

**The Effect of Web-based Education on First and Second Dose HPV Administration Rates
and Provider Intent to Vaccinate**

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Abstract

Objectives: To assess whether a web-based video education addressing barriers to the human papillomavirus (HPV) vaccine will increase first and second dose administration rates and health care provider intent to vaccinate.

Study Design: Ten health care providers from Vaccines for Children (VFC) clinics in New Mexico were included in this pretest/posttest study. Providers were given a questionnaire adapted from the Determinants of Intent to Vaccinate (DIVA) questionnaire. Only two subscales were utilized for this project (total of 10 items): Adaptation to the Patient's Profile and General Practitioner's Commitment to the Vaccine Approach. Martinez et al. (2016) suggest that PCP's commitment to the vaccination approach" can be used as a stand-alone tool with a Cronbach's alpha > .70. Following the pretest, which served as consent, providers viewed a short, four video series addressing common barriers to the HPV vaccine, followed by the same questionnaire. First and second dose rates of the HPV vaccine were measured prior to the intervention and three months post intervention using the New Mexico Immunization Information System (NMSIIS).

Results: A Wilcoxon Ranks test was used for statistical analysis of the survey responses. Alpha was set at $\leq .10$. Four of the 10 questions were statistically significant for increasing provider intent to vaccinate. HPV first dose rates increased in all three clinics and second dose rates increased in two out of the three clinics.

Conclusions: Web-based education is a successful intervention for increasing provider intent to vaccinate and first and second dose HPV administration rates. Not only can the intervention be used for the HPV vaccine, but to help increase administration rates of all other vaccines.

The Effect of Web-based Education on First and Second Dose HPV Administration Rates and Provider Intent to Vaccinate

Human papillomavirus (HPV) is the most common vaccine preventable, viral infection of the reproductive system (World Health Organization [WHO], 2016). About 27,000 people get cancer every year as the result of HPV related infections (Centers for Disease Control and Prevention [CDC], 2015). To date, the best protection against HPV related infection is the HPV vaccine. The HPV vaccine consists of three doses over a six-month period however, studies show that completion of all three doses remains low across the United States (Perkins et al., 2016; Suh et al., 2012). The Healthy People 2020 goal for the completion of the 3-dose series of the HPV vaccine in males and females ages 13-17 years old is 80 percent (Healthy People 2020, 2017). Data from 2017 indicate that in the United States, only 46% of teens have received all 3 of the recommended doses of HPV vaccine (CDC, 2017).

In 2016, the CDC changed the recommendation for adolescents younger than 15 years of age. The new recommendation states that for this age group, only two doses of the HPV vaccine six months apart are needed. For individuals older than 15 years of age, the 3-dose series is still advised. However, even with the new recommendations, the New Mexico Department of Health reported that in 2016, only 43% of teens had received the first dose and only 32% had received the second dose (NMDOH, 2017).

Background and Significance

In 2017, The New Mexico Department of Health (NMDOH) and The New Mexico Pediatric Society conducted a pilot study to improve HPV vaccination rates by educating providers on two key quality improvement strategies; (1) strong provider recommendation to vaccinate and (2) use of reminder-recall methods. Outreach to providers at Vaccine for Children

(VFC) clinics was initiated via email followed up by a phone call survey. The email included educational materials to address commonly identified barriers to HPV vaccination and strategies to address the barriers. Follow-up phone calls were made by two NMDOH personnel to 162 VFC clinics with 86 clinics responding.

Of the 42 clinics called by one NMDOH personnel, 30 (70%) of the clinic personnel indicated that the educational materials provided by email were too long, and generally not read by providers. In-person follow-up visits were made to five VFC clinics to further explore issues. Providers at 4 of the 5 clinics visited stated that the email with the educational materials was too lengthy and recommended a brief video or shorter email. Evidence suggests that web-based education is more effective and more cost effective compared to face-to-face education (Maloney et al., 2012). A PICO question was then developed to guide the literature search: How does a web-based video addressing barriers to the HPV vaccine compared to text-based education materials affect provider intent to vaccinate and HPV vaccination first and second dose administration rates?

Search Strategy

Databases searched for the literature review included Cumulative Index of Nursing and Allied Health Library (CINAHL) and PubMed. The following keywords were used in the initial search: (web-based AND education OR intervention AND immunize OR immunization(s) OR vaccine OR vaccine(s)). This search yielded 487 results in PubMed and 44 results in CINAHL. A more refined search with the limits of the last ten years and the keywords (web-based OR non web-based OR intervention(s) OR intervention OR education AND immunization(s) OR immunize OR vaccine OR vaccination(s) yielded 8 results in PubMed and 39 results in CINAHL. There were three systematic reviews found through the database search. Individual

articles listed in the reference list for each systematic review were searched using specific inclusion criteria to focus the search. Inclusion criteria were that the studies evaluate the relationship between a web-based intervention and immunization rates and that the study was published within the last ten years. Of the 13 studies reviewed from the database and reference list, seven were chosen for inclusion in the literature review for this project. Six of the seven studies were specific to the HPV vaccine.

Evidence Synthesis

The seven studies included in the literature review were evaluated using Melnyk and Fineout-Overholt's (2011) rapid critical appraisal. Of the seven studies, there were four systematic reviews (SR), and three randomized control trials (RCT) (Appendix A). Four of the studies were level I evidence and the other three were level II evidence. All of the studies utilized large sample sizes and strict inclusion criteria (Appendix A). In all seven studies, the sample recruitment procedure, inclusion criteria, sample size, interventions, setting and outcomes were discussed. Only one out of the seven studies provided a conceptual framework to guide their study. The synthesis of the findings led to the conclusion that use of a web-based education can lead to an increase in the knowledge and attitudes of the participant as well as an increase in immunization rates. All seven studies concluded that interventions are needed to help increase immunization rates. With the evidence gathered from the studies, it was determined that web-based education was a feasible intervention to increase immunization rates.

Evidence Based Practice Model and Theoretical Framework

The model chosen to guide this project was Rosswurm and Larabee's (1999) 6-step Model for Evidence-Based Practice (Appendix B). This model provided a step-by-step guide on how to a sustainable evidence-based practice change. The first step within this model was to assess the

need for a change in practice. With the low HPV vaccination rate in New Mexico and the U.S., there is a need for a change in practice to increase these rates. The next step was to link the problem intervention and the outcomes (Rosswurm & Larabee, 1999). Once the intervention to improve outcomes was chosen, the evidence was synthesized and the feasibility, benefits and risks were identified (Rosswurm & Larabee, 1999). Implementing and evaluating the practice change was the next step. A web-based educational intervention was developed and outcomes including provider intent to vaccinate and HPV first and second dose rates were measured. The final step will be to integrate and maintain the practice change.

The theoretical framework used to guide the web-based education was adapted from the Determinants of Intent to Vaccinate (DIVA) by Martinez et al. (2016). The original framework consisted of seven domains; 1) characteristics and expected benefits, 2) properties of the vaccine, 3) information about the vaccine, 4) practical and organizational aspects, 5) adaptation to the patient's profile, 6) practitioner's individual experience and 7) practitioner's commitment to the vaccine approach. For this project, only two of the domains, adaptation to the patient's profile and general practitioner commitment to the vaccine approach were measured (Appendix C).

Purpose Statement

The purpose of this project was to assess whether a web-based video education addressing the barrier to the HPV vaccination would increase provider intent to vaccinate and administration rates of the first and second doses of the HPV vaccine.

Methods

Ethics

University Institutional Review Board (IRB) approval was obtained prior to the start of the project. The pre-and post-tests were assigned code numbers and responses were not linked to

individual providers or clinics. The project director had access to the New Mexico Immunization Information System (NMSIIS) for only a specified 3-month period during the project. Once the project was completed all data were deleted.

Participants and Setting

Nineteen Health care providers (Physician's Assistant, Nurse Practitioner, Medical Doctor, Doctor of Osteopathic Medicine) employed by Vaccine for Children (VFC) clinics in New Mexico were eligible and agreed to participate in the project. Inclusion criteria were any healthcare provider employed at one of the VFC clinics participating in the project. There were no exclusion criteria. Demographic data was not collected from the participants. The project was conducted in three VFC clinics in rural, northern New Mexico. Vaccines for children is a federally funded program that provides vaccines at no cost to those who are unable to pay for vaccines (CDC, 2016). Clinics that want to be part of this program must follow strict guidelines set by the New Mexico Department of Health (NMDOH) such as, temperature logs for vaccines, vaccine management plans, and an extensive application each year (NMDOH, 2015).

Organizational Culture

There were not any organizational barriers in place that impacted their readiness to participate in this project. Each of the clinics that participated in this project had a horizontal organization structure and therefore their focus was on the goals of the organization. The focus of each clinic was to provide the health care providers with the tools needed to succeed in the goals of the organization such as increasing HPV immunization rates.

Procedures

VFC clinics in northern New Mexico were contacted about their interest in participating in an educational project addressing commonly identified barriers to HPV vaccination and site

approval was obtained. The project director contacted the VFCs that expressed interest in participating to arrange dates and times convenient to providers. Flyers with the date and time of presentations were then sent to the clinics. Recruitment of participants consisted of a short 10-minute presentation on what the project entailed. The project director distributed a pre-coded packet to each provider interested in participating in the project. Packets contained: (1) a consent letter, (2) a pre-coded pre-test, which served as consent once completed, (3) a link to the YouTube video as the educational intervention, (4) pre-coded post-test, and two stamped envelopes addressed to the project director. The project director sent the web link to providers willing to share their email as well as a reminder email at two weeks and one-month post intervention. Another email with an extension of the due date was sent two months later. Survey materials were not sent to the project director via email, so that material could not be linked to an email address.

Outcome Measures, Data Collection and Analysis Plan

Intent to vaccinate was measured using the *Determinants of Intent to Vaccinate (DIVA)* (Martinez et al., 2016). Only two subscales were utilized for this project (total of 10 items): Adaptation to the Patient's Profile and General Practitioner's Commitment to the Vaccine Approach. Martinez et al. (2016) suggest that PCP's commitment to the vaccination approach" can be used as a stand-alone tool with a Cronbach's alpha > .70. Construct validity was demonstrated by Martinez and colleagues using a Delphi panel to distinguish among the hypothesized 6 domains. In 30 out of 36 comparisons, the rank obtained by the descriptive analyses was identical or adjacent to the rank given by the Delphi panel demonstrating adequate construct validity. Vaccination Administration Rates were measured using the New Mexico Immunization Information System (NMSIIS) used by VFC clinics and the NMDOH to measure

vaccination rates. The rates were reported in aggregate for each clinic site, and no individual level data on HPV rates for each provider were provided.

Providers were asked to take the pre-test and send it to the project director using the envelope supplied in the packet. Once they complete the pre-test, they viewed the web-based presentation. Viewing the entire presentation was anticipated to take no longer than 15 minutes. Once providers watched the video, they took the post-test and mailed it to the project director using a second stamped envelope. Vaccination rates for each participating clinic were measured at 2 months following recruitment presentations.

Outcomes/Results

Ten surveys were returned to the project director and survey responses were entered into SPSS. A Wilcoxon Signed Rank Test was used to compare pre- and post-test responses (Table 2, Appendix D). Because of the low risk to participants and the small sample size, an alpha of $\leq .10$ was selected to detect statistical significance. Four out of the ten questions were statistically significant (Table 2, Appendix D). Providers attitude towards prescribing the HPV vaccine were improved post intervention regarding the patient's knowledge and preconceived ideas about the vaccine (pretest $M= 3.10$, $SD=.876$, posttest $M= 3.60$, $SD= .699$, $Z= -1.414$, $p=.059$) and the level of acceptance by their patients (pretest $M= 4.00$, $SD= .876$, posttest $M= 3.40$, $SD= .843$, $Z= -1.857$, $p=.063$). Post intervention, providers attitudes towards insisting on vaccination (pretest $M= 2.40$, $SD= 1.075$, posttest $M= 2.80$, $SD= 1.033$, $z= -2.000$, $p= .046$) and following prescription regimen (pretest $M= 2.90$, $SD= .994$, posttest $M= 3.30$, $SD= .949$, $Z= -1.633$, $p= 1.02$) were also improved. Vaccination rates for each participating clinic were measured at 2 months following recruitment presentations using NMSIIS. HPV 1st dose rates increased in all three clinics and increased in two clinics for the 2nd dose of the HPV vaccine (Figure 3,

Appendix E). These results were consistent with what the literature suggested in that web-based interventions are successful in increasing immunization rates as well as informed decision making of providers (Doherty & Lowe, 2008; Francis et al, 2016; Niccolai et al., 2015; Pot et al., 2017).

Discussion

The need for increased HPV vaccination rates in New Mexico and across the United States indicates the need for interventions that are successful at increasing rates. This project demonstrates that web-based education can be used successfully to increase provider's intent to vaccinate as well as increase vaccination rates. Provider's attitude toward prescribing the HPV vaccine in relation to the patient's knowledge and preconceived ideas and the level of acceptance by patients was improved. Additionally, after the intervention it was also found that providers felt more comfortable insisting on the vaccination even if the patient was reluctant.

This project demonstrated that web-based education is a successful intervention for increasing vaccination rates and provider intent to vaccinate. These finding may have implications for the development of web-based education programs to improve the administration rates of other vaccines. Some limitations found throughout the project were the small sample size of providers as well as the small number of clinics used for the intervention. The intervention was presented to 20 providers, however, only 10 providers returned their surveys despite three reminder emails.

Conclusion

The increase in vaccination rates within the three clinics indicates that web-based education is a successful method for increasing intent to vaccinate as well as vaccination rates. Provider education and messaging designed to increase vaccination rates must be delivered in a

manner to increase uptake by providers. Findings were consistent with the literature supporting web-based educational messaging as an effective method of improving vaccination rates.

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Appendix A

Table 1. Evaluation Table

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Doherty and Low (2008) Effects of Web-based Intervention on College Student's Knowledge of the Human Papillomavirus and Attitudes toward Vaccination.	Did not state or mention a framework	Design: RCT Purpose: To test the effects of a web-based intervention on HPV knowledge and attitudes toward vaccination in both men and women.	N= 119 CG: 58 IG: 61 Demos: FG= 68 MG: 51 Setting: undergraduate college Inclusion: undergraduate students from an introductory psychology course and one abnormal psychology course.	IV1: Educational website DV1: HPV knowledge and attitudes (short term follow up results) DV2: HPV knowledge and attitudes (one month follow up)	Baseline survey and follow up survey measuring knowledge and attitudes toward the HPV vaccine	ANOVA Alpha = .05	DV1: IG attitudes improved (p<.0001) Knowledge improved (p<.0001) DV2: p<.0001	LOE: II Conclusions: Results indicate that the web-based education did improve knowledge and attitudes about the HPV vaccine. This could lead to an increase in vaccine uptake by adolescents and college students.
Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Francis et al., (2016) Communication technologies to improve HPV vaccination	Grounded theory	Design: Systematic review Purpose: To examine the	n= 12 Demos: MA was 16.61 years 7 studies were of	IV1: EHR prompts IV2: Text messages, computer video	Common statistical analyses among studies was not discussed in	6/10 studies had p <.05 for increase in vaccination	IV1: IG- 50% CR CG: 42% CR IV2: no sig.	LOE: I Conclusions: Vaccine completion rate was

Key: **AGR-** age range; **appt-** Appointment; **AR-** Attrition rate; **BPR-** Best practice reminder; **CDC-** Centers for Disease Control and Prevention; **CG-** Control group; **CI-** Confidence interval; **CR=** Completion Rate; **CT-** Communication technologies; **DEF-** definition; **DO-** Doctor of Osteopathic medicine; **EHR-** electronic health record; **FG-** Female gender; **FM:** family medicine; **HPV-** Human papillomavirus; **ID-** Infectious disease; **IG-** Intervention group; **IIS-** Immunization Information System; **ins-** insurance; **Imm-** Immunization; **IVN-** Intervention; **LOE-** Level of Evidence; **MA-** Mean age; **MD-** medical doctor; **MG-** Male gender; **N:** Sample size (people); **NRCT:** Non-randomized control trial; **n:** Sample size (studies); **NP-** Nurse practitioner; **PA;** physician's assistant; **PC-** Primary care; **PF-** Performance Feedback; **QES-** Quasi-experimental study; **RCT-** Randomized control trial; **RN-** Registered Nurse; **sig-** significant; **US-**United states

initiation and completion: A systematic review	effectiveness of communication technology interventions on HPV vaccination initiation and completion	mixed MG and FG. 3 studies used EHR IVN. Setting: Healthcare setting and 1 n= college campus Inclusion: test efficacy of HPV vaccine IVN; measure vaccine initiation or completion; used computer, internet of mobile technology; use an experimental design (RCT)	IV3: telephone calls DV1: HPV vaccination initiation and completion DEF: CT- text, email or mailed letter	SR, Cohen's K	rates. $\alpha = .05$	difference on CR IV3: IG36.5 % CR CG: 21.4% CR	higher among the IVN group in 6/10 studies.	
Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Maloney et al. (2011). Effectiveness of Web-based versus face-to-face delivery of education in prescription of falls prevention exercise to health professionals: randomized trial.	Kirkpatrick's participation reaction and change in behavior	Design: RCT Purpose: To compare two approaches for training clinicians in prescribing exercise to prevent falls.	N= 135 IG: 67 CG: 68 Inclusion: Health care providers who held a bachelor's degree.	IVN1: educational intervention IVN2: Face-to-face intervention. DV1: participant satisfaction DV2: knowledge	Multiple choice test, questionnaire	Chi-square test and a 2 sample t test	DV1: p= .75 DV2: p= .07	LOE: II Conclusions: Web-based and face to face education are both efficient in delivery of information, but web-based is favorable due to its ability to overcome access issues for health care professionals in remote

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	settings. Decision for Use in Practice/Application to Practice
Niccolai et al., (2015) Practice- and community based interventions to increase human papillomavirus vaccine coverage	Grounded theory	Design: Systematic review Purpose: To systematically review the literature on effectiveness of interventions conducted to increase HPV vaccination rates in the US.	n= 14 n RCT= 7 n QES= 8 Demos: 13 studies included FG; 2 included males AGR: 9-20. Inclusion: conducted in US, AGR <=18, HPV vaccination rates, comparison group.	IV1: EHR alerts IV2: PF IV3: web based or text based education DV1: HPV vaccination rates DEF: PF-informing providers about their performance and vaccination rates.	Measurement used in the studies not mentioned	Common statistical analyses not mentioned in SR α = not mentioned	Statistically significant increases in at least 1 HPV vaccine outcome in 12/14 studies, NS \uparrow in 1 study and mixed effects in 1 study.	LOE: I Conclusions: There was statistically sig. increases in imm. rates in most of the interventions looked at.
Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Pot et al. (2017). Effectiveness of a Web- based Tailored Intervention With Virtual Assistants Promoting the Acceptability of HPV Vaccination Among Mothers of Invited Girls: Randomized Control	No reported theoretical framework.	Design: RCT Purpose: To evaluate the effectiveness of the Web-based tailored Intervention for promoting HPV vaccination acceptance.	N= 8062 mothers IG: 3995 CG: 4067 Demos: Mothers Setting: mothers from the Dutch vaccination register Inclusion: All children with	IV1: Web-based intervention DV1: HPV vaccination uptake DV2: informed decision making and decisional conflict	DV1: Praeventis (National immunization register) DV2: Web-based surveys	Descriptive statistics, SPSS, IBM Corp. α = .05	DV1: p=.60 DV2: p<.001	LOE: II Conclusions: This computer-tailored intervention has the potential to improve HPV vaccination acceptability and informed decision making.

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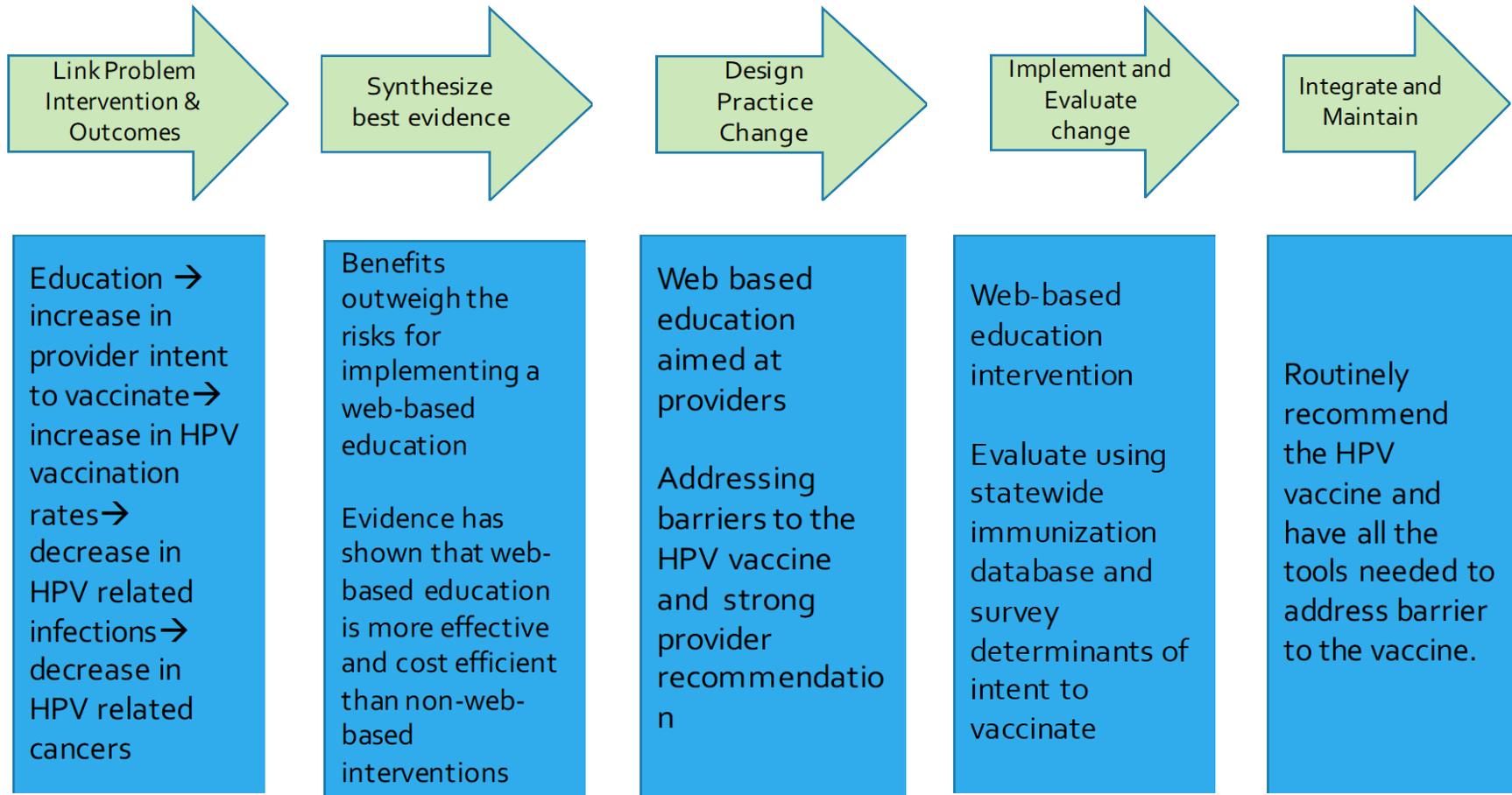
Trial		asthma >60 months and <20 years of age.						
Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Rosen et al. (2013) Quality of Web-Based Educational Interventions for Clinicians on Human Papillomavirus Vaccine: Content and Usability Assessment	Quality Evaluation Framework	Design: Systematic review Purpose: To expand research by identifying HPV vaccine web-based interventions developed for clinicians and to evaluate the quality of the web-based educational interventions.	N= 21 Demos: interventions Setting: general search engine Inclusion: Created for Clinicians, delivered information about the HPV vaccine and provided CE credits. Exclusion: Created for patients, parents or adolescents or if they focused on vaccines other than the HPV vaccine.	IV1: Web based intervention DV1: Access DV2: Content DV3: Design DV4: Evaluation DV5: Interactivity DV6: Theory and Models	IV1: general search engines DV1: whether registration was required and the cost of the intervention DV2: purpose, date, presentation of references, links to other sources and reliability DV3: layout and graphics DV4: evaluation of participant outcomes, level of evaluation and opportunities to evaluate intervention DV5: location for participants and interactive components.	ALL DV: Calculated using the Krippendorff's coefficient.	DV1: 62% required registration DV2: 81% identified purpose, 57% date, 86% provided references, and 38% provided links. DV3: 19 intervention s included easy to read text and only 13 intervention s included graphics. DV4: 81% assessed HPV vaccine knowledge, and none assessed	LOE: I Conclusions:. Web-based interventions have shown to increase clinician knowledge and recommendation of the HPC vaccine. There is a need for further research on HPV related Web-based educational interventions.

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/Application to Practice
Priest and Knowlden (2014) Systematic Review of Primary Prevention Human Papillomavirus Interventions Targeting College Students	Grounded Theory	Design: Systematic Review Purpose: To systematically review HPV interventions targeting college students.	N= 12 interventions Demos: RCT design: N=9 Pretest/posttest design: N=3 Inclusion: completed primary prevention interventions targeting general HPV vaccine uptake which used any quantitative design published in the English language from January 2000 to January 2014.	IV1: theory based educational intervention IV2: web-based educational intervention IV3: Mail or text based educational intervention IV4: single session educational intervention DV1: HPV vaccine uptake in college students DV1: HPV vaccine knowledge, intention and attitudes.	Measurement used in the studies not mentioned	Statistical analyses not mentioned in SR α = not mentioned	attitudes. DV5: 24% included an interactive component.	LOE: I Conclusions: There is a need for more interventions that evaluate the efficacy of HPV prevention interventions, including HPV knowledge and attitudes. Efficacy of interventions can be enhanced by utilizing Web- based delivery programs.

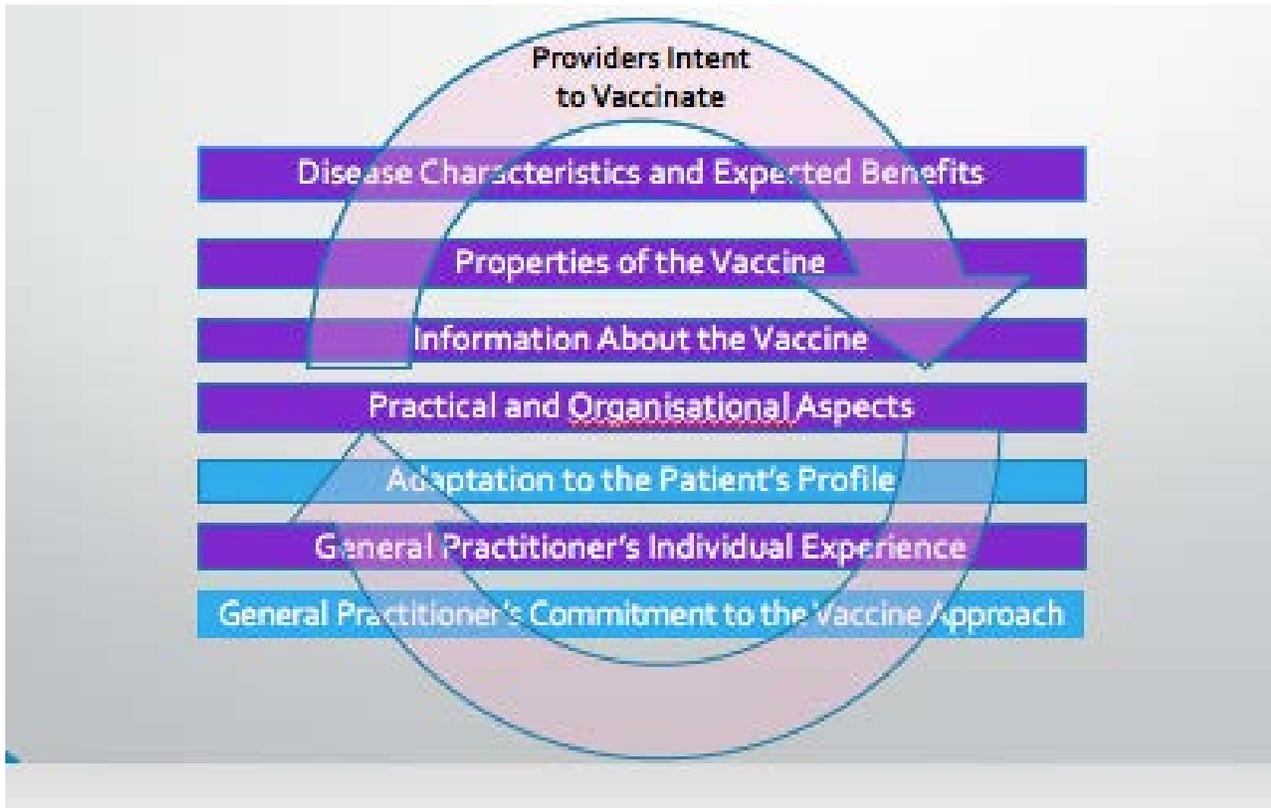
Key: **AGR-** age range; **appt-** Appointment; **AR-** Attrition rate; **BPR-** Best practice reminder; **CDC-** Centers for Disease Control and Prevention; **CG-** Control group; **CI-** Confidence interval; **CR=** Completion Rate; **CT-** Communication technologies; **DEF-** definition; **DO-** Doctor of Osteopathic medicine; **EHR-** electronic health record; **FG-** Female gender; **FM:** family medicine; **HPV-** Human papillomavirus; **ID-** Infectious disease; **IG-** Intervention group; **IIS-** Immunization Information System; **ins-** insurance; **Imm-** Immunization; **IVN-** Intervention; **LOE-** Level of Evidence; **MA-** Mean age; **MD-** medical doctor; **MG-** Male gender; **N:** Sample size (people); **NRCT:** Non-randomized control trial; **n:** Sample size (studies); **NP-** Nurse practitioner; **PA;** physician’s assistant; **PC-** Primary care; **PF-** Performance Feedback; **QES-** Quasi-experimental study; **RCT-** Randomized control trial; **RN-** Registered Nurse; **sig-** significant; **US-**United states

Appendix B
 Figure 1. EBP Model: Rosswum and Larabee's (1999).



Appendix C

Figure 2. Theoretical Framework: DIVA



Appendix D

Table 2. Wilcoxon Signed Rank Test

Table 1					
<i>Intent to Vaccinate: N= 10</i>					
Survey Questions	Pre Test Mean	Pre Test SD	Post Test Mean	Post Test SD	ASYMP. SIG. (2-tailed)
Patient's Knowledge	3.10	.876	3.60	.699	.059 *
HPV and behavioral norms	2.90	.995	3.10	.876	.157
Level of acceptance	4.00	.816	3.40	.843	.063 *
Cost	3.80	1.135	3.70	1.059	.317
Raising the Subject	3.60	.699	3.80	.422	.157
Prescribing	3.70	.483	3.80	.422	.317
Insisting	2.40	1.075	2.80	1.033	.046 *
Properly followed prescription	2.90	.994	3.30	.949	.102 *
Subject of Interest	3.60	.699	3.50	.707	.317
Attitude in agreement with beliefs	3.70	.483	3.80	.422	.317

* Indicates statistically significant data; p = .10
 Table 1 Wilcoxon Test

Appendix E

Figure 3. HPV Vaccination Rate Data

