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### Permalink

<https://escholarship.org/uc/item/45c3k73m>

### Journal

The Journal for Nurse Practitioners, 14(6)

### ISSN

1555-4155

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### Publication Date

2018-06-01

### DOI

10.1016/j.nurpra.2018.03.008

Peer reviewed

# HIV Primary Care Curriculum Improves HIV Knowledge, Confidence and Attitudes

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## ABSTRACT

To meet the goals of the National HIV/AIDS Strategy and the need for a human immunodeficiency virus (HIV)-competent primary care workforce, education and training of nurse practitioners are critical. The University of California, San Francisco School of Nursing developed and implemented an HIV primary care curriculum and evaluated this curriculum for a graduating cohort of 55 students. Results show gains in students' HIV knowledge and confidence in providing basic HIV care and improvements in attitudes toward people living with HIV. We have been able to show that HIV content can be successfully integrated into a nurse practitioner generalist curriculum.

**Keywords:** HIV primary care, HIV workforce, nurse practitioner education, nurse practitioner evaluation  
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In March 2013, the University of California, San Francisco (UCSF) School of Nursing (SON) was funded for 5 years by the Health Resources and Services Administration to increase the number of nurse practitioner (NP) clinicians who provide culturally competent, comprehensive human immunodeficiency virus (HIV) primary care at entry into practice. This Health Resources and Services Administration HIV workforce initiative funded 1 physician assistant (PA) and 4 NP programs nationwide, which most used to develop new HIV specialty tracks. UCSF SON decided to develop, integrate, and implement an HIV primary care curriculum for all primary care students while maintaining the pre-existing HIV specialty curriculum first initiated in 2004.

HIV is now largely a manageable disease in primary care settings. As more primary care clinics rely on NPs, NPs become a key profession to meet the demand for HIV screening and care. Potent and well-tolerated antiretroviral therapy has shifted HIV

from a lethal diagnosis to a manageable chronic disease.<sup>1</sup> People living with HIV (PLWH) now achieve near-normal life expectancies, with HIV mortality reduced every year.<sup>2</sup>

Early initiation of antiretroviral therapy after a diagnosis of HIV has been shown to sustain viral suppression, greatly improve survival, and virtually eliminate HIV transmission.<sup>1,3</sup> Unfortunately, although routine HIV screening has been advocated by the Centers for Disease Control and Prevention since 2006, an estimated 15% of individuals with HIV are unaware of their status with a median delay of 3 years from diagnosis to entry into care, according to a recent study.<sup>4,5</sup> Among those who had seen a health care provider in the past year, two thirds were not screened for HIV.<sup>5</sup> HIV infections continue to occur with a reported 38,782 new cases for 2016, mostly among young, black, and Latino men who have sex with men with a much lesser, although still concerning, number associated with injection drug use (10%) and heterosexual contact (10%).<sup>1</sup> Although

gender identity data are not routinely collected on transgender people, a recent analysis indicates high rates of HIV prevalence (22%) among transwomen in high-income countries including the United States.<sup>6</sup> Recently, the Centers for Disease Control and Prevention Division of HIV/AIDS Prevention has made a statement that PLWH who have an undetectable HIV viral load will not sexually transmit HIV to their partners, further underscoring the need for early intervention and pre-exposure prophylaxis for high-risk partners.<sup>7</sup>

Recently updated to 2020, the National HIV/AIDS Strategy (NHAS) is a 5-year plan that details the principles, priorities, and actions needed to guide the national response to the HIV epidemic. The NHAS has 3 primary goals: 1) to reduce the number of people who become infected with HIV, 2) to increase access to care and optimize health outcomes for people living with HIV, and 3) to reduce HIV-related health disparities.<sup>8</sup> Achievement of the NHAS goals is inextricably linked to accelerated efforts to expand HIV prevention, screening and diagnosis in primary care settings, initiating HIV treatment, and engaging and retaining PLWH in care.

Expanding the NP workforce to provide HIV primary care is essential to meet the goals of the NHAS. This situation is made more urgent because an ongoing shortage of primary care providers is predicted to worsen at the same time that high numbers of HIV providers retire.<sup>9</sup> The supply of primary care physicians is expected to increase by 8% by 2020, whereas the demand is expected to be almost twice that at 14%.<sup>10</sup> Many experts agree that NPs can offer a solution to this worsening deficit of MD primary care providers.<sup>10,11</sup> Evidence supports the quality of HIV treatment outcomes provided by NPs as equivalent to physicians and at a lower cost.<sup>12,13</sup> Safety net clinics, where populations at risk for HIV obtain care, are hiring NPs at much higher rates than MDs.<sup>14</sup>

At the time we initiated our project, few if any graduate nursing programs provided HIV course work or HIV content in their curriculum, and a review of the nursing literature suggested an overall lack of HIV education and research related to NP education. In the late 1990s and early 2000s, there was a push to educate nursing students about HIV.

Most studies reviewed focused on attitudes, reluctance to provide care, and stigma toward PLWH.

A survey to explore NPs' empathy and willingness to provide care showed "highly supportive attitudes" toward PLWH. Increased comfort level with providing care was strongly associated with HIV training and education, with the exception of patients who were highly complex or had advanced stages of HIV.<sup>15</sup> A 2009 review of international studies of nursing students also cited a lack of education as a major cause of students' negative attitudes and reluctance to care for patients with HIV/AIDS and conversely found that HIV education was associated with improvement in HIV knowledge and attitudes to patients.<sup>16</sup> A survey of undergraduate nursing students in 2004 noted that 18% reported that none of the courses or training they had attended included HIV content.<sup>17</sup>

Recently, a series of articles have been published on national HIV workforce capacity development describing HIV specialty programs for NPs in master's and doctor of nursing practice programs.<sup>18</sup> Although these specialty programs have been highly successful in enrolling and graduating students with HIV expertise, the number of students trained to date will not address the projected needs for an HIV primary care workforce.

The UCSF primary care NP program determined to fully integrate HIV content into the core primary care NP curricula to ensure that all NP students received basic HIV training. Primary care NP tracks enroll an average of 60 students per year who complete the program in 6 to 8 academic quarters over 2 years. Integrating HIV into the curricula ensured the majority of primary care NP students graduating from UCSF would receive course content on primary care management of HIV without having to take additional courses. A subset of students who elected to take HIV specialty training also received more advanced HIV courses and clinical training with providers in HIV specialty clinics or primary care clinics with colocated HIV specialty care, in addition to the integrated curriculum.

In year 1 (2013), we developed a validated set of HIV primary care competencies using a Delphi method to achieve expert consensus on relevant content for an HIV primary care curriculum. Using

this validated set of competencies, we performed a gap analysis of the NP curriculum to identify where HIV content could be strategically integrated. The gap analysis was performed across the entire NP curriculum, which included the master's and advanced practice core, the primary care core, and the NP clinical courses. In year 2 (2014) of the project, the first cohort of students was enrolled. An evaluation was constructed to measure the efficacy of HIV content integration.

## METHODS

To evaluate our curriculum, we created assessment tools to measure the effect of the HIV primary care integrated curriculum with NP students before and after they completed the NP program. We received UCSF Institutional Review Board approval for all tools and procedures we used. We worked with the 2 largest primary care NP programs at UCSF SON: the adult geriatric primary care program and the family NP program. Baseline and follow-up assessments were voluntary self-report questionnaires that measured HIV-related knowledge, confidence, and attitudes. We adapted the instrument from a tool initially developed with HIV clinical experts to evaluate community-based, primary care clinicians attending an online HIV telehealth community of practice developed at the Pacific AIDS Education and Training Center, which drew from the work of Ogden and Nyblade<sup>19</sup> and Varas-Diaz and Neilands.<sup>20</sup> We then adapted the questionnaire to the HIV primary care competencies used for NP HIV content integration. Baseline and follow-up assessments were collected from students at 3 time points: baseline at the beginning of their first year (October 2014), first follow-up at the beginning of their second year (October 2015), and final follow-up at the end of their second year (May 2016). The survey was administered online through the online survey website Qualtrics, and students were e-mailed a link to complete the survey. In order to maintain anonymity, the link directed students first to a registration site to collect identifying information like name and e-mail and then forwarded them to Qualtrics, a separate survey site, for the anonymous baseline and follow-up surveys. The UCSF team had no ability to connect name to assessment data. Data from Qualtrics

were exported to SPSS Version 24 (IBM Corp, Armonk, NY) for analysis. The independent samples *t* test and analysis of variance test were used on means; the paired *t* test could not be used because the questionnaires were collected anonymously, and pairs could not be matched. Each section was analyzed to assess the difference between baseline and follow-up.

Confidence was assessed by asking students to rate their confidence performing 15 HIV-related services on a Likert scale from 1 (“none or no skill”) to 7 (“expert, teach others”) (Table 2). For each question, the means were calculated for baseline and follow-up and compared using the independent *t* test. A change in knowledge was measured by asking students to answer 20 multiple-choice, 1 best answer questions about HIV. Correct answers were scored 1 point each, and baseline and follow-up mean scores were compared using the independent *t* test. Attitudes were measured by asking students if they strongly agreed, agreed, disagreed, or strongly disagreed with statements on a 1- to 4-point scale, and means were analyzed using independent *t* tests. Paired *t* tests could not be performed because students' responses were anonymous and could not be matched.

Nine months after graduation, a brief employment survey was e-mailed to all graduated students via a link to a Qualtrics self-report survey. The survey contained 10 questions asking about their employment role, their experience with HIV patients, and workplace policies related to HIV. We waited 9 months to administer the survey to increase the likelihood that graduates would be employed as NPs.

## RESULTS

A total of 60 students were included in the evaluation. The response rate was 100% at baseline and 92% at the final follow-up ( $n = 55$ ). There were slightly more students in the family NP program (58%) than the adult geriatric primary care program (42%). Eight students (13%) reported being in the HIV specialty, which required additional HIV-focused coursework (6 units) and HIV clinical practicum (130–150 hours). Students identified as white (45%), Asian/Pacific Islander (27%), Latino (13%), African-American/black (7%), and multiracial (8.3%). Students were female (78%), male (20%), and transgender (1.7%); 75% identified as heterosexual, 13% as gay/lesbian, 8.3% as

bisexual, and 3.3% declined to state. Most students (63%) were employed as RNs. At baseline, most students (75%) were either currently working in a clinic, hospital, or other health care setting or had in the past. Of these students, 91% had provided services directly to patients and 57% directly to HIV patients.

The change in HIV knowledge at the final assessment was 6 at baseline and 11.3 at the final follow-up and was statistically significant ( $P < .000$ ) (Table 1). Question categories that had the greatest increase in knowledge were basic treatment (32%) followed by screening and diagnosis (28%), post-exposure prophylaxis (23%), and complex treatment (22%).

For confidence measures, the overall mean scores increased from baseline (2.2) to the final follow-up (4.0) and were statistically significant ( $P < .000$ ) (Table 2). Statistical significance was also true across 4 categories of confidence questions that match the categories for knowledge questions. The mean scores for screening and diagnosis were the highest at the end with a score of 5 (“competent”) and marked the greatest change in score between baseline and follow-up. Post-exposure prophylaxis marked the next highest scores at follow-up (4.4) followed by treatment—basic and treatment—complex, which had the lowest final score (3.3, “slight knowledge, skills”).

Attitudes were measured on a 4-point scale of strongly agree (4), agree (3), disagree (2), and strongly disagree (1). The shift from baseline to the final follow-up was statistically significant for 6 of the 23

statements (Table 3). In each of these statements, the final follow-up scores decreased in selected statements across 3 different categories (access to care, drug use, and morality), indicating less agreement with stigmatizing statements. The overall scores did not change and were not statistically significant, in part because students already had such low agreement with stigmatizing attitudes for the other questions.

The postgraduate survey had 40 respondents for a response rate of 72%. Most respondents were employed as NPs (85%) in a clinic setting (73%) and provided direct care to patients (92%), including direct care to HIV patients (47%). Most reported that they worked with providers who treated HIV (55%); 39% reported treating an HIV patient themselves, 53% reported their health care setting performed HIV screening on a regular basis always or most of the time, and 50% reported they could apply the skills they learned from the UCSF SON NP program in caring for HIV patients more than half the time (Table 4).

### Limitations

This evaluation has several limitations. We do not know if the statistically significant changes reported across HIV-related knowledge, confidence, and attitudes are because of the integration of HIV content into the NP curricula or if some of the changes, particularly in attitudes, would have occurred anyway because of the generalist NP curriculum, which

**Table 1. Knowledge Questions Categories**

Category	Topics	Number of Questions	Average Percent of Students Who Answered Correctly		
			Baseline (%)	Final (%)	Change (%)
PEP	Accidental needlestick, unprotected sex	2	17	40	23
Screening and diagnosis	Acute HIV symptoms, testing and screening recommendations	6	46	74	28
Treatment—basic	Treatment-naive patients, treatment guidelines, adherence	5	29	61	32
Treatment—complex	Comorbidities, resistance testing, pregnancy	7	22	43	22

PEP = post-exposure prophylaxis.

**Table 2. Average Change in Confidence by Category**

Row Labels	Count of Category	Average of Baseline	Average of Second Follow-up	Average of Change
Screening & diagnosis <sup>a</sup>	4	2.9	4.9	2.00
PEP <sup>a</sup>	1	2.6	4.4	1.82
Treatment—basic <sup>a</sup>	6	2.0	3.7	1.66
Treatment—complex <sup>a</sup>	4	1.7	3.3	1.65
Overall	15	2.2	4.0	1.80

Scale: 1 = none or no skill; 2 = vague knowledge, skills, competence; 3 = slight knowledge, skills, competence; 4 = medium knowledge, skills, competence; 5 = competent; 6 = very competent; 7 = expert, teach others.

<sup>a</sup> P score < .000.

emphasizes care of vulnerable populations, or the geographic location of the school in an area with high HIV prevalence and easy access to HIV expertise. Additionally, these data represent only 1 cohort of students, and we do not know if these results will be replicated in future cohorts. Scores reported represent scores for all students in the primary care NP programs inclusive of 8 students who elected the HIV specialty training. HIV specialty students may have enhanced the HIV knowledge, confidence, and attitudes of their nonspecialty peers in small group clinical conferences and HIV case-based discussions in the generalist courses. Finally, this is a self-report instrument, and self-report can be prone to social desirability response bias.<sup>21,22</sup>

## DISCUSSION

This survey was given to all participants in the major primary care NP programs at UCSF, not solely those who were students in the HIV specialty. The results of this survey indicate that over time students receiving the HIV content integrated into an NP curriculum improved their HIV-related confidence, knowledge, and attitudes in areas that are relevant for NPs entering primary care. Students' average HIV confidence score increased from "vague knowledge and skills" on the scale at baseline to "medium knowledge and skills" at second follow-up. The largest increase in knowledge questions answered correctly was in HIV screening, diagnosis, and basic HIV treatment. Students did the least well answering complex HIV treatment questions

**Table 3. Attitudes That Showed Significant Change**

	Baseline	Final Follow-up	Difference	P Value
<b>Access</b>				
Some of my coworkers do not want to treat HIV-positive patients	2.20	1.73	-0.47	.005
<b>Drug use</b>				
The vast majority of drug users are not compliant and should not be started on ARVs.	1.77	1.44	-0.33	.024
People who are infected with HIV through drug use could have avoided it if they wanted to.	2.05	1.71	-0.34	.025
<b>Morality</b>				
It is unforgivable when people with HIV do not reveal their status to their sexual partners.	2.93	2.58	-0.35	.026
I feel sorry for a woman who is infected with HIV by her husband/boyfriend when she was faithful to him.	3.40	3.00	-0.40	.010
I feel sorry for the children infected with HIV	3.60	3.04	-0.56	.000

ARV = antiretroviral therapy; HIV = human immunodeficiency virus.

Scale: 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly disagree.

**Table 4. Postgraduate Survey (N = 40)**

	n	%
Employment setting		
Clinic	29	72.5
Hospital	6	15.0
Other health care setting	3	7.5
Not currently employed in a health care setting	2	5.0
Employment role		
Nurse practitioner	33	82.5
Registered nurse	5	12.5
Not currently employed	2	5.0
Patient services		
Provide services directly to patients	35	92.1
Provide services directly to HIV patients	17	44.7
Other providers in work setting treat HIV		
Yes	21	55.3
No	13	34.2
Don't know	4	10.5
Number of HIV patients treated in the past 6 months		
None	23	60.5
1-5	12	31.6
6-10	2	5.3
11-20	0	0.0
More than 20	1	2.6
How often HIV testing policies and procedures are followed in their workplace		
Rarely/never	2	5.3
Some of the time	2	5.3
Most of the time	12	31.6
Always	8	21.0
Don't know	14	36.8
Can apply skills learned from UCSF School of Nursing to care for patients with HIV in current job		

*continued***Table 4. (continued)**

	n	%
Not at all	5	13.2
Some of the time	14	36.8
Half the time	1	2.6
Most of the time	8	21.0
All of the time	10	26.3

HIV = human immunodeficiency virus; UCSF = University of California, San Francisco.

that involved more specialized knowledge, such as HIV medication resistance. This questionnaire was not designed to fully assess how prepared students are to treat HIV patients because it lacks a clinical component; however, results indicate that students receiving the HIV primary care curriculum entered clinical practice with higher levels of HIV knowledge and confidence than when they first entered the NP program. This was further emphasized in the postgraduate survey in which 50% of respondents said they could apply the HIV-related knowledge and skills learned at UCSF in their current work setting and 40% reported that they had seen 1 or more HIV patients in the past 6 months. How NPs newly entering practice would otherwise gain this level of HIV education is unclear because HIV is not routinely integrated in other NP primary care programs.

Documenting attitudes is important for understanding how an educational program can shape students' perceptions of patients. For example, the decrease in agreement to negative statements about patients who use misuse substances is very important because primary care providers are likely to see substance misusers who are at risk for HIV and be confronted with providing or withholding screening and treatment. Additional promising shifts in attitudes can be seen in related statements such as "People get infected with HIV because they have been irresponsible in some way" and "My clinic/workplace is welcoming to drug users." These shifts are important because negative attitudes have had implications for HIV treatment. Studies have shown that providers are more likely to defer HIV treatment for patients who are injection drug users.<sup>23</sup> Finally, there were



decreases in agreement with statements related to morality including “People get infected with HIV because they have been irresponsible in some way” and “Infection with HIV is the direct result of people’s promiscuity.” Students changed over time to agree less with statements that may be interpreted as sympathetic but carry negative, moralistic judgments about certain groups associated with HIV, according to the literature on stigma.<sup>19,24</sup> Early in the HIV epidemic, biases were common against lesbian, gay, bisexual, transgender, and queer community members and substance misusers, who were often seen as the *guilty* parties in spreading HIV to *innocent* infants and monogamous heterosexual partners. Looking at the changes in attitudes from our sample of students, we can say that the students have a declining urge to view potential HIV patients on a guilty to innocent continuum, which depends on demographic factors. An increase in positive attitudes toward HIV patients is correlated with a willingness to provide care,<sup>25</sup> and, therefore, this shift is quite important. Educational programs can and should be leveraged to reduce HIV-related stigma and, therefore, increase access to care.

## CONCLUSIONS

At a time when the NHAS calls for greater attention to managing HIV in primary care environments, our evaluation indicates that including HIV as part of NP primary care curricula offers graduating NPs the ability to gain core HIV knowledge, confidence, and positive attitudes that they will carry with them into practice, offering patients greater access to HIV screening, prevention, and treatment. The average HIV specialty program generally attracts a fraction of the overall students in a given NP program; in our cohort, it was 8 students (13% of the program). We believe that HIV specialty training is valuable and serves an important role for students who are committed to work in an HIV specialty setting. However, without the integrated HIV curriculum, the remaining 47 students would have graduated with little to no HIV training, leaving them unprepared to provide basic HIV screening, prevention, and treatment upon entering practice. Our experience also indicates that HIV content can be strategically integrated into an NP curriculum and that

faculty are willing to add HIV course content when course materials and curriculum consultation are provided. The integration of HIV into NP education will achieve the vision of the NHAS that “the United States will become a place where new HIV infections are rare, and when they do occur, every person, regardless of age, gender, race/ethnicity, sexual orientation, gender identity or socioeconomic circumstance, will have unfettered access to high quality, life-extending care, free from stigma and discrimination.”<sup>8</sup> **JNP**

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Supported by the Health Resources Services Administration (Project Directors: Drs. Portillo and Dawson-Rose) (grant no. H4AHA26223).

1555-4155/18/\$ see front matter  
 © 2018 Published by Elsevier Inc.  
<https://doi.org/10.1016/j.nurpra.2018.03.008>