

U.S. Nurse Practitioner Beliefs About Routine HIV Screening: Predicting Behaviors

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Abstract

HIV is a preventable infection. Effective HIV prevention interventions, which include routine HIV screening, have reduced HIV transmission. As health care providers, nurse practitioners (NPs) have a role in screening for HIV. In this study, we explored NP attitudinal, social normative (expectation and priority), and behavioral control (perceived barriers and facilitators) beliefs that predicted their self-reported HIV screening behaviors. The Theory of Planned Behavior guided the study. Data from 141 NPs were collected through a cross-sectional, paper and pencil survey. Findings revealed that the belief that “my office staff supports routine HIV screening with my patients” predicted HIV screening, whereas the belief that “consent from a parent/guardian should be obtained before screening for HIV in a person younger than 18 years” predicted less HIV screening. Nurse practitioners identified social normative expectations to be most influential in predicting their routine HIV screening behaviors.

Key words: HIV screening, nurse practitioner, descriptive study

The U.S. Centers for Disease Control and Prevention (CDC) has recommended that all persons ages 13–64 years have an HIV test at least once in a lifetime and those at higher risk should have annual testing (Branson et al., 2006). To promote testing for HIV infection, the CDC has also recommended that health care providers screen patients (adults, adolescents, and pregnant women) in all health care settings. Specifically, it is recommended to screen all pregnant women, adolescents, and adult patients seen at any one of eight specific health care settings, including emergency departments, urgent care clinics, inpatient services, substance abuse treatment clinics, public health clinics, community clinics, corrections health care clinics, and primary care settings (Branson et al., 2006). Studies of health care providers working in the eight health care settings have reported not routinely performing HIV screening (Burns et al., 2008; Gongidi, Sierakowski, Bowen, Jacobs, & Fernandez, 2010; Goyal et al., 2013; Hecht, Smith, Radonich, Kozlovskaya, & Totten, 2011; Korthuis et al., 2011; Montano, Phillips, Kasprzyk, & Greek, 2008; Sison et al., 2013; Sutherland & Spencer, 2016). These data suggest missed opportunities by

health care providers to identify those infected with HIV. A missed testing opportunity for a patient is defined as a patient with a new HIV diagnosis who had an encounter at a health care facility in the previous year and was not diagnosed at that encounter (DeRose, Zucker, Cennimo, & Swaminathan, 2017). Routine and universal HIV screening practices can identify people who are unaware of their HIV status while simultaneously reducing transmission and HIV-related mortality (Branson et al., 2006; Moyer, 2013).

Health care providers use evidence-based resources, such as the U.S. Preventive Services Task Force (USPSTF), to guide clinical practice and aid in decisions regarding patient care. Using risk-benefit data and evidence, the USPSTF grades clinical recommendations using an A-to-D system. In 2013, the USPSTF issued a Grade A recommendation supporting HIV screening for all adolescents and adults, ages 15–65 years, and all pregnant women (Moyer, 2013). The need to offer routine and universal HIV screening per the CDC HIV screening recommendations (Branson et al., 2006) and the USPSTF (Moyer, 2013) exists; yet more information is needed to discern their beliefs, barriers, facilitators, and social norms related to routine HIV screening. Health care providers, especially nurse practitioners (NPs), have an important role in screening while focusing on health promotion and disease prevention. Little is known about NP routine HIV screening behaviors and their beliefs. Therefore, a better understanding of the factors that influence NP HIV screening behaviors is imperative. Furthermore, no studies exist using a conceptual or

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

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<http://dx.doi.org/10.1097/JNC.000000000000014>

theoretical model to examine the factors that influence NP HIV screening behaviors. The main constructs of the Theory of Planned Behavior (TPB) by Ajzen (1988) guided the design, instrument measures, and objective evaluation for our research. This analysis was part of a larger research study completed for dissertation work (Sutherland, 2015). The goal of our study analysis was to explore NP attitudinal, social normative (expectation and priority), and behavior control (perceived barriers and facilitators) beliefs that would predict the self-reported HIV screening behaviors of NPs.

Background

The United States has worked to end the HIV epidemic since the epidemic was first identified in 1981. An estimated 1.2 million people are living with HIV in the United States, and an estimated one in eight of those (13%) are not aware that they are infected. Young people, ages 13–24 years, are more likely to be unaware of being infected (Centers for Disease Control and Prevention, 2017).

As defined by the American Association of Nurse Practitioners (AANP), an NP is educationally prepared to diagnose and treat health conditions while emphasizing prevention and wellness (American Association of Nurse Practitioners, n.d.). The single, best strategy to prevent HIV infection is through disease prevention (i.e., avoiding exposure to HIV infection). Health promotion strategies (i.e., HIV screening) can identify infection early and reduce risks for clinical progression. Through screening practices, an opportunity exists to educate and inform persons about harm reduction and/or link them to care. HIV prevention interventions also include access to pre-exposure prophylaxis, post-exposure prophylaxis, and harm reduction services for people who inject drugs. In addition, HIV care, including antiretroviral therapy, is available. It is now recommended that all persons with HIV be offered treatment for their own health and to suppress the viral load, thus decreasing the risk of transmission to others (Moyer, 2013). Providers and nurses make important judgments in their decisions to screen for HIV. They have a role in determining whether a patient accepts HIV screening and influencing HIV prevention strategies (Bender Ignacio et al., 2014). Nurses, especially NPs, are well suited to embrace HIV screening.

Effective HIV strategies and interventions can reduce complications or death from the disease. Health consequences related to HIV infection include susceptibility to other infections (i.e., pneumonia, tuberculosis, *Pneumocystis carinii* pneumonia, candidiasis, and neuropathy;

Swanson, 2009). In addition, people living with HIV may experience chronic pain, fatigue, and mental health problems such as depression, anxiety, and dementia (Swanson, 2009). Of greatest concern is the increased risk of mortality. Nearly 600,000 persons in the United States have died of HIV infection, which affects individuals, families, and communities. It is reported that screening based on risk factors alone may miss 20%–25% of undiagnosed people living with HIV who report no risk factors (Moyer, 2013). Therefore, routine HIV screening can identify infection early and reduce HIV transmission, thus preventing negative health consequences associated with HIV infection.

Theory of Planned Behavior

Routine HIV screening is defined as performing an HIV test on persons in a population (Branson et al., 2006). This behavior is the first step in HIV clinical care and in preventing new infections. The provider–patient relationship and the services provided, in conjunction with effective discussions and education, offer an opportunity for diagnosis and early intervention. We used the TPB (Ajzen, 1988; Fishbein & Ajzen, 1975) to explore routine NP HIV screening behaviors. The TPB hypothesized that behavior was intentional and influenced by three concepts: attitudes, subjective norms, and perceived behavioral control beliefs toward the intention predicting the behavior. The immediate precedent to the behavior is the intention toward the behavior. The likeliness that a person will perform or not perform a behavior is based on the person's likeliness to have a strong or weak intention to perform the behavior. Furthermore, the more approving the attitude, social norms, and perceived behavioral control beliefs, the more likely the person will have intention toward the behavior and will actually perform the behavior (Ajzen, 1988).

In theory validation research, the concepts in the TPB have explained up to half of the variance in practice intentions/behaviors among health care providers. The amount of behavior variance explained by TPB was high compared with other cognitive behavior theories (Eccles et al., 2007, Foy et al., 2007). Furthermore, the TPB has been studied in samples of health care providers to predict clinical intentions and behaviors (Koyio, Kikwilu, Mulder, & Frencken, 2012; Natan, Faour, Naamhah, Grinberg, & Klein-Kremer, 2012), yet no studies using the theory examine the HIV screening behaviors of health care providers. Our study supports the application of the TPB and its theoretical relevance for examining the factors that influence NP HIV screening behaviors.

Methods

Study Design

We used a cross-sectional method to collect quantitative data via a self-report, paper and pencil survey. All data were collected in the fall of 2014 from a national sample of members of an NP organization. Responses were anonymous and not linked to mailing addresses. All study procedures were reviewed and approved by the Human Subjects Review Board at Binghamton University (Protocol Number: 3335-14) and the research manager at the AANP. The survey was pretested by an expert NP for clarity and understanding of the items and flow of the survey. The expert also agreed that the items assessed attitudinal, social normative, and perceived behavioral control beliefs related to HIV screening. The survey reported a 9.1 Flesch-Kincaid grade reading level. A detailed explanation of methods can be found in previous publications (Sutherland, 2015; Sutherland & Spencer, 2016).

Sample and Procedures

The largest U.S. professional NP organization, the AANP, has >36,000 members and 90% report current clinical practice. Nurse practitioners were recruited using mailing addresses provided by the AANP. To increase the likelihood of participant responses (Dillman, 2007; Edwards et al., 2002), mailings included (a) an introductory postcard to the study, (b) the questionnaire packet (including cover letter, questionnaire, and self-addressed stamped return envelope), and (c) a follow-up/thank you postcard to a random sample of 600 U.S. Nurse practitioners in a 6-week period. The organization reported using SPSS version 21 to select the random sample from their database of actively practicing NP members ($n = 27,768$). Sampling excluded retired members, student members, and those no longer in active practice. The introductory postcard described the purpose of the study and notified the NPs that a questionnaire would be arriving within 3–5 business days. A reminder follow-up postcard was sent 3 weeks later. As compensation, participants were eligible to provide an email address to be entered in a drawing to win an iPad mini.

Measures

The survey entitled, *Attitudes and Perceived Behavioral Control toward HIV Screening and the Perceived Social Norms Questionnaire*, consisted of two surveys: *Nurse Practitioners' HIV Screening Survey* and *Nurse*

Practitioners' Perceived Social Norms toward HIV Screening. Permission to use both instruments and adapt items was obtained from the original authors (Goyal et al., 2013; Mansell, Salinas, Sanchez, & Abdolrasulnia, 2011). The items in the *Nurse Practitioners' HIV Screening Survey* were first used to evaluate pediatric primary care provider HIV screening practices and attitudes. Validation of the scale in previous work with reliabilities ranging from 0.56 to 0.87 has been reported (Goyal et al., 2013). The items in the *Nurse Practitioners' Perceived Social Norms toward HIV Screening* were developed for NPs to initiate discussions about sexual concerns. Validation of the scale in previous work with reliabilities ranging from 0.55 to 0.74 has been reported (Mansell et al., 2011).

We examined attitudinal, social normative, and perceived behavioral control belief factors based on the TPB framework (Ajzen, 1988), which may predict routine HIV screening behaviors in NPs. Analysis included a total of 46 questionnaire items: 12 items measured NP attitudinal beliefs related to HIV screening, 6 items measured NP perceived social norms related to HIV screening (three items measured subjective norm expectation and three measured subjective norm priority), 26 items measured NP perceived behavioral control of HIV screening (18 items measured barriers and 8 measured facilitators), and 1 item measured routine HIV screening. Coding was based on the assumptions for non-parametric statistics concerning the minimum expected cell frequency.

To measure HIV screening attitudes, NPs responded to 13 items related to beliefs about HIV screening with responses ranging from 1 = *strongly disagree* to 5 = *strongly agree*. More positive HIV attitudinal beliefs were defined as either *agree* or *strongly agree* and recorded as *yes*; all other responses were recorded as *no*. Five items were reverse coded to be consistent with positive scoring, and one item was removed from the final analysis because of confusion with terminology.

To measure perceived social norms related to HIV screening, NPs responded to a total of six items. Three items measured social normative priority for HIV screening and three measured social normative expectations with responses ranging from 1 = *strongly disagree* to 6 = *strongly agree*. Greater HIV social normative beliefs were defined as *slightly agree*, *agree*, or *strongly agree* and were recorded as *yes*; all other responses were recorded as *no*.

To measure perceived behavioral control related to HIV screening, NP participants responded to 26 items related to beliefs about HIV screening. Eighteen items measured barriers and eight items measured facilitators

with responses ranging from 1 = *strongly disagree* to 5 = *strongly agree*. A greater number of perceived behavioral barriers and facilitators were defined either *agree* or *strongly agree* and recoded as *yes*; all other responses were recoded as *no*. Of the barrier items, two were reverse coded to be consistent with positive scoring. Table 1 summarizes the descriptive statistics and Cronbach alpha for the study measures.

To measure routine HIV screening behaviors, NPs were asked, *What percentage of patients ages 13–64 years would you estimate you have tested for HIV within the last year?* with response ranges of 0%, 1%–5%, 6%–25%, 26%–50%, 51%–75%, and *more than 75%*. Positive HIV screening behavior was defined as screening at least 26% of patients and recoded as *yes* for the analysis. Nurse practitioners who reported screening 25% or fewer patients were defined as not routinely screening patients for HIV and recoded *no*.

Data Analysis

Before statistical analysis, data were entered into SPSS 22.0 and systematically checked for errors. All variables were recoded to reflect categorical membership defined as either *yes* or *no*. Statistical significance was defined at $p = .05$, using an a priori power analysis. A sample size of 129 was needed for 80% power to detect any significant associations of moderate strength. Data were reported using the chi-square test for independence (with Yates Continuity Correction), Spearman correlation coefficient, and logistic regressions. SPSS Software (version 22.0) was also used for purposes of analyses (SPSS Inc., Chicago, IL).

Table 1. Descriptive Statistics and Cronbach Alphas for Study Measures

| Scale | <i>M</i> | <i>SD</i> | Range | α |
|---|----------|-----------|-------|----------|
| HIV screening attitude beliefs | 46.28 | 5.9 | 33–60 | 0.72 |
| HIV screening normative beliefs | | | | |
| Norm priority | 14.16 | 3.0 | 3–18 | 0.67 |
| Norm expectation | 13.45 | 3.7 | 3–18 | 0.79 |
| HIV screening perceived control beliefs | | | | |
| Facilitators | 29.95 | 6.3 | 8–40 | 0.92 |
| Barriers | 44.77 | 10.62 | 18–78 | 0.84 |

Note. *M* = mean; *SD* = standard deviation; α = Cronbach alpha.

Results

A total of 180 NPs responded to the study (response rate = 30%). Of the 180 responses, 141 met eligibility and were used in our analysis. Those NPs ($n = 38$) who did not self-identify themselves as practicing in a recommended CDC HIV screening setting and one NP who self-reported seeing no patients between the ages of 13 and 64 years were excluded (response rate = 24%). Demographic analyses indicated that most participants were female (92.2%; $n = 130$), White (88.7%; $n = 125$), ages 50–59 years (39.0%; $n = 55$), and working in primary care (43.3%; $n = 61$) or community clinic (18.4%; $n = 26$) settings. Self-reported years of experience of the sample were 10–20 years (29.1%; $n = 41$), less than 1 year to 5 years of experience (28.2%; $n = 40$), or 20 years or more of experience (27.0%; $n = 38$). Five to 10 years of experience (15.6%; $n = 22$) was least reported by the sample. Participants most often reported practicing in the South (36.9%; $n = 52$); practice in the North-East (16.7%; $n = 23$) was least reported. Additional sample characteristics have been previously reported (Sutherland & Spencer, 2016).

Attitudinal Beliefs Related to Routine HIV Screening

Approximately 25% ($n = 35$) of our NP participants reported routine HIV screening. Results revealed that three attitudinal belief items were significantly related to NP HIV screening behaviors. Chi-square testing for independence (with Yates Continuity Correction) indicated a significant association between *agreement that offering routine HIV screening to all patients regardless of risk will benefit my patients* ($\chi^2[1, n = 138] = 6.64, p = .01, \phi = 0.24$); *agreement that consent from parent/guardian should be obtained* ($\chi^2[1, n = 138] = 4.27, p = .04, \phi = 0.19$); and *agreement with the 2013 Coverage Guide for HIV* ($\chi^2[1, n = 137] = p = .01, \phi = 0.24$). The NPs who reported more HIV screening behaviors also reported (a) agreement that *offering routine HIV screening to all patients regardless of risk will benefit my patients*, (b) agreement that *consent from parent/guardian should be obtained*, and (c) agreement with *the 2013 Coverage Guide for HIV*. No other individual belief items were statistically significant (Table 2).

Social Normative Beliefs Related to Routine HIV Screening

In our sample of NPs, no social normative priority beliefs were significantly related to NP HIV screening behaviors. In contrast, results revealed that two social

Table 2. Nurse Practitioner Beliefs Predicting HIV Screening Behaviors (*n* = 141)

| Variable | Report HIV Screening Behaviors, <i>n</i> (%) | <i>p</i> -Value |
|---|--|-----------------|
| Attitudinal beliefs | | |
| Agree HIV screening benefits patients (<i>n</i> = 138) | 28 (20.3) | .010** |
| Agree consent from parent/guardian should be obtained (<i>n</i> = 138) | 26 (18.8) | .039* |
| Agree with 2013 <i>Coverage Guide for HIV</i> (<i>n</i> = 137) | 26 (19.0) | .011** |
| Social normative beliefs | | |
| <i>Priority</i> : no items | | |
| Expectation | | |
| Colleagues assume I would discuss HIV with concerned patients (<i>n</i> = 138) | 33 (23.9) | .009** |
| My office staff supports my routine HIV screening (<i>n</i> = 135) | 35 (25.9) | .0001*** |
| Perceived behavior control beliefs | | |
| Facilitators | | |
| Consultation in how to incorporate routine testing into the flow of a busy practice (<i>n</i> = 134) | 16 (11.9) | .016* |
| Information about which HIV tests are available and when and how to order (<i>n</i> = 134) | 19 (14.2) | .008** |
| Barriers | | |
| Not confident in knowledge (<i>n</i> = 137) | 1 (0.7) | .010** |
| Not cost-effective (<i>n</i> = 137) | 1 (0.7) | .052* |
| Difficult to screen when accompanied by a guardian/spouse/third-party person (<i>n</i> = 136) | 19 (14.0) | .038* |
| Difficult to ensure follow-up to patients for their HIV test results (<i>n</i> = 137) | 6 (4.4) | .049* |
| Uncomfortable delivering HIV test results (<i>n</i> = 137) | 0 (0.0) | .026* |
| Do not know where to refer patients with a positive HIV test (<i>n</i> = 137) | 1 (0.7) | .052* |
| Lack of staffing is an obstacle to adopt routine HIV screening (<i>n</i> = 134) | 2 (1.5) | .030* |

**p* ≤ .05;
 ***p* ≤ .01;
 ****p* ≤ .001.

normative expectation beliefs were significantly related to NP HIV screening behaviors. Chi-square testing for independence (with Yates Continuity Correction) indicated a significant association between agreement that *colleagues assume I would discuss HIV with concerned patients* ($\chi^2[1, n = 138] = 6.78, p = .009, \phi = 0.24$) and *my office staff supports my routine HIV screening even when it takes more time* ($\chi^2[1, n = 135] = 21.64, p = .0001, \phi = 0.42$). The proportion of NPs who reported more HIV screening behaviors also

reported agreement with these measure items. No other belief items were statistically significant (Table 2).

Perceived Behavioral Control Beliefs About Routine HIV Screening

We found that two perceived behavioral control facilitator beliefs and seven perceived behavioral control barrier beliefs were significantly related to NP HIV screening behaviors. In regard to facilitator beliefs,

chi-square testing for independence (with Yates Continuity Correction) indicated a significant association with measure items related to agreement with *consultation in how to incorporate routine testing into the flow of a busy practice* ($\chi^2[1, n = 134] = 5.85, p = .02, \phi = -0.28$) and *information about which HIV tests are available and when and how to order* ($\chi^2[1, n = 134] = 6.98, p = .01, \phi = -0.25$) in NPs with positive HIV screening behaviors. Overall, NPs with HIV screening behaviors reported few barriers; however, compared with those without HIV screening behaviors, seven belief items were statistically significant. Chi-square testing for independence (with Yates Continuity Correction) indicated a significant association with measure items related to agreement with *having confidence in HIV knowledge* ($\chi^2[1, n = 137] = 6.69, p = .01, \phi = -0.24$); *being a cost-effective measure* ($\chi^2[1, n = 137] = 3.76, p = .05, \phi = -0.19$); *difficulty in screening when accompanied by a guardian/spouse/third-party person* ($\chi^2[1, n = 136] = 4.33, p = .04, \phi = -0.20$); *ensuring appropriate follow-up to patients for their HIV test results* ($\chi^2[1, n = 137] = 3.86, p = .05, \phi = -0.19$); *delivering HIV test results* ($\chi^2[1, n = 137] = 4.98, p = .03, \phi = -0.27$); *ability to refer patients with a positive HIV test* ($\chi^2[1, n = 137] = 3.76, p = .05, \phi = -0.19$); and *appropriate staffing* ($\chi^2[1, n = 134] = 4.70, p = .30, \phi = -0.21$). No other perceived behavioral control belief items were statistically significant (Table 2).

Correlations and Logistic Regressions to Predict HIV Screening Behaviors

Consistent with the TPB, attitudes, social norms (priority and expectation), and behavioral control (facilitators and barriers) simultaneously accounted for 33% of the

variance in behaviors related to routine HIV screening. Three of the predictors in the model were found to correlate significantly with NP HIV screening behaviors (Table 3): attitudes related to HIV screening and behavior ($n = 133, r = 0.38, p = .0001$), social normative expectations ($n = 135, r = 0.43, p = .0001$), and perceived behavioral control barrier beliefs ($n = 130, r = -0.45, p = .0001$). The correlations for normative priority and control facilitators were not statistically significant. Although three variable correlations were statistically significant, the regression coefficients obtained in the binary logistic regression analysis showed that only social normative expectations ($p = .02$) and attitudinal beliefs ($p = .03$) made independent contributions to the prediction of behaviors (Table 4).

The strongest predictor of HIV screening was social normative expectation, recording an odds ratio (OR) of 1.22, followed by attitudinal beliefs, recording an OR of 1.13. Regression coefficients not statistically significant were perceived behavioral control facilitators ($p = .25$), perceived behavioral control barriers ($p = .35$), and social normative priorities ($p = .44$). A second logistic regression analysis was performed to test which of the social normative expectations and attitudinal beliefs about HIV screening predicted NP HIV screening behaviors. The belief items found to be statistically significant were *my office staff supports routine HIV screening with my patients even when it takes more time* (OR: 1.79, 95% confidence interval: 1.0–3.1, $p = .04$) predicted NP HIV screening behaviors and *consent from a parent/guardian should be obtained before screening for HIV in a person younger than 18 years* (OR: 0.61, 95% confidence interval: 0.4–1.0, $p = .04$) predicted NPs not screening for HIV. No other items were statistically significant.

Table 3. Correlations of Variables

| Predictor Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------------|-------|-------|--------------------|-------------------|--------------------|-------------------|--------------------|---|
| 1. Attitude scale | 46.28 | 5.9 | — | | | | | |
| 2. Normative priority scale | 14.16 | 3.03 | 0.16 | — | | | | |
| 3. Normative expectation scale | 13.45 | 3.68 | 0.42 ^a | 0.25 ^a | — | | | |
| 4. Control facilitator scale | 29.95 | 6.32 | 0.12 | 0.29 ^a | 0.05 | — | | |
| 5. Control barrier scale | 44.77 | 10.62 | -0.50 ^a | -0.07 | -0.40 ^a | 0.30 ^a | — | |
| 6. Behavior | 2.81 | 1.40 | 0.38 ^a | 0.04 | 0.43 ^a | -0.11 | -0.45 ^a | — |

Note. M = mean; SD = standard deviation; the y axis also translates to the corresponding x axis. Example: x axis "1 = attitude scale" translates to y axis "1 = attitude scale."

^aCorrelation is significant at the 0.01 level (two tailed).

Table 4. Logistic Regression Examining Predictors of HIV Screening Behavior

| Variables | B | S.E. | Wald | Df | p-Value | Odds Ratio | 95% CI for Odds Ratio | |
|-------------------------|-------|------|------|----|---------|------------|-----------------------|-------|
| | | | | | | | Lower | Upper |
| Social norm expectation | 0.20 | 0.08 | 5.73 | 1 | .02 | 1.22 | 1.04 | 1.44 |
| Attitude | 0.12 | 0.06 | 4.84 | 1 | .03 | 1.13 | 1.01 | 1.26 |
| Control facilitator | −0.05 | 0.05 | 1.35 | 1 | .25 | 0.95 | 0.87 | 1.04 |
| Control barrier | −0.03 | 0.03 | 0.87 | 1 | .35 | 0.97 | 0.91 | 1.03 |
| Social norm priority | −0.07 | 0.09 | 0.60 | 1 | .44 | 0.93 | 0.78 | 1.11 |
| Constant | −6.11 | 3.43 | 3.16 | 0 | .08 | 0.002 | | |

Note: CI = confidence interval; OR = odds ratio.

Discussion

There were important findings in our analysis. The first finding was the need for office staff to have more positive beliefs about supporting HIV screening. Health care organizations and leaders of organizations will need to advocate translation of HIV screening recommendations into practice to meet the needs of the individuals, families, and communities served. This finding confirmed extremes in the delivery of care that exist in various health care settings and locations. Social norm expectation belief changes that originate in individual health systems and health care provider practice settings are needed for NPs to translate HIV screening recommendations into practice. Nurse practitioners who reported office staff who demonstrated support for routine HIV screening reported higher rates of HIV screening, even when it took more time. Office staff should be trained to support routine HIV screening by completing HIV screening modules and in-service education. Our study demonstrated the clinical utility of positive social norm expectations when routinely screening for HIV.

The second finding was the need for research efforts and practice recommendations to address screening in a person younger than 18 years. Recommendations that address procedures for health care providers to perform HIV screening for this age group are needed. This is especially important because one of every four new HIV infections affects a young person (Centers for Disease Control and Prevention, 2014).

HIV testing recommendations specific to pregnant women encourage screening in the routine panel of prenatal screening tests and repeating screening in the third trimester for certain populations or geographic areas. Furthermore, women screened during a previous

pregnancy should be rescreened with each subsequent pregnancy. Untested women who present in labor and whose HIV status is unknown should be tested. These recommendations focus on HIV screening for the first-time tester and on the benefits of identifying and treating women living with HIV to reduce rates of mother-to-child transmission. Early identification and treatment of all pregnant women with HIV has proven to be effective in the prevention of neonatal infection and improves women's health (Committee on Obstetric Practice and HIV Expert Work Group, 2015).

A similar approach is needed for people younger than 18 years. Most new HIV infections are reported in adolescents and young adults, yet half remain undiagnosed (Centers for Disease Control and Prevention, 2017). Recommendations with a focus on HIV screening for the first-time adolescent tester are needed. A recent study by Van Handel, Kann, Olsen, and Dietz (2016) reported that HIV testing prevalence was low among high school students (17% of male and 27% of female students) and young adults (33%). Between 2005 and 2013, there was no increase in testing among young adult males and decreased testing among young adult Black females, which is of concern given their higher risks of HIV infection. Therefore, focused recommendations for health care providers are needed to address HIV screening rates in this age group. More specifically, recommendations are needed for adolescents younger than 18 years with regard to consent procedures, especially when accompanied by a guardian/parent/third person.

In addition, high rates of NP non-HIV screening behaviors (i.e., low rates of screening) exist despite recommendations (Branson et al., 2006) and practice guidelines (Moyer, 2013). Therefore, it is incumbent on

the NP to take the initiative to screen for HIV. Health care providers who care for persons between the ages of 13 and 64 years should review current intake practices and HIV screening procedures where they are employed. Nurse practitioners should consider internal changes that could be made to increase routine HIV screening.

Our study highlights the need for a new course of action to increase HIV screening rates by NPs to increase case finding and decrease the incidence of HIV infections. It was vital to determine which factors (attitudinal, social normative, and perceived behavioral control) predict NP behaviors related to routine HIV screening for patients ages 13–64 years. Only by identifying factors that predict HIV screening behaviors can interventions be developed to modify beliefs to increase HIV screening.

Limitations

Our study had several potential limitations. Not all NPs eligible for the study completed the study, thus posing a threat to response bias. The internal reliability of the instrument scales suggested good internal consistency reliability with the exception of the normative priority scale (0.67), whereby a factor structure is needed. Providing participants with the option to complete a self-administered, web-based survey or postal mailed survey may have yielded additional responses. A longitudinal study would measure attitudinal, social normative, and perceived behavioral control beliefs related to HIV screening behaviors over time. Finally, a larger response rate would have made the results more generalizable.

Key Considerations

- Nurse practitioners can increase rates of HIV screening and improve HIV prevention strategies.
- Practice settings should consider HIV social norms in their support staff as a mediator to increase screening rates.
- Improved consent procedures are needed for patients younger than 18 years.
- Nurse practitioners should review current intake practices and HIV screening procedures to increase HIV screening rates in their practice settings.
- HIV screening recommendations should include a recommended age for an adolescent's first-time HIV test.

Conclusion

Little was known about NP attitudinal, social normative, and perceived behavioral control beliefs regarding routine HIV screening. We explored those factors that influenced HIV screening behaviors for NPs and are the first to describe NP HIV screening beliefs predicting their HIV screening behaviors and guided by a theoretical model. Conceptual research utilization can influence how health care organizations and providers reflect on their own HIV screening practices, thus providing evidence to be used in the translation of evidence-based HIV screening practices for nursing.

Disclosures

The authors report no real or perceived vested interests related to this article that could be construed as a conflict of interest.

Acknowledgments

The authors would like to thank all of the nurse practitioners who participated in the study.

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