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Intersection of HPV and Sexual Assault: An Opportunity for Practice Change

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ABSTRACT

Background: An opportunity exists for nurses to integrate HPV education and prevention strategies into the care for adolescent and young adult sexual assault patients.

Study design: An exploratory, cross-sectional, E-mail survey was conducted to explore forensic nurses' (1) level of support and (2) facilitators and barriers that may influence nurses' level of support regarding incorporating HPV preventative strategies into their care. Eligibility for inclusion was nurse members of the International Association of Forensic Nurses who are stakeholders in the care of sexual assault patients.

Results: 541 nurses completed the survey. 98% were supportive of at least providing patients with written educational information regarding HPV and the HPV vaccine; 86% were supportive of providing written information plus making changes to the discharge instructions to incorporate HPV vaccination recommendations; and 53% were supportive of providing written information, making changes to the discharge instructions, and initiating HPV vaccination at the point of care. The strongest predictor of level of support was having positive perceived benefits for HPV vaccination. A one standard deviation increase in perceived benefit was associated with a 50% increased odds of having the highest level of support (OR = 1.5, CI [1.1, 1.9]).

Conclusions: Nurses provide care for many adolescent and young adult sexual assault patients who are at risk for acquiring HPV and are within the age range for HPV vaccination. There is an opportunity to update current practice guidelines and recommendations. The nurses in this national sample were overwhelmingly supportive of integrating HPV prevention strategies into care.

KEY WORDS:

human papillomavirus (HPV); nursing; sexual assault

American youth are at risk for both sexually transmitted infections (STI), including the human papillomavirus (HPV), and sexual assault, at disproportionately large rates (Black et al., 2011; Centers for Disease Control and Prevention [CDC], 2012). Forensic nurses care for these adolescents and young adults; however, their understanding and awareness of the specific risks associated with HPV have not been fully explicated. There are many factors that contribute to an increased risk for HPV acquisition and morbidity among young victims of sexual assault. These factors include increased risk for being a victim of sexual assault again, increased numbers of lifetime sexual partners, increased risk of STIs including HPV, lower odds of being screened for cervical cancer, and increased risks for abnormal cervical cytology (Farley, Golding, & Minkoff, 2002; Fisher, Daigle, Cullen, & Turner, 2003; Kahn et al., 2005; Sadler, Mengeling, Syrop, Torner, & Booth, 2011).

Recent research has advanced our understanding of the HPV virus family and vaccine and has begun to uncover facilitators and barriers for obtaining the vaccine. Vaccination efforts are currently targeting two equally significant

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groups: primary prevention (vaccination for those who have not had sexual contact); and secondary prevention or "catch up" vaccination (vaccination for those who have already had sexual contact and/or exposure). Health provider, particularly physician recommendation, has been identified as a vaccine facilitator (Conroy et al., 2009; Reiter, Brewer, Gottlieb, McRee, & Smith, 2009). However, little is known about nurses' roles in dissemination of information about HPV as well as their impact on vaccination rates. Forensic nurses who care for sexual assault patients are in a unique position; these nurses provide care for many adolescents and young adults still in the age range for "catch-up" vaccinations (up to age of 26 years) who are at risk for acquiring HPV. Current post-sexual-assault nursing care includes protocols for assessment, education, and treatment for STI exposure that includes potentially other vaccines (including tetanus and hepatitis B). Nurses also provide written educational materials and discharge instructions that include both medical, including ongoing STI care, and psychological follow-up.

However, at this time, forensic nurses who care for this population have not yet updated guidelines to assess for and educate patients about HPV and the HPV vaccine.

The HPV vaccine is not curative, nor does it provide post-exposure prophylaxis. However, because of the increased risk related to current exposure and future exposure for this patient population, as well as the current otherwise comprehensive treatment for all other STIs that the patient may have been exposed to, it seems lacking not to at least mention or provide some type of written information regarding the most prevalent STI in the United States today (CDC, 2009). This information is necessary to provide to patients. It helps to ensure understanding of the health risks related to the possible HPV exposure as well as the need for appropriate future follow-up care, including vaccination and cancer screening.

There is a preventative window of opportunity to incorporate HPV education into current care, which may provide future cancer protection for this high-risk population and contribute to the vaccination catch-up efforts. Incorporating information about HPV into forensic nursing care highlights the importance of HPV as a public health burden, sets a precedent for vaccination with the understanding that not all sexual activity is consensual, and contributes to efforts to inform patients about cancer risks associated with this virus.

Review of HPV and the HPV Vaccine

HPV and the HPV vaccine have recently become a major focus in health research as well as in public health campaigns. HPV is a virus family that includes over 150 different strains. Forty strains are known to be sexually transmitted and have been established as the cause of cervical cancer and genital warts. Recently, this virus has also been implicated as the cause of other types of cancers including vulvar, vaginal, penile, anal, and head and neck. In the United States, HPV each year is the cause of roughly 21,700 cancers in women and 11,700 cancers in men. There are four significant strains of HPV that produce most of the HPV-related cancers and warts in men and women. Two strains (16 and 18) are known as high-risk oncogenic and have been associated with 70% of cervical and anal cancers and 60% of oropharyngeal squamous cell cancers. Two low-risk strains (6 and 11) have been associated with 90% of genital, anal, and oral warts (CDC, 2009; Gillespie, Rubinchik, Hoel, & Sutkowski, 2009; National Cancer Institute, 2011).

In the United States, HPV is the most common STI. Roughly 20 million Americans are currently infected with HPV, with 6 million new cases each year. Researchers and epidemiologists have estimated that at least 50% of both sexually active men and women will contract this virus at some point in their lives (CDC, 2009; Weinstock, Berman, & Cates, 2004). The incidence of HPV infection for women ages 15–19 years is approximately 25% and increases to 45% by 20–24 years old (Gillespie et al., 2009). In one recent study, the incidence rate of HPV for the 409 female participants (ages 13–26 years) was 68%, and only 5% of these participants had received at least one dose of the HPV vaccine (Kahn et al., 2008).

HPV infection rates for men are more difficult to determine related to a lack of easy screening methods, but anal, penile, and cancers of the head and neck, specifically oropharyngeal (tonsil and tongue base), are on the rise in the United States and disproportionately affect younger men (3:1; Gillespie et al., 2009; Marur, D'Souza, Westra, & Forastiere, 2010).

The FDA in 2006 approved a vaccine (Gardisil) to prevent the four significant strains of HPV (16, 18, 6, and 11) in women, and in 2010, this vaccine was approved for men. Currently, the FDA approval for vaccination includes all adolescents and young adults ages 9–26 years. The CDC guidelines recommend HPV vaccine for all children ages 11–12 years with "catch-up" vaccination for those ages 13–26 years who have not been previously vaccinated (CDC, 2011). Vaccination represents a significant step toward the reduction of the HPV public health burden if widespread uptake occurs.

Materials and Methods

The aims of this cross-sectional electronic mail survey were to (1) determine the level of forensic nurses' support for incorporating HPV preventative strategies into the routine care for sexual assault patients and (2) identify factors that are associated with (knowledge, attitude, experience, normative beliefs, self-efficacy, perceived barriers, and perceived benefits) nurses' support of integrating HPV prevention strategies into the routine care for sexual

assault patients. The dependent variable was membership into one of the four ordinal support categories. These groups are ordinal in nature, with the first being no support for changing practice to incorporate HPV prevention strategies and the last being the highest level of support to begin to initiate vaccination at point of care post sexual assault. This study was approved by a university institutional review board.

The conceptual model used to guide this study utilized concepts from both the Health Belief Model (HBM) and the Theory of Planned behavior (TPB). Many leading HPV researchers have used concepts from the TPB in conjunction with the HBM to guide their work (Kahn et al., 2009; Kahn, Rosenthal, Hamann, & Bernstein, 2003; Riedesel et al., 2005). According to Ajzen (1991), TPB is a useful theory linking attitudes and behaviors and was designed to help clinicians and researchers predict and explain human behavior. The HBM is widely recognized by researchers as a framework to explain health behaviors as well as helping to explain and predict acceptance of health recommendations (Janz & Becker, 1984; National Cancer Institute, 2005). This study utilized the following concepts: attitudes, normative beliefs, perceived benefits, perceived barriers, self-efficacy, and also added was, knowledge and experience. Concepts from the HBM and TPB that were not utilized in this study were viewed as linked to nurses' intentions and actions, which are not feasible to measure at this exploratory time.

Sample

The study sample included nurses who are members of the International Association of Forensic Nurses (IAFN) and who are stake holders in the care of patients post sexual assault (defined as providing direct care, counseling, follow-up, education, and research and policy development). The sample was recruited via the IAFN electronic mail listserve; members were emailed with information about the study and a URL address where they could access additional information. After viewing the additional information, informed consent was collected before access to the online survey. At the end of the survey, participants were provided an additional URL address to access if they chose to be entered into the prize drawing to receive one of two Apple iPads. Data collection was completed with Qualtrex online survey software.

Sample size calculations to achieve 80% power revealed a conservative sample size of approximately 240 nurses. These calculations took into consideration the potential loss of power when utilizing an ordinal outcome variable (Taylor, West, & Aiken, 2006).

Measures

The conceptual model guided the development of this survey. Also contributing to survey development was an extensive evaluation of published reports in the field where researchers utilized the theories explicated and reported psychometrics. This evaluation of existing survey questions plus an appraisal of a recent systematic review of measures used in studies on HPV vaccine acceptability (Allen et al., 2010) helped to guide survey development. The newly developed survey questions were then reviewed and critiqued by an expert cancer (HPV) researcher to enhance face and content validity. Finally, all measures were pretested among members of the intended audiences, revised, and retested.

The general demographic questions included age, race/ethnicity, and country of residence. Professional demographics (years as a nurse and highest degree earned), type of forensic practice, and type of primary nursing practice were also included. Participants were also asked if they have ever heard of HPV and what their primary source of information has been.

Following the conceptual model, the survey questions focused on seven independent variables. The knowledge measure consisted of six questions that each had multipart dichotomous answer choices, which cumulatively totaled 32 answer possibilities. After extensive psychometric evaluation, for the final analysis, a 14-item measure for knowledge of HPV and the HPV vaccine was utilized. The Cronbach's alpha (α) for this measure was 0.77. One example of a knowledge question was "HPV can be transmitted by sexual intercourse, oral to genital contact, genital to genital contact, blood transfusions, and/or sharing needles," with answer choices as yes or no for each. Clinical experience with HPV was assessed with four items, $\alpha = 0.60$, and an example of a question was "Do you currently care for patients who have a history of HPV or manage Pap test results?" with answer choices yes or no.

The perceived benefits, perceived barriers, normative beliefs, self-efficacy, and vaccine attitudes measures were all Likert-scale format questions. The perceived benefit measure had seven items, $\alpha = 0.89$, and an example of a question was "It would be a benefit to sexual assault patients to learn more about HPV and the HPV vaccine," with answer choices of strongly agree to strongly disagree. Perceived barriers were assessed with eight items, $\alpha = 0.70$, and an example of a question was "I am reluctant to discuss HPV related to time" (strongly agree to strongly disagree).

Normative beliefs were assessed with six items, $\alpha = 0.77$, and an example of a question was "Would you most likely make HPV vaccine recommendations to your patients if you were following recommendations from nursing and medical colleagues, Centers of Disease Control and Prevention, and/or the IAFN?" (very unlikely to very likely). Self-efficacy with practice change was assessed with three items, $\alpha = 0.97$; an example of a question was "I am confident in my ability to adapt to practice changes" (strongly disagree to strongly agree).

Lastly, the vaccine attitudes measure included eight items, $\alpha = 0.94$, and an example of this type of question was "If there were a vaccine that prevented cancer would you want your patients to get vaccinated" or "specifically, I would recommend the HPV vaccine to sexual assault patients" (strongly disagree to strongly agree).

The outcome variable, level of support, was assessed by asking the following question: "If there were to be a change in practice guidelines related to the care of the patient during a sexual assault examination, what would you be supportive of?" (choose one answer). The four ordinal answer choices were (1) "I am not supportive of any changes that incorporate HPV education or HPV vaccination for sexual assault patients," (2) "Written educational materials about the HPV virus and vaccine should be provided to sexual assault patients in their discharge packet/paperwork," (3) "Written educational materials about the HPV virus and vaccine should be provided in their discharge packet/paperwork, and recommendations for HPV vaccination should be included in the written discharge instructions for sexual assault patients," and (4) "Written educational materials about the HPV virus and vaccine should be provided, recommendations for HPV vaccination should be included in the written discharge instructions, and if possible, the HPV vaccination series should be initiated during the care of a sexual assault patient."

Statistical Analysis

Descriptive statistics included the mean and standard deviation for continuous variables. Ordinal logistic regression was used in the final analysis because the outcome variable is ordinal and categorical (membership into one of the four support categories). The goal was essentially to predict the probability of which nurses will fall into the different categories along the ordinal scale (Mertler & Vannatta, 2005) based on their vector of independent variable values. The statistical analysis was conducted using SPSS 19.

Results

Sample Characteristics

The final sample size consisted of 519 nurses. The nurses were predominantly White (93.4%), and all were women. Only 3.7% were identified as Hispanic, 1.9% as Black, 1% as Asian, and 1% as other. The mean age was 45 years with a range of 24–70 years. Most participants were from the United States (93.4%), but 4.8% were identified as Canadian and 1% as other. These forensic nurses had a high level of nursing experience (54.1% reporting 17 or more years of experience). Others reported 11–16 years (19.7%), 5–10 years (17.9%), and 0–4 years (6.6%). The nurses had less forensic experience: 40.7% reported 0–4 years as a forensic nurse, 33.9% reported 5–10 years, 16.4% reported 11–16 years, and 7.9% reported 17 years or more. The reported highest degrees earned were 28.9% with associate or diploma, 37.2% with baccalaureate, 28.5% with masters, and 4.6% with doctoral degrees (PhD or DNP).

Among these nurses, all of whom care for sexual assault patients, 73% identified themselves as SANE-A and 41.4% identified themselves as SANE-P providers (these were not mutually exclusive categories). Other types of forensic practice focus participants identified (not mutually exclusive categories) included 32% child abuse, 4.8% corrections, 6% death investigations, 40.3% emergency practice, 8.7% geriatrics, 14.5% education, 2.5% psychology, 29.3% interpersonal violence, 6.9% legal nurse consulting, and 18.3% assessment of injury.

Almost unanimously, participants had heard of HPV (99.8%). The reported sources of HPV information included (not mutually exclusive responses) 66.5% from academic articles, 43.9% from professional organizations, 35.8% from professional conferences, 29.7% from media, 28.7% from colleagues, 28.5% from personal knowledge, 27.6% from other healthcare professionals, 24.1% from promotional materials from industry, and 22% from academic lectures.

Key basic HPV knowledge was extremely high, and every nurse knew that HPV could cause cervical cancer. All nurses could identify that risk factors included multiple sexual partners, and nearly everyone could identify other risk factors including sexual intercourse before age of 18 years (93.4%), having a history of a STI (96.0%), and having sex without a condom (99.2%). The nurses almost unanimously identified the key HPV prevention strategies including delaying the onset of sexual activity (97.7%), using condoms (96.0%), and receiving the HPV vaccine (98.8%). However, besides identifying HPV correctly as the causative agent for cervical cancers, many nurses also identified herpes simplex virus, chlamydia, and HIV incorrectly. Only 76.9% of the nurses knew that HPV can cause anal cancers, and 49.7% could correctly identify that HPV can cause cancers in the glands of the head or neck. Of the possible 32 total dichotomous item scores, the mean score was 26.61, averaging an overall knowledge score of 83% correct.

Many of these nurses reported clinical experiences caring for patients who have a history of HPV or managing Pap test results (51.8%), currently recommending and/or giving the HPV vaccine to patients where they work in a nonforensic setting (42.4%) or forensic setting (39.1%). Over 28% of the nurses reported ever discussing the initiation of HPV education or vaccination for sexual assault patients where they work.

The nurses reported very positive levels of HPV vaccine attitudes, normative beliefs, perceived vaccine benefits, and self-efficacy toward practice change. The nurses

perceived barriers toward HPV vaccination were low (see Table 1, mean scores).

Multivariate Analysis

Aim 1

The overall level of support for incorporating HPV prevention strategies into care was very high. Of the 519 nurses, only 2.1% (n = 11) did not support any change to practice. Almost 12% (n = 62) were supportive of providing written HPV educational information only, 33.3% (n = 173) were supportive of providing written information plus recommending HPV vaccination in the discharge instructions, and overwhelmingly 52.6% (n = 273) were supportive of providing written information and recommendation for HPV vaccination in the discharge instructions plus support for initiation of the vaccination series at point of care.

Aim 2

The scores from the seven identified independent variables measures were summed and standardized. Because the number of items varied from measure to measure, standardized scores were used to allow for optimal comparisons of coefficients. Significance was set at $p \leq 0.05$. Before final analysis, the correlation matrix was examined. All of the independent variables significantly correlated with the outcome variable (level of support) except self-efficacy. Both the knowledge measure and perceived barriers had negative Pearson correlations (r) related to level of support. Despite significance, the r values for each of the independent variables indicated weak linear relationships ($r < 0.50$).

An ordinal logistic regression was performed to examine how the independent variables are related to the probabilities of different levels of support. All seven independent variables were used in this regression. The coefficient for each independent variable (B) represents how probabilities of level of support change as values on the independent variables change. These movements depend on where the individual participant started on the scale to begin with.

Four independent variables were significant. Both clinical experience (p = 0.029, B = 0.122, CI [0.013, 0.232]) and perceived benefit (p = 0.000, B = 0.283, CI [0.135, 0.431]) moved individuals up on the level of support scale (high clinical experience and high perceived benefit predicted the probability of having a higher level of support). Both perceived barriers (p = 0.002, B= −0.184, CI [−0.300, −0.068]) and knowledge (p = 0.002, B = −0.167, CI [−0.274, −0.060]) moved individuals down on the level of support scale (high perceived barriers and high knowledge scores predicted the probability of having a lower level of support).

TABLE 1. Mean Scores*

Variable	Range of mean scores	Overall mean score
Vaccine attitudes (eight items)	3.81–4.51	4.20
Normative beliefs (six items)	3.38–4.57	4.14
Perceived benefits (seven items)	3.77–4.29	4.07
Perceived barriers (eight items)	1.54–3.98	2.59
Self-efficacy (three items)	4.27–4.31	4.30

*Mean scores based on 5-point Likert scales (higher score = higher belief/attitude).

Post Hoc Dichotomous Model

On the basis of the findings from Aim 1, a post hoc analysis was undertaken to optimally explain the dichotomous nature of the data. Approximately 85% of the participants reported their level of support in the top 2 categories; therefore, outcome data were essentially dichotomous into these two. The results from Aim 2 were essentially predicting probabilities of movements up and down the support scale at the very top end (all with high levels of support). Therefore, a new two-category level of support outcome variable was created, thus placing participants in either the highest level of support (support for initiation of vaccination; 52.6%) or all other level of support (47.4%). Lastly, having the outcome evenly distributed for this post hoc analysis had the added benefit of producing more statistical power.

Another correlation matrix was examined and revealed the same pattern described previously. For this analysis, logistic regression was utilized to examine the probabilities of influence the independent variables had on the dichotomous support outcome variable. Again, all seven independent variables, the standardized scale scores, were used in this regression.

This model elucidates that knowledge, clinical experience, perceived benefits, and perceived barriers are all predictors of the highest level of support. Knowledge (p = 0.003, OR = 0.744, CI [0.615, 0.899]) and perceived barriers (p = 0.010, OR = 0.757, CI [0.613, 0.936]) remained negative predictors. These two variables were associated with decreasing the odds of an individual being in the highest level of support. These independent variables are continuous, so one standard deviation increase in level of knowledge is associated with 25.6% lower odds, and an increase in perceived barrier is associated with 24.3% lower odds of being in the highest support category (category 4).

Clinical experience (p = 0.029, OR = 1.242, CI [1.02, 1.50]) and perceived benefits (p = 0.003, OR = 1.50, CI [1.14, 1.96]) remained positive predictors of support and

are associated with increased odds of being in category 4. A one standard deviation increase in clinical experience with HPV is associated with 24.2% higher odds, and an increase in perceived benefit is associated with 50% increased odds of being in the highest support category (see Table 2).

Discussion of Findings

Numerous investigators have documented that provider recommendation is a strong facilitating factor for HPV vaccination uptake (Conroy et al., 2009; Reiter et al., 2009). This study was one of the first to uncover nurses' support related to vaccination. The forensic nurses in this study reported overwhelming high levels of support for HPV education, recommendation, and vaccination for sexual assault patients. Of the nurses, only 2.1% were not supportive of some type of approach to integrate HPV prevention strategies into routine sexual assault care. Almost the entire sample (98%) supported providing HPV education at time of care post sexual assault. Approximately 86% of the nurses supported change to written discharge instructions/paperwork that would include recommendation for HPV vaccination. Lastly, 53% of the nurses indicated that HPV vaccination should be initiated during care in the emergency department post sexual assault.

The nurses' general knowledge, vaccine attitudes, normative beliefs, and perceived benefits were all highly positive. The nurses' perceived barriers to vaccination were low. The participants overwhelmingly reported their level of support in the top 2 support categories. The analyses revealed that clinical experience and perceived benefits were facilitators of level of support and for HPV vaccine initiation at point of care. Knowledge and perceived barriers were factors that decreased the likelihood of the nurse having the very highest level of support (vaccine initiation at point of care). Perceived benefits were the overall strongest predictor of support. Normative beliefs, vaccine attitudes, and self-efficacy were not significant predictors.

Previously, Kahn et al. (2005) identified high levels of knowledge as a variable associated with intention to vaccinate for physicians; however, in this study, surprisingly high levels of knowledge moved nurses slightly down on the support scale. All nurses in this study had relatively high knowledge about HPV; however, nurses with the highest levels of knowledge had 25.6 % lower odds of being in category 4, support for vaccination at points of care. One possible explanation for why those with the very highest level of knowledge were less supportive of initiating the vaccine at point of care post sexual assault may be related to concerns associated with the multiple dose nature of the vaccine and need to follow up for subsequent vaccinations (however, this was not assessed specifically as a potential barrier in this study). Despite the importance of assessing for and understanding provider baseline knowledge, it is not a concept that has been fully established as a predictor of behavioral change, intention, or support. In this study, perceived benefits, a concept explicated in the HBM, was the most influential factor of level of support.

Kahn et al. (2005) reported that experience caring for sexually active adolescent patients was associated with intention to vaccinate. In this study, 100% of the participants care for sexual assault patients; therefore, these nurses all have a baseline of experience caring for patients who have had some type of sexual contact. However, the reported level of clinical experience related to HPV was significant and positively associated with these nurses' level of support. Nurses with high levels of clinical experience related to HPV had 24.2% higher odds of having the highest level of support for HPV vaccination (category 4).

Provider perceived barriers for HPV vaccination have been documented previously. Some of the barriers reported in the literature have been (1) perceived cost for patients and lack of awareness of vaccine assistance programs, (2) perceived parental and patient lack of education and understanding, and (3) provider comfort discussing sexual activity or the sexual connection to this virus and

TABLE 2. Logistic Regression, Two-Category Level of Support

Model	B	*SE*	Wald	*df*	Sig	Exp (B)
Constant	0.116	0.093	1.55	1	0.212	1.123
Self-efficacy	−0.102	0.109	0.868	1	0.352	0.903
Vaccine attitudes	0.094	0.125	0.563	1	0.453	1.09
Normative beliefs	−0.118	0.130	0.820	1	0.365	0.889
Perceived benefits	0.405	0.137	8.75	1	0.003*	1.50
Perceived barriers	−0.278	0.108	6.57	1	0.010*	0.757
Clinical experience	0.216	0.099	4.73	1	0.029*	1.24
Knowledge	−0.296	0.098	9.08	1	0.003*	0.744

*Significance at $p \leq 0.05$.

vaccine as well as perceived concern that vaccination implies condoning sexual activity (Daley et al., 2011; Kahn et al., 2009; McCave, 2010). Vadaparampil and colleagues (2011) also reported that providers with low perceived barriers were more likely to recommend the HPV vaccine to their patients. This study's findings are similar to those reported by previous researchers. On the Likert scale, the respondents reported the greatest perceived barriers as concerns about parental or patient lack of education and understanding (mean score= 3.98) as well as cost if the patient did not have insurance or qualify for vaccine assistance programs (mean score= 3.30). However, unlike the work of previous researchers, the lowest perceived barrier was reluctance to discuss sexuality and STIs (mean score= 1.54). Surprisingly, these nurses did not perceive the time associated with adding additional responsibilities into routine care as a barrier (mean score= 2.08). Potentially, this may be related to the altruistic and dedicated nature of nurses who care for victims of sexual assault.

In this study, perceived benefit was the strongest overall predictor of support. This was similar to the physician level of support described by McCave (2010): Personal belief in the positive impact of vaccination was reported by physicians who most often provided the vaccine to their patients.

There are several limitations of this study, and future research is needed. The limitations include the cross-sectional design and the self-report methodology of the convenience sample of IAFN members. This survey captured the one-time snapshot of the participants' attitudes, beliefs, and knowledge level. This sample did not capture the full population of nurses who care for sexual assault patients and was homogenous in race and ethnicity. Lastly, because of the early stage of research for nurses, in particular, the unique populations of forensic nurses, standardized measurement tools are not available, and this can lead to problems related to validity.

Despite the limitations, several strengths should be highlighted. This study provides data on a large pool of nurses from an international (mostly national) sample. It was based on a conceptual model that integrates constructs from two highly utilized theories in the existing HPV research. Lastly, this study is also one of the first whose intent was to explore nurses' roles in facilitating HPV vaccination.

Implications for Clinical Forensic Nursing Practice

This study helped to highlight HPV as a health risk post sexual assault and elucidated a potential need for improvement in patient education and guidelines for care. Hopefully, any interest and insights generated by participation will lead to the nurses including this knowledge into their practice. In turn, changes in clinical practice will have a positive impact on the patients, families, and communities they live in and care for.

On the basis of the findings, it is clear that there is still room for future nursing education regarding HPV and the HPV vaccine. Educational interventions might not necessarily cover basic HPV information but, perhaps, grow nurses' knowledge at a higher level and help nurses stay up to date on the latest developments related to the HPV virus and its growing links to numerous types of cancers. Continuing education efforts are necessary, and consideration for these types of events can be made at the local or professional organization level.

Nurses who provide post-sexual-assault care are aware of the emotional nature of the visit and have adopted strategies to provide comprehensive and clear discharge information in written format. This information addresses necessary physical and mental health follow-up. Post-sexual-assault patients have many fears, and exposure to STIs is among them. If nurses have a greater understanding and awareness of HPV and its potential health sequelae for this at-risk population, then they will be able to comfortably and confidently address these issues. Patients, post sexual assault, need to be aware that exposure to the HPV virus was possible, and they need to have the tools to mitigate these risks. These tools include information and education, access to vaccination for future prophylaxis (important in case they were not exposed and/or coverage for strains they were not exposed to), and understanding the importance of, and access to, recommended routine cancer screenings. Nurses also need to be aware of costs and available insurance coverage for the HPV vaccine. Total cost for vaccination may vary depending on the type of medical insurance the patient has, or if the patient qualifies for free vaccines through the Vaccines for Children Program, or the Merck Vaccine Patient Assistance program.

Historically, IAFN members are known to be passionate advocates for the care and rights of sexual assault patients. The participants in this study also reported high levels of self-efficacy to practice change. These two factors together may help contribute to a growing national awareness and advocacy for changes in practice guidelines to begin to incorporate HPV preventative strategies into the care of sexual assault patients. Level of support has been documented as very high, and nurses working with nurse leaders can make simple changes to existing policies.

Future research should focus on capturing viewpoints from the larger population of nurses who care for sexual assault patients. Many nurses who care for sexual assault patients are employed by hospitals and state organizations; therefore, these organizations should be evaluated.

It will also be important to survey a more diverse population of nurses (including diversity of race, ethnicity, and gender).

Conclusion

Forensic nurses provide care for many adolescents and young adults within the age range for HPV vaccination. These sexual assault patients are at risk for acquiring HPV and at risk for increased long-term HPV-related morbidity. The nurses currently discuss, offer treatment for, and provide education and instructions about all other STIs. They currently offer or provide medication for these STIs as well as opportunity for vaccination for tetanus or hepatitis B. The latest science supports a view that HPV acquisition risk is important to consider for this population of patients and an opportunity to change practice guidelines and recommendations exists.

The evidence is clear that actions should be taken to update current guidelines and SANE/sexual assault care standards. Information and interventions to promote positive perceived benefits for vaccination can be considered and potentially disseminated through professional and academic organizations, publications, and/or conferences, as well as in basic nursing education programs. It is important to always remember that vaccination is just one way to reduce the health burden of HPV-related diseases, so nurses have the responsibility to continue to promote routine cancer screenings despite vaccination status. Vaccination is not a substitute for routine screening and care, especially because these patients may have already been exposed to the virus. Lastly, risks for STIs are a major concern for patients post sexual assault, and HPV should be included in the discussion.

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