

# Clinician Utilization of Best Practices for HIV Care and Status Disclosure: A Cross-Sectional Study

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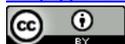
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## Abstract

Determining the baseline utilization of best practices among clinicians, with regard to HIV care and disclosure of status to at-risk partners, is critical to addressing HIV prevention issues and disease transmission. In this study, we examined clinicians' utilization of best practices for HIV/AIDS care and the disclosure of HIV status to sexual and needle-sharing partners (HSSNSP). We conducted a cross-sectional survey of 100 clinicians to assess knowledge, attitude, and behavior towards best practices for HIV care and disclosure of HSSNSP. Multiple logistic regression analysis was used to determine factors associated with the utilization of clinical best practices for HIV care and disclosure of HSSNSP. Forty eight percent of the participants revealed poor behaviors. Fifty six percent showed less positive attitudes towards clinical best practices for HIV care and disclosure of status. Less than half (32%) of the participants had earned at least 1 HIV/AIDS CME credit in the past two years. Our study showed strong associations between the utilization of best practices for HIV care and the disclosure of status, and clinician attitudes and knowledge levels. Further research that aims to improve knowledge and attitudes on clinical best practices for providing HIV/AIDS care and the disclosure of status is needed. This improvement may lead to increase in the utilization of best practices for HIV care and disclosure of status, and contribute to decreases in disease transmission rates.

## Keywords

HIV/AIDS Care, Status Disclosure, Best Practice, Clinician, Sexual and Needle-Sharing Partners

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## 1. Introduction

Despite major advances in HIV treatment, the incidence of HIV infections in the United States has remained relatively unchanged since the 1990s with around 49,000 cases per year [1]-[4]. The steady incidence of HIV is due, in part, to the high rates of undiagnosed infections. At the end of 2009, 1 in 5 (18.1%) [5], US adults and adolescents living with HIV infection had not been diagnosed. Clinicians have the potential to significantly influence patients' risk for transmission of HIV by screening for HIV transmission risk behaviors; communicating prevention messages; discussing sexual and drug use behavior; facilitating disclosure of HIV status to sexual and needle-sharing partners, counseling and testing; and identifying and treating other sexually transmitted diseases [6]. Hence, the optimal use of clinical best practices in HIV care and partner notification of HIV status, among clinicians may significantly contribute to the incidence of the disease, and HIV/AIDS health outcomes. However, one of the most consistent findings in health services research is the significant gap between best practices (as determined by scientific evidence), on one hand, and actual clinical care, on the other [7]. According to a study in 2004 [8], about 35% of physicians appear to be relatively non-compliant with general best practice guidelines, resulting in potentially devastating consequences to patients' health.

Appropriate care by HIV care provider and serostatus disclosure [9] are key components of HIV prevention and disease transmission. To our knowledge, no studies to date have directly assessed clinicians' utilization of evidence-based best practices relative to HIV care and the disclosure of HIV status to sexual and needle-sharing partners (HSSNSP). Without determining, among clinicians, baseline utilization of best practices for HIV care and disclosure of status to at-risk partners, patients will likely continue to experience sub-optimal HIV/AIDS care and disclosure practices, and high HIV transmission rates may persist. This study explored clinicians' utilization of evidence-based practices relative to patient history taking, case management, case reporting, and the disclosure of HSSNSP.

## 2. Methods

### 2.1. Participants and Procedures

HIV disproportionately affects vulnerable populations such as black and minority ethnic groups [10] [11] both nationally and in the area this study was conducted. We therefore, specifically sought to recruit clinicians who provided care to minority populations. We conducted a cross-sectional survey of a convenience sample of medical residents, attending physicians and non-academic providers who provide primary care to HIV patients. Majority of the participants were recruited from a Community Physicians Network (CPN), faculty, and residency training programs at a historically black institution located in inner-city Atlanta. The medical school was chosen because its clinicians focused on addressing primary healthcare needs, with emphasis on minorities and the underserved urban and rural populations in Georgia and the nation. Other sources of recruitment included Atlanta Medical Association (AMA) and Georgia State Medical Association (GSMA) members.

The participants were recruited into the study from July 2012 to November 2012. Using a power of 90 and  $P = 0.05$ , a sample size of 96 was derived based on previous studies which showed that 35% of physicians do not adhere to clinical guidelines [8]. Paper questionnaire and informed consent were administered directly and randomly to participants at: grand rounds, morning report sessions, faculty meetings (Grady Health System/yellow pod clinic), AMA and GSMA meetings. Administration of paper questionnaires were preceded by a 5 - 10 minute verbal introduction of the study goals and objectives by the Principal Investigator (PI). Participants were informed that the survey was voluntary, confidential, and asked to sign an informed consent before participation. Recruitment e-mails were also sent via a virtual private network to members of the medical school's Community Physicians Network (CPN), chairs and program coordinators of Internal Medicine, Family Medicine, Obstetrics and Gynecology, and Community Health and Preventive Medicine departments. The e-mail asked providers to share their attitudes, knowledge, and behaviors regarding best practices for HIV care and disclosure of HSSNSP. If one potential participant refused to participate, the next available potential participant was approached until 100 participants were enrolled. Our inclusion criteria were adult primary care providers with no restriction to race, ethnicity, gender or number of years of practice. Non-adult and non-primary care specialties such as pediatrics and surgery were excluded from this study.

Survey development was informed by the theories of knowledge, attitude, behavior [12], and diffusion of innovation [13]. Assessment items were derived from HIV best practice guidelines developed by the Prevention

with Positives Workgroup of the San Francisco HIV Prevention Council [14] and the HIV Health Services Planning Council [15]. The survey instrument was piloted among, four internists and four family practitioners. The clinicians' feedbacks were compared for consistency and redundancy. Additional domains of interest were also identified. The survey was further evaluated for relevancy, clarity and appropriateness of responses by four more clinicians. Modifications were made to the survey in response to this review. Finally, three survey methodology experts evaluated the survey construction and modifications were made in response to the expert review.

The 27-item survey had three domains designed to assess providers' knowledge, attitudes and behaviors regarding clinical best practices for HIV care and disclosure of HSSNSP. We explicitly asked the question: "What are the knowledge levels, attitudes and behaviors (utilization of best practices) among clinicians with regard to HIV care, and disclosure of HIV status to sexual and needle-sharing partners (HSSNSP)?" We hypothesized that clinicians have sub-optimal knowledge levels, less positive attitudes, which are associated with poor behaviors with regard to HIV care and disclosure of HSSNSP. The questionnaire and study protocols were reviewed and approved by the Institutional Review Board at the Morehouse School of Medicine, Atlanta, Georgia.

## 2.2. Variables

### 2.2.1. Behavior; Utilization of Best Practices (Dependent Variable)

Eight items assessed behavior regarding the utilization of best practices for providing primary care to HIV-infected persons and disclosure of HSSNSP. We found good internal consistency with the behavior scale as evidenced by Cronbach's  $\alpha = 0.849$ , which correlates with satisfactory internal validity. To assess behavior, participants were asked the following questions: "How often do you ask how the patient might have acquired HIV?"; "How often do you ask about current and past sexual and/or needle-sharing partners?"; "How often do you ask an HIV-infected person if he/she is sexually active?"; "How often do you ask HIV positive patients whether their partners have been notified of the patient's status?"; "How often do you ask HIV-infected persons whether their partners have been tested for HIV?"; "How often do you report HIV cases to the health department?"; and "How often do you help encourage HIV-infected persons to voluntarily disclose their status to at-risk partner(s)?" Using a four-point Likert scale (1 = never; 2 = occasionally; 3 = often; 4 = always), provider behavior was categorized as poor behavior (1 & 2), and good behavior (3 & 4). Participants were also asked whether they had ever encountered a situation where they worried that the disclosure of an HIV status to a patient or sexual partner would lead to physical harm, psycho-social and or economic consequences (yes/no). Participants that answered yes were then asked whether they would handle the dilemma by referral to state/county health department, harm reduction counseling, shelter, request a psychiatric consult, do nothing or take other action.

### 2.2.2. Attitude (Independent Variable)

Six items assessed attitudes toward the utilization of clinical best practices when providing primary care to HIV-infected persons or disclosing HSSNSP. We found internal consistency with the attitudinal scale as evidenced by Cronbach's  $\alpha = 0.81$ , which correlates with satisfactory internal validity. On a four-point Likert scale (1 = not comfortable; 2 = somewhat comfortable; 3 = comfortable; to 4 = very comfortable), participants were asked: "How would you describe your degree of comfort when communicating the diagnosis of HIV to positive persons?" and "How would you describe your degree of comfort when communicating the diagnosis of HIV to sexual/ needle-sharing partner?"

Using a four-point Likert scale (1 = definitely not effective, and 4 = definitely effective), the question "How would you assess the effectiveness of the collaboration between the physician and the state health department with respect to disclosure of HIV status to sexual/needle sharing partners?" was asked. Participants were also asked on a four-point Likert scale (1 = not confident, and 4 = very confident), "Are you confident that you use best practices in communicating HIV diagnosis to patients?" Provider attitude was categorized as less positive (1 & 2), or more positive (3 & 4). Participants were also asked: "Do you recommend any individual(s) be present at the point of disclosure of positive HIV status to a patient?" and "Do you recommend any other individual(s) be present at the point of disclosure of positive HIV status to an at-risk partner?" (yes/no). Participants that answered "yes" were then asked who they recommend among (social worker, psychologist, nurse, sexual partner, or to specify other recommendations).

### 2.2.3. Knowledge (Independent Variable)

To assess the knowledge of participants regarding the utilization of best practices when providing primary care

to HIV-infected persons or disclosing HSSNSP, four items were used. The first item was worded: “When do you disclose a positive HIV test report to a patient?” (After a rapid HIV test, after a Western blot test). Knowledge on participation in a minimum number of HIV/AIDS Continuing Medical Education (CME) credit hours as a Georgia requirement for medical licensure was dichotomously assessed (yes/no). Following this question, participants were asked how many HIV/AIDS CME credit hours they had earned in the past 2 years: responses ranged from 0 to above 10. The fourth item was related to Georgia HIV law: HIV O.C.G.A. § 24-9-47 Disclosure of AIDS confidential information [16]. The participants were asked, “When the patient of a physician has been determined to be infected with HIV and that patient’s physician believes that the spouse or sexual partner or any child of the patient, spouse, or sexual partner is a person at risk of being infected with HIV by that patient, the physician?” Three responses were listed as follows: 1) shall be confidential and not disclose, 2) is required to disclose, and 3) may disclose to that spouse, sexual partner, or child that the patient has been determined to be infected with HIV, after first attempting to notify the patient that such disclosure is going to be made. Response 3) represents current Georgia HIV law, and indicated good knowledge.

### 2.3. Data Analysis

Data were analyzed with PASW Statistics 18 (SPSS Inc.). Descriptive statistics described the demographic characteristics of participants. Chi-square was used to compare behavioral, attitude and knowledge variables by provider status (medical resident/attending physician). Multiple logistic regression analysis tested the relationship between provider behavior, and their knowledge and attitude towards clinical best practices for HIV/AIDS care and disclosure of HSSNSP.

## 3. Results

### 3.1. Participant Characteristics

The demographics of all respondents are shown in **Table 1**. One hundred respondents completed the survey and 58.2% were female. 54% of the participants were medical residents. The respondents had a wide range of clinical experience. There was a fairly even distribution of respondents by year level among medical residents, with more 3rd year medical residents (35.8%). The attending physicians had clinical experience that ranged from <1 year to >21 years post residency. One-third (33%) of the respondents indicated that at least one of HIV-infected patients in their care admitted having a sexual partner who was unaware of the patient’s HIV status. Overall, the participants were similar to the distribution of the total population of medical residents and attending physicians in the general medical school, AMA, and GSMA populations based on gender, years of training, and specialty.

### 3.2. Behavior and Attitude

**Table 2** presents the distribution of attitudinal and behavioral responses relative to the utilization of clinical best practices for HIV care and HSSNSP. Over half, (56%) of the participants seem to show less positive attitudes toward HIV clinical best practices. Forty-five percent indicated that they never or occasionally ask HIV-infected patients in their practice, how they might have acquired HIV infection. Seventy percent of the participants reported that they never or occasionally report HIV cases to the state health department as depicted in **Figure 1**. Furthermore, 64% and 70% of participants who practice in private and academic settings respectively had poor behavior scores with respect to reporting HIV cases to the health department.

The study identified difference in the degree of comfort when communicating the diagnosis of HIV to positive persons and sexual/ needle-sharing partners among medical residents and attending physicians ( $P \leq 0.0001$ ). More attending physicians (79.8%) expressed positive attitudes regarding their degree of comfort when communicating HIV diagnosis to patients compared to residents (58.6%). Only about one-third (38%) of attending physicians noted not comfortable or somewhat comfortable attitudes toward communicating HIV diagnosis to sexual/needle-sharing partner, compared to one half (51%) of residents. A significant proportion (56%) of clinicians affirmed that they were not confident or somewhat confident that they used best practices when communicating HIV diagnosis.

Fifty-four percent of the participants revealed poor behavior with regard to asking HIV-infected persons about their current and past needle-sharing partners. Although one-third (34%) of the participants had provided care to

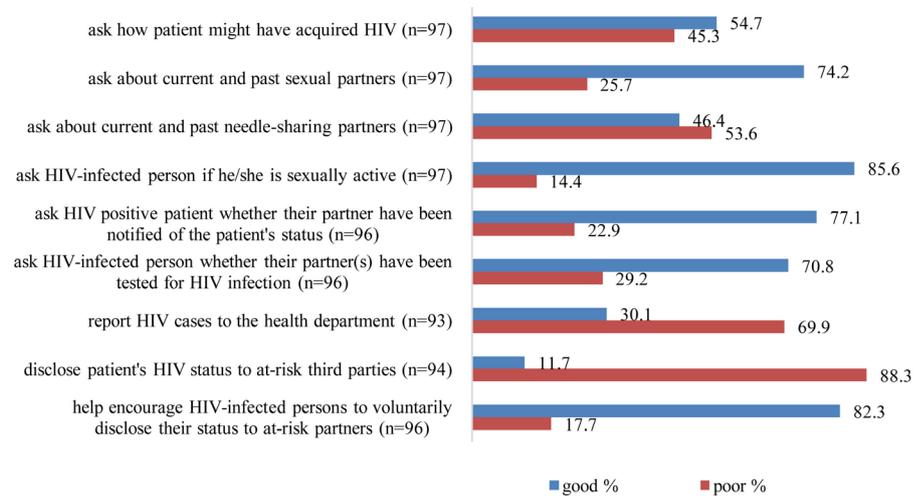
**Table 1.** Demographic characteristics of Georgia medical residents and attending physicians who provide care to HIV/AIDS patients: Georgia, 2012.

Participant characteristics			(%)
Gender (n = 100)	Male		41.8
	Female		58.2
Health professional Medical resident (n = 54)	1st year		28.3
	2nd year		30.2
	3rd year		35.8
	4th year		5.7
	Attending physician (n = 46)	0 - 5 years	14.0
	6 - 10 years	11.6	
	11 - 15 years	18.6	
	16 - 20 years	20.9	
	>21 years	34.9	
Specialty (n = 98)	Internal medicine		55.1
	Family medicine		22.4
	Preventive medicine		6.1
	Obstetrics & gynecology		15.3
	Psychiatry		1.0
HIV primary care provider status (n = 97)	Provider		77.3
	Non-provider		22.7
No. of HIV patients seen/month (n = 81)	0 - 3		71.6
	4 - 6		16.0
	7 - 9		8.6
	10 - 12		2.5
	>13		1.2
Practice setting (n = 97)	Academic		76.3
	Private		11.3
	Hospitalist		1.0
	Correctional facility		1.0
	Government/public health/county clinic		3.1
	Academic and private		3.1
	Academic and veterans affairs		1.0
% of HIV cases seen in past 12 months with undisclosed sexual partners (n = 89)	None		66.3
	10 - 20		16.9
	30 - 40		4.5
	50 - 60		9.0
	70 - 80		1.1
	90 - 100		2.2

**Table 2.** Distribution of attitude and behavior responses among providers regarding the utilization of clinical best practices for hiv/aids care and disclosure of status: Georgia, 2012.

Variable		N	%
<b>Behavior</b>	Poor	42	48
	Good	45	52
<b>Attitude</b>	Less Positive	50	56
	More Positive	40	44

Poor—% of providers that reported “never” or “occasionally”; Good—% of providers that reported “always” or “often” to the behavioral questions; Less Positive—% of providers that reported “not comfortable” or “somewhat comfortable”; More Positive—% of providers that reported “comfortable” or “very comfortable” to the attitudinal items.



**Figure 1.** Percent of optimal and sub-optimal behavior scores among Georgia HIV/AIDS primary care providers: Georgia, 2012. Poor% refers to the percentage of providers that reported “never” or “occasionally” to the behavioral questions; Good% refers to the percentage of providers that reported “always” or “often” to the behavioral questions.

at least one HIV patient with an undisclosed sexual partner within the past 12 months (**Table 1**), the majority (88%) of participants noted that they “never” or “occasionally” disclosed their patient’s HSSNSP. Conversely, most (82%) of the participants noted that they always or often help encourage HIV-infected persons to voluntarily disclose their status to at-risk partners (**Figure 1**).

### 3.3. Knowledge

When asked about the time of disclosure of positive HIV test report to a patient, 22% of the participants disclosed after a rapid HIV test, while 78% of the participants disclosed positive HIV reports only after a western blot (confirmatory) test was done (good knowledge). Although the state of Georgia does not have a minimum HIV/AIDS Continuing Medical Education (CME) credit hour(s) required for physician licensure, 23% of the participants indicated that Georgia did have a minimum HIV/AIDS CME credit for medical licensure. This suggests that about one-fourth of participants have low knowledge levels of the state HIV/AIDS CME credit requirement for medical licensure. As depicted in **Table 3**, only 31% of the participants had earned any HIV/AIDS-related CME credit in the past 2 years while one-third (32%) had earned at least 1 CME credit within the past 2 years.

In addition, knowledge of Georgia HIV disclosure law—HIV O.C.G.A. § 24-9-47—was assessed. While Georgia law states that “the physician may disclose to that spouse, sexual partner, or child that the patient has been determined to be infected with HIV”, after first attempting to notify the patient that such disclosure is going to be made, “only 27% of the participants correctly reported the law”. The majority (73%) of participants incorrectly indicated that physicians are either “required to” or “shall be confidential and not disclose to” that spouse, sexual partner, or child that the patient has been determined to be infected with HIV.

### 3.4. Factors Associated with Behavior

In the multiple logistic regression model, having adjusted for gender, health professional status, specialty, years of clinical experience, and practice setting, two variables (knowledge and attitude) were found to be independently associated factors of the dependent variable (behavior) *i.e.*, utilization of best practices when providing care to HIV-infected persons and disclosing HSSNSP. Knowledge level was assessed using two knowledge items: 1) when to disclose a positive HIV report to a patient and categorized as after a rapid HIV test (poor knowledge) and after a Western blot test (good knowledge), 2) number of earned HIV/AIDS CME credit(s) in the past 2 years, categorized as none (poor knowledge) and 1 or >(good knowledge). Attitude was assessed using a dichotomous attitude variable (less positive and more positive). Level of training and gender covariates were also considered in the model.

**Table 3.** Knowledge regarding clinical best practices for HIV/AIDS care and disclosure of HIV status to sexual and needle-sharing partners: Georgia, 2012.

Knowledge	Response	%
When do you disclose a positive HIV test report to an HIV-infected person?	After a rapid test	21.7
	After a western blot	78.3
Does Georgia have a requirement for medical licensure that physicians participate in a minimum number of HIV/AIDS CME credit hours?	Yes	23
	No**	77
HIV/AIDS CME credits earned in the past 2 years	None	68.5
	1 and >	31.5
Regarding GA law on HIV status disclosure for physicians	Required to disclose/Not disclose	73.1
	May disclose**	26.9

Note: \*\* Denotes good behavior.

The odds of good behavior (utilizing best practices for HIV care and disclosure of HSSNSP) among providers with HIV/AIDS-related CME credits were 8 times greater than providers with no HIV/AIDS-related CME credits (OR = 8.05; 95% CI = 1.43, 45.12; P = 0.018) (Table 4). Knowledge about when to disclose a positive HIV test report to a patient was also associated with utilization of best practices for HIV care and HSSNSP. The odds of good behavior among participants who indicated that they disclosed positive test report to a patient after a Western blot test (*i.e.*, knowledgeable), were 35 times that of those that disclosed positive test report to patient after a rapid HIV test (OR = 34.65; 95% CI = 3.2 - 373.1; P = 0.003).

Among providers who showed positive attitudes toward best practices for HIV care and HSSNSP, the odds of good behavior were 24.4 times that of those with less positive attitudes toward best practice guidelines (OR = 24.4; 95% CI = 3.6 - 167.5; P = 0.001). The observed relationships between level of training and gender with the utilization of best practices regarding HIV care and disclosure of HSSNSP were not statistically significant.

#### 4. Discussion

In other medical fields (cardiology, oncology, etc.), significant gaps have also been found between clinical practice and guidelines [17]-[22]. Overall, our results are slightly higher than those reported for the application of guidelines among patients with other chronic diseases [18] [19] [23]. Although a significant proportion of HIV-infected patients that have partners with unknown HIV status are seen by their primary care providers, majority of providers leave the responsibility of disclosing HSSNSP, to the patient, state health department, HIV specialist, or the ER provider (first point of hospital contact), without any way of tracking if or how these disclosures are done. It is likely that some providers assume that their patients and laboratories have disclosed HIV diagnosis to at-risk partners and the state health department respectively.

At a policy level, existing laws are clearly porous in addressing the public health implications of HIV transmission in Georgia. The law [16] affords the physician an option to disclose or not disclose even when he or she reasonably believes that a spouse, child or sexual partner is a person at-risk of being infected with HIV by a known patient. Essentially, the HIV provider discloses positive HIV status to an at-risk sexual/needle sharing partner, spouse or child at-will regardless of the potential ramifications (psychosocial, risk of physical harm, risk of HIV transmission) of the disease. Nonetheless, the lack of awareness/familiarity [24] on state HIV disclosure laws among physicians is likely to explain our results. Addressing this issue requires promoting awareness on state laws on HIV status disclosure among physicians, and action at the state law/policy level.

Our result suggests that the number of years of training and clinical experience may influence the attitude of the provider toward best practices for the disclosure of positive HIV status to sexual and needle-sharing partners. Our analysis revealed a behavior consistent with an increasing trend in the underutilization of clinical best practices for HIV care and partner notification when compared with previous research [8] [25]. Over two-thirds of residents and attending physicians never or occasionally report HIV cases to the state health department. This high non-report rate may be attributed to the perception of a non-obligation or lack of need to act by providers—especially in academic settings, since laboratories or first contact emergency room providers ought to report all HIV cases to the state health department. Lack of inertia from previous practice and lack of self-efficacy attitudinal barriers [20] may have also contributed to high non-report rates since some providers noted low comfort

**Table 4.** Factors associated with behavior (utilization of best practices for providing care to HIV infected persons and disclosure of HIV status to at-risk partners) among Georgia HIV care providers: Georgia, 2012.

Variables	Good N (%)	Poor N (%)	OR (95% CI)	P
<b>Knowledge</b>				
Earned HIV/AIDS CME credits				
1 or >	21 (75.0)	7 (25.0)	8.05 (1.43 - 45.12)	<b>0.018</b>
None (ref)	23 (42.6)	31 (57.4)	1	
Disclosure of positive report				
After western blot test	36 (57.1)	27 (42.9)	36.6 (3.2 - 373.1)	<b>0.003</b>
After rapid HIV test (ref)	7 (36.8)	12 (63.2)	1	
<b>Attitude</b>				
Attitude score				
More positive	14 (32.6)	28 (73.7)	24.4 (3.6 - 167.5)	<b>0.001</b>
Less positive (ref)	10 (26.3)	29 (67.4)	1	
<b>Gender</b>				
Female	25 (52.1)	23 (47.9)	3.8 (0.748 - 19.31)	0.107
Male (ref)	20 (51.3)	19 (48.7)	1	
<b>Level of Training</b>				
Attending physician	25 (62.5)	15 (37.5)	2.6 (0.49 - 14.3)	0.26
Medical resident (ref)	20 (42.5)	27 (57.5)	1	

Note: The reference group was providers with poor behavior; CME, Continuing Medical Education; HIV, Human, Immune deficiency Virus; AIDS, Acquired Immune Deficiency Syndrome; CI, Confidence Interval; OR, Odds Ratio.

levels with disclosure practices.

Furthermore, a significant proportion (63.7%) of providers in private settings also indicated that they occasionally or never reported HIV cases to the state health department. Hence, suggesting an overall decline in the HIV case report rate to state health department by the clinician which could impact partner notification. In addition, only 11.7% of HIV care providers noted that they engaged in the partner disclosure practices. This low partner disclosure practice may be explained by low knowledge levels and/or less positive attitudes among the providers, toward best practices for HIV/AIDS care and disclosure of HSSNSP.

Clinicians who had less positive attitudes towards best practices were significantly less likely to adhere to best practice guidelines or utilize best practices for providing HIV care and disclosure of HIV status to at-risk partners. Clinicians who had earned some HIV/AIDS-related CME credit hours were more likely to have good behaviors than those without HIV/AIDS-related CME credit. Therefore, attitude and knowledge on clinical guidelines are predictors of adherence and utilization of best practices in providing HIV care and disclosing HSSNSP. The overall poor knowledge levels, less positive attitudes, and underutilization of best practices among HIV care providers may account for the high incidence of HIV in the region. Exploring policies that would increase HIV/AIDS-related CME participation rates among physicians, and finding interventions that focus on enhancing positive attitudes toward best practices for HIV/AIDS care and disclosure of HSSNSP maybe of high yield in improving behavior and reducing HIV incidence.

These data do not reflect a lack of dedication by the clinician. Some of the findings may arise from limited time to obtain comprehensive sexual histories and assess patients for HIV transmission risks. Some clinicians assume that their patients and laboratories have disclosed HSSNSP and the state health department respectively. These clinicians seek to refer patients to the HIV specialist as they feel they do not require the skill/training needed to engage in HIV care or disclose HSSNSP. Barriers to adherence to practice guidelines by physicians can be categorized as follows: barriers affecting the physician's knowledge (lack of awareness or lack of familiarity), attitudes (lack of agreement, lack of self-efficacy, lack of outcome expectancy, or the inertia of previous practice), or behavior (including external barriers such as patient factors) [20] [24].

Our research has some limitations. First, the study did not follow clinicians over time, and so we could not examine how broader factors combine with knowledge and attitudes to explain clinicians' behavior relative the utilization of best practices for HIV/AIDS care and disclosure of HSSNSP. Additionally, in this cross-sectional study we cannot infer the temporal sequence between knowledge, attitudes, and behavior, and thus causality cannot be established. Our survey relied on clinician self-report, and as with many surveys the accuracy of

self-reported information is not known. However, other evidence suggest that physicians overstate their adherence with best practice guidelines and that when physician and patient reports are compared, physicians provide higher reports of adherence with clinical guidelines than do patients [26] [27]. Second, because name and contact information was required, physicians may have responded differently from their otherwise actual responses due to concerns of lack of anonymity. Third, clinicians who participated in this study provide primary care to a largely minority population with HIV/AIDS. Hence, these results may not be generalizable to all primary care providers. Additionally, this study used a relatively small sample size.

## 5. Conclusion

Further research that aims at improving awareness and attitudes towards evidence-based clinical practices for providing HIV/AIDS care and disclosing HSSNSP of HIV-infected persons is needed. Research that depicts the barriers that influence case reporting to state health department, communication of HIV diagnosis, and disclosure practices by residents and physicians involved in HIV/AIDS care would be helpful and could inform the development of curriculum and other interventions to address these issues. In addition, exploring state medical licensure policies for HIV/AIDS-related CME participation among primary care providers policies, and finding interventions that focus on enhancing positive attitudes toward best practices for HIV/AIDS care and disclosure of HSSNSP maybe of high yield in improving provider utilization of best practices, HIV care, and potentially reduce HIV transmission.

## Conflict of Interest Statement

The authors declare that there are no conflicts of interests.

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