



Improving human papilloma virus vaccination rates throughout military treatment facilities



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ABSTRACT

Objectives: The four objectives of this study were to (1) educate military healthcare providers on HPV disease and vaccine, (2) assess short term recall of information presented at educational sessions, (3) assess provider comfort level with the vaccine, and (4) assess improvement in HPV vaccination rates.

Methods: Standardized interactive educational sessions were conducted at military primary care clinics with pre- and post-educational quizzes administered before and immediately following the sessions. Provider attitudes were assessed using Likert scale questionnaires. Vaccination rates in children and young adolescents ages 11–18 at one of the participating regions that had a champion and started a Quality Improvement (QI) project were assessed at baseline, at 3-months and at 6-months post sessions. **Results:** 200 providers were reached at 48 primary care clinics during May 2014 through October 2015 with 200 quizzes and Likert scale questionnaires returned. There was increase in knowledge following the educational sessions as revealed in the pre- and post- test scores [$t(57) = -5.04$, $p < 0.001$]. There was a significant overall increase in comfort in answering patients' and parents' questions about HPV vaccine [$p = 0.003$]. There was a significant increase in the number of vaccines given at all the clinics 3-months after the educational sessions at the region who had a champion dedicated to monitoring vaccine rates and ensuring implementation efforts [$p = 0.01$] and started a QI project. This increase was not sustained at 6-months [$p = 0.324$].

Conclusions: Improvement in provider short term knowledge recall and comfort level in answering parents' questions was seen. We found that educational sessions can improve HPV vaccination rates in military clinics that have a vaccine champion for up to 3-months. Further research into the effects of having clinic vaccine champions is critical.

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1. Introduction

Human papillomavirus is the most common sexually transmitted infection in the United States. Almost all sexually active men and women will be infected with HPV at some point in their lives, mostly during the teenaged and college-aged years [1]. HPV infections cause 26,000 new cancer cases each year, in addition to 300,000 cases of genital warts [1]. Cervical cancer is the most common cancer caused by HPV, leading to the deaths of 4000 U.S. women each year [1]. Cervical dysplasia associated with HPV can

lead to several different surgical procedures—such as cold knife conization, laser conization, large loop excision of the transformation zone, ablation, and excision—that can have negative outcomes, including an increased risk of perinatal mortality and severe pre-term births [2]. The virus plays a significant role in other cancers as 72% of invasive oropharyngeal squamous cell carcinomas are positive for HPV [3,3–5]. Without vaccination during their lifetimes, more than 168,000 women will develop cervical cancer, and more than 54,000 will die [6].

The HPV vaccine has been available since 2006 to prevent this infection, but it has been underused. The vaccine's effectiveness was demonstrated within 4 years of its introduction. One study showed that vaccine-type HPV prevalence in cervicovaginal swabs decreased significantly in females aged 14–19—with vaccine effectiveness of greater than 1 dose at 82%. The same study showed that

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the prevalence of oral HPV was lower in the vaccine arm than in the control arm [7,8]. Literature continues to support a reassuring vaccine safety profile and significant effectiveness [9,10].

However, HPV vaccination rates remain low in the United States [11–14]. The Healthy People 2020 vaccination goal is 80%; however, in 2016, ≥ 1 -dose HPV vaccination coverage among teens was 60.4% (65.1% for females; 56.0% for males), and 43.4% were up to date with the recommended HPV vaccination series (49.5% for females; 37.5% for males) [15]. This gap can lead to serious health and financial consequences and translate into 53,000 future cervical cancer cases over the lifetime of girls 12 and younger [16]. Increasing the U.S. vaccination rate from 40% to 80% could prevent an estimated 4400 cervical cancer cases and 1400 deaths [6].

Vaccination rates among military adolescent dependents are also discouraging. Despite the vaccine being provided at no cost to the patient, less than 30% of females and less than 20% of males aged 13–15 receive all three doses [17]. Although the vaccine is a covered benefit provided by TRICARE (a military healthcare system), only 16% of active duty servicewomen completed the vaccination series compared to 43% of dependent daughters and 21% of dependent wives [18]. These results indicate a problem with the system and a definite need for improvement in HPV education and vaccination within the military system; hence the pilot project was initiated.

Barriers to optimal vaccine coverage include weak recommendations from healthcare providers, a lack of knowledge about the HPV vaccine and vaccine recommendations among providers and families, and parental delay in starting the HPV series [5,19,20]. The Centers for Disease Control and Prevention and the President's Cancer Panel have identified several interventions that can increase vaccine rates: (1) strengthening healthcare provider recommendations, (2) providing in-person and webinar-based vaccine education for clinic champions who are dedicated to monitoring vaccine rates and ensuring implementation efforts, (3) educating parents and adolescents about vaccines, (4) implementing reminder/recall systems, and (5) using every office visit to administer vaccinations [9,11,12]. Improving healthcare provider recommendations has been targeted as a key strategy to increase HPV immunization coverage [13,16,21,22]. Studies have shown that one of the strongest predictors of HPV vaccination is whether the physician discussed the vaccine and gave a recommendation, which together increased the odds of initiating the vaccine by 93-fold [23]. If the recommendation was considered "strong," patients were 4 times more likely to decide to be vaccinated [23]. Parental reports suggest that a substantial number of adolescents do not receive vaccine recommendations from their healthcare providers [24–29]. Furthermore, recommendations to parents and adolescents may be weak, as some providers report limited support for the HPV vaccine or suggest delaying vaccines if they encounter resistance [30–32]. Parents and adolescents with higher knowledge levels of HPV and vaccines do not have an increased likelihood of obtaining the vaccine compared to those with lower knowledge levels [33]. This observation underscores the importance of not only providing education but also giving a strong recommendation for the vaccine. These overlooked chances translate into missed opportunities for cancer prevention.

Therefore, the goal of this Quality Improvement (QI) project was primarily to educate military health care providers, nursing and support staff on HPV disease and the vaccine, and how to effectively communicate the need for this vaccine to their patients and parents, emphasizing cancer prevention. In addition, short-term recall of information presented, as well as provider attitudes towards the vaccine was assessed. Finally, improvement in vaccine rates achieved by educating providers was documented in one region that not only had a clinic champion but also started a QI project.

2. Methods

2.1. Participants

The target audience for this project was healthcare providers, nurses, and support staff in family medicine, pediatrics, and adolescent medicine at 48 clinics associated with 9 major regions: Fort Hood Region (Killeen, TX); Joint Base Lewis-McChord, which includes Madigan Army Medical Center (Tacoma, WA); Joint Base San Antonio, which includes San Antonio Military Medical Center and Randolph Air Force Base (San Antonio, TX); Tripler Army Medical Center (Honolulu, HI); William Beaumont Army Medical Center (El Paso, TX); Evans Army Community Hospital and the Air Force Academy (Colorado Springs, CO); Naval Medical Center San Diego (San Diego, CA); Irwin Army Community Hospital (Fort Riley, KS); and Bassett Army Community Hospital (Fort Wainwright, AK). These regions compose a large portion of the Uniformed Services West Chapter of the American Academy of Pediatrics.

Our goal was to connect with about 200 healthcare providers, nurses, and support staff and increase the vaccination rate among the more than 67,000 adolescents eligible for the HPV vaccine in these 9 regions. Demographic characteristics of healthcare providers, nurses, and support staff at each region were not obtained for this study. Support staff included those involved in scheduling, checking in patients, and providing administrative assistance to each clinic.

2.2. Measures

The proposed activity was evaluated by the Institutional Review Board (IRB) at Carl R. Darnall Army Medical Center (Fort Hood, TX). Ultimately it was decided that this study would be a Clinical QI/Measurement project that did not require IRB review.

The four objectives of this study were to (1) educate healthcare providers on HPV and its vaccine, stressing the importance of strengthening provider recommendations; (2) assess short-term recall of information presented at the educational sessions; (3) assess provider attitudes toward the HPV vaccine and recommendations; and (4) assess improvement in HPV vaccination rates across military treatment facilities within the Uniformed Services West Chapter of the American Academy of Pediatrics.

We conducted provider education at the clinic level from May 2014 to October 2015 via standardized, interactive 1-h educational sessions led by a subject matter expert. The educational sessions coincided with mandatory weekly meetings attended by military staff. Subject matter experts were adolescent medicine fellowship trained physicians with specific interest in improving HPV vaccine rates. They prepared the educational sessions for participants based on data available at the time of those sessions. The presentation "You are the Key to HPV Cancer Prevention" from the Centers for Disease Control and Prevention was used. The sessions included role-playing how to recommend and effectively communicate the importance of this vaccine to patients and parents [28,29]. Informational reference materials were given to healthcare providers from the Centers for Disease Control and Prevention website, including "Tips and timesavers for talking with parents about HPV vaccine," "HPV safety factsheet," and the "You are the Key to Cancer Prevention" video. To reinforce objectives and keep providers engaged, the same training was repeated a second time after receiving feedback from the first round of educational sessions. We provided continuing medical education credit to those providers who wished to receive credit for attending the educational sessions. Communication strategies included making the recommendation routine, consistent, and urgent; focusing on cancer prevention; framing the vaccine in the context of other adolescent vaccines; making

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