NEGATIVE AFFECT AND RISK FOR HUMAN IMMUNODEFICIENCY VIRUS AMONG ADULTS IN ESSIEN UDIM LOCAL GOVERNMENT AREA OF AKWA IBOM STATE

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Abstract
The study examining the relationship between human immunodeficiency virus HIV-related risk behavioural and negative affective states has brought about mixed findings. It examined the potential moderating role of gender and sexual orientation on a negative affect and HIV-related risk behaviour. The cross-sectional design was used for the study and measures of depression, anxiety and HIV-related risk behaviour collected from participants at the time of the pretest counseling. Analysis of variance (ANOVA) was used to analyze the data. The study conducted through a community-based, anonymous HIV counseling and testing site with 185 (men and women) participants recruited for the study. Centre for Epidemiological Studies Depressed Mode Scale and the Beck Anxiety Inventory Structured interview regarding HIV-related risk behaviour was completed by the participants. Results indicated that depression and anxiety were significantly related to HIV-related risk behaviour. Conclusions were drawn.

Various researchers examining determinants of human immunodeficiency virus (HIV)-related sexual risk behaviours has concentrated largely on social-cognitive factors rather than affective variables (Stiffman, Earls & Cunningham, 2002). Although very few number of studies examining the role of negative affective states in HIV-related risk behaviours have emerged in published reports over the past decade (Walsh & Rudolph, 2006), the findings of such investigation have been equivocal, and it has been difficult to draw firm conclusions regarding the relationship between HIV-related sexual risk behaviour and negative affective states, such as depression and anxiety. Reports of a positive association between depression and anxiety and sexual risk behaviour are frequent. Studies examining adolescents, HIV-positive adults (Kelly, Murphy & Bahr, 2003), HIV-positive men who have sex with men (Clement, 2002), HIV-negative men who have sex with men (Strathdee, Hogg & Martinade, 1998), female sex workers (Alegria, Vera & Freeman, 1994), have found higher level of HIV-related sexual risk behaviour. However, reports of no significant association among those variables are also frequent and other studies have found that neither depression nor anxiety was related to HIV-related sexual risk.
behaviour. Reports of negative associations are infrequent but have been found among men who have sex with men.

As a result of the equivocal findings, it is difficult to determine whether there is a relationship between the negative affective states of depression and anxiety and HIV-related sexual risk behaviours. Comparison across studies is also complicated by the diversity of populations sampled. Studies have been conducted using samples from several different populations, including men who have sex with men, injection-drug users or substance using adults, and HIV-positive persons. Studies that use samples of women have varied in terms of the women selected. Some use samples of substance abusing women, whereas others use samples of sex workers, often with significant overlap between these categories. Still other studies use women attending health clinics. Most of the research utilized samples of homogeneous participants (as in men who have sex with men) or heterogeneous participants from clinical population (as in HIV-positive men and women, or male and female injection-drug users).

Meta-analysis that includes many of the studies cited above concluded that there is little support for an association between negative affective states and HIV-related sexual risk behaviour (Grepes and Marks, 2001). Effect of size for depression, anxiety, and anger were non-significant, and the variability in effect sizes could not be accounted for by subject population sampled. Given that well documented gender differences exist in the prevalence of depression and anxiety as well as sexual behaviours (Oliver & Hyde, 2006), this factor may account for some of the variability in effect size. Further, depression and anxiety may be differentially related to sexual behaviour for men and women. Gender is an important variable to consider, however, it has been infrequently examined in studies of the relationship between negative affect and HIV-related sexual risk behaviour. Of the studies that include both men and women, gender comparisons are infrequent. When gender comparisons are performed, differences have been found between men and women including differences in sexual risk behaviour and in depression levels (Nemoto, Foster & Brown, 2005). Among studies with mixed gender samples, very few have examined the relationship between negative affect and sexual risk behaviour separately for men and women. Although one study found that neither gender nor ethnicity moderated any of the significant relationships between psychological variables and HIV-related sexual risk behaviour, it was not examined separately for men and women because neither depression nor anxiety was significantly related to sexual risk level in the combined gender analysis (Reilly & Woo, 2001).

Significant differences between men and women have been noted in the few studies where men and women have been examined separately within the same investigation. Kennedy, Skurnick & Wan (2003) found that differences in sexual risk behaviour varied by gender and HIV status, with little overlap in psychological correlates of sexual risk behaviour in a sample of sex discordant heterosexual couples.
Nemoto, Foster & Brown (2005) found that women reported significantly greater depression more than did men and that depression was positively associated with having multiple sex partners among women but unrelated to sexual risk behaviour in men.

Sexual orientation may play a role in the relationship between depression or anxiety and HIV-related sexual risk behaviour. Again, HIV study samples often include either men who have sex with men or heterosexual women. Although men’s sexual orientation has been a central feature of HIV prevention literature because of the high prevalence rates of HIV infection among homosexual and bisexual men, women sexual orientation has received little attention. Differences among heterosexual, homosexual and bisexual men are widely recognized as influential in HIV risk behaviour for men, whereas women sexual orientation is rarely mentioned or assessed, even among samples of women.

The present study examined the relationship between negative affective states and HIV-related risk among a community sample of individuals at risk for HIV infection attending an anonymous HIV test site. Analyses were conducted to examine the role of gender and behavioural sexual orientation, depression, and anxiety in HIV-related risk. Given the existence of gender and sexual orientation differences in depression, anxiety and risk behaviour, it was anticipated that the relationship between depression or anxiety and HIV risk would be moderated by sexual orientation and gender. This study was carried out on adults in Essien Udim Local Government Area of Akwa Ibom State, Nigeria.

Methods
The consent of heart to heart centres (HIV test centres) was sought for their co-operation and assistance to enhance the carrying out of this cross-sectional study of negative affective states and HIV-related risk behaviour. Eligible adult participants were recruited after the completion of pretest counseling and the administration of an HIV test site of an acquired immunodeficiency syndrome (AIDS) service organization by HIV test counselors and research assistants. HIV test counselors and research assistants at the sites were trained to complete the informed consent process with eligible participants and to provide instructions for the completion of self-administered questionnaires for those who agreed to participate. The questionnaires were read to the participants who could not read as well as the responses so that these could help the research assistants to fill the questionnaires. The completed questionnaires contained questions assessing depression and anxiety. HIV-related risk behaviour data were collected from the structured interview conducted during pretest counseling.

Sample
Participants included adult men and women attending an anonymous HIV test site for HIV-anti-body testing and pretest counseling. During the 10 months of the
study 385 eligible individuals were presented for anonymous HIV testing. Of these, 200 were approached for their consent on participation, data from 185 (92.5%) were used for the analyses as shown in table 1 below.

Table 1
Demographic Characteristics of Study Participants (N = 185)

<table>
<thead>
<tr>
<th>Gender orientation</th>
<th>Age (y)</th>
<th>Behavioural sexual orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>≤ 30-36.7%</td>
<td>Heterosexual 66.5%</td>
</tr>
<tr>
<td>Female</td>
<td>≤ 31-50.4%</td>
<td>Homosexual 9.7%</td>
</tr>
<tr>
<td></td>
<td>≤ 51-9.6%</td>
<td>Bisexual 23.8%</td>
</tr>
</tbody>
</table>

Data in Table 1 shows that majority of the participants were heterosexual (66.5%), male (55.7%) and between the ages of 31 and 50 years (54.6%). These demographic distributions are reflective of the community from which the sample was drawn. Participants completed two self-administered standardized questionnaire assessing affective symptomatology: the Centre for Epidemiological Studies Depressed Mood Scale (depression) (Radolf, 1977) and the Beck Anxiety Inventory (anxiety), (Beck, Epstein, Brown & Steer (1988) were adapted for the study. Gender behavioural sexual orientation and HIV-related risk information were extracted from data collected during pretest counseling sessions.

Depression
The Centre for Epidemiological Studies Depressed Mood Scale consists of 20 self-report, likert-type items that assess depressive symptomatology experienced during the past week (scale of 0-3:0 = rarely or 3 = most of the time). The measure was developed for use in assessing depression in the general population and is not designed for clinical purposes. It has demonstrated validity as well as internal consistency, with $\alpha = .85$ in the general population and $\alpha = .90$ in a patient sample and $\alpha = .79$ in the present sample. A score of 16 (one SD above the mean) is widely used as cut off score for significant levels of depressive symptomatology. Scores of 0 to 15 are indicative of absence of significant depressive symptomatology, scores of 16 to 31 (one to three SDs above the mean of the normative community sample) are indicative of mild to moderate levels of depressive symptomatology, and scores of 32 and above (more than three SDs above the mean) are indicative of moderate to severe levels of depression symptoms. Three levels of depressive symptomatology were examined in the present study because of possibility of a curvilinear relationship between depression and HIV related risk.

Anxiety
The Beck Anxiety Inventory consists of 21 self report, likert type items that access anxiety symptomatology in the past week (scale of 0 – 3:0 = not at all, 3 =
severely). The measure has high internal consistency (α = .94 in the present sample). Validation studies have also demonstrated high internal consistency (α = .92) and good test-retest reliability (r = .75), concurrent validity, discriminant validity and better discrimination for other widely used anxiety measures. Scores of 0 to 15 are indicative of minimal to mild levels of significant anxiety symptoms; scores of 16 to 25 are indicative of moderate level of anxiety symptoms; scores of 26 and above are indicative of severe levels of anxiety symptoms (Anthony, Orsillo & Boemer, 2001).

Again, three levels of anxiety symptomatology were examined in the present study because of the possibility of a curvilinear relationship between anxiety and HIV-related risk.

**Gender, Behavioural Sexual Orientation and HIV-Related Risk**

Gender, behavioural sexual orientation and HIV-related risk information were extracted from the risk assessment used throughout the state for pretest counseling during all anonymous HIV test. HIV test counselors administered this risk assessment in a semi-structured interview format. Demographic information and risk factors for HIV were assessed, including sexual relations with female partners, number of sexual partners, number of needle-sharing partners, number of risk status, (i.e injection-drug-using partner, bi-sexual male partner, HIV positive partner), injection-drug use, transfusion or transplant history, recentness of last unprotected intercourse and exchange of sex for drugs or money, among others. Information regarding participant gender and behavioural sexual orientation was determined separately for men and women by self report of sexual relations with only opposite sex partners, only same-sex partners, or sexual relationship with both opposite and same sex partners. Participants were classified into one of five groups by gender and behavioural sexual orientation. (a) men who have sex with men (homosexual men) (b) men who have sex with men and women (bisexual men) (c) men who have sex with women (heterosexual men) (d) women who have sex with men (heterosexual women) (e) women who have sex with men and women (bisexual women).

A continuous index of HIV risk was computed for each participant by summing up the number of dichotomous coded risk factors present from seven risk factors for HIV including (a) unprotected intercourse in the past years, (b) multiple sex partners in the past years, (c) history of a sexual transmitted disease diagnosis, (d) sexual relation with an injection-drug-using-partner, (e) sexual relation with an HIV positive partner, (f) exchange of sex for drugs or money and (g) history of injection-drug use. HIV index scores may range from 0 (indicating relatively low risk for HIV). This composite index of HIV-related risk was used as the dependent variable. Composite indices may present a more accurate reflection of risk level than any single, continuous, dichotomous variable (e.g unprotected sex with one HIV positive partner or multiple partners or unknown serostatus confers greater risk than unprotected sex with monogamous negative partner. Similarly, the level of risk posed by having multiple sexual partners is mitigated by the frequency of condom use.
Empirically evaluated measures of sexual behaviours are notably to find; few instruments are available and even fewer have established psychometric properties. There is no agreed upon standard of reliable and valid measurement, and there is little consensus about appropriate behaviours for an accurate index of risk behaviour of HIV transmission. Sexual risk has been conceptualized in a number of ways such as frequency of unprotected intercourse, number of sexual partners, condom use or summary variables constructed from measures of a number of behaviours (Leigh & Stall, 2003). Unfortunately, frequent counts of specific behaviours, such as, episodes of unprotected intercourse or number of partners, may not reflect accurate counts; rather, they may reflect inferential strategies or estimates. Measures of whether or not an individual has engaged in a behaviour (incidence measures) have been found to have high test-retest reliability, whereas reports of frequency of sexual behaviour have been found to be more variable and less reliable with longer recall periods (Catania, Gibson, Chitwood & Coates, 2008).

Furthermore, the reliability of frequency data varies among groups, adolescents and heterogenous adults reports less complex sexual patterns and evidence more reliable reports than do homosexual men. Because of the limitations resulting from recall accuracy, brief reporting periods are recommended for frequency measures. However, such periods may not accurately represent an individual’s behaviour over longer periods of time. Overall, good reliability has been found for measures of frequency of specific acts. Global measures such as incidence measures may be better for describing risk factors across heterogenous groups, whereas more detailed measures such as frequency measures may be preferred for distinguishing risk differences within high risk populations (Twitchell, Huber, Reback & Sophia, 2002).

Analysis
Descriptive statistics for depression, anxiety and risk behaviour were calculated as a function of gender and behavioural sexual orientation. Analysis of variance (ANOVA) was used to examine depression, anxiety and risk behavioural differences among gender and behavioural sexual orientation. ANOVA was used to examine differences in risk behaviour by gender and behavioural sexual orientation group and level of negative affect.

Results

Table 2
Risk Index, Depression and Anxiety Scores By Gender and Behavioural Sexual Orientation

<table>
<thead>
<tr>
<th></th>
<th>n (%)</th>
<th>Depression Mean (SD)</th>
<th>Anxiety score Mean (SD)</th>
<th>Risk Index Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homosexual men</td>
<td>18 (9.7)</td>
<td>20.89 (7.86)</td>
<td>10.89 (12.50)</td>
<td>17.8 (0.89)</td>
</tr>
</tbody>
</table>
Data in Table 2 shows the results of the risk index, depression and anxiety scores by gender and behavioural sexual orientation. Depression scores were normally distributed and ranged from 0 to 47 with the mean score of 22.45 (SD 8.83) falling in the mild to moderate range for the sample. A one-way ANOVA revealed no significant differences among the five gender and behavioural sexual or orientation depression scores (F [4, 180] = 1.03, p = .39). Examination of effect size (eta² = 0.47) revealed a very small effect size and low observed power (.64) to detect. However, a second one-way ANOVA did reveal significant genders differences on depression scores (F [1, 183] = 3.99, p = 0.48) with women (mean, 23.89; S.D, 8.60) scoring higher than men (mean, 21.31; S.D, 8.89).

Anxiety scores were positively skewed and ranged from 0 to 60 with the mean score of 11.12 (S.D, 11.79) falling within the minimal to mid range for the sample. One-way ANOVA revealed no significant differences among the five gender, behavioural and sexual orientation groups on anxiety scores (F [14, 180] = 2.20, p = .07). Examination of effect of size (eta² = .22) revealed a very small effect size and low observed power (.32) to detect such small effects. A second one-way ANOVA revealed significant gender differences on anxiety scores (F[1, 183] = 3.94, p = 0.49), the risk index score for participants ranged from 0 to 7 with a mean number of 1.99 (S.D, 1.14) risk factors for the entire sample. Overall risk index scores were normally distributed; these scores displayed a positive Kurtosis. Risk index scores were normally distributed for homosexual men, bisexual men and bisexual women and display positive Kurtosis for heterosexual men and heterosexual women.

**Table 3**

**Frequency of Risk Factors in Risk Index by Gender and Behavioural Sexual Orientation**

<table>
<thead>
<tr>
<th></th>
<th>Unprotected intercourse past years</th>
<th>Multiple sex partner in past years</th>
<th>History of STD diagnosis</th>
<th>Sex with IUD partner</th>
<th>Sex with HIV positive partner</th>
<th>Exchanges sex for drugs or money</th>
<th>History of injection in drug use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homosexual men</td>
<td>n (9.7)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
</tr>
</tbody>
</table>
Data in Table 3 shows the frequency of occurrence of each of the seven risk factors in the risk index for each of the five gender and behavioural sexual orientation groups and the entire sample.

Key:
STD indicates sexually transmitted disease
IDU indicates injection drug user
HIV indicates human immunodeficiency virus

Table 4
Risk Index Scores as a Function of Gender and Behavioural Sexual Orientation and Depression Level

<table>
<thead>
<tr>
<th></th>
<th>No Depression</th>
<th>Mild Anxiety to Moderate Anxiety</th>
<th>Moderate Anxiety to Severe Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homosexual men</td>
<td>2.2</td>
<td>1.7</td>
<td>0</td>
</tr>
<tr>
<td>Heterosexual men</td>
<td>1.7</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Bisexual men</td>
<td>3.3</td>
<td>2.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Heterosexual women</td>
<td>1.5</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Bisexual women</td>
<td>3.0</td>
<td>2.9</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Data in Table 4 shows the risk index scores as a function of gender and behavioural sexual orientation. ANOVA was used in analyzing risk behaviour. Two 3 (depression level or anxiety level) x 5 (gender and behavioural sexual orientation) ANOVAs were performed with risk index scores and anxiety scores were not normally distributed; ANOVA was conducted because it is robust against violation of its assumptions of normality unless they are particularly severe (Keppel, 1982). A3 (depression level) x 5 (gender and behavioural sexual orientation) ANOVA with three levels of depression (no depression, mild-moderate depression and moderate-severe depression) and five gender and behavioural sexual orientation groups revealed a significant main effect for gender and behavioural sexual orientation (F[4, 170] = 7.08, p < .0001) and a significant gender and behavioural sexual orientation x
depression level interaction (F [8, 170] = 2.53, p = 0.12) risk index scores. There was no main effect for depression level (F [2, 170] = 0.35, p = 0.71). Risk index scores varied by gender and behavioural sexual orientation; however, this variation was moderate by depression level.

A3 (anxiety level) x 5 gender and behavioural sexual orientation ANOVA with three levels of anxiety and five gender and behavioural sexual groups also revealed a significant main effect for gender and behavioural sexual orientation (F[4, 170] = 7.98, p < .0001) and a significant gender and behavioural sexual orientation x anxiety level interaction (F[8, 170] = 2.79, p = .006) for risk index scores. There was no main effect on anxiety level (F[2, 170] = 2.30, p = .10). Again, risk index scores varied by gender and behavioural sexual orientation, this variation was moderated by anxiety level.

Post hoc analyses for the main effect of gender and behavioural sexual orientation revealed that bisexual women reported significantly greater risk than did heterosexual women, heterosexual and homosexual men but not bisexual men. Bisexual men reported significantly greater risk than did heterosexual women but not other gender and behavioural sexual orientation group.

Post hoc analyses for the depression effect revealed no significant differences within gender and behavioural sexual orientation groups by level of depression at the mild-moderate level of depression, bisexual men and bisexual women reported significantly greater risk than did bisexual men and homosexual men. Mild-moderate levels of depression were associated with greater risk among both bisexual men and bisexual women, whereas moderate-severe levels of depression were associated with greater risk among bi-sexual women.

Table 5
Risk Index Scores as a Function of Gender and Behavioural Sexual Orientation and Anxiety Level

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>None to Mild Anxiety</th>
<th>Moderate Anxiety</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homosexual men</td>
<td>1.8</td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Heterosexual men</td>
<td>2.3</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Bisexual men</td>
<td>2.3</td>
<td>2.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Heterosexual women</td>
<td>1.6</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Bisexual women</td>
<td>2.4</td>
<td>2.8</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Table 5 shows that the post hoc analyses for the anxiety intervention effect revealed significantly greater risk among bi-sexual women with severe anxiety compared with bi-sexual women with mild anxiety. No other significant differences were found within gender and behavioural sexual orientation groups by level of anxiety. At the none mild level of anxiety, bi-sexual men reported significantly
greater risk than did heterosexual women. At the severe of anxiety, bi-sexual women reported significantly greater risk than did homosexual men, bisexual men, heterosexual men and heterosexual women. None mild levels of anxiety were associated with higher risk index scores only for bi-sexual men, whereas anxiety was associated with higher risk index scores only for bisexual women.

**Discussion**

Consistent with previous studies (Walsh & Rudolph, 2006; Liegh & Stall, 1993), small but statistically significant gender differences in depression and anxiety were found among individuals at risk for HIV infection, with women reporting higher levels of both depression and anxiety symptomatology than men. Mean scores for depression and anxiety were in the minimal to mild ranges of severity for both genders. Although there were no significant differences in depression or anxiety as a function of gender and behavioural sexual orientation, this factor was significantly associated with HIV-related risk behaviour. Post hoc analysis of the main effect for gender and behavioural sexual orientation produced somewhat surprising results. Although it was anticipated that gender and behavioural sexual orientation differences would be present in HIV-related risk, it was not anticipated that the highest levels of HIV-related risk would be found among women who have sex with men and women. These women reported greater HIV-related risk than other gender and behavioural sexual orientation groups, with the exception of men who have sex with men and women.

Consistent with meta-analytic findings, (Crepaz & Marks, 2001) the absence of a significant main effect of depression or anxiety in HIV-related risk suggests that variations in risk level cannot be explained solely by these negative affective states and gender and behavioural sexual orientation on HIV risk indicate that the relationship between gender and behavioural sex orientation and risk is moderate by depression and anxiety. In other words, depression and anxiety account for significant variation in risk for some gender and behavioural sexual orientation groups but not for others. In particular, women who have sex with both men and women and who are experiencing elevated levels of depressive symptomatology, whether they are moderate or severe elevations, are most likely to report greater risk. Similarly, men who have sex with men and women and who are experiencing mild-moderate elevations in depressive symptomatology are also at high risk. Regarding anxiety, men who have sex with men and women and who are experiencing low levels of anxiety are at elevated risk, as are women who have sex with men and women and who are experiencing severe levels of anxiety. These interactions suggest that depression and anxiety are significantly related to HIV-related risk for bisexual men and women in particular. Furthermore, the interactions also suggest that different levels of symptomatology influence each of these groups. The present study suggests that depression and anxiety are significantly related to HIV-related risk among bisexual women, and, possibly to a lesser extent, bisexual men.
Conclusion

Although these results are suggestive, several considerations should be noted. Possibly the most salient caution regarding the findings of the present study involves the interpretation of causality and casual direction. Given the cross-sectional nature of the data, causality cannot be inferred. Furthermore, it is quite possible that HIV-related risk behaviour results in increased levels of depression and anxiety among particular at-risk groups, rather than depression or anxiety acting as causal agents in HIV-related risk behaviour. Regardless of the direction of this association, the association still remains and points to the need for intervention. Whether depression and anxiety are the cause or consequences of HIV-related risk behaviour, interventions aimed at reducing these uncomfortable and potentially debilitating affective states are warranted. The present study is limited by the temporal inconsistency in the measures used. As with virtually all other studies in this area, depression and anxiety are assessed over a short time frame, whereas risk behaviour was assessed over a long time frame. This is an unfortunate measurement artifact: longer time intervals may not accurately capture state variables such as affect, and shorter time intervals may not accurately represent sexual risk behaviour (Catania, Gibson, Chitwood & Coates, 2000). Although the sample used in this present study reflected HIV-related infected men and women in the geographic region from which it was drawn, there was not sufficient representation of different ethnic groups to examine these dimensions statistically. As a result, these findings may not generalize populations of persons ethnically.

References


