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EDUCATIONAL TECHNOLOGIES TO PROMOTE VACCINATION AGAINST HUMAN PAPILLOMAVIRUS: INTEGRATIVE LITERATURE REVIEW

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ABSTRACT: This study aimed to investigate the educational technologies built and/or used to promote Papillomaviridae vaccination. An integrative literature review was undertaken in the CINAHL, Pubmed, Scopus, LILACS, BDENF and Adolec databases, using the descriptors technology, vaccination, Papillomaviridae, educational technology and health education. The final sample consisted of 11 original articles published in English. Of these, six were found in Pubmed; four came from 2011 and eight were developed in the United States. In more than half (6), the level of evidence was four and, concerning the methodological rigor, almost all (10) presented level A. The video was the most cited educational technology (5), besides electronic device messages, web pages, computer program, radio serial and print materials. Future research should be developed to identify technologies, aiming to improve compliance with the vaccination schedule against Papillomaviridae.

DESCRIPTORS: Technology. Health education. Vaccination. Papillomaviridae. Pacient compliance.

TECNOLOGIAS EDUCATIVAS PARA PROMOÇÃO DA VACINAÇÃO CONTRA O PAPILOMAVÍRUS HUMANO: REVISÃO INTEGRATIVA DA LITERATURA

RESUMO: Objetivou-se investigar as tecnologias educativas construídas e/ou utilizadas para promoção da vacinação contra o Papilomavírus Humano. Trata-se de revisão integrativa da literatura, nas bases de dados CINAHL, PubMed, Scopus, LILACS, BDENF e Adolec, utilizando os descritores tecnologia, vacinação, Papilomavírus Humano, tecnologia educacional e educação em saúde. A amostra final foi de 11 artigos originais, publicados em língua inglesa. Destes, seis foram encontrados na PubMed; quatro eram de 2011 e oito foram desenvolvidos nos Estados Unidos. Em mais da metade (6), o nível de evidência foi quatro e, de acordo com o rigor metodológico, quase todos (10) apresentaram nível A. O vídeo foi a tecnologia educativa mais citada (5), além de mensagens de dispositivos eletrônicos, páginas da internet, programa de computador, radionovela e materiais impressos. Futuras pesquisas devem ser desenvolvidas para identificação de tecnologias, visando melhoria da adesão ao esquema vacinal contra o Papilomavírus Humano.

DESCRITORES: Tecnologia. Educação em saúde. Vacinação. Papillomaviridae. Cooperação do paciente.

TECNOLOGÍAS EDUCATIVAS PARA PROMOVER LA VACUNACIÓN CONTRA EL VIRUS DEL PAPILOMA HUMANO: REVISIÓN INTEGRADORA DE LA LITERATURA

RESUMEN: Este estudio tuvo como objetivo investigar las tecnologías educativas construidas y/o utilizados para la promoción de la vacunación contra el Papillomaviridae. Se trata de una revisión integradora de la literatura, en las bases de datos CINAHL, PubMed, Scopus, LILACS, BDENF y Adolec, utilizando los descriptores de la tecnología, la vacunación, el Papillomaviridae, la tecnología educativa y la educación sanitaria. La muestra final de 11 artículos originales publicados en Inglés. De estas sales se encontraron en PubMed; cuatro eran 2011 y ocho fueron desarrollados en los Estados Unidos. En más de la mitad (6), el nivel de evidencia era cuatro y, de acuerdo con el rigor metodológico, casi todos (10) tenían nivel A. El video era la tecnología más citado de la educación (5), y los dispositivos electrónicos de mensajes, páginas web, programa de ordenador, la telenovela y materiales de impresión. La investigación futura debe ser desarrollado para la identificación de tecnologías, con el fin de mejorar la adherencia al programa de vacunación contra el Papillomaviridae.

DESCRIPTORES: Tecnología. Educación para la salud. Vacunación. Papillomaviridae. Cooperación del paciente.

INTRODUCTION

The human papillomavirus (HPV) is responsible for almost all cases of cervical cancer and a variable fraction of vaginal, vulvar, penal and anal cancer of serotypes 16 and 18, classified as high-risk HPV.[1-2] To try and reduce the incidence and mortality due to these tumors, the prophylactic vaccines against HPV were created, which offered the possibility to act at the primary care level, limiting the infection by the virus.[3]

Implementing this vaccine involves the need to organize educative activities for the population about the agent responsible for one of the main sexually transmitted infections, including measures to raise awareness and acceptability, reduce the stigma and gain reliability to vaccinate the girls in the age range indicated before the sexual initiation.[4]

The health education actions stimulate the discussions in this group and involve the parents' participation. They are processed through interpersonal orientations or through strategies that do not permit interaction among the participants. These should be devised in view of the context the stakeholders are in.[5]

The technologies, tools used in the educative actions, contribute to the production of knowledge, aiming to transform an empirical into a scientific approach. They target behaviors to achieve health involving learning, in which knowledge, attitudes and skills are added for care in the health-disease process, in the problems that demand permanent or temporary changes and in the perception of risk and/or vulnerability among the groups that demand more attention.[6]

Thus, the knowledge produced in enriched by the action of man, beyond the mere construction and use of artifacts or equipment, as they are not limited to the use of means, but also represent a facilitating tool. They are focused on the logical organization of activities, in order to be observed, understood and transmitted systematically and permit the planning, execution, control and monitoring involved in any and all education processes.[7]

These tools are important components for the immunization programs, employed in the health interventions developed. Different approaches can be applied to disseminate the knowledge on the vaccine against HPV to the target public and country. The distribution of educative material, presentation of immunobiological material by professionals and reproduction of videos in waiting rooms can be used for that end. Investments in knowledge enhancement can also contribute to further the attendance of health services.[8]

In addition, the dissemination of knowledge on HPV and vaccination in the school context is part of the development of health promotion and education programs, as this is a space of teaching-learning, social contact and growth, in which fundamental values are acquired, which influence the students in the formation and most important phases of their lives.[9] Being one of the main types of social equipment nowadays, the school is challenged to articulate the content addressed in the classroom with the young people's social reality.

The identification of the educative technologies on HPV that contribute to the capitation for vaccination, developed and used by the health teams and other areas to work with young people and family members, can guide the professionals' work process, as they join support to plan interventions. This survey also intends to disseminate the knowledge produced on the theme, so as to cooperate with the target population's adherence to the immunization against the virus.

This study also intended to expand the list of references that contribute to evidence-based women's health care. Hence, the goal was to investigate the educative technologies constructed and/or used to promote the vaccination against HPV.

METHOD

To achieve the proposed objective, the integrative review was used as a research method that permits the search, critical assessment and synthesis of available evidence on the research theme, presenting the state-of-the-art of this theme in the end result, as well as the implementation of effective interventions in health care, the reduction of costs and the identification of gaps to be completed in future studies.[10]

To elaborate the study, the following phases were operated: 1) elaboration of the research question; 2) sampling or literature search for primary studies; 3) data extraction; 4) assessment of primary studies; 5) analysis and synthesis of results; 6) presentation of final study.[11] The following research question was established: what

educative technologies have health professionals constructed and/or used to promote vaccination against HPV?

The following criteria were adopted to include the studies: theme of publication HPV and vaccination: discuss the construction and/or use of educative technology on HPV to contribute to vaccination adherence; be an original study; be published in Portuguese, English and Spanish between 2006 and 2014, as the first vaccine against HPV (Gardasil®) was approved in 2006.[12] The exclusion criteria were: studies in the form of a dissertation, thesis, book or book chapter, editorial, reflexive study and experience report; and studies that did not respond to the objective of the review.

As regards the evidence level, the studies were classified according to the hierarchical system that ranks the studies in six levels: level 1, meta-analysis of multiple controlled studies; level 2, individual study with experimental design; level 3, study with experimental design, such as a non-randomized study with a single pre and post-test group, time series or case-control; level 5, case report or systematically obtained data whose quality can be verified or program assessment data; level 6, opinion of respectable authorities based on clinical competency or the opinion of an expert committee, including interpretations of information not based on research.[13]

The bibliographic survey was undertaken between July 1st and December 31st 2014. A search was undertaken of articles indexed in the databases Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, Scopus, *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS), *Base de Dados de Enfermagem* (BDENF) and Adolec. The Descriptors in Health Sciences (DeCS) and Medical Subject Headings (MeSH) were consulted to identify the following descriptors in English and their respective correspondents in Portuguese: technology, vaccination, HPV, educational technology and health education. The descriptor educational technology was found in DeCS only.

Initially, the search was done by peers, with a view to standardizing the order of the descriptors and their combinations in the databases. Next, the searches were done separately. The results were compared to identify possible disagreements and correct any errors in this phase.

In the selection phase of the primary studies, the title and abstract of the 2,830 publications identified were carefully read (Table 1). As a result, 2,796 were excluded because they did not address the study theme (2,365); could not be accessed (2); corresponded to a dissertation (2), thesis (1) and book chapter (1); were repeated (8) and were integrative or systematic reviews of the literature (417). The articles found in more than one database were included only once. The full text of the remaining 34 publications was read to check whether they responded to the research question and complied with the inclusion criteria, leading to the exclusion of 23 articles. Thus, the final sample consisted of 11 original articles (Table 2).

Table 1 – Publications between 2006 and 2014 about educative technologies to promote vaccination against HPV. Recife-PE, 2014

Crossings	Databases					
	CINAHL	PubMed	Scopus	LILACS	BDENF	Adolec
Technology AND Vaccination AND HPV	11	68	68	1	-	-
Technology AND Vaccination	40	889	921	9	-	-
Technology AND HPV	30	439	335	6	-	1
Technology AND Health education AND HPV AND Vaccination	-	7	5	-	-	-
Educational technology AND HPV AND Vaccination	-	-	-	-	-	-
Total	**81**	**1,403**	**1,329**	**16**	**-**	**1**

Table 2 – Selected publications on educational technologies to promote vaccination against HPV. Recife-PE, 2014

Databases	Publications found	Selection based on the reading of the title and abstract	Final sample after reading the full text
CINAHL	81	3	2
PubMed	1,403	17	6
Scopus	1,329	14	3
LILACS	16	-	-
Adolec	1	-	-
Total	2,830	34	11

To extract the data, a validated and adapted form was completed, including the identification of the original article, the institution where the study was developed, type of scientific journal and methodological characteristics of the study.[14] To assess the methodological rigor of the selected studies, a tool was used adapted from the Critical Appraisal Skills Program (CASP).[15] This tool was adapted due to the fact that it offers an alternative to assess the quality of quantitative and qualitative studies objectively, systematically and easy to understand. The studies were classified in two categories, according to the instrument score: A (6 to 10 points) – studies with good methodological quality and limited bias and, B (at least 5 points) – studies with satisfactory methodological quality but with increased potential bias. Therefore, the studies were fully read and reread. To permit a better understanding and visualization of the collected information, tables were elaborated with the search results.

The articles were attached to the tools, properly completed to create a database. The software IBM® SPSS®, version PASW Statistics 18 was used to process the data surveyed. The further presentation and analysis of the data were based on the absolute frequencies obtained.

RESULTS

In the analysis of the 11 publications selected, it was verified that more than half (6) of the studies were published in the database PubMed, followed by Scopus (3), as shown in tables 1 and 2. The year 2011 showed the largest number of articles (4) and the United States was the country that most developed studies on the theme (8). The prevailing language was English (11).

Most of the journals the manuscripts were published in came from other areas (7) than medicine or nursing. In total, three publications were exclusively medical and only one came from nursing. Some studies discussed the construction and/or use of more than one educative technology. Among all technologies found, the video was the most mentioned (5) to promote knowledge on HPV and contribute to better vaccination adherence against the virus in the target public (Table 3).

About the classification of the evidence found, evidence level 4 was predominant (6), followed by four level 2 studies and only one level 3 study. As regards the assessment of methodological rigor, ten studies presented level A and only one level B.

Table 3 – Synthesis of the studies that presented the construction and/or use of educational technologies about HPV and vaccination

Authors/ Database	Objective	Method/evidence level	Educational technology	Results
Construction of technologies				
Vallery et al.[16] PubMed	Develop and assess a short film for 11 and 12-year-old adolescents on HPV and cervical cancer before vaccination to be approved by adults.	Methodological study in which students and parents helped to construct the movie, seven focus groups consisting of students, nurses and parents performed the assessment and, after giving their consent, the adolescents watched the movie and then answered a questionnaire. Evidence level=4.	Video	Elaboration of the movie HPV, what's that, Miss?. The assessment showed some taboos concerning sexuality by the parents and intention to take the vaccine by the students in the themes raised. With the parents' authorization, 814 seventh-year students watched the movie. The proportion of correct answers ranged between 62.4% and 97.2%.
Thomas et al.[17] CINAHL	Determine whether messages for HPV vaccination could be successfully transmitted through wireless technology using the Hip Hop culture.	Methodological study in which messages were developed based on a literature review and informal feedback from young Afro-descendants. Evidence level=4.	Music and text message	Text messages were created using a Hip Hop music file. These were easily sent and spontaneously accepted. The messages can be of use for health promotion campaigns and will be used in an intervention study.

Authors/ Database	Objective	Method/evidence level	Educational technology	Results
Smalley et al.[18] Scopus	Develop decision support tools through immunization programmers for the age range between 7 and 18 years in the United States, and for adolescents of up to 19 years old in Canada.	Methodological tool in which each support tool developed used a dynamic programming algorithm to build recommended immunization calendars in an optimized manner, accelerating the scheduling and eliminating errors. Evidence level=4.	Computer program	The constructed tool consists of three components: A user interface, a vaccine library and a programmer. When the age and vaccine history are launched in the user interface, an intermediary file is created in a specific format. The programmer then accesses that file and the library and uses the dynamic programming algorithm to create individual immunization recommendations.
Kepka et al.[19] PubMed	Develop a radio serial to promote awareness raising and knowledge about the HPV vaccine among Latin parents.	Methodological study, in which 36 parents of girls between nine and 14 years of age participated in individual interviews that produced themes for the creation of photographic serials. Through three focus groups, 33 parents saw the photographic serials and opined on the most relevant serials to construct the radio serial. Evidence level=4.	Photographic serial and radio serial	The interviews produced four themes that served to construct photographic serials, in pamphlets that showed images and short dialogues. In the focus groups, the most familiar photographic serials were used to produce the radio serial. The last focus group listened to the material and informed that they liked the length and content and considered it a good health education strategy.
Construction and use of technologies				
Tozzi et al.[20] CINAHL	Compare the quality between a sample of internet sites in Italian and a sample of sites in English.	Quantitative, non-experimental study, in which five evaluators analyzed websites in Italian and English. The domains access, credibility, content and design were investigated. The scores were compared. Evidence level=4.	Websites	74 sites in Italian and 117 in English were found. The latter scored higher on access ($p<0.01$), credibility ($p<0.01$) and content ($p<0.01$). Sites from governmental agencies or universities scored higher on credibility, content and design. In total, 16.2% of the sites in Italian were against immunization for HPV, compared to 6% of the English websites ($p<0.5$).
Chapman et al.[21] PubMed	Determine, in a pilot study, whether the use of an video-based educational tool can influence the acceptance of the HPV vaccine.	Quantitative, quasi-experimental study in which 186 mothers answered a questionnaire on knowledge and beliefs about HPV, sociodemographic data and acceptance of the vaccine, watched an eight-minute video and answered a post-video questionnaire. Evidence level=3.	Video	The acceptance of the vaccine increased from 66.7% to 78% after the presentation of the video ($p=0.0014$). Next, 94.1% (175) approved the vaccination at the age of nine years ($p<0.0001$). The perception that the vaccine promotes sex and whether the participants talk to their daughters about sex or not affected the acceptance of the vaccine.
Kepka et al.[22] PubMed	Assess the efficacy of a radio serial in Spanish as an educative tool.	Quantitative, experimental study in which 88 parents of girls between nine and 17 years took a pretest. Forty-six of them listened to the radio serial (intervention group) and 42 listened to a prevention message for prostate cancer (control group). Next, they answered a post-test. Evidence level=2.	Radio serial	About the knowledge and beliefs on HPV, scores increased in the answers to seven items between the pre and post-test in the intervention group. When comparing the two groups, a significant increase was found in the number of correct answers in the intervention group on five items. The analysis of the beliefs and decision making showed an increase in two out of 10 items in the intervention group.
Kharbanda et al.[23] Scopus	Implementing and assessing a text message service to remind the parents when the daughters were apt for the next dose of the HPV vaccine.	Quantitative, experimental study in which text messages were developed. Comparative analysis was developed between the group of 124 adolescents whose parents received the text messages (intervention group) and the control groups 1 and 2 (308 adolescents who did not receive the messages and 1,080 with two vaccination doses before the research, respectively). Evidence level=2.	Text message	The adolescents whose parents were enrolled to receive the text messages presented significantly higher results in relation to control group 1 within one month of the appropriate period to administer the dose (51.5% versus 35%), similarly to control group 2 (51.5% versus 38.1%). The increase was also observed when a four-month period beyond the recommended was assessed for the administration of the dose (64.5% versus 51.1% versus 52.9%).

Authors/ Database	Objective	Method/evidence level	Educational technology	Results
Merzouk et al.[24] PubMed	Assess the knowledge on HPV in students from West Virginia, create an educative video to be used as a supplement in health classes and determine whether an educative intervention increases the knowledge about the impact of HPV in their lives.	Quantitative, experimental study in which 626 secondary-education students participated: 372 watched the classes with the educative video about HPV (intervention group) and 254 watched the traditional health education classes (control group). The students answered a pre and post-test with 11 true-and-false questions. The changes in the scores were compared between the two groups. Evidence level=2.	Video	The post-test scores of the intervention groups significantly increased in comparison with the scores in the control group ($p<0.0001$), from 71.14% to 81.48% in the first. About the knowledge, 74.60% answered that not all women with HPV can present cancer in the post-test.
Krawczyk et al.[25] PubMed	Compare the efficacy of two educative interventions on HPV to increase the knowledge and vaccination intention among college students.	Quantitative, experimental study in which 200 college students read a pamphlet about HPV (written intervention group) or watched a video about HPV and vaccine (video intervention group) or read a pamphlet about cancer prevention strategies in general (control group). The participants answered a questionnaire before and after each activity. Evidence level=2.	Pamphlet and video	The students' mean age was 20.4 years. The intervention groups with pamphlet and video obtained high knowledge scores compared to the control group. No significant difference was found between the intervention groups. Both the written and video intervention significantly increased the vaccination intent, without a significant difference in the control group.
Humiston et al.[26] Scopus	Assess physicians' experience with strategies to increase the immunization rates among adolescents and the perceived feasibility, sustainability and usability.	Quantitative, non-experimental study, in which pediatricians and general clinicians from two health services were contacted to answer a form with 20 questions, focused on two recommended vaccine categories for adolescents (non-seasonal, including the HPV vaccine, and the influenza vaccine). Evidence level=4.	Print and electronic material	The response rate was 75.9% (148 out of 195 professionals). More than half of the practices informed were preventive visits by the nurse, medical education and visits for vaccination. One of the strategies cited in educative practice involving patients in the non-seasonal vaccine group was the use of printed resources (manuals for example) and electronic resources (such as videos, e-mails and websites), the latter with high rates. More than 40% informed taking interest in the use of these resources.

DISCUSSION

The final sample resulted in recent publications, as a search for the last ten years showed studies published between 2008 and 2013.[16-26] This reflects how the new technologies have been incorporated into the education process established nowadays, contributing to the democratization of communication, education and knowledge, based on the individuals' cultural reality.[27]

A considerable number of manuscripts originated in research developed in the United States, totaling 72.7% of the studies found.[17-19,21-24,26] The interest in developing educative technologies focused on HPV, intended to promote the vaccination of the target-public in this location, is justified by the low adherence and low vaccination coverage rates, as the records showed that only one third of the young girls received at least one dose of the vaccine and that 30% of the girls who started the scheme did not complete it.[28] In addition, the incidence and mortality rates due to cervical cancer in that country are high in the population, with estimated numbers of 12,360 new cases and 4,020 deaths caused by this cancer in 2014.[29] This reality does not differ much from the reality found in Brazil, in which 15,590 new cases of the same cancer were expected in the same year.[30]

Among the educative technologies constructed and used in interventions involving the population, the video technology stood out.[16,21,24-26] The use of audiovisual techniques has increased in experimental studies recently. This resource permits reconsidering care strategies, as part of the therapeutic process in many approaches.[31]

To investigate the use of this tool as educative material in different clinical situations, a review of randomized controlled studies evidenced a positive impact in 13 out of 22 publications found.[32] Two studies that used video are also highlighted. One of them promoted a pilot vaccination campaign against flue before the exhibition of movies in cinemas, with good results, suggesting studies to prove the efficacy of publicity messages in health communication.[33]

The other was focused on anti-tetanus vaccination for women in Cambodja, in which the use of this technology showed a positive effect.[34]

Besides the video, other technologies elaborated and used were electronic messages (mobile phone, BlackBerry® and iPhone®),[17,23,26] software,[18] radio serial,[19,22] websites[20] and print materials (pamphlets and manuals),[25-26] some of which permitted the participants' interaction in the learning process through the use of hypermedia.[17-18,20,23,26] Information and communication technologies like the internet or mobile telephony have been part of several age groups' lives, including the youngest ages, and represent the main means to search information nowadays.[35]

In line with these interactive technologies, a smartphone application was found that was specifically developed for the rural province of Sichuan, China, to improve the local childhood immunization coverage through updated vaccination records, leading to a list of children who had not been vaccinated and the forwarding of health education information to physicians.[36]

The construction of tools adapted to certain population groups' culture highlighted the radio serial, widely known among Americans with Latin origins and which presented satisfactory results in knowledge dissemination and in the modification of beliefs and concepts on the HPV vaccine,[19,22] besides the text messages with Hip Hop music files for young Afro-descendant Americans, which showed good acceptance.[17] These technologies used the Grounded Theory and the Theory of Rational Action for the construction, respectively. Similarly, the use of a constructivist theoretical framework was observed in the design and analysis of educative interfaces, using a software for geometry teaching as a model.[37]

The participation of the target public in the development of the educative technology, mainly students and parents, was present in some publications, involving the completion of questionnaires on the theme, the execution of individual interviews and focus groups.[16-17,19,22-23] Only one publication presented the nursing professional's contribution in the elaboration of the educative material.[16]

The use of participatory design, based on the constructivist learning theory and involving the subjects of the teaching-learning process, could also be seen on a study was intended to propose an educational technology in the context of histology teaching. The students' learning needs were surveyed through two focus groups involving students and individual interviews with the teachers.[38] As opposed to these findings, materials stood out that were elaborated without the influence of representatives from the target population, produced vertically and treating the target public as something closed or homogeneous.[39]

Some studies developed educative interventions focused on HPV and vaccination, mainly involving the parents' participation. These actions contributed to improve the knowledge on HPV, the vaccination intent and immunization rates against the virus, with increased percentages after the execution of the activities.[21-25] This demonstrates the impact of using educative tools in the interventions, as health education strategies, clarifying doubts, completing knowledge gaps, bringing about behavioral changes and stimulating decision making.[40] In line with these results, the findings from a study that investigated whether an approach using information technology could enhance the pneumococcal vaccination rates at an adult health service. The use of a computerized reminder system increased the vaccination rates from 38.8% to 45.4% among the elderly.[41]

In one of the studies, some weakness was diagnosed in the parents' knowledge on the HPV vaccine to permit their daughters' immunization. This shortage was acknowledged, as well as the need to implement educative programs in schools. In addition, mistaken concepts exist about the vaccine, including that its administration can make the young girls start sexual activity early.[16] In Brazil, studies to enhance the knowledge on the theme and sensitize the target public of the vaccination against HPV and the parents could cause an increase in the adherence rates, which have been lower in the second phase of the vaccination coverage (only 45% of the adolescents between 11 and 13 years were vaccinated).[42]

CONCLUSION

The educative technologies focused on HPV, which particularly affected the vaccination, produced and/or applied in interventions involving the population, mainly parents and girls in the age range indicated at the different locations, used videos, electronic messages, websites, software, radio serial and print materials (such as pamphlets) as communication vehicles. The construction of this material produced creative, reliable and useful tools for health education. Their use revealed a positive impact in the studies found.

No publications on the research theme were located in Brazil. This can be related to the fact that the vaccine was only included in the National Immunization Program as from 2014, and studies that intend to elaborate and verify the effect of these technologies are either incipient or have not been developed. Based on previously published experiences, other studies need to be developed, mainly randomized clinical trials, in developing and underdeveloped countries, with a view to granting the population access to knowledge on the virus and the prevention forms, thus contributing to improve the adherence to the vaccination scheme against HPV.

REFERENCES

1. Bragagnolo A, Eli D, Haas P. Papiloma Vírus Humano (HPV). Rev Bras Anal Clin. 2010 Abr-Jun; 42(2):91-6.
2. Rosa MI, Medeiros LR, Rosa DD, Bozzeti MC, Silva FR, Silva BR. Papilomavírus humano e neoplasia cervical. Cad Saúde Pública [internet]. 2009 [cited 2014 Jul 13]; 25(5):953-64. Available from: http://www.scielo.br/pdf/csp/v25n5/02.pdf
3. Borsatto AZ, Vidal MLB, Rocha RCNP. Vacina contra o HPV e a prevenção do câncer do colo do útero: subsídios para a prática. Rev Bras Cancerol [internet]. 2011 [cited 2014 Jul 14]; 57(1):67-74. Available from: http://www.inca.gov.br/rbc/n_57/v01/pdf/10_revisao_de_literatura_vacina_hpv_prevencao_cancer_colo_utero_subsidios.pdf
4. Sanches EB. Prevenção do HPV: a utilização da vacina nos serviços de saúde. Rev Saúde Pesquisa [internet]. 2010 [cited 2014 Jul 12]; 3(2):255-61. Available from: http://www.cesumar.br/pesquisa/periodicos/index.php/saudpesq/article/viewArticle/1257
5. Amorim VL, Vieira NFC, Monteiro EMLM, Sherlock MSM, Barroso MGT. Práticas educativas desenvolvidas por enfermeiros na promoção à saúde do adolescente. RPBS [internet]. 2006 [cited 2014 Jul 12]; 19(4):240-6. Available from: http://ojs.unifor.br/index.php/RBPS/article/view/989
6. Gubert FA, Santos ACL, Aragão KA, Pereira DCR, Vieira NFC, Pinheiro PNC. Tecnologias educativas no contexto escolar: estratégia de educação em saúde em escola pública de Fortaleza-CE. Rev Eletr Enferm [internet]. 2009 [cited 2014 Jul 12]; 11(1):165-72. Available from: http://www.fen.ufg.br/revista/v11/n1/pdf/v11n1a21.pdf
7. Nietsche EA, Backes VMS, Colomé CLM, Ceratti RN, Ferraz F. Tecnologias educacionais, assistenciais e gerenciais: uma reflexão a partir da concepção dos docentes de enfermagem. Rev Latino-Am Enfermagem. 2005 Mai-Jun; 13(3):344-53.
8. Gowda C, Schaffer SE, Dombkpwski KJ, Dempsey Af. Understanding attitudes toward adolescent vaccination and the decision-making dynamic among adolescents, parents and providers. BMC Public Health [internet]. 2012 [cited 2014 Jul 12]; 12:509. Available from: http://www.biomedcentral.com/content/pdf/1471-2458-12-509.pdf
9. Gonçalves FD, Catrib AMF, Vieira NFC, Vieira LJES. A promoção da saúde na educação infantil. Interface Comunic Saúde Educ [internet]. 2008 [cited 2014 Jul 20]; 12(24):181-92. Available from: http://www.scielo.br/pdf/icse/v12n24/13.pdf
10. Mendes KDS, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. Texto Contexto Enferm [internet]. 2008 [cited 2014 Jul 15]; 17(4):758. Available from: http://www.ca.unisc.br/portal/upload/com_arquivo/revisao_integrativa__metodo_de_pesquisa_para_incorporacao_de_evidencias_na_saude_e_na_enfermagem.pdf
11. Galvão CM, Mensdes KDS, Silveira RCCP. Revisão integrativa: método de revisão para sintetizar as evidências disponíveis na literatura. In: Bravidelli MM. TCC-Trabalho de Conclusão de Curso: guia prático para docentes e alunos da área da saúde. São Paulo: Látria; 2010.
12. Collucci C. Vacina que protege mulher de infecção pelo HPV é aprovada. Folha de São Paulo, 2006 Ago 29.
13. Galvão CM. Níveis de evidência. Acta Paul Enferm [internet]. 2006 [cited 2014 Oct 06]; 19(2). Available from: http://www.scielo.br/pdf/ape/v19n2/a01v19n2.pdf
14. Ursi ES. Prevenção de lesões no perioperatório: revisão integrativa da literatura [dissertação]. Ribeirão Preto (SP): Departamento de Enfermagem Geral e Especializada, Universidade de São Paulo, Programa de Enfermagem Fundamental; 2005.
15. Critical Appraisal Skills Programme. 10 questions to help you make sense of a review [internet]. 2013 [cited 2014 Oct 06]. Available from: http://media.wix.com/ugd/dded87_ebad01cd736c4b868abe4b10e7c2ef23.pdf
16. Vallery LA, Roberts SA, Kitchener HC, Brabin L. Informing adolescents about human papillomavirus vaccination: What will parents allow? Vaccine. 2008 Mar; 26:2203-10.
17. Thomas TL, Stephens DP, Blanchard B. Hip Hop, Health, and Human Papilloma Virus (HPV): Using Wireless Technology to Increase HPV Vaccination Uptake. J Nurses Practitioners. 2010 Jun; 6(6):464-70.
18. Smalley HK, Keskinocak P, Engineer FG, Pickering LK. Universal Tool for Vaccine Scheduling: Applications for Children and Adults. Interfaces. 2011 Set-Out; 41(5):436-54.

19. Kepka DL, Rodriguez HP, Thompson B. Development of a radionovela to promote HPV vaccine awareness and knowledge among latino parents. Public Health Reports. 2012 Jan-Fev; 127:130-8.

20. Tozzi AE, Buonuomo PS, Atti MLC, Carloni E, Meloni M, Gamba F. Comparison of quality of internet pages on human papillomavirus immunization in Italian and in English. J Adolescent Health. 2010; 46:83-9.

21. Chapman E, Venkat P, Ko E, Orezzoli JP, Carmen MD, Garner EIO. Use of multimedia as an educational tool to improve human papillomavirus vaccine acceptability - A pilot study. Gynecologic Oncology. 2010 Mai; 118:103-7.

22. Kepka DL, Coronado GD, Rodriguez HP, Thompson B. Evaluation of a radionovela to promote HPV vaccine and knowledge among hispanic parents. J Community Health. 2011 Mar; 36:957-65.

23. Kharbanda EO, Stockwell MS, Fox HW, Andres R, Lara M, Rickert Vaughn. Text message reminders to promote human papillomavirus vaccination. Vaccine. 2011 Fev; 29:2537-41.

24. Merzouk MD, Courtney P, Garrett-Albaugh S, Janoo J, Hobbs G, Vernon M. Knowledge of HPV in west virginia high school health students and the effects of an educational tool. J Pediatr Adolesc Gyinecol. 2011; 24:278-81.

25. Krawczyk A, Lau E, Perez S, Delisle V, Amsel R, Rosberger Z. How to inform: comparing written and video education interventions to increase human papillomavirus knowledge and vaccination intentions in young adults. J American College Health. 2012 Mai-Jun; 60(4):316-21.

26. Humiston SG, Serwint JR, Szilagyi PG, Vincelli PA, Dhepyasuwan N, Rand CM, et al. Increasing adolescent immunization rates in primary care: strategies physicians use and would consider implementing. Clinical Pediatrics. 2013 Abr; 52(8):710-20.

27. Goméz GO. Comunicação, educação e novas tecnologias: Tríade do século XXI. Comunic Educ. 2002 Jan-Abr; 23:57-70.

28. CEDIPI. Esquemas reduzidos de vacinação para HPV são possíveis? [internet]. 2014 [cited 2014 Nov 10]. Available from: http://cedipi.com.br/content/esquemas-reduzidos-de-vacina%C3%A7%C3%A3o-para-hpv-s%C3%A3o-poss%C3%ADveis

29. Siegel R, Ma J, Zou Z, Jemal A. Cancer statistics, 2014. CA Cancer J Clin [internet]. 2014 [cited 2014 Nov 10]; 64:9-29. Available from: http://onlinelibrary.wiley.com/doi/10.3322/caac.21208/pdf

30. Instituto Nacional de Câncer José Alencar Gomes da Silva. Coordenação de Prevenção e Vigilância. Estimativa 2014: Incidência de câncer no Brasil. Rio de Janeiro: INCA; 2014.

31. Bteshe M, Estellita-Lins C. Os diferentes usos do vídeo no cuidado à saúde materno-infantil. R Eletr de Com Inf Inov Saúde. 2011 Jun; 5(2):53-64.

32. Jeste DV, Dunn LB, Folsom DP, Zissok D. Multimedia educational aids for improving consumer knowledge about illness management and treatment decisions: a review of randomized controlled trials. J Psychiatr Res. 2008 Jan; 42(1):1-21.

33. Peddecord KM, Jacobson IG, Elgelberg M, Kwizera L, Macias V, Gustafson KW. Can movie theater advertisements promote health behaviors? Evaluation of a flu vaccination pilot campaign. J Health Commun. 2008 Set; 13(6):596-613.

34. Painvin C, Schlumberger M, Chhem DB, Savannarom D, Phong P, Gilberg S. Impact positif d'un documentaire vidéo-TV sur la vaccination antitétanique des femmes au Cambodge et causes de non-vaccination. Bull Soc Pathol Exot. 2011; 104:29-37.

35. Amicizia D, Domnich A, Gasparini R, Bragazzi NL, Lai PL, Panatto D. An overview of current and potential use of information and communication technologies for immunization promotion among adolescents. Human Vaccines & Immunotherapeutics. 2013 Dez; 9(12):2634-42.

36. Chen L, Wang W, Du X, Rao X, Velthoven MH, Yang R, et al. Effectiveness of a smart phone app on improving immunization of children in rural Sichuan Province, China: study protocol for a paired cluster randomized controlled trial. BMC Public Health. 2014 Mar; 14:262-70.

37. Gomes AS. Referencial teórico construtivista para avaliação de software educativo. Rev Bras Inform Educ. 2008 Mai-Ago; 16(2):9-21.

38. Santa-Rosa JG, Struchiner M. Tecnologia Educacional no contexto do ensino de histologia: pesquisa e desenvolvimento de um ambiente virtual de ensino e aprendizagem. Rev Bras Educ Médica. 2011 Fev; 35(2):289-98.

39. Nogueira MJ, Modena CM, Schall VT. Materiais educativos impressos sobre saúde sexual e reprodutiva utilizados na atenção básica em Belo Horizonte, MG: caracterização e algumas considerações. Rev Eletr de Com Inf Inov Saúde [internet]. 2009 Dez [cited 2014 Nov 10]; 3(4):169-79. Available from http://www.reciis.icict.fiocruz.br/index.php/reciis/article/view/727

40. Barbosa SM, Dias FLA, Pinheiro AKB, Pinheiro PNC, Vieira NFC. Jogo educativo como estratégia de educação em saúde para adolescentes na prevenção às DST/AIDS. Rev Eletr Enf [internt]. 2010 Jun [cited 2014 Nov 10]; 12(2):337-41. Available from: https://www.fen.ufg.br/fen_revista/v12/n2/v12n2a17.htm

41. Dexheimer JW, Talbot III TR, Ye F, Shyr Y, Jones I, Gregg WM, et al. A computerized pnemococcal

vaccination reminder system in the adult emergency depertment. Vaccine. 2011 Jul; 29:7035-41.

42. Laboissière P. HPV: menos da metade das meninas de 11 a 13 anos recebeu segunda dose da vacina. Agência Brasil [internet]. 2014 [cited 2014 Nov 11]. Available from: http://agenciabrasil.ebc.com.br/geral/noticia/2014-11/hpv-menos-da-metade-das-meninas-de-11-13-anos-recebeu-segunda-dose-da-vacina

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