Knowledge of Case Workers and Correctional Officers towards HIV and HCV Infections: Opportunity for Public Health Education in the Correctional System

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Objective: Given the heavy burden of hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infections in correctional facilities, we examined knowledge about these infections among case workers and correctional officers in penal institutions in Puerto Rico.

Methods: We used data from a cross-sectional study of state prisons, commissioned by the Puerto Rico Department of Correction and Rehabilitation, to assess knowledge about HCV and HIV (10 items each) among 256 case workers and correctional officers from 18 penal institutions selected in the prison system. Total scores for each scale ranged from 0 to 10 points, with higher scores reflecting more knowledge.

Results: Of 256 participants, 64.8% were males, 39.6% were aged 30-39 years, and 70.3% were case workers. The percentage of correct responses for knowledge items ranged from 8.5% to 97.0% for HCV infection and from 38.7% to 99.6% for HIV infection. The vast majority (>96%) of participants knew that injection drug users should be tested for HCV infection and that sharing of needle injection equipment and multiple sex partners increase the risk of HIV infection. However, misconceptions about routes of transmission for these viral infections were found, with larger gaps in knowledge for HCV infection. Mean knowledge scores for HCV and HIV infections were 4.20±0.17 and 6.95±0.22, respectively, being significantly ($p<0.05$) higher for case workers.

Conclusion: The findings about HCV and HIV knowledge in an important segment of the correctional system staff support the urgent need for increasing educational opportunities for correctional staff. [*P R Health Sci J 2015;34:135-141*]

Key words: Prison staff, HCV infection, HIV infection, Knowledge, Public health education

Individuals infected with the hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are over-represented in United States (US) prisons and jails. Among HIV infected African-Americans and Hispanics/Latinos, 20% were behind bars at some point during 2006 (1). Rates of HCV seroprevalence in prisons are two to 40 times greater than the general population (2-4). The prevalence of HIV and HCV co-infection is estimated at 38% among jail detainees (5).

Given the high rates of risky injection behaviors and the heavy burden of these blood-borne infections in jails and prisons, public health agencies recognize the importance of including incarcerated populations in disease prevention and control efforts. The Centers for Disease Control and Prevention (CDC) have recommended the implementation of comprehensive coverage of HIV and viral hepatitis services in correctional systems (6, 7). Similarly, the United Nations Office on Drugs and Crime, in collaboration with the World Health Organization and the Joint United Nations Program on HIV/AIDS, have provided a framework for mounting an effective national response to HIV/AIDS in prisons and as a tool to prevent the spread of HIV (8, 9). Despite these recommendations, the Tenth National Survey of Infectious Diseases in Correctional Facilities suggests that jails and prisons provide very limited peer-led education (41% of state/federal systems and 30% of city/county systems), multi-session prevention counseling (48% of state/federal systems and 58% of city/county systems), and comprehensive HIV and sexually transmitted infections

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(STI) prevention programs (2% of state/federal systems and 6% in city/county systems) (2).

Knowledge about the capacity building needs and cultural competence of prison staff regarding HIV and HCV is crucial to respond to this unmet need and inform the formulation of effective public health policies and prevention interventions in the criminal justice setting (8-12). Correctional staff requires training to recognize their role in promoting inmates' health and rehabilitation goals (8, 13).

Currently, both in the US and Canada, HIV has been recognized as an occupational hazard for prison guards (14, 15). Nonetheless, organizational culture and negative staff attitudes limit the acceptability of HIV prevention programs. For example, the Union of Canadian Correctional Officers opposed implementation of harm reduction measures to reduce HIV infection among inmates (16, 17). To the extent that dysfunctional culture and staff attitudes are left unaddressed, an institutional environment may be promoted that inhibits inmates from disclosing their HIV and HCV serostatus or accessing medical care. Failure to facilitate capacity building may lead to fear, stereotyping, and discrimination of infected individuals or those at high risk, hampering HIV and HCV prevention or treatment efforts.

Previous studies have investigated the knowledge, concerns, attitudes, and risk perceptions of prison staff towards HIV/AIDS (18), tuberculosis (19), HIV and other STI testing in prisons (20), methadone maintenance treatment (21), and opioid substitution therapy for HIV-infected prisoners (22). These investigations have underscored the need to have an informed and skilled workforce that could translate health promotion goals into effective actions in the prison setting. Moreover, two pilot studies suggest that providing training on mental health to correctional officers can increase their confidence and lead to safer working conditions for both staff and prisoners (23, 24).

Puerto Rican prisoners bear a high burden of HCV (50%) and HIV (7%), rates that are greater than those estimated for the aggregate U.S. population in federal and state prisons in 2008 (12% to 35% and 1.5%, respectively) (4, 25, 26, 27) and for the general population of Puerto Rico (17 and 7 times higher, respectively) (28). Moreover, a large percentage of Puerto Rican inmates are in custody for drug-related offenses (60.4%), are more likely to be male (97.2%), are under 35 years of age (74.6%), are less educated (50.6%), have a diagnosis of drug abuse/dependence (53.5%) and history of prior incarceration (68.8%), and have acquired tattoos in prison (59.6%) (29). A history of injection drug use (34.6%) is also significantly higher than in the general population (28-30). Although HIV testing and linkage to medical care within the correctional setting are adequate, both screening and treatment services for HCV and drug dependence in the prison setting still remain a challenge (31). To this end, this study examined for the first time knowledge of case workers and correctional officers towards HCV and HIV in prisons in Puerto Rico. Moreover, we explored their perceived levels of risk of HCV and HIV infections, and the extent of in-prison capacity training about HIV/AIDS and HCV. Building capacity within the correctional system to improve, deliver, and evaluate effective public health responses should benefit staff, inmates, and the communities to which they return.

Methods

Study population

We used data from a cross-sectional study of state prisons, commissioned by the Puerto Rico Department of Correction and Rehabilitation in 2005-2006 that assessed for the first time drug treatment and HIV, HCV, and hepatitis B virus (HBV) prevention needs of the inmate population to inform health services planning (31). The sample for the present study was selected among correctional officers and case workers employed in 18 penal institutions randomly selected out of the 39 existent in the Puerto Rico prison system. Correctional officers or prison guards perform custodial duties and are required to balance their authority with an understanding of inmates rehabilitation needs. Case workers are responsible for the initial evaluation of the inmate and subsequently provide orientation about and follow-up of services to both the inmates and their families. A total of 321 staff members were selected through a simple random selection process from a list of employees, assigned to the 7:00 a.m. – 3:00 p.m. and 3:00 – 11:00 p.m. shifts, in both occupational groups.

The study was approved by the University of Puerto Rico Medical Sciences Campus Institutional Review Board, and informed consent was obtained prior to survey participation. Participation was anonymous, and participants were not offered incentives for responding to the survey.

Measures

A trained field worker recruited the staff in the prison setting, obtained consent, and handed out the self-administered, anonymous questionnaire that elicited information on gender (male, female), age (21-29 years, 30-39 years, 40-49 years, ≥50 years), educational attainment (12^{th} grade or less, more than 12^{th} grade), occupational group (case worker, correctional officer), and length of employment in the correctional system (<5 years, 5-9 years, ≥10 years).

Two scales previously used in a population-based study to assess the level of knowledge about HCV and HIV infections among non-institutionalized Puerto Rican adults aged 21-64 years were used (32). In brief, HCV knowledge items were modeled after those used by Buffington et al. in a national survey of 3,666 adults in the US that oversampled racial minorities (33). These were translated into Spanish and back-translated to English. Comparison of the original instrument with the back-translated instrument was carried out, and discrepancies between the two versions were addressed to ensure lexical equivalence, ease of understanding, and missing items (32). The HIV/AIDS knowledge items were obtained from a

previously developed questionnaire which was validated by experts for face, content, and construct validity and tested among women attending an STI clinic in Puerto Rico (34). The level of knowledge about HCV and HIV (10 items each) was assessed in the areas of transmission routes, prevention methods, and clinical sequelae. Staff rated their knowledge as "Agree", "Disagree", or "Do not know".

Participants were also asked, in separate questions, about their perceived levels of risk of HCV and HIV infections, which were evaluated on a four-point scale ranging from 1 (Extremely unlikely) to 4 (Very likely). In addition, the extent of in-prison capacity training about HIV/AIDS and HCV prevention and management of infected individuals was queried, with scores ranging from 1 (No training) to 4 (A lot of training). Once the questionnaire was completed, participants placed it in an envelope without identifiers that was subsequently sealed and deposited it through a slit in an enclosed box. The sealed box with the completed questionnaires was retrieved two days later by project staff.

Statistical analysis

Each correct answer of the HCV and HIV scales was scored as 1 point. An incorrect or "do not know" answer was given a score of 0. A knowledge score was computed by summing correct responses to each scale; scores for each scale ranged from 0 to 10 points, with higher scores reflecting more knowledge. Responses to all the knowledge items were converted to a percentage indicating the proportion of correct responses. Summary measures (mean±standard error) were used to describe continuous variables, whereas frequency distributions were generated for categorical variables. Mean knowledge scores were compared according to selected characteristics using Student's t test or analysis of variance. Statistical analyses were performed using SPSS (SPSS Inc., Version 19, Chicago, IL).

Results

Of 321 staff members selected, 256 (79.8%) participated in the study (76 case workers and 180 correctional officers). Most participants were males (64.8%), aged 30-49 years (67%), had attained more than 12 years of education (58.6%), and have been working in the correctional system for an average of 9.7 years (Table 1). A substantial proportion of participants perceived that they were somewhat or very likely to become infected with HCV (72.6%) and HIV (63.5%). Over a half of the respondents indicated that they had not received training about HCV prevention (51%) or management of HCV infected individuals (64.7%) as opposed to 22.4% who reported no HIV/AIDS prevention training.

HCV knowledge

The proportion of correct responses for HCV infection knowledge items ranged from 8.5% to 97.0% (Table 2). Although the vast majority (97.0%) of participants acknowledged that injection drug users should be tested for HCV infection, knowledge about routes of transmission was poor. The majority of respondents indicated that HCV can be acquired through casual contact in the workplace (91.5%), by sharing personal effects such as hairbrush and cutlery (82.7%), or by eating contaminated food items (71.3%). A significant proportion disagreed that the possibility of acquiring HCV through sexual relations is low (87.2%), while 15.6% indicated that HCV can be acquired by shaking hands with an infected person. More than three quarters erroneously reported that hepatitis C is a vaccine preventable disease (75.6%).

Table 1. Characteristics of case workers and correctional officers, Puerto Rico, 2005 (n=256)

Characteristic	Number*	Percentage
Occupation		
Case workers	76	29.7
Correctional officers	180	70.3
Gender		
Male	164	64.8
Female	89	35.2
Age group		
21-29 years	69	27.1
30-39 years	101	39.6
40-49 years	70	27.4
≥50 years	15	5.9
Mean±SE	35.3±0.7	
Educational attainment		
12th grade or less	106	41.4
More than 12th grade	150	58.6
Length of employment in the correctional system		
<5 years	86	33.9
5-9 years	61	24.0
≥10 years	107	42.1
Mean±SE	9.7±0.7	
Perceived level of risk of HCV infection		
Extremely unlikely/Somewhat unlikely	63	27.4
Somewhat likely/Very likely	167	72.6
Perceived level of risk of HIV infection		
Extremely unlikely/Somewhat unlikely	84	36.5
Somewhat likely/Very likely	146	63.5
Training about HCV prevention		
None	130	51.0
Some/Enough/A lot	125	49.0
Training about management of HCV infected inmates		
None	165	64.7
Some/Enough/A lot	90	35.3
Training about AIDS prevention and how to protect others		
None	57	22.4
Some/Enough/A lot	198	77.6

*Some variables do not reflect all 256 study participants due to missing values.

Table 2. Percent distribution of correct responses to HCV and HIV knowledge scales (n=256)

Scale	Item	Agree	Disagree
HCV	Someone who currently injects illegal drugs should be tested.	97.0*	3.0
	Can be infected by shaking hands with an infected person.	84.4	15.6*
	Hepatitis C is usually resolved without any consequences.	70.3	29.7*
	Someone with hepatitis C can feel fine.	49.5*	50.5
	There is treatment available to cure hepatitis C.	27.5*	72.5
	Hepatitis C virus can be acquired by eating contaminated foods.	28.7	71.3*
	There is a vaccine for hepatitis C.	24.4	75.6*
	The infection can be acquired using personal effects of an infected person such as hairbrush and cutlery.	17.3	82.7*
	A coworker of someone with hepatitis C virus infection should be tested.	8.5	91.5*
	The possibility of acquiring hepatitis C virus through sexual relations is low.	12.8*	87.2
HIV	Sharing of needle injection equipment can get a person infected with the AIDS virus.	99.6*	0.4
	People who have many sexual partners have a higher risk of contracting the virus that causes AIDS.	96.3*	3.7
	Someone who has the AIDS virus can look normal and healthy.	85.2*	14.8
	A person can become infected with the virus that causes AIDS if he/she works around infected people.	79.4	20.6*
	There is a difference between a person who is infected with the virus that causes AIDS and a person who has AIDS.	68.0*	32.0
	People can become infected with the virus that causes AIDS when an infected person sneezes or coughs.	70.1	29.9*
	A person can become infected with the virus that causes AIDS from a mosquito bite.	63.4	36.6*
	A person can become infected with the virus that causes AIDS by eating in a restaurant where the cook has HIV/AIDS.	47.9	52.1*
	The infection can be acquired using personal effects of an infected person, such as hairbrush and cutlery.	46.3	53.7*
	A person can become infected with the virus that causes AIDS by closed-mouth or social kissing.	38.7	61.3*

*Correct response

HIV knowledge

The proportion of correct responses for HIV infection knowledge items ranged from 38.7% to 99.6% (Table 2). Although the vast majority (>96%) of participants agreed that sharing of needle injection equipment and having multiple sex partners increase the risk of HIV, a significant proportion believed that the virus can be transmitted through closed-mouth kissing (61.3%), sharing personal effects such as hairbrush and cutlery (53.7%), eating at a restaurant where the cook has HIV/AIDS (52.1%), mosquito bites (36.6%), sneezing and coughing (29.9%), and casual contact in the workplace (20.6%).

Variations in HCV and HIV infections' knowledge

Overall mean knowledge score for HCV infection was 4.20±0.17 out of 10 points and was significantly ($p<0.05$) higher for staff with a higher educational level (4.55±0.18) and case workers (5.80±0.34) (Table 3). For HIV infection, overall mean knowledge score was 6.95±0.22 out of 10 points. Mean scores were significantly ($p<0.05$) higher for case workers (8.25±0.24), respondents with at least 10 years working in the correctional system (7.63±0.33), and those who had received training about HIV/AIDS prevention (7.28±0.23).

Discussion

This study assessed HIV and HCV knowledge among case workers and correctional staff in a sample of penal institutions existent in the Puerto Rico prison system. Despite the HIV prevention campaigns launched in the past three decades in Puerto Rico, the results of this study indicate that knowledge about HIV among staff was relatively fair, with larger gaps in knowledge for HCV infection. This result is consistent with a study of inner-city adults from a community at high risk for HIV and HCV that found less accurate health beliefs about HCV (causes, clinical sequelae, and control) than about HIV (35). Another study examined HCV knowledge of staff in two drug-free and two methadone maintenance treatment programs and found that several items were not answered correctly by the majority of participating staff, reinforcing the need for effective HCV training for all staff in drug treatment programs (36). Similarly, a previous study conducted in Puerto Rico found that public knowledge about HCV is minimal despite the greater prevalence of HCV than HIV in the general population (28, 32). These findings might partially reflect the prevailing social stigma around HCV and the limited federal and public health resources allocated for comprehensive HCV-related services and public health messages, despite the strategies delineated in the CDC National Hepatitis C Prevention Strategy and the Institute of Medicine National Strategy for the Control of Hepatitis B and C (10, 37). For example, of the CDC National Center for HIV/AIDS, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis Prevention's budget in 2010, the vast majority of funds (71%) were allocated to HIV prevention programs, whereas only 2% of the funds were distributed to viral hepatitis (38). The finding of poor knowledge about HCV raises the troublesome possibility that it can contribute to continued viral transmission, inadequate access to prevention, diagnosis, and treatment services, poor health outcomes in infected inmates, and the persistence of stigma and prejudice towards inmates living with hepatitis C (10). In view of the new and emerging drug regimens for HCV and HIV infections, our findings may also have implications for the delivery of effective treatment and adherence in the correctional setting. Since access

to and utilization of services in this environment are greatly dependent on both custodial staff and case workers' recognition of the need for care as well as of facilitation of access to care for inmates in need, it is reasonable to assume that their knowledge will bear upon their intentions to procure or facilitate care for those inmates that may benefit from treatment services.

Our study highlights several misconceptions regarding HCV and HIV transmission that are important targets for public health interventions. A significant proportion of staff believed that HCV could be transmitted by eating contaminated foods, sharing personal effects, casual contact with a coworker, and through sexual relations, and nearly a third believed that HCV was vaccine preventable. In contrast, less than half still believed that HIV could be transmitted by eating in a restaurant where the cook has AIDS, through mosquito bites and sharing personal effects, and by closed-mouth or social kissing. These differences suggest that lessons learned from HIV interventions can be adapted to improve HCV knowledge among staff, and education efforts in the prison setting needs to be intensified through a systemic and sustainable approach to eliminate some of the prevailing myths and misconceptions about HIV and HCV.

Table 3. Mean knowledge scores for HCV and HIV according to selected characteristics (n=256).

Characteristic	HCV		HIV	
	Mean±SE	P value*	Mean±SE	P value*
Overall	4.20±0.17	-	6.95±0.22	-
Age group		0.824		0.137
21-29 years	4.24±0.35		6.44±0.46	
30-39 years	4.02±0.23		6.71±0.34	
40-49 years	4.42±0.28		7.83±0.35	
≥50 years	4.07±0.41		6.89±1.22	
Gender		0.369		0.271
Male	4.13±0.21		6.80±0.26	
Female	4.46±0.29		7.42±0.41	
Educational attainment		0.022		0.100
12th grade or less	3.93±0.24		6.62±0.28	
More than 12th grade	4.55±0.18		7.37±0.29	
Occupation		0.001		0.004
Case workers	5.80±0.34		8.25±0.24	
Correctional officers	4.12±0.17		6.88±0.23	
Length of employment in correctional system		0.690		0.041
<5 years	3.99±0.26		6.18±0.36	
5-9 years	4.21±0.27		6.64±0.33	
≥10 years	4.36±0.25		7.63±0.33	
Perceived level of risk of HCV infection		0.589		0.887
Extremely unlikely/Somewhat unlikely	4.02±0.31		6.70±0.45	
Somewhat likely/Very likely	4.29±0.21		7.00±0.24	
Perceived level of risk of HIV infection		0.789		0.132
Extremely unlikely/Somewhat unlikely	4.26±0.26		7.35±0.42	
Somewhat likely/Very likely	4.22±0.25		6.76±0.24	
Training about HCV prevention		0.619		0.531
A lot/Enough/Some	4.33±0.18		7.21±0.33	
None	4.10±0.28		6.75±0.32	
Training about management of HCV infected inmates		0.134		0.094
A lot/Enough/Some	4.52±0.25		7.51±0.26	
None	4.03±0.17		6.66±0.30	
Training about HIV/AIDS prevention		0.073		0.025
A lot/Enough/Some	4.38±0.19		7.28±0.23	
None	3.77±0.23		6.15±0.41	

*P value obtained from Student's t test or analysis of variance

Variations in HCV and HIV knowledge were noted among study subgroups. Although case workers had greater overall knowledge about both HCV and HIV than correctional officers, most of them indicated that training on HCV prevention and management of infected inmates was scarce. This finding could reflect a higher educational attainment achieved by case workers in Puerto Rico as compared to correctional officers. Improving correctional staff's knowledge, attitudes, and skills is an essential precursor to offering inmates appropriate counseling and referral for medical follow-up and treatment while incarcerated or on release to the community. Length of employment within the correctional system did not influence the participant's knowledge score on the HCV scale; however, it did impact the score on the HIV scale, probably reflecting that HIV training and technical support has received greater priority than HCV in the prison setting. The limited training activities on these infections, especially for HCV, may reflect limitations in resources or in the scope of conditions included in workforce capacity building programs. Efforts should be made by state and federal health authorities to support prison systems with significant prevalence of HCV in their attempts to improve knowledge about different dimensions of these important communicable diseases and their control in the prison setting (9, 10, 20).

A significant proportion of case workers and correctional officers perceived themselves to be at risk of acquiring HCV and HIV infections, which is in line with previous studies (18, 20, 39). There is a clear educational need to address unfounded perceptions of risk but also the need to meet staff's occupational safety concerns. Thus, education alone will not

provide a sustainable effect on HIV and HCV knowledge and risk perception among prison staff. Further research is needed to understand the factors that influence the process of perceived risk towards HCV and HIV infections among prison staff.

Among the limitations of the study is the exclusion of jails and federal prisons, institutions which may have different issues regarding staffing or HIV/HCV capacity trainings. By limiting the study to case workers and correctional officers, we could not generalize the study results to all correctional staff. Moreover, the HIV/AIDS knowledge items used in this study was only validated in females attending an STI clinic in Puerto Rico. Despite these limitations, this is the first study to document a substantial lack of knowledge of HCV and a high concern of HIV and HCV infection among case workers and correctional staff in Puerto Rico.

Future research should address correctional staff's health promotion needs in the criminal justice system, and the effect of these knowledge deficits and dysfunctional attitudes on inmates' risk for blood-borne infections. Existing training materials that have been successfully applied in other correctional settings should be tested to address the needs for education that have been identified in the present study. Addressing knowledge is only one component of workforce development that emerges from our findings. Future studies should assess if improving knowledge has an effect on prison staff's attitudes pertaining to need for HIV/HCV services and the role of stigma from staff on inmates' access to HIV and STI testing and treatment (20). These research activities should inform the development and implementation of sustainable training activities in the prevention of blood-borne infections, and in harm reduction in prisons. Public health service officials, policy makers, and correctional system executives and staff should use this information to design effective health promotion strategies, train correctional staff, and improve correctional health programs.

Resumen

Objetivo: Dado el impacto de las infecciones con el virus de hepatitis C (VHC) y virus de inmunodeficiencia humana (VIH) en instituciones correccionales, se evaluó el conocimiento sobre estas infecciones en técnicos sociopenales y oficiales de corrección en instituciones penales en Puerto Rico. Métodos: Se analizaron datos obtenidos de un estudio transversal en prisiones estatales, comisionado por el Departamento de Corrección y Rehabilitación, para evaluar el conocimiento sobre el VHC y VIH (10 ítemes cada una) en 256 técnicos sociopenales y oficiales de corrección de 18 instituciones penales seleccionadas del sistema de corrección de Puerto Rico. Las puntuaciones totales de cada escala fluctuaron entre 0 y 10, con puntuaciones más altas reflejando mayor conocimiento. Resultados: De 256 participantes, 64.8% eran varones, 39.6% tenían entre 30 y 39 años de edad y 70.3% eran técnicos sociopenales. El porcentaje de respuestas correctas para los ítemes de conocimientos fluctuó de 8.5% a 97.0% para la infección con el VHC y de 38.7% a 99.6% para la infección con el VIH. La gran mayoría (>96%) de los participantes conocía que los usuarios de drogas inyectables deben someterse a la prueba de detección del VHC y que compartir el equipo de inyección de drogas y tener múltiples parejas sexuales aumentan el riesgo de infección con el VIH. Sin embargo, se documentaron ideas erróneas sobre las rutas de transmisión de estas infecciones virales, principalmente en el conocimiento sobre el VHC. Las puntuaciones promedios para el conocimiento sobre la infección con el VHC y VIH fueron 4.20±0.17 y 6.95±0.22, respectivamente, siendo éstas significativamente ($p<0.05$) mayor para los técnicos sociopenales que para los oficiales de corrección. Conclusión: Los hallazgos observados sobre el conocimiento de las infecciones con el VHC y VIH en un segmento importante del sistema correccional apuntan a la necesidad de acción urgente de aumentar las oportunidades de educación en estos grupos ocupacionales.

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