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MEDICAL SERVICE USE AMONG INDIVIDUALS RECEIVING HIV PREVENTION SERVICES IN LOS ANGELES COUNTY

ERLYANA ERLYANA, DENNIS G. FISHER, and GRACE L. REYNOLDS

California State University, Long Beach

MICHAEL JANSEN

Los Angeles County Dept. of Public Health

Abstract

Timely provision of medical services among communities at increased risk of HIV infection is crucial to detect the infection and to further prevent the spread of HIV. In the US, about one third of HIV cases were identified in the later stage of infection. The current study utilized the Gelberg-Andersen behavioral model for predicting medical service use among people who were at risk of HIV infection. The candidate variables included: social support, attitudinal, and behavioral variables. The data were collected from clients of HIV prevention agencies in Los Angeles County in 2004 who participated in the Countywide Risk Assessment Survey (CRAS). Using a logistic regression model, the study suggested that factors that were positively associated with use of medical services included living in a treatment center/ halfway house or mission/ shelter, experience of physical/ sexual abuse, and ever receiving HIV testing/ counseling. Factors inversely associated with medical service use were male gender, education, and consumption of alcohol. Analysis was conducted using SAS 9.3. Most of the findings are consistent with the Gelberg-Andersen model. The exception was that victims of physical or sexual abuse were more likely to use services instead of less likely as predicted by the model.

Keywords

utilization; vulnerable population; medical services

INTRODUCTION

Access to medical services is essential to maintaining health. For individuals at high risk of HIV infection, timely provision of medical services could facilitate detecting the infection at an early stage, thus reducing the likelihood of transmission to others, increasing timely treatment initiation, and reducing the economic burden of HIV disease (Fleishman, Yehia, Moore, & Gebo, 2010). In the United States, about 32% of HIV infected persons were diagnosed at the late stage of infection (CDC, 2011), therefore, this study aimed to investigate factors affecting medical service use among people who were at risk of HIV infection.

LITERATURE REVIEW: PREDICTORS OF MEDICAL SERVICE USE

Consistent with the Gelberg-Andersen model, this study examines the literature along two dimensions: traditional and vulnerable factors to predict use of medical services among groups vulnerable to HIV infection (Gelberg, Andersen, & Leake, 2000; Stein, Andersen, & Gelberg, 2007; Stein, Andersen, Koegel, & Gelberg, 2000). For the traditional factors, previous studies suggested that lower access to medical services was associated with female gender, younger age, lower levels of education, and racial/ ethnic minority status (Anthony, et al., 2007; Ashman, Perez-Jimenez, & Marconi, 2004; Beer, Fagan, Valverde, & Bertolli, 2009; Cunningham, Sohler, Berg, Shapiro, & Heller, 2006; Smith & Kirking, 1999; Sohler, Li, & Cunningham, 2009). These individuals have poorer access to medical care because of a lack of access to resources and higher competing needs such as child care or other family responsibilities. Among minorities, they are less likely to use medical services because of less willingness to disclose their HIV status and being less integrated into the HIV-positive community (Kalichman, Graham, Luke, & Austin, 2002; Kinsler, et al., 2009). Ethnic minorities were more likely to mistrust and experience greater prejudice from health care providers (Tobias, et al., 2007). Another study suggested that barriers and unmet need for supportive services (any service other than primary medical care) is much greater among African American, low-income persons and those who are gay or bisexual (Wohl, et al., 2011).

As for the vulnerable factors, studies reported that individuals with a lack of social support as indicated by living in unstable housing were less likely to receive information and necessary medical services, and hence were more likely to utilize emergency room services and to experience hospitalization (Cunningham, Sohler, McCoy, Heller, & Selwyn, 2005; Tobias, et al., 2007; Wolitski, et al., 2010). Furthermore, there is evidence that access to other support services such as outreach programs, HIV testing and counseling, drug treatment and case management programs can reduce the negative impact of unstable housing on medical services use. Participants in such programs had optimal use of medical care (Knowlton, et al., 2001), had surprisingly high utilization of ambulatory care (Cunningham, et al., 2005), and were more likely to use medical services (Anthony, et al., 2007; Cunningham, Sanchez, Li, Heller, & Sohler, 2008; Cunningham, et al., 2007), and therefore had increased access to medical care (Molitor, et al., 2005; Wolitski, et al., 2010).

Attitudinal and behavioral variables were also considered to be vulnerable factors that predicted medical service use. The variables included abuse experience, risky sexual practices, and drug and alcohol users. Those who experienced abuse were more likely to engage in unprotected sex, sex with multiple partners, and exchange sex for money or drugs. They were also more likely to have a higher need for both physical and mental health services, but low use of outpatient medical services and lack of adherence to treatment (Arriola, Loudon, Doldren, & Fortenberry, 2005; Browning & Laumann, 1997; Lichtenstein, 2006; Meade, Hansen, Kochman, & Sikkema, 2009). Those who experienced abuse at any time period (remote, ongoing, or recent abuse) were also more likely to utilize emergency care than those who never experienced abuse (Chartier, Walker, & Naimark, 2007).

Those who engaged in risky sexual practices (male-to-male contact and sex trading) have also been found to have poorer health status and to lack access to care due to lack of resources (Crepaz & Marks, 2002; Uphold & Mkanta, 2005). Drug users were also associated with excessive alcohol consumption, risky sexual practices and less use of medical services (Anthony, et al., 2007; Cavazos-Rehg, et al., 2009; Cunningham, et al., 2006; Heath, Lanoye, & Maisto, 2011; Luseno, Wechsberg, Kline, & Ellerson, 2010). IDUs have been reported to be more likely to use ER and inpatient services and less likely to use outpatient services due to low SES, increased disease severity, complications from comorbidities, and lack of responsibility for their health (Cavaleri, et al., 2010; McGeary & French, 2000). They are more likely to be diagnosed at a later stage of infection and to utilize inpatient and emergency care (ER) services which may result in receiving suboptimal medical care (Fleishman, et al., 2005; Manavi, McMillan, Ogilvie, & Scott, 2004).

Alcohol use was also considered to be a significant predictor of medical service use (Conigliaro, Justice, Gordon, & Bryant, 2006; Cunningham, et al., 2006; Heath, et al., 2011; Kim, Kertesz, Horton, Tibbetts, & Samet, 2006; Kraemer, et al., 2006), even among outreach-targeted individuals or veterans where access to medical services were available.

METHODS

This study utilized the Gelberg-Andersen model that includes vulnerability factors such as abuse experience, risky sexual practice, drug and alcohol use, and unstable living arrangement to predict ER use. This model is appropriate to use since these factors were prevalent to the target population of the study which are clients of HIV prevention agencies in Los Angeles County.

Data from the Countywide Risk Assessment Survey (CRAS) was used for the study. These data were collected in May and June 2004 by 220 HIV prevention service provider staff from the Office of AIDS Programs and Policy (OAPP-funded agencies across Los Angeles County, California). The survey collected demographic variables such as age, race, gender, sexual orientation, education, living arrangement, alcohol and drug use, and sexual risk practices from 1,968 clients who came to those OAPP--funded agencies.

Information regarding alcohol and drug use and sexual risk practices included perceptions and practices of risk-related behaviors such as sharing needles, bleach use for syringe and needle disinfection, and condom use with main and casual sex partners. However, the analysis did not include perceptions of bleach use for syringe and needle disinfection due to the limited number of observations. The behavioral variables included being victims of sexual and physical abuse (abuse experience), practice of risky behavior including IDU, and engaging in risky sexual behavior (men who have sex with men (MSM), multiple partners, commercial sex work, or exchange of sex for money or drugs). The outcome variable was whether the individuals used medical services (received in agencies funded by Los Angeles County) in the past six months. Bivariate and logistic regression analyses were employed to identify factors that were associated with medical care use. Logistic regression is widely used in health science research and is particularly appropriate to model dichotomous

outcomes. Summary of goodness-of-fit measures was included to measure how well the entire model matches the observed values.

RESULTS

The final study sample was 1,993 adults who were predominantly Hispanics (44.1%), US-born (77.8%), male (66.2%), heterosexual (54.7%), had a GED/ high school diploma or did not complete high school (38.5% & 27.4% respectively), and lived in a house or apartment (72.0%) (Table1). Seventy-two percent of the respondents used alcohol in the past six months, 42% used cocaine in the past six months, 23% had ever injected drugs, 19.5% used a needle and syringe either to inject drugs, inject vitamins, insulin, or steroids, or engaged in home tattooing or body piercing in the past six months, 7.4% shared needles in the past six months, 53.2% experienced abuse, 24.5% engaged in survival sex trading (sex either for money, drugs, or something else), 22% were HIV positive, 82% had ever received HIV testing and counseling and 34.2% received case management in the past six months.

In our study population, 42% of the respondents reported that they had received medical services in the past six months. The number is relatively high compared to other studies. This may be caused by the nature of the study population where 82% of the respondents have ever received HIV testing and counseling and 34.2% received other supportive services (such as case management) in the past six months. Use of medical services was significantly higher among those who had HIV positive, ever received HIV testing and counseling and case management (74.5% vs. 37.4% for HIV status, 45% vs. 28.1% for HIV testing/ counseling and 73% vs. 25.9% for case management) (Table 1).

The average age of the respondents who reported use of medical services was significantly older than respondents who did not receive medical services (34 years vs. 32 years) and heterosexual respondents were more likely to use medical services than gay/lesbian/ bisexual respondents (44.7% vs. 38.6%). Across the four groups of ethnicities in the sample, African American were more likely to use medical services than any other race/ethnicity (48% for African American, 44.2% for Whites , 37.2% for Hispanics, and 42.5% for other races) and male respondents were less likely to use medical services than female respondents (38.3% vs. 49.2%). The findings for African American and female respondents were unexpected because previous studies have suggested that they tend to use fewer medical services (Beer, et al., 2009; Sohler, et al., 2009).

The association between level of education and medical service use revealed that respondents with the lowest level of the education (did not complete high school) were more likely to use medical services than respondents with high school, some college or higher level of education (48.2% for did not complete High School, 43.2% for high school, and 35.5% for some college or higher level of education). As for living arrangements, respondents who lived in a treatment center/ halfway house and mission/ shelters were more likely to use medical services than respondents who lived in a house or apartment (64.4% for halfway house or treatment center, 79.5% for shelter or mission, and 35.1% for a house or apartment). Respondents who lived in a hotel, motel or rooming house and car, vacant building, street, alley or park were also more likely to use medical services than those who

lived in a house or apartment (45.4% for hotel, motel or rooming house and 45.2% for car, vacant building, street, alley or park).

With respect to attitudinal and behavioral variables, alcohol users were less likely to use medical services than non-users (38.6% vs.50.4%). On the other hand, respondents who used cocaine, injected drugs, and shared needles were more likely to use medical services than non-users (49.3% vs. 40.2% for cocaine use, 48.7% vs. 40% for injection drugs use, and 48.1% vs. 40.4% for needle use). Respondents who shared needles, experienced abuse and engaged in survival sex trading were also more likely to use medical services than respondents who did not (48.9% vs. 41.4% for needle sharing, 46.8% vs. 36.2% for abuse experience and 54.8% vs. 37.8% for survival sex trading). These associations are reported in Table 1.

The logistic regression model (Table 2) identified six variables that significantly affected medical service use including male gender, living arrangement, education, sexual or physical abuse experience, alcohol use, and HIV testing and counseling. Race was not a significant factor that affected use of medical services in the logistic model as previous literature suggested. Living in a treatment center/ halfway house ($OR = 2.58, p=.01$) or mission/ shelter ($OR = 6.82, p<.0001$), experienced abuse ($OR = 1.33, p=.01$), and ever received HIV testing/ counseling ($OR = 2.14, p<.0001$) were significant and positively associated with medical service use. Being male ($OR = .65, p<.0001$), having some college education or higher ($OR =.66, p=.002$), and use of alcohol ($OR = .64, p=.001$) were significant and negatively associated with medical service use.

DISCUSSION

In this study, the bivariate analyses showed that variables associated with medical service use included age, race, gender, sexual orientation, education, living arrangement, alcohol use, cocaine use, drug injection, risky needle use, physical and sexual abuse, survival sex trading, HIV testing/ counseling, HIV infection status, and case management.

However, of those variables, only six of them (gender, living arrangement, education, alcohol use, abuse experience, and HIV testing/ counseling) were found to be significantly associated with medical service use in the logistic regression model. Living arrangement was the strongest predictor in the model. Those living in a mission/ shelter were close to 7 times more likely and those living in a halfway/ treatment center were close to 3 times more likely to use medical services than those living in a house. The findings suggest that living in a mission/ shelter or halfway house/ treatment center (some treatment programs may have medical services on premises) will increase the likelihood of using medical services. On the other hand, living in unstable living arrangements such as car, vacant building, street, alley, or park was not found to be significantly associated with medical service use. This finding suggests that unstable living arrangements may not deter use of medical services as previous studies reported (Cunningham, et al., 2005; Tobias, et al., 2007; Wolitski, et al., 2010). Our study findings might imply that respondents who live in a house or apartment were healthier and therefore they were less likely to use medical services because they did not need them.

Another strong predictor of medical service use in our model was whether respondents ever received HIV testing and counseling. As the literature suggests, having access to other services led to higher use of medical services. In our study, access to supportive services (such as case management) significantly affected use of medical services. Having ever received HIV testing and counseling in the past 6 months doubled the likelihood of receiving medical care. ($OR = 2.1$). This finding confirmed the importance of exposure to services such as HIV testing or counseling or access to other supportive services to increase access to medical care (Molitor, et al., 2005; Wolitski, et al., 2010). Therefore, easy access and entry into care and integration of support services are crucial to improving optimal health care delivery.

As for attitudinal and behavioral variables, in contrast with the literature, our study found that victims of physical or sexual abuse were more likely to use medical services. The findings suggest that the sample might have poorer health status and higher health care needs; therefore they were more likely to utilize medical services. For risky sexual practices (as indicated by sex trading practice) and drug users (IDUs and cocaine use), our study suggested significant impacts of those variables, but they were in the opposite direction from our hypotheses. They were positively and significantly associated with medical service use, but they were not found to be significant predictors in the multivariate logistic regression model. Only those who used alcohol, as the literature suggested, were significantly less likely to use medical services.

As for the predisposing factors, in previous studies, lower access to medical services was associated with lower levels of education, younger age, female gender and racial/ ethnic minority status (Anthony, et al., 2007; Ashman, et al., 2004; Cunningham, et al., 2006; Smith & Kirking, 1999; Sohler, et al., 2009). In contrast with this literature, in our study, race was not a significant factor affecting use of medical services and males were less likely to use medical services. Those with higher levels of education were less likely to use medical services. Similar to living arrangement, these findings might imply that those with higher levels of education were healthier. However, we could not include HIV infection status in our model as a proxy of health status due to excessive missing data.

CONCLUSION

Most findings from this study were consistent with the proposed Gelberg-Andersen model. The impact of the traditional predisposing factor of male gender was negatively associated with medical service use. Our study also found that the predisposing factors specific to vulnerable population such as alcohol use were negatively associated with medical service use, while living in a mission or shelter, being victims of sexual or physical abuse, access to counseling/ testing and other supportive services led to higher use of medical services. Among those, living in a mission or a shelter and living in a halfway house or a treatment center was the first and second strongest predictor of medical service use. The findings reiterate the importance of providing medical services closer to where people live. Another strong predictor of medical service use was whether individuals ever received HIV counseling or testing. The study suggested that even for those with abuse experience, drug users, or individuals with risky sexual behaviors, ease of entry to services (both medical

and/or other supportive services) will help those high-risk individuals in accessing medical services.

The study may overestimate the use of medical services because the population studied was individuals who came to OAPP--funded agencies to seek and receive HIV prevention-related services, therefore the findings may not be generalize to all communities at risk of HIV infection. The cross sectional design also limits our ability to determine any causal relationships or associations.

In conclusion, this study was able to use the Gelberg-Andersen model of health services usage with a marginalized sample from the largest county in the United States, Los Angeles County, California. The CRAS data are an important source of behavioral and attitudinal data on individuals served by the Los Angeles County Department of Public Health, Office of AIDS Programs and Policy. The collection of CRAS data ended in 2004 due to a lack of funding. The CRAS data are an important addition to the public health information available to public health authorities as they contain data beyond the routine disease surveillance data available through public health reporting laws, including attitudes and behaviors.

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Table 1

Association between Use of Medical Services and Client Characteristics

Variable	Variable Distribution <i>n</i> (%)	Use Medical Services <i>n</i> (%)	Chi-Square Test of Independence
N	1,993	836 (41.9)	
Race			
African American	536 (26.9)	257 (47.9)	16.6, <i>df</i> = 3, <i>p</i> = .001
White	344 (17.3)	152 (44.2)	
Hispanic	878 (44.1)	327 (37.2)	
Others	233 (11.7)	99 (42.5)	
Nativity (US Born)			
Yes	1550 (77.8)	660 (42.6)	1.2, <i>df</i> = 1,
No	441 (22.2)	175 (39.7)	<i>p</i> = .276
Gender			
Male	1320 (66.2)	505 (38.3)	21.8, <i>df</i> = 1, <i>p</i> < .0001
Female	673 (33.8)	331 (49.2)	
Sexual Orientation			
Heterosexual	1091 (54.7)	488 (44.7)	7.7, <i>df</i> = 1, <i>p</i> = .006
Gay, Lesbian, Bisexual	902 (45.3)	348 (38.6)	
Education			
Did not complete High School	546 (27.4)	263 (48.2)	20.8, <i>df</i> = 2, <i>p</i> < .0001
GED/ High School Diploma	766 (38.5)	331 (43.2)	
Some College or higher	679 (34.1)	241 (35.5)	
Living Arrangement			
House or apartment	1432 (72)	502 (35.1)	133.5, <i>df</i> = 4, <i>p</i> < .0001
Hotel, motel or rooming house	66 (3.3)	30 (45.4)	
Halfway house, treatment center	289 (14.5)	186 (64.4)	
Shelter or mission	78 (3.9)	62 (79.5)	
Car, vacant building, street, alley, or park	124 (6.2)	56 (45.2)	
Alcohol Use			
Yes	1436 (72.1)	555 (38.6)	22.9, <i>df</i> = 1, <i>p</i> < .0001
No	555 (27.9)	280 (50.4)	
Cocaine Use			
Yes	371 (18.6)	183 (49.3)	10.3, <i>df</i> = 1, <i>p</i> = .001
No	1619 (81.4)	651 (40.2)	
Ever Injected Drugs			
Yes	450 (22.9)	219 (48.7)	10.7, <i>df</i> = 1, <i>p</i> = 0.001
No	1518 (77.1)	607 (40)	
Needle Use^a			
Yes	386 (19.4)	186 (48.2)	7.8, <i>df</i> = 1, <i>p</i> = 0.005
No	1602 (80.6)	647 (40.4)	

Variable	Variable Distribution <i>n</i> (%)	Use Medical Services <i>n</i> (%)	Chi-Square Test of Independence
Needle Sharing			
Yes	143 (7.4)	70 (48.9)	3.1, <i>df</i> = 1,
No	1799 (92.6)	745 (41.4)	<i>p</i> = 0.079
Experience Abuse			
Yes	1090 (54.7)	510 (46.8)	22.8, <i>df</i> = 1,
No	901 (45.3)	326 (36.2)	<i>p</i> < 0.0001
Survival Sex Trade			
Yes	487 (24.5)	267 (54.8)	44.0, <i>df</i> = 1,
No	1504 (75.5)	568 (37.8)	<i>p</i> < 0.0001
Ever Received HIV testing/ counseling			
Yes	1639 (82.3)	737 (45)	33.7, <i>df</i> = 1,
No	352 (17.7)	99 (28.1)	<i>p</i> < 0.0001
HIV Positive^b			
Yes	322 (22.1)	240 (74.5)	139.2, <i>df</i> = 1,
No	1133 (77.9)	424 (37.4)	<i>p</i> < 0.0001
Receive Case Management			
Yes	681 (34.2)	497 (73)	408.6, <i>df</i> = 1,
No	1311 (65.8)	339 (25.9)	<i>p</i> < 0.0001

Note:

^a Needle use include use for injecting drugs, vitamins, insulin, steroids; home tattooing/ body piercing

^b 561 (28%) data missing

Table2

Logistic Regression of Medical Service Use – Odds Ratio

Independent Variable	Estimates		
	Odds Ratio	95% Wald Confidence Limit	<i>p</i>
Male	0.65	0.53, 0.80	<.0001
Race			
African American	1.27	0.90, 1.64	.04
White (reference)	-	-	-
Hispanic	0.88	0.67, 1.18	.03
Others	1.11	0.78, 1.61	.60
Living Arrangement			
House or apartment (reference)	-	-	-
Hotel, motel or rooming house	1.24	0.74, 2.08	.06
Halfway house, treatment center	2.58	1.95, 3.41	.01
Shelter or mission	6.82	3.85, 12.10	<.0001
Car, vacant building, street, alley, or park	1.41	0.95, 2.08	.05
Education			
Did not complete High School (reference)	-	-	-
GED/ High School Diploma	0.89	0.70, 1.13	.35
Some College or higher	0.66	0.50, 0.86	.002
Alcohol Use	0.69	0.56, 0.86	.001
Experience Abuse	1.33	1.10, 1.62	.01
Ever received HIV testing/ counseling	2.14	1.62, 2.81	<.0001

Note:

Area under curve = 0.698

Hosmer Lemeslow goodness of fit: $\chi^2 = 12.6392$, $df = 8$, $P > \chi^2 = .1249$