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ORIGINAL PAPER

# Factors Associated with Sexual Risk of HIV Transmission Among HIV-Positive Latino Men Who have Sex with Men on the U.S.-México Border

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**Abstract** We present results from a cross-sectional, clinic-based survey of border-region Latino men who have sex with men (MSM) and who also are living with HIV in the El Paso-Ciudad Juárez area. Among the 66 participants who reported serodiscordant anal or vaginal intercourse, we examined levels of psychological distress and substance use and the association of these variables with condomless sex. Bivariate analyses indicated that MSM who reported condomless sex with a serodiscordant partner were more likely to report higher scores on measures of anxiety, depression, and trauma. These men were also more likely to report more days of alcohol use to the point of intoxication. In multivariate logistic regression, no variables were independently associated with sexual risk behavior, but symptoms of anxiety trended toward statistical significance. Our study is one of few reports aimed at understanding the HIV epidemic among Latino MSM living with HIV in the El Paso-Ciudad Juárez border region. Although we found no evidence of a relation between our measures of psychological distress and substance use and sexual risk behavior in multivariate analyses, psychological distress and problematic alcohol use were common in the sample and are important targets for intervention in their own right.

**Resumen** Nosotros presentamos los resultados de un estudio transversal, encuesta basada en la clínica de la región fronteriza de El Paso Ciudad Juárez con hombres latinos que tienen sexo con hombres (HSH) y que viven con VIH. Entre los 66 participantes que reportaron sexo anal o vaginal serodiscordante, examinamos los niveles de estrés psicológico y el uso de sustancias y la asociación de estos variables con el variable de sexo sin condón. Los análisis bivariantes indicaron que los HSH que reportaron tener sexo sin condón con una pareja serodiscordante eran más propensos a reportar puntuaciones más altas en las medidas de la ansiedad, la depresión y el trauma. Estos hombres también eran más propensos a reportar más días de consumo de alcohol hasta el punto de intoxicación. En la regresión logística multivariante, los variables no se asociaron de forma independiente con comportamientos sexuales de riesgo, pero los síntomas de ansiedad mostraron una tendencia hacia la significación estadística. Nuestro estudio es uno de los pocos reportes dirigido a la comprensión de la epidemia del VIH entre HSH latinos que viven con el VIH en la región fronteriza de El PasoCiudad Juárez. Aunque nosotros no encontramos ron pruebas de un relación entre nuestras medidas de los trastornos psicológicos, consumo de sustancias, y el comportamiento sexual de riesgo en los análisis multivariantes, angustia psicológica y problemático uso de alcohol eran comunes en la muestra, y son objetivos importantes para la intervención en su propio derecho.

**Keywords** Latino/Hispanic · Men who have sex with men (MSM) · Risk factors · HIV positive · HIV prevention

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## Introduction

In the United States (U.S.), men who have sex with men (MSM) continue to shoulder a disproportionate burden of the HIV epidemic. MSM constitute approximately 2 % of the U.S. population [1], but 68 % of new HIV cases [2] and 54 % of people living with HIV (PLWH) [3].

Latino MSM, including those living along the U.S.-México border, appear to be particularly affected. Across the U.S., Latino MSM acquire HIV at three times the rate of White MSM, second only to African American MSM [4]. Along the border with México, researchers have warned that fluid migration, high rates of risk behavior on both sides of the border, and the scarcity of prevention services create the potential for an explosion in the epidemic [5–7]. In this region, nearly 63 % of HIV cases among men and women are attributed to male-to-male sexual contact and this attributable prevalence increased 11.4 % per year among men and 4.4 % per year among women between 2003 and 2006 [6]. Latino MSM specifically account for the largest proportion of new HIV cases in the region [5, 8], and rates of sexual risk behavior are notably high [7, 9]. Preventing HIV along the border therefore requires lessening risk of sexual transmission among Latino MSM.

Correlates of sexual risk behavior among Latino MSM living in specific regions along the border may reveal targets for tailored intervention. One area of research involves establishing the burden of psychological distress and substance use and its possible effects on border-region Latino MSM living with HIV, in an effort to support prevention with positives [10]. In general, psychological distress is both more prevalent among MSM living with HIV, including Latino MSM, than among other PLWH and also associated with a set of behavioral factors that likely contribute to forward transmission of the virus [11–13]. Similar factors may contribute to forward transmission specifically among Latino MSM in the border region, though there is a dearth of data on psychological distress among Latinos living with HIV [12, 14], let alone as a correlate of sexual risk behavior or in this specific region. Diversity among Latino MSM and along the 2,000 miles of the border also limits generalization across regionally recruited samples [15], supporting the need for regionally specific assessment.

Findings among MSM may help guide research on correlates of sexual risk behavior among Latino MSM living with HIV in a particular region. Among MSM, psychological distress has been associated with increased sexual risk behavior as well as worse health outcomes [13, 16–19], similar to findings among Latino MSM [20, 21]. In one study, depressive symptoms accounted for approximately 14 % of the variance in sexual risk among Latino MSM [21]. Among MSM living with HIV, the frequency of depression and childhood sexual abuse is higher than among HIV-negative MSM, and both depression and childhood sexual abuse are related to subsequent sexual risk and substance use [22, 23]. Sexual assault in adulthood may be particularly high among Latino MSM in border regions [24]. Substance use itself has also been associated with sexual risk behavior among MSM living with HIV [25], among Latino MSM specifically [26–29], and distinguished as an HIV risk factor for both U.S. and foreign-born Latino MSM [30].

In the current study, we present results from a cross-sectional, clinic-based survey of Latino MSM living with HIV in the El Paso-Ciudad Juárez border region. The latest Centers for Disease Control and Prevention estimates show that Texas carries one of the highest lifetime risks of HIV in the U.S. and that Latino MSM now account for 1 in 4 new HIV infections in the state [31]. In an effort to contribute to the limited research among this population, we examined our sample's level of psychological distress and substance use and the impact of these psychosocial factors on sexual transmission risk during intercourse with serodiscordant partners. Ultimately, our aim is to elucidate factors that might inform HIV prevention efforts among this vulnerable group who bear the brunt of the regional epidemic.

## Methods

### Procedures

This study was part of an intervention trial evaluating a cognitive-behavioral treatment program for depression and HIV medication adherence [32]. The research site was a community health center that offers HIV services in the border city of El Paso, Texas, just opposite Ciudad Juárez, México.

Participant recruitment involved the placement of posters and handouts in the clinic waiting room, exam rooms, and at the clinic front desk encouraging patients to inquire about the study. Clinicians and other clinic staff could also refer patients directly. Eligible participants were (1) over 18 years of age, (2) HIV-seropositive, (3) able to speak either English or Spanish, and (4) on antiretroviral therapy (ART) for at least 30 days. Study staff obtained written informed consent after confirming eligibility and describing the survey protocol. All procedures were approved by the Institutional Review Boards at the University of Washington and University of Texas El Paso, and by the clinic administration.

Prior to randomization in the intervention trial, enrolled participants completed a baseline assessment that consisted

of a 1-hour, pencil-and-paper survey. Research assistants administered the first part (e.g., sociodemographics, sexual orientation and sexual history, substance use, HIV disclosure) as an interview to build rapport and to facilitate the discussion of sensitive topics. Participants then completed the remainder of the questionnaire on their own, which included additional psychosocial and attitudinal variables (e.g., social support, depression and anxiety, alcohol problems, psychological adaptation, and quality of life). Participants were assessed in English or Spanish, depending on their preference. Each participant was paid $20 and data were collected between December 2009 and August 2011. Of the 300 participants surveyed, 40 were selected for the intervention trial.

Among the 300 participants who completed the parent study's screening survey, we selected for our secondary analyses only Latino MSM who also reported sexual behavior with the potential for HIV transmission risk (e.g., intercourse with an HIV-negative or HIV serostatus unknown partner). Specifically, of the 241 participants who identified as male or male-to-female transgender, 181 (75.1 %) reported either Mexican or Latino identity. Among the 141 of these who reported lifetime sexual contact with men, 98 (69.5 %) reported anal or vaginal intercourse in the past 6 months. Among these sexually active MSM, we selected only those who reported serodiscordant intercourse. This resulted in a final analytic sample of 66 MSM, including both male ($n = 64$) and male-to-female transgender ($n = 2$) participants.

## Measures

A certified translator translated all scales from English into the regional Spanish dialect. A second certified translator then independently back-translated the scales. A committee consisting of both the translators and bilingual content experts then reviewed the translations and resolved discrepancies by consensus [33]. All measures described below are well-validated scales commonly used in HIV research and Cronbach alpha scores refer to the present sample ($N = 66$).

### *Sociodemographic Variables*

Sociodemographic variables included: *age*; *gender* (male vs. male-to-female transgender); *number of people living in household*; self-identified *gay sexual identity* (gay vs. not strictly gay); in a committed relationship with a *primary partner* (No vs. Yes); *male primary partner* (No vs. Yes); *length of primary partner relationship* (coded at the median as $\geq$6 years vs. < 6 years); *homeless* (No vs. Yes); *employed* (full or part-time vs. odd jobs or unemployed); *annual household income* (in U.S. dollars); *border crossings* (a count of roundtrip U.S.-México border crossings during the last year); *interviewed in Spanish* (No vs. Yes); *lived in México within past year* (No vs. Yes); *Mexican descent* (No vs. Yes); and *U.S. acculturation* and *country of origin acculturation* (continuous measures).

Homelessness was defined as living in a shelter, group home, or half-way house. Acculturation was measured using the Abbreviated Multidimensional Acculturation Scale (AMAS-ZABB), which was developed to incorporate a bi-dimensional process of acculturation and validated in two separate Latino samples in both English and Spanish [34]. For each factor in the scale (cultural identity, language competence and cultural competence) the bi-dimensional measurement represents two domains (U.S. acculturation and Latino acculturation). The scale consists of 42 Likert-scale response items ranging from *strongly disagree* (1) to *strongly agree* (4) for the cultural identity subscale and *not at all* (1) to *extremely well/like a native* (4) for the language and cultural competence subscales.

### *Sexual Risk Behavior*

Participants indicated number of male and female partners with whom they had anal or vaginal intercourse within the past 6 months. They then reported whether they had a "main, steady or primary" sexual partner, that partner's serostatus (HIV-positive, HIV-negative, or HIV status unknown), and the aggregate number of vaginal/anal intercourse events (a) with condoms and (b) without condoms. Participants also indicated the number of casual partners with whom they had sex in the past 6 months who were (a) HIV positive, (b) HIV negative, or (c) HIV status unknown; for each serostatus, participants reported the aggregate number of intercourse events (a) with condoms and (b) without condoms.

Sexual risk behavior was defined as any condomless anal or vaginal intercourse with a serodiscordant (i.e., HIV negative or serostatus unknown) partner, whether with a casual or "main, steady or primary" partner. Sexual risk behavior was dichotomously categorized (No vs. Yes) for two reasons. First, counts of sex acts were not normally distributed or amenable to transformation for linear regression. In addition, recent evidence suggests that MSM who report using condoms *sometimes* may be no more protected from infection than those who report *never* using condoms [35].

### *Depression Symptoms*

Symptoms of depression were measured using the Beck Depression Inventory (BDI-IA). The BDI-IA consists of 21 multiple-choice items ($\alpha = 0.91$) that measure self-reported depressive symptoms over the past week, including

the day of the interview. Response options ranged from 0 to 3. Item ratings were summed, with possible scores ranging from 0 to 63 and thresholds calculated for *minimal* (≤9), *mild* (10–16), *moderate* (17–29) and *severe* (≥30) *depression* [36, 37].

#### *Trauma Symptoms*

Symptoms of trauma were measured using the Posttraumatic Stress Disorder (PTSD) Symptom Checklist (PCL-C), a 17-item assessment (α = 0.95) of the frequency of three posttraumatic stress factors over the past month. The factors correspond to diagnostic criteria B, C and D in the *Diagnostic and Statistical Manual of Mental Disorders IV-TR* [38]. Item ratings were summed, with possible scores ranging from 0 to 85, to indicate a total severity score. Participants who met criteria B, C and D for PTSD were coded dichotomously for "possible PTSD" as *trauma* (No vs. Yes) [39].

#### *Anxiety Symptoms*

Symptoms of anxiety were derived from the anxiety portion of the Hospital Anxiety and Depression Scale (HADS), a 7-item assessment (α = 0.88) which measures current frequency of anxiety-related symptoms (i.e., tense, wound up). Item ratings were summed with possible total scores ranging from 0 to 21. A summary score of 8 or higher was used to dichotomize participants as screening positive for an anxiety disorder (No vs. Yes) [40].

#### *Alcohol Problems*

Alcohol problems were assessed with the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT comprises 10 items (α = 0.86) that assess hazardous drinking (frequency and quantity); dependence symptoms (impaired control, morning drinking); and harmful alcohol use (guilt, alcohol related injuries). All items consist of either 3- or 5-point categorical responses, with a total score ranging from 0 to 40. Alcohol problems were dichotomously categorized (No vs. Yes) based on a threshold score of 8 or higher, with additional categories for *hazardous use* (8–14), *harmful use* (15–19), and *possible alcohol dependence* (≥20) [41].

#### *Substance Use*

Substance use was measured with the Addiction Severity Index-Lite (ASI-Lite) which asks participants to report the number of times each of thirteen different substances (e.g., alcohol, heroin, cocaine) has been used (a) in the past 30 days or (b) in the participant's lifetime (in number of years), and the route of administration [42]. Injection of any substance within a participant's lifetime was dichotomously categorized (No vs. Yes).

### Statistical Analyses

We used *t* tests and Pearson or Fisher's exact Chi square tests to compare participants who either did or did not report sexual risk behavior with respect to continuous and categorical sociodemographic, mental health, and substance use variables. Variables associated at $p < 0.10$ were entered into a multivariate logistic regression model to determine which were independently related to sexual risk behavior. We included *trauma* in the descriptive analyses but not in the regression model for two reasons: the measures for anxiety and trauma were highly correlated ($r = 0.80$, $p < 0.001$); and the *anxiety* measure screens for a broader set of anxiety disorders, including PTSD [40]. We also did not include *time since diagnosis* in the regression, as it was correlated with *age* ($r = 0.59$, $p < 0.001$), or *lifetime alcohol use* as it conceptually overlapped with *alcohol use to intoxication within the past 30 days*. All analyses were conducted using SPSS v. 19 (IBM, Armonk, NY, USA). All assumptions were met for the statistical tests.

No data were missing for the dependent variable; missing responses for independent variables were imputed with the mean, and participants with missing data did not differ systematically from the rest of the sample on sociodemographic measures.

## Results

### Participant Characteristics

As shown in Table 1, the sample ranged in age from 21 to 70 years and the average time since diagnosis with HIV was just under a decade (*M*/*SD* = 9.5/6.3). Most participants reported Mexican descent (97 %). Over a quarter (27.3 %) had lived in México in the past year and more than half (65.2 %) chose to be interviewed in Spanish. Most participants reported not working full- or part-time jobs, with nearly half not working at all (45.5 %) and just over one-quarter working odd jobs (25.8 %). Annual household income was low (*M*/*SD* = $17,391/$16,572, *mdn* = $10,932). Nearly half reported renting their abode (45.5 %) and very few reported living in a shelter or group home (1.5 %).

Additionally shown in Table 1, nearly thirty percent of the sample indicated that they lived alone and over one-quarter reported living with family (28.8 %). Forty-one percent of the sample reported "being in a committed

**Table 1** Sociodemographic and psychosocial characteristics among 66 HIV-positive Latino MSM living along the U.S.-Mexico border and reporting serodiscordant anal or vaginal intercourse within the past 6 months

| | | Condomless serodiscordant intercourse | | |
|---|---|---|---|---|
| | Total (*N* = 66) Mean (SD) | No 53 (80.3 %) Mean (SD) | Yes 13 (19.7 %) Mean (SD) | t |
| Sociodemographics | | | | |
| Age (in years) | 42.94 (11.63) | 45.26 (11.36) | 33.46 (7.25) | 3.56*** |
| Time since diagnosis (in years) | 9.50 (6.30) | 10.47 (6.01) | 5.55 (6.11) | 2.63** |
| Annual household income (in USD) | 17391 (16527) | 16773 (16078) | 19863 (18703) | −0.60 |
| Number of border crossings in past year | 32.42 (57.41) | 29.03 (52.72) | 46.23 (74.51) | −0.79 |
| Number of people living in household | 1.68 (1.67) | 1.66 (1.72) | 1.77 (1.54) | −0.21 |
| Psychosocial factors | | | | |
| U.S. acculturation | 60.88 (16.79) | 59.02 (16.99) | 68.46 (14.09) | −1.85* |
| Latino acculturation | 70.16 (12.51) | 70.79 (12.27) | 67.59 (13.65) | 0.83 |
| Mental health | | | | |
| Anxiety symptoms[a] | 6.92 (4.58) | 5.92 (3.82) | 10.99 (5.27) | −3.27*** |
| Depression symptoms[b] | 10.40 (9.16) | 9.00 (8.44) | 16.11 (10.10) | −2.62** |
| Trauma symptoms[c] | 35.32 (14.95) | 32.70 (12.36) | 46.00 (19.87) | −2.31** |
| Alcohol problems[d] | 6.76 (6.90) | 6.28 (6.39) | 8.69 (8.74) | −1.13 |
| Substance use[e] | | | | |
| Alcohol (days/past 30) | 6.53 (8.77) | 6.15 (8.32) | 8.08 (10.63) | −0.71 |
| Alcohol to intoxication (days/past 30) | 1.33 (2.96) | 1.00 (2.75) | 2.69 (3.52) | −1.88* |
| Alcohol (years/lifetime) | 19.44 (11.74) | 20.66 (12.29) | 14.46 (7.69) | 1.73* |
| Other opiates (days/past 30) | 0.30 (2.46) | 0.38 (2.75) | 0 (0) | 0.49 |
| Cannabis (days/past 30) | 2.68 (7.25) | 2.92 (7.73) | 1.69 (4.97) | 0.55 |
| Inhalants (days/past 30) | 0.08 (0.62) | 0 (0) | 0.38 (1.39) | −1.00 |
| Cocaine (days/past 30) | 0.64 (2.09) | 0.45 (1.62) | 1.38 (3.38) | −0.97 |
| Sedatives/hypnotics/tranquilizers (days/past 30) | 2.38 (7.84) | 2.96 (8.66) | 0 (0) | 2.49** |
| More than one substance (days/past 30) | 1.52 (4.00) | 1.38 (4.08) | 2.08 (3.80) | −0.56 |
| | *N* (%) | *n* (%) | *n* (%) | $\chi^2$ |
| Sociodemographics | | | | |
| Male (vs. MTF transgender) | 64 (97.0) | 51 (96.2) | 13 (100.0) | 0.51 |
| Gay identity | 44 (66.7) | 33 (62.3) | 11 (84.3) | 2.35 |
| Primary committed partner | 27 (40.9) | 21 (39.6) | 6 (46.2) | 0.18 |
| Male partner | 21 (77.8) | 16 (76.2) | 5 (83.3) | 0.14 |
| Together for ≥6 years | 12 (57.1) | 11 (52.4) | 1 (16.7) | 2.41 |
| Homeless | 1 (1.5) | 1 (1.9) | 0 (0) | 0.25 |
| Lived in México within past year | 18 (27.3) | 13 (24.5) | 5 (38.5) | 1.02 |
| Interviewed in Spanish | 43 (65.2) | 37 (69.8) | 6 (46.2) | 2.57 |
| Mexican descent | 64 (97.0) | 52 (98.1) | 12 (92.3) | 1.20 |

**Table 1** continued

| | $N$ (%) | $n$ (%) | $n$ (%) | $\chi^2$ |
|---|---|---|---|---|
| Employed full or part time | 19 (28.8) | 16 (30.2) | 3 (23.1) | 0.26 |
| Substance use | | | | |
| Injection drug use (lifetime) | 3 (4.5) | 2 (3.8) | 1 (7.1) | 0.37 |

Test statistics comparing condomless serodiscordant intercourse (No vs. Yes) are derived using $t$-tests and Pearson or Fisher's Exact $\chi^2$ tests

[a] Based on a summary score (0 to 21) on the anxiety portion of the *Hospital Anxiety and Depression Scale*. A score of 8 or higher indicates a positive screen for anxiety disorder

[b] Based on a summary score (ranging from 0 to 63) on the the *Beck Depression Inventory-IA*. A score of 10 or higher indicates mild to severe depression

[c] Based on a summary score of trauma severity (ranging from 0 to 85) on the *Posttraumatic Stress Disorder Symptom Checklist*

[d] Based on a summary score (ranging from 0 to 40) on the *Alcohol Use Disorders Identification Test*. A score of 8 or higher indicates problematic alcohol use

[e] On the *Addiction Severity Index-Lite*, participants reported no use of heroin, methadone, amphetamine, hallucinogens or barbiturates within the past 30 days

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

relationship with a primary partner," mostly with men (77.8 %) and for more than 6 years (57.1 %). When later asked about sexual partnerships, just under half ($n = 30$, 45.5 %) reported a "main, steady or primary" sexual partner, few of whom shared the same HIV-positive status ($n = 2$, 6.7 %). Of those reporting a main *sexual* partner, the majority reported an HIV-negative main sexual partner ($n = 22$, 73.3 %) or a main sexual partner of unknown serostatus ($n = 6$, 20.0 %).

Most of the sample identified toward one end of a 7-point Likert scale on *sexual orientation* and *gender of lifetime sexual partners* variables. The majority reported as *only* or *mostly gay/lesbian* ($n = 45$, 68.2 %) and far fewer identified as *only* or *mostly heterosexual* ($n = 8$, 12.1 %). About one quarter identified in the middle range as *equally* or *somewhat more heterosexual* or *gay/lesbian* ($n = 13$, 19.7 %). This corresponded approximately with reports of the gender of lifetime sexual partners. Seventy-nine percent endorsed lifetime sexual contact with *only* or *mostly men* ($n = 52$, 78.8 %), and fewer with *mostly women* ($n = 6$, 9.1 %) or with *men and women equally* ($n = 8$, 12.1 %). By definition, the sample did not include respondents who reported lifetime sexual behavior exclusively with women.

## Sexual Risk Behavior within the Past 6 Months

Of our selected sample of 66 sexually active HIV-seropositive Latino MSM who reported serodiscordant intercourse (i.e., with an HIV-negative or HIV status unknown partner) within the last 6 months, approximately one-fifth reported condomless sex ($n = 13$, 19.7 %). Of these participants, most ($n = 10$) reported condomless sex with a casual sexual partner and fewer reported condomless sex with a main sexual partner ($n = 5$). However, the average number of events of condomless sex was lower with casual partners ($M/SD = 1.3/4.6$) than with main sexual partners ($M/SD = 3.1/11.6$).

We do not know the gender of participants' sexual partners by serostatus; however, few of the 66 MSM reported intercourse in the past 6 months with women ($n = 9$, 13.6 %) and among these participants the average number of partners was quite low ($M/SD = 0.2/0.5$). Most reported intercourse with men ($n = 58$, 88.0 %) and these participants reported an average of 3 partners within the past 6 months ($M/SD = 3.0/6.3$).

## Mental Health and Substance Use

Findings indicate some level of psychological distress and substance use. A large minority of participants screened positive for PTSD ($n = 16$, 24.2 %); reported moderate or severe depressive symptoms ($n = 18$, 27.3 %); met the threshold for a potential anxiety disorder ($n = 24$, 36.4 %); or reported alcohol problems ($n = 23$, 34.8 %). Forty percent reported more than "minimal" depressive symptoms, with 11 % reporting mild depressive symptoms ($n = 7$) in addition to 23 % reporting moderate ($n = 15$) and 5 % reporting severe depression ($n = 3$).

With respect to substance use, alcohol was the most commonly and frequently used substance in the past 30 days ($n = 51$, 77.2 %, $M/SD = 6.5/8.8$ days). According to the ASI-Lite, just over half reported use of only alcohol and no other substances in the past 30 days ($n = 34$, 51.2 %) and just over 25 % reported use of alcohol to intoxication in the same time period ($n = 17$, 25.8 %). According to the AUDIT, one-third of

participants reported alcohol problems. Twenty-one percent of participants reported hazardous alcohol use ($n = 14$); several reported indicators of either harmful use ($n = 4$, 6.1 %) or possible alcohol dependence ($n = 5$, 7.6 %).

Use of other substances within the past 30 days was limited and about one-sixth reported not using substances at all ($n = 11$, 16.7 %). The most commonly used substances other than alcohol were cannabis ($n = 12$, 18.2 %, $M/SD = 2.7/7.2$ days of use), cocaine ($n = 10$, 15.2 %, $M/SD = 0.6/2.1$ days of use), and sedatives, hypnotics, or tranquilizers ($n = 6$, 9.1 %, $M/SD = 2.4/7.8$ days of use). About one-quarter of participants reported at least one day of using more than one substance (n = 16, 24.2 %, $M/SD = 1.5/4.0$ days of use).

### Multivariate Analyses of Sexual Risk Behavior

Bivariate analyses indicated that several variables were associated with sexual risk behavior in the past 6 months (Table 1). MSM who reported sexual risk behavior were significantly more likely to be younger ($M = 33.5$ years vs. 45.3, $t = 3.56$, $p = 0.001$) and more recently diagnosed with HIV ($M = 5.6$ years vs. 10.5, $t = 2.63$, $p = 0.011$). They also were significantly more likely to report higher scores on symptoms of anxiety ($M = 11.0$ vs. 5.9, $t = -3.27$, $p = 0.005$), depression ($M = 16.1$ vs. 9.0, $t = -2.62$, $p = 0.011$), trauma ($M = 46.0$ vs. 32.7, $t = -2.31$, $p = 0.037$), and U.S. acculturation ($M = 68.5$ vs. 59.0, $t = -1.85$, $p = 0.069$). Those who reported sexual risk behavior also reported significantly more days of alcohol use to intoxication ($M = 2.7$ days vs. 1.0, $t = -1.88$, $p = 0.065$), but fewer days of sedative, hypnotic, or tranquilizer use ($M = 0$ days vs. 3.0, $t = 2.49$, $p = 0.065$) and fewer years of alcohol use within their lifetimes ($M = 14.5$ years vs. 20.7, $t = 1.73$, $p = 0.088$). No other variables differed by sexual risk behavior, including other measures of lifetime substance use on the ASI-Lite.

In multivariate analyses (Table 2), no variables were independently associated with sexual risk behavior. Symptoms of anxiety trended toward significance (AOR 1.30, 95 % CI 0.99, 1.72, $p = 0.06$).

## Discussion

We sought to describe psychological distress and substance use as well as other correlates of inconsistent condom use among MSM living with HIV in the El Paso-Ciudad Juárez border region who also reported recent serodiscordant sex. Of these 66 participants, just under one in five reported inconsistent condom use.

The relatively low prevalence of sexual risk behavior in our parent study may reflect differences in sampling and in regional characteristics. This compares with a meta-analysis that reported a 26 % prevalence of serodiscordant anal intercourse among HIV-positive MSM in the U.S. [43]. Our study was clinic-based and patients might minimize reports of risk behavior when asked in settings where they also receive HIV care [43]. Likewise, stigma toward HIV and sex between men may be higher in the border region where this study was conducted as compared to other regions of the U.S. [44]. If this is the case, our sample of HIV-positive MSM may be less inclined to select or report serodiscordant sexual partners. Notably, those with sexual risk were younger and more recently diagnosed. Younger MSM may be more sexually active [45] and therefore presented with more opportunity not to use condoms consistently. Likewise, both younger and more recently diagnosed participants may not yet have accrued the necessary skills to navigate condom use or additional harm reduction practices, like serosorting, after an HIV diagnosis [46].

A substantial proportion of the participants indicated probable PTSD (24.2 %), mild-to-severe depression (37.9 %), anxiety (36.4 %), and hazardous and severe alcohol problems (34.8 %). The burden of psychological distress and problematic alcohol use in our sample is much higher than in the general population [47, 48], which is consistent with findings of high burdens of anxiety, depression and substance use disorders among sexual minority men [49, 50], PLWH [22], and people living along the U.S.-Mexico border [51]. These may be conservative estimates, as depression can be under-diagnosed in the context of HIV medical care [52] and Latinos in general face disparities in the recognition and treatment of psychological distress [53], which may have contributed to selection bias in study participation.

Consistent with reports from other studies [13, 23, 26–28, 54, 55], bivariate analyses indicated that the main correlates of sexual risk behavior were depression, anxiety, and days of alcohol intoxication within the past 30 days. In subsequent multivariate analyses controlling for age, U.S. acculturation, and other mental health and substance use variables, however, no individual variable remained significantly associated with sexual risk behavior. Even given the limited statistical power of these analyses, symptoms of anxiety trended toward significance. The absence of significant associations in the multivariate analyses between psychological distress and substance use with sexual risk behavior in our sample may be due to unassessed moderating factors that protect these participants despite their psychological risk characteristics. We should note that Latino MSM living in the El Paso-Ciudad Juárez region may also differ substantially from other U.S. MSM and other border-region Latino MSM (e.g., those

**Table 2** Bivariate and multivariate logistic regression analyses of factors associated with condomless intercourse among 66 HIV-positive Latino MSM living along the U.S.-Mexico Border who reported serodiscordant anal or vaginal intercourse in the past 6 months

| | Sexual risk behavior | | |
|---|---|---|---|
| | OR [95 % CI] | AOR[a] [95 % CI] | AOR[b] [95 % CI] |
| Anxiety symptoms[c] | 1.30 [1.11–1.52] | 1.20 [1.01–1.41] | 1.30 [0.99–1.72] |
| Depression symptoms[d] | 1.08 [1.01–1.16] | 1.06 [0.98–1.14] | 0.96 [0.85–1.09] |
| Alcohol intoxication (days/past 30)[e] | 1.17 [0.98–1.40] | 1.04 [0.85–1.26] | 0.93 [0.74–1.16] |

Both *anxiety* and *depression* are continuous measures of symptom severity

[a] Odds ratio is adjusted for *age* (in years) and *U.S. acculturation*

[b] Odds ratio is adjusted for *age* (in years), *U.S. acculturation*, and all other variables in the table

[c] Based on a summary score (0–21) on the anxiety portion of the *Hospital Anxiety and Depression Scale*

[d] Based on a summary score (ranging from 0 to 63) on the the *Beck Depression Inventory-IA*

[e] Based on the *Addiction Severity Index-Lite*

from the Tijuana-San Diego area) [15]. Little research on correlates associated with HIV risk behavior exist among Latino MSM along the border [7] and even less among Latino MSM living with HIV along the border. Given the dearth of knowledge about Latino MSM living with HIV in the El Paso-Ciudad Juárez border region, these results have important implications for further HIV prevention research with this vulnerable population. For example, we know that mental health has been associated with sexual risk behavior among Latino MSM in other regions [56] and that improved mental health among MSM also leads to better adherence to treatment and less transmission risk [57]. We also know that psychological distress can be effectively targeted among PLWH to reduce risk of HIV transmission [10, 32, 58]. Prevention interventions that target improved behavioral outcomes among PLWH (i.e., prevention with positives) have also significantly reduced condomless intercourse among MSM living with HIV, but this efficacy is moderated by severe depression, alcohol, and drug abuse [10, 58]. Data from our study suggest that Latino MSM in the El Paso-Ciudad Juárez region who are younger, recently diagnosed with HIV, experience psychological distress, or report high levels of alcohol use may benefit from this kind of targeted HIV prevention.

High levels of psychological distress in our sample also suggest the need for psychological intervention for its own sake, to improve the quality of life among this vulnerable population. Depressive symptomatology, in particular, is associated with many deleterious health outcomes, including higher viral load [59], HIV disease progression [60], and shorter survival time [61]. Studies demonstrate that depression can be successfully treated among PLHIV and, when it is, health outcomes improve [62].

Unfortunately there are few culturally specific therapies for Latino MSM living with HIV and high stigma of mental illness discourages treatment seeking. Latinos rank at the bottom of rates of racial/ethnic groups seeking and accessing substance use and depression treatment [63]. Even when substance use treatment is accessible, utilization rates are low [64] and Latinos are likely to terminate early, report treatment to be of low quality, and have poorer outcomes [65]. However, the need for treatment of psychological distress near El Paso-Ciudad Juàrez appears to be high. As an example, the largest public hospital in this specific border region recently conducted a comprehensive needs assessment, identifying treatment of mental health disorders as one of the top three priorities [66].

One approach to address psychological distress and substance use involves adapting evidence-based treatment and task shifting to personnel beyond highly trained mental health professionals. A meta-analysis of 76 mental health interventions found a fourfold increase in effect size when interventions were culturally tailored for a specific group versus a heterogeneous group [67]. A review of the evidence on poorer access and quality of care for racial/ethnic minorities also indicates that when appropriate treatment is well-delivered to minorities, results are comparable to those seen in the general population, especially if the treating clinician attends to cultural elements [68]. In the parent study of this border-region project [32], we tested a modified cognitive-behavioral therapy for adherence and depression and demonstrated its ability to improve outcomes in terms of both mental health as well as health behaviors (i.e., adherence to ART medications). Interventions that target both mental health as well as viral load are especially potent as HIV prevention interventions because they substantially reduce the possibility for transmission during sex [69].

Additional efforts to prevent HIV might include patient education about these prevention benefits of HIV medication in relation to sexual risk behavior. Both PrEP, which preceded our study, and treatment as prevention [70] might be particularly appealing, as sexual intimacy may motivate some MSM to consider the adoption of, and possibly adherence to, biomedical prevention [71].

There are several limitations to our study. First, self-reported mental health, substance use and sexual risk behaviors are vulnerable to social desirability and recall bias. Our findings are likely to be conservative estimates. We attempted to minimize recall bias by asking participants to recall sexual intercourse within the past 6 months by specific partner characteristics (the number of events with casual and primary partners and by partner serostatus) [72]. We further attempted to minimize social desirability bias by building rapport and allowing participants to answer questions about mental health without the involvement of an interviewer. Second, we sampled participants from a community health clinic, which limits the external validity of our findings. In particular, we cannot generalize relations between our study's independent variables and sexual risk behavior among all El Paso-Ciudad Juárez MSM or those MSM living with undiagnosed HIV, a population which likely differs both in behavior and transmission risk from MSM who access healthcare [73]. Third, the number of comparisons made in the bivariate analyses increases the likelihood of Type I errors and our small sample size increases the likelihood of Type II errors. Post-hoc analyses revealed low statistical power, which limits our confidence in interpreting our null findings in multivariate analyses. Fourth, our study was cross-sectional and precludes causal explanations. Fifth, evidence suggests that the threshold for meeting severity in depressive symptoms among Latinos living along the U.S.-México border, at least in regions that include Arizona and California, may differ from those in the original BDI-IA sample [74], so our report of mild, moderate and severe depression is preliminary. Sixth, in our baseline survey, we did not measure viral suppression, which can dramatically reduce the risk of sexual transmission of HIV [69]. If participants were virally suppressed, we might have overestimated actual HIV transmission risk in this population. Seventh, we specifically selected our sample to include only MSM who had the opportunity not to use or to use condoms consistently with an HIV-negative or HIV serostatus unknown partner, regardless of whether the partner was casual or steady; ideally we would be able to control for partner type. Future research in this region and population should examine this question with greater statistical power.

In conclusion, our study is one of few reports aimed at exploring the HIV epidemic among Latino MSM living with HIV, the population most burdened by the epidemic in the border region. Given the scant healthcare resources along the U.S.-México border [5, 11, 75], our findings may provide support for targeting behavioral interventions toward MSM who are younger, recently diagnosed with HIV, and who report psychological distress and alcohol use. It is unclear whether effective interventions for PLWH reduce sexual risk behavior across all contexts [76], and our findings with regard to other measures of psychological distress are limited by a small sample size. Even though we found no evidence of a relation between our measures of psychological distress and substance use with sexual risk behavior in multivariate analyses, psychological distress and problematic alcohol use were common in the sample and are important targets for intervention in their own right.

Future research might seek to replicate these findings to better assess the associations suggested by the literature, in a larger sample and one recruited outside of healthcare settings. This would allow us to explore the potential of strategies to reduce psychological distress among MSM living in the El Paso-Ciudad Juárez border-region who are most burdened by HIV.

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**Compliance with Ethical Standards**

**Conflict of Interest** Bryan A. Kutner, Kimberly M. Nelson, Jane M. Simoni, John A. Sauceda, and John S. Wiebe declares that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

## References

1. CDC. HIV among young men who have sex with men. 2014. Available from: http://www.cdc.gov/hiv/risk/gender/msm/. Accessed 15 May 2015.
2. CDC. Diagnoses of HIV infection in the United States and dependent areas, 2013. Vol. 25, HIV Surveillance Report. 2015. Available from: http://www.cdc.gov/hiv/library/reports/surveillance/. Accessed 30 Mar 2015.

3. CDC. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas—2012. Vol. 19, HIV Surveillance Supplemental Report. Centers for Disease Control and Prevention; 2014. Report No.: 3.
4. CDC. HIV Infections Attributed to Male-to-Male Sexual Contact—Metropolitan Statistical Areas, United States and Puerto Rico, 2010. MMWR Morb Mortal Wkly Rep. 2012;61(47). http://www.cdc.gov/mmwr/pdf/wk/mm6147.pdf.
5. Santos G, Puga AM, Medina C. HAART, adherence, and cultural issues in the US Latino community. AIDS Read. 2004;14(10 Suppl):S26–9.
6. Espinoza L, Hall HI, Hu X. Increases in HIV Diagnoses at the U.S.–Mexico Border, 2003–2006. AIDS Educ Prev. 2009;21(-supplement b):19–33.
7. Gudelia Rangel M, Martínez-Donate AP, Hovell MF, Santibáñez J, Sipan CL, Izazola-Licea JA. Prevalence of risk factors for HIV infection among Mexican migrants and immigrants: probability survey in the north border of Mexico. Salud Pública Méx. 2006;48:3–12.
8. Sanchez MA, Lemp GF, Magis-Rodríguez C, Bravo-García E, Carter S, Ruiz JD. The epidemiology of HIV among Mexican migrants and recent immigrants in California and Mexico. JAIDS. 2004;1(37 Suppl 4):S204–14.
9. Rhodes SD, McCoy TP, Hergenrather KC, Vissman AT, Wolfson M, Alonzo J, et al. Prevalence estimates of health risk behaviors of immigrant Latino men who have sex with men. J Rural Health. 2012;28(1):73–83.
10. Crepaz N, Lyles CM, Wolitski RJ, Passin WF, Rama SM, Herbst JH, et al. Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. AIDS. 2006;20(2):143–57.
11. del Rio C. Latinos and HIV care in the Southeastern United States: new challenges complicating longstanding problems. Clin Infect Dis. 2011;53(5):488–9.
12. Kelley CF, Hernandez-Ramos I, Franco-Paredes C, del Rio C. Clinical, epidemiologic characteristics of foreign-born Latinos with HIV/AIDS at an urban HIV clinic. AIDS Read. 2007;17(2):73–88.
13. Fendrich M, Avci O, Johnson TP, Mackesy-Amiti ME. Depression, substance use and HIV risk in a probability sample of men who have sex with men. Addict Behav. 2013;38(3):1715–8.
14. Carrico AW, Johnson MO, Morin SF, Remien RH, Charlebois ED, Steward WT, et al. Correlates of suicidal ideation among HIV-positive persons. AIDS. 2007;21(9):1199–203.
15. Keesee MS, Shinault KA, Carabin H. Socio-demographic characteristics of HIV/AIDS individuals living and receiving care along the US-Mexico border through five SPNS demonstration projects. J HIV/AIDS Soc Svs; 2006.
16. White JM, Gordon JR, Mimiaga MJ. The role of substance use and mental health problems in medication adherence among HIV-infected MSM. LGBT Health. 2014;1(4):319–22.
17. Leserman J, Barroso J, Pence BW, Salahuddin N, Harmon JL. Trauma, stressful life events and depression predict HIV-related fatigue. AIDS Care. 2008;20(10):1258–65.
18. Hart TA, James CA, Purcell DW, Farber E. Social anxiety and HIV transmission risk among HIV-seropositive male patients. AIDS Patient Care STDS. 2008;22(11):879–86.
19. Bradley MV, Remien RH, Dolezal C. Depression symptoms and sexual HIV risk behavior among serodiscordant couples. Psychosom Med. 2008;70(2):186–91.
20. DeSantis JP, Arcia A, Vermeesch A, Gattamorta KA. Using structural equation modeling to identify predictors of sexual behaviors among Hispanic men who have sex with men. Nurs Clin N Am. 2011;46(2):233–48.
21. De Santis JPJ, Colin JMJ, Vasquez EEP, McCain GCG. The relationship of depressive symptoms, self-esteem, and sexual behaviors in a predominantly Hispanic sample of men who have sex with men. Am J Mens Health. 2008;2(4):314–21.
22. Ciesla JA, Roberts JE. Meta-analysis of the relationship between HIV infection and risk for depressive disorders. Am J Psychiatry. 2001;158(5):725–30.
23. Schafer KR, Gupta S, Dillingham R. HIV-infected men who have sex with men and histories of childhood sexual abuse: implications for health and prevention. J Assoc Nurses AIDS Care. 2013;24(4):288–98.
24. Semple SJ, Stockman JK, Goodman-Meza D, Pitpitan EV, Strathdee SA, Chavarin CV, et al. correlates of sexual violence among men who have sex with men in Tijuana, Mexico. Arch Sex Behav; 2016.
25. Perry NS, Taylor SW, Elsesser S, Safren SA, O'Cleirigh C. the predominant relationship between sexual environment characteristics and hiv-serodiscordant condomless anal sex among HIV-positive men who have sex with men (MSM). AIDS Behav. 2015;20(6):1228–35.
26. Bedoya CA, Mimiaga MJ, Beauchamp G, Donnell D, Mayer KH, Safren SA. Predictors of HIV transmission risk behavior and seroconversion among Latino men who have sex with men in Project EXPLORE. AIDS Behav. 2012;16(3):608–17.
27. Boone MR, Cook SH, Wilson P. Substance use and sexual risk behavior in HIV-positive men who have sex with men: an episode-level analysis. AIDS Behav. 2013;17(5):1883–7.
28. Mansergh G, Flores S, Koblin B, Hudson S, McKirnan D, Colfax GN, et al. Alcohol and drug use in the context of anal sex and other factors associated with sexually transmitted infections: results from a multi-city study of high-risk men who have sex with men in the USA. Sex Transm Infect. 2008;84(6):509–11.
29. Poppen PJ, Reisen CA, Zea MC, Bianchi FT, Echeverry JJ. Predictors of unprotected anal intercourse among HIV-positive Latino gay and bisexual men. AIDS Behav. 2004;8(4):379–89.
30. Mizuno Y, Borkowf CB, Ayala G, Carballo-Dieguez A, Millett GA. correlates of sexual risk for hiv among us-born and foreign-born Latino men who have sex with men (MSM): an analysis from the Brothers y Hermanos Study. J Immigr Minor Health. 2015;17(1):47–55.
31. Hess K, Hu X, Lansky A, Mermin J, Hall HI. Estimating the lifetime risk of a diagnosis of HIV infection in the United States. In: Conference on retroviruses and opportunistic infections CROI, 22–25 Feb 2016, Boston, Abstract 52.
32. Simoni JM, Wiebe JS, Sauceda JA, Huh D, Sanchez G, Longoria V, Bedoya CA, Safren SA. A preliminary RCT of CBT-AD for adherence and depression among HIV-Positive Latinos on the U.S.-Mexico border: the Nuevo Día study. AIDS Behav. 2013;17(8):2816–29.
33. Brislin RW. Translation and content analysis of oral and written material. In: Triandis HC, Berry JW, editors. Handbook of cross-cultural psychology. Boston; 1980. p. 389–444.
34. Zea MC, Asner-Self KK, Birman D. The abbreviated multidimentional acculturation scale: empirical validation with two Latino/Latina samples. Cultur Divers Ethnic Minor Psychol. 2003;9(2):107–26.
35. Remis RS, Alary M, Liu J, Kaul R, Palmer RWH. HIV transmission among men who have sex with men due to condom failure. PLoS ONE. 2014;9(9):e107540.
36. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. Clin Psychol Rev. 1988;8(1):77–100.
37. Beck AT, Steer RA. Manual for the revised Beck depression inventory. Austin: The Psychological Association; 1987.

38. Marshall GNG. Posttraumatic stress disorder symptom checklist: factor structure and English-Spanish measurement invariance. J Trauma Stress. 2004;17(3):223–30.
39. McDonald SD, Calhoun PS. The diagnostic accuracy of the PTSD Checklist: a critical review. Clin Psychol Rev. 2010;30(8):976–87.
40. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. J Psychosom Res. 2002;52(2):69–77.
41. Babor TF, la Fuente de JR, Saunders J, Grant M. The alcohol use disorders identification test: guidelines for use in primary care. Geneva, Switzerland: World Health Organization; 2001
42. McLellan AT, Cacciola JC, Alterman AI, Rikoon SH, Carise D. The Addiction Severity Index at 25: origins, contributions and transitions. Am J Addict. 2006;15(2):113–24.
43. Crepaz N, Marks G, Liau A, Mullins MM, Aupont LW, Marshall KJ, et al. Prevalence of unprotected anal intercourse among HIV-diagnosed MSM in the United States: a meta-analysis. AIDS. 2009;23(13):1617–29.
44. Darrow WW, Montanea JE, Gladwin H. AIDS-related stigma among Black and Hispanic young adults. AIDS Behav. 2009;13(6):1178–88.
45. Pines HA, Gorbach PM, Weiss RE, Shoptaw S, Landovitz RJ, Javanbakht M, et al. Sexual risk trajectories among MSM in the United States: implications for pre-exposure prophylaxis delivery. JAIDS. 2014;65(5):579–86.
46. Grov C, Rendina HJ, Moody RL, Ventuneac A, Parsons JT. HIV serosorting, status disclosure, and strategic positioning among highly sexually active gay and bisexual men. AIDS Patient Care STDS. 2015;29(10):559–68.
47. Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psych. 2005;62(6):617.
48. Shim RS, Baltrus P, Ye J, Rust G. Prevalence, treatment, and control of depressive symptoms in the United States: results from the National Health and Nutrition Examination Survey (NHANES), 2005-2008. J Am Board Fam Med. 2011;24(1):33–8.
49. Bostwick WB, Boyd CJ, Hughes TL, McCabe SE. Dimensions of sexual orientation and the prevalence of mood and anxiety disorders in the United States. Am J Pub Health. 2010;100(3):468–75.
50. McCabe SE, Hughes TL, Bostwick WB, West BT, Boyd CJ. Sexual orientation, substance use behaviors and substance dependence in the United States. Addiction. 2009;104(8):1333–45.
51. Longoria A, Wiebe JS, Jones A. A nurse-based disease management model of HIV/AIDS care on the U.S./Mexico Border. In: Curiel H, editor. Innovative strategies for HIVAIDS prevention care along the US-Mexico Border. Washington DC; 2007.
52. Asch SM, Kilbourne AM, Gifford AL, Burnam MA, Turner B, Shapiro MF, et al. Underdiagnosis of depression in HIV: who are we missing? J Gen Intern Med. 2003;18(6):450–60.
53. Lewis-Fernández R, Das AK, Alfonso C, Weissman MM, Olfson M. Depression in US Hispanics: diagnostic and management considerations in family practice. J Am Board Fam Pract. 2005;18(4):282–96.
54. Akin M, Fernandez MI, Bowen GS, Warren JC. HIV risk behaviors of Latin American and Caribbean men who have sex with men in Miami, Florida, USA. Rev Panam Salud Publica. 2008;23(5):341–8.
55. Fernandez MI, Bowen GS, Warren JC, Ibañez GE, Hernandez N, Harper GW, et al. Crystal methamphetamine: a source of added sexual risk for Hispanic men who have sex with men? Drug Alcohol Depend. 2007;86(2–3):245–52.
56. De Santis JP, Arcia A, Vermeesch A, Gattamorta KA. Using structural equation modeling to identify predictors of sexual behaviors among Hispanic men who have sex with men. Nurs Clin North Am. 2011;46(2):233.
57. Sikkema KJ, Hansen NB, Kochman A, Santos J, Watt MH, Wilson PA, et al. The development and feasibility of a brief risk reduction intervention for newly HIV-diagnosed men who have sex with men. J Commun Psychol. 2011;39(6):717–32.
58. Herbst JH, Kay LS, Passin WF, Lyles CM, Crepaz N, Marín BV, et al. A systematic review and meta-analysis of behavioral interventions to reduce HIV risk behaviors of Hispanics in the United States and Puerto Rico. AIDS Behav. 2006;11(1):25–47.
59. Chan KS, Orlando M, Joyce G, Gifford AL, Burnam MA, Tucker JS, et al. Combination antiretroviral therapy and improvements in mental health: results from a nationally representative sample of persons undergoing care for HIV in the United States. JAIDS. 2003;33(1):104–11.
60. Alciati A, Gallo L, Monforte AD, Brambilla F, Mellado C. Major depression-related immunological changes and combination antiretroviral therapy in HIV-seropositive patients. Hum Psychopharmacol. 2007;22(1):33–40.
61. Lima VD, Geller J, Bangsberg DR, Patterson TL, Daniel M, Kerr T, et al. The effect of adherence on the association between depressive symptoms and mortality among HIV-infected individuals first initiating HAART. AIDS. 2007;21(9):1175–83.
62. Olatunji BO, Mimiaga MJ, Cleirigh CO. A review of treatment studies of depression in HIV. Top HIV Med. 2006;14(3):112–24.
63. Alegría M, Chatterji P, Wells K, Cao Z. Disparity in depression treatment among racial and ethnic minority populations in the United States. Psychiatr Serv. 2008;1(59):1264–72.
64. Alvarez J, Jason LA, Olson BD, Ferrari JR, Davis MI. Substance abuse prevalence and treatment among Latinos and Latinas. J Ethn Subst Abuse. 2007;6(2):115–41.
65. Alvarez J, Olson BD, Jason LA, Davis MI, Ferrari JR. Heterogeneity among Latinas and Latinos entering substance abuse treatment: findings from a national database. JSAT. 2004;26(4):277–84.
66. University Medical Center of El Paso. Community Health Needs Assessments & Implementation Plans 2014–2016. El Paso. 2014. pp. 1–15. http://www.umcelpaso.org/WebShell/umcep.nsf/DefaultFrameset/Site+Defaults?OpenDocument&DocID=8E164B0DDE46203887256D85006DAA51. Accessed 25 May 2016.
67. Griner D, Smith TB. Culturally adapted mental health intervention: a meta-analytic review. Psychotherapy. 2006;43(4):531–48.
68. Schraufnagel TJ, Wagner AW, Miranda J, Roy-Byrne PP. Treating minority patients with depression and anxiety: what does the evidence tell us? Gen Hosp Psychiatry. 2006;28(1):27–36.
69. Cohen MS, Smith MK, Muessig KE, Hallett TB, Powers KA, Kashuba AD. Antiretroviral treatment of HIV-1 prevents transmission of HIV-1: where do we go from here? Lancet. 2013;382(9903):1515–24.
70. US Public Health Service. Preexposure Prophylaxis for the Prevention of HIV Infection in the United States—2014. HIV Surveillance Supplemental Report. Centers for Disease Control and Prevention; 2014. p. 1–43.
71. Gamarel KE, Golub SA. Intimacy motivations and pre-exposure prophylaxis (PrEP) adoption intentions among HIV-negative men who have sex with men (MSM) in romantic relationships. Ann Behav Med. 2015;49(2):177–86.
72. Mustanski B, Starks T, Newcomb ME. Methods for the design and analysis of relationship and partner effects on sexual health. Arch Sex Behav. 2013;43(1):21–33.
73. Skarbinski J, Rosenberg E, Paz-Bailey G, Hall HI, Rose CE, Viall AH, et al. Human immunodeficiency virus transmission at each step of the care continuum in the United States. JAMA Intern Med. 2015;175(4):588–96.

74. Dawes SE, Suarez P, Vaida F, Marcotte TD, Atkinson JH, Grant I, et al. Demographic influences and suggested cut-scores for the Beck Depression Inventory in a non-clinical Spanish speaking population from the US-Mexico border region. Int J Cult Ment Health. 2010;3(1):34–42.
75. Dennis AM, Napravnik S, Seña AC, Eron JJ. Late entry to HIV care among Latinos compared with non-Latinos in a southeastern US cohort. Clin Infect Dis. 2011;53(5):480–7.
76. Johnson WD, Díaz RM, Flanders WD, Goodman M, Hill AN, Holtgrave D, et al. Behavioral interventions to reduce risk for sexual transmission of HIV among men who have sex with men. Cochrane Database Syst Rev. 2008;3:CD001230.