccine&Itemid=72405&lang=es.
3. Organización Panamericana de la Salud [Internet]. Vacuna contra el Virus del Papiloma Humano (VPH). [Obtenido el 11 de septiembre de 2021]. Disponible en: <https://www.paho.org/es/tag/vacuna-contravirus-papiloma-humano-vph>.
4. Sistema Nacional de Vigilancia Epidemiológica [Internet], 2020. Boletín Epidemiológico, Sistema Nacional de Vigilancia. [Obtenido el 11 de septiembre de 2021]. Disponible en: <https://www.gob.mx/cms/uploads/attachment/file/557690/sem23.pdf>.
5. Heredia-Caballero AG, Palacios-López GG, Castillo-Hernández MC, Hernández-Bueno AI, Medina-Arizmendi FV. Prevalencia y tipificación de genotipos de virus del papiloma humano en mujeres del área metropolitana del Valle de México. Ginecol. obstet. Méx. [Internet]. 2017. [Obtenido el 11 de septiembre de 2021]. 85 (12): 809-818. Disponible en: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0300-90412017001200809&lng=es.
6. Carrión-Ordóñez I, Bravo-Salinas SE, Izquierdo-Coronel SA, Marrero-Escalona E. del R. Conocimientos sobre sexualidad y conductas sexuales de jóvenes universitarios, Cañar RECIMUNDO. [Internet]. 2020. [Obtenido el 11 de septiembre de 2021]. 4 (4): 115-128. Disponible en: [https://doi.org/10.26820/recimundo/4.\(4\).noviembre.2020.115-128](https://doi.org/10.26820/recimundo/4.(4).noviembre.2020.115-128).
7. Méndez-Ruiz MD, Villegas-Pantoja MÁ, Guzmán-Ramírez V, Santos-Ramírez CJ. Alcohol, edad de la primera relación sexual y número de parejas sexuales en jóvenes mexicanas. Enfermería Clínica. [Internet]. 2020. [Obtenido el 11 de septiembre de 2021]. Disponible en: <https://doi.org/10.1016/j.enfcli.2020.01.010>
8. Rico G, García H, Arana G, Monroy R, Velasco R, Contreras G. Capítulo IV. Información que tienen los adultos jóvenes universitarios acerca del virus del Papiloma Humano (VPH). en Scougall V., (Compilador). Estudios Multidisciplinarios en Ciencias de la Salud. 2020. Alfaomega (243-262). México.
9. Medina ML, Medina MG, Merino LA. Conductas de riesgo y nivel de conocimientos sobre Papiloma virus humano en universitarios del noreste de Argentina. Enf Infec Microbiol. 2014. 34(4):140-144.
10. Hernández-Márquez CI, Brito-García I, Mendoza-Martínez M, Yunes-Díaz EM, Hernández-Márquez E. Conocimiento y creencias de mujeres del estado de Morelos sobre el virus del papiloma humano. Revista Cubana de Enfermería. [Internet]. 2016. [Obtenido el 11 de septiembre de 2021]. 32 (4). Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03192016000400004&lng=es&tlng=es.
11. Nuramalia N, Ida L, Nurhaedar J. The Effectiveness of Audio Visual Media Intervention Aku Bangga Aku Tahu (ABAT) toward Adolescent Attitude as a Practice of Prevention of HIV and AIDS Transmission. International Journal of Multicultural and Multireligious Understanding. [Internet]. 2019. [Obtenido el 11

- de septiembre de 2021]. 6(5): 713-719. Disponible en: <http://dx.doi.org/10.18415/ijmmu.v6i5.1177>
12. Garzón-Orjuela N, Sánchez-Bello NF, Bonilla-Mahecha LP, Moreno- Hernández LA, Suárez-Ángel MC, Murcia-Ardila NV, Luque-Angulo SC, Eslava-Schmalbach J. Efectividad de las estrategias de transferencia de conocimiento en lenguaje audiovisual comparadas con otras para mejorar desenlaces en la salud individual y de la población general: revisión sistemática. *Revista Colombiana de Psiquiatría* [Internet]. 2019. [Obtenido el 11 de septiembre de 2021]. 48(2): 105-126. Disponible en: <https://doi.org/10.1016/j.rcp.2017.07.005>
 13. Hirshfield S, Downing MJ, Chiasson MA, Yoon IS, Houang ST, Teran RA, Grov C, Sullivan PS, Gordon RJ, Hoover DR, Parsons JT. Evaluation of Sex Positive! A Video eHealth Intervention for Men Living with HIV. *AIDS and behavior*. [Internet]. 2019. [Obtenido el 11 de septiembre de 2021]. 23(11): 3103–3118. Disponible en: <https://doi.org/10.1007/s10461-019-02498-5>
 14. Von Sneidern E, Quijano L, Paredes M, Obando E. Estrategias educativas para la prevención de enfermedades de transmisión sexual en adolescentes. *Revista Medica Sanitas*. [Internet]. 2016. [Obtenido el 11 de septiembre de 2021]. 19 (4): 198-207. Disponible en: https://www.unisanitas.edu.co/Revista/61/RevTema_Estrategias_educativas.pdf
 15. Fisher J, Fisher W. Changing AIDS-Risk Behavior. *Psychological Bulletin*. [Internet]. 1992. [Obtenido el 11 de septiembre de 2021]. 3(3): 455-474. Disponible en: DOI [10.1037/0033-2909.111.3.455](https://doi.org/10.1037/0033-2909.111.3.455)
 16. Báez FJ, Chang-Chong F, Ortiz Hernández MJ, Nava Navarro, V., Zenteno López MÁ, Flores-Merlo M. Diseño y validación de un video educativo para la prevención del VPH. *Enfermería Global*. [Internet] 2021. [Obtenido el 11 de septiembre de 2021]. 20 (3): 389 – 411. Disponible en: DOI: <https://doi.org/10.6018/eglobal.445631>
 17. Bunn C, Kalinga C, Mtema O, Abdulla S, Dillip A, Lwanda J, et al. Arts-based approaches to promoting health in sub-Saharan Africa: a scoping review. *BMJ. Global Health*. [Internet]. 2020. [Obtenido el 11 de septiembre de 2021]. 5 (5): e001987. Disponible en: <http://dx.doi.org/10.1136/bmjgh-2019-001987>
 18. Moher D, Schulz KF, Altman D. Consort Group y CONSORT Group. La declaración CONSORT: recomendaciones revisadas para mejorar la calidad de los informes de los ensayos aleatorios de grupos paralelos. [Internet]. 2001. [Obtenido el 11 de septiembre de 2021]. *Jama*, 285 (15): 1987-1991. Disponible en: https://www.medwave.cl/medios/servicios/mednet/CONSORT_Statement.pdf
 19. Elashoff DJ, Dixon JW. Crece MK. Paquete Estadístico n'Query Advisor. (Version 4.0). Copyright [Software Estadístico]. 2000. Los Ángeles C. Statistical Solutions.
 20. Xolocotzi-Morales D, Marín-Laredo MM, Gómez-Alonso C, Valenzuela-Gandarilla J. Conocimiento de los adolescentes de Guanajuato sobre prevención de la infección del virus del papiloma humano. *Revista de análisis cuantitativo y estadístico*. [Internet]. 2016 [Recuperado el 11 septiembre de 2021]. 3 (8): 1-11. Disponible en: https://www.ecorfan.org/bolivia/researchjournals/Analisis_Cuantitativo_y_Estadistico/vol3num8/Revista_de_Analisis_Cuantitativo_y_Estadistico_V3_N8_1.pdf
 21. Pérez-Pérez YP. Relación de los conocimientos sobre el virus del papiloma humano con el uso del condón en universitarios indígenas. *Horizonte Sanitario*. [Internet]. 2021. [Obtenido el 11 de septiembre de 2021]. 20 (2): 189-196. Disponible en: <https://doi.org/10.19136/hs.a20n2.3927>

22. Moya M. Persuasión y cambio de actitudes. En Morales J.F (Editor). Psicología social. 2000. Madrid. McGraw-Hill.
23. Donné L, Hoeks J, Jansen C. Using a narrative to spark safer sex communication. Health education journal. [Internet]. 2017. [obtenido el 10 de septiembre de 2020]. 76 (6). Disponible en: <https://doi.org/10.1177/0017896917710967>
24. Cámara de Diputados del Honorable Congreso de la Unión. Ley General de Salud. [Internet]. 2014. México D.F, México. Recuperado el 11 de agosto de 2021. Disponible en: http://www.diputados.gob.mx/LeyesBiblio/pdf/142_040614.pdf

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