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Depression and Associated Factors Among Gay and Heterosexual Male University Students
in Nigeria

Olakunle A Oginni,^{1,2,4} Kolawole S Mosaku,^{1,2} Boladale M Mapayi,^{1,2} Adesanmi
Akinsulore,^{1,2} Temitope O Afolabi^{1,3}

¹Department of Mental Health, Obafemi Awolowo University Teaching Hospitals Complex,
Ile-Ife, Nigeria.

²Department of Mental Health, Obafemi Awolowo University, Ile-Ife, Nigeria.

³Department of Community Medicine, Obafemi Awolowo University, Ile-Ife, Nigeria.

⁴To whom correspondence should be addressed at Department of Mental Health, Obafemi
Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria; email:

kaoginni@yahoo.co.uk

ABSTRACT

Homosexuality is a recognized risk factor for depression in high income countries; however, there is little research investigating the relationship between depression and sexual orientation in developing countries, especially in Africa. In this first study to investigate psychopathology in sexual minority men in Nigeria, the prevalence rates of depression in Nigerian gay and heterosexual individuals were compared as well as the explanatory power of risk and resilience factors in both groups. Eighty-one gay and 81 heterosexual male university students were respectively recruited from the Obafemi Awolowo University. Both groups were assessed for depression and other clinical factors, including alcohol and other substance use, suicidal ideation, and resilience. Gay students were further assessed for sexuality-related variables, including minority stress factors such as internalized homophobia and perceived stigma. The prevalence rates of depression among gay and heterosexual students were respectively 16% and 4.9% (OR: 3.7; 95% CI: 1.15-11.82), and this increased likelihood for depression was significantly attenuated by resilience. Clinical factors correlated significantly with depression in both groups, explaining 31% of the variance in depression in gay and heterosexual students, respectively. Sexuality-related variables including internalized homophobia and perceived stigma were further associated with depression in gay students—accounting for a further 14% of the variance of depression in gay students. The findings highlight the importance of minority stress factors in understanding depression among non-heterosexual individuals in a developing country, and the need for further research to investigate the mechanisms of these relationships in such settings.

Keywords: Homosexuality, sexual orientation, depression, Nigeria.

INTRODUCTION

Negative attitudes towards homosexuality predominate in most of Africa, including Nigeria, where homosexual behavior is a punishable crime (*Criminal Code Act*, 1990; Ottoson, 2010). Discrimination against lesbian, gay, and bisexual (LGB) individuals triggers other processes, such as the concealment of sexual orientation, expectation and perception of stigma as well as the internalization of the stigma (internalized homophobia) (Meyer, 2003), all of which can serve as stressors with adverse mental health sequelae (Schlager, 1998).

Homosexual orientation has been identified as a significant risk factor for depressive episodes (King et al., 2008; Marshal et al., 2011; Plöderl & Tremblay, 2015). Globally, the current prevalence rate of major depression is estimated to range from 0.8-6% (Blazer, Kessler, & McGonagle, 1994; Jenkins et al., 1997; Weissman et al., 1996; Woodward, Taylor, Abelson, & Matusko, 2013) which is similar to that reported among Nigerian university students (Adewuya, Ola, Aloba, Mapayi, & Oginni, 2006). Gay and bisexual men have been reported to be up to four times more likely than heterosexual men to be depressed (Fergusson, Horwood, & Beautrais, 1999; King et al., 2008; Plöderl & Tremblay, 2015) and this increased risk has been attributed to the minority stress consequent on membership in a sexual minority group (Meyer, 1995).

Depression in Heterosexual Men

While innate characteristics such as genetics and female gender may underlie some risk for depression (Joyce, 2009; Sullivan, Neale, & Kendler, 2000), the importance of external stressors is recognized in the vulnerability-stress model which explains depression as resulting from the interaction of an innate vulnerability with stressful experiences (Ingram & Luxton, 2005). Such stressors include low socioeconomic status which may reflect disadvantages with which individuals have to cope and poor academic performance—especially among students in whom priority is placed on optimal performance (Bostanci et

al., 2005; Eisenberg, Gollust, Golberstein, & Hefner, 2007). And while social isolation has been implicated in older individuals, this has not been demonstrated among students (Arslan, Ayranci, Unsal, & Arslantas, 2009). The stress of adjusting to a new environment has been suggested as an explanation for the association between younger age and depression among university students (Eisenberg et al., 2007). Adewuya et al. (2006) confirmed the association of depression with female gender and poor academic performance, but found no significant association with low socioeconomic status which may indicate socioeconomic homogeneity as only students who can afford university education in Nigeria pursue it. Childhood stressors associated with depression include family disruption (from loss or separation) and neglect and maltreatment (Bennett, Sullivan, & Lewis, 2010; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Tennant, 1988); however, the association with maltreatment has not been replicated in Nigeria, suggesting different sociocultural dynamics (Oladeji, Makanjuola, & Gureje, 2010). These interactions may be modified by coping strategies—negatively by maladaptive strategies such as use of alcohol and other psychoactive substances or positively by resilience factors (Joyce, 2009).

Depression in Gay Men

Similar stressors have been described among gay men, however, with different underlying mechanisms and magnitudes of effect. For example, Oswald and Wyatt (2011) found a stronger relationship between poor academic performance and poor mental health among LGB students compared to heterosexual students. Parental neglect in childhood has also been found to be associated with adult depression among LGB individuals, but this was found to be explained by higher gender-nonconformity in childhood which predicted poor parent-child relationships (Roberts, Rosario, Slopen, Calzo, & Austin, 2013).

More unique to gay men are the components of minority stress which include the expectation and actual experience of discrimination, the consequent concealment of sexual

orientation and internalized homophobia (Meyer, 2003). While discrimination may represent an independent social stressor, the expectation of discrimination may further foster a sense of social exclusion and self-directed negativity which contribute to a more general vulnerability manifested as difficulty with affective and behavioral regulation and thus a different pathway for depression and other mental health problems (Pachankis et al., 2015). Other stressors include exclusion from legal marriage, limited legal rights for same-sex partners, lack of access to support within traditional family networks, insensitivity to sexual minority health issues among care providers, and ostracism in health care settings (Brotman, Ryan, & Cormier, 2003). Fredriksen-Goldsen and Muraco (2010) have also highlighted the direct neurotoxic viral effects as well as the indirect stigma-related impacts of HIV/AIDS which is higher among gay and bisexual men. In addition to a compromised ability to cope with general stressors (Schrimshaw, Siegel, Downing, & Parsons, 2013), the use of psychoactive substances as a means of coping is more common among gay and bisexual men (Keogh et al., 2009; Stall & Wiley, 1988), which may also directly increase the risk for adverse outcomes (Cowen, Harrison, & Burns, 2012). However, Kwon (2013) has suggested that resilience factors are important in LGB individuals in mitigating the stressful impact of prejudice and discrimination in homophobic environments.

There is little information about the comparison of factors associated with depression in non-heterosexual and heterosexual individuals and fewer studies have investigated these factors in low and middle income countries such as Nigeria. This study, therefore, is an attempt to fill this gap by investigating factors associated with depression among gay and heterosexual students in Nigeria.

The objectives of this study were to compare the prevalence of depression among Nigerian gay and heterosexual university students and to compare the explanatory power of

risk and resilience factors for depression in both gay and heterosexual students, and of sexual minority-specific risk factors in gay students.

METHOD

Participants

The study was carried out at the Obafemi Awolowo University, Ile-Ife in South-Western Nigeria. It is a federal university with a student population of about 32,000 from the three major tribes of Nigeria (Yoruba, Igbo, and Hausa). A recent study found that 0.7% of the students self-identified as gay (Boladale, Olakunle, Olutayo, & Adesanmi, 2015), although this may be an underestimate. Eighty-one male gay students and 81 age-matched male heterosexual controls were recruited. With the collected sample, we achieved a power of 0.85 assuming a four-fold difference in the prevalence of depression and this seemed sufficient.

Procedure

Gay students were recruited via snowballing; the initial seeds were contacted through an online-based Nigerian Lesbian Gay Bisexual and Transgender (LGBT) organization, Queer Alliance Nigeria, which was selected because of the online nature of the organization which facilitated a wider reach of gay individuals. Interviews were carried out at pre-agreed sites which included lecture theatres and cafés on the university premises where some privacy could be guaranteed. Prospective heterosexual controls were identified from these sites and approached after the interview had been concluded and the gay students had left the venue. They were then asked about their age and sexual orientation after the study had been explained to them to ensure heterosexual orientation of the controls and that they were matched for age.

Informed consent was obtained from the participants after the aim and objectives had been explained to them.

Measures

Sociodemographic variables

This enquired about variables such as age, sex, current level of study, marital status, religion, town of domicile, and tribe of the participants. Socioeconomic status was assessed by monthly allowance and whether the participants had to work to supplement their monthly income. Academic performance was also assessed among undergraduate students through the Cumulative Grade Point Average (CGPA) which ranged from 0-5.

Family-related variables

These included the marital status of the participants' parents, for which options included "Never married," "Married," "Separated," "Divorced," and "Widowed." Due to the small number of cases in the categories other than "Married," these were combined into a single category of "Not married."

The experience of neglect by parents in childhood was ascertained by a single question: "Were you often left alone or unsupervised when you were too young to be left alone or left to go hungry by your parents before the age of 18 years?" The response to this question was either yes or no.

A single question was further asked about gender atypical behavior in childhood—"As a child, did you behave in ways typical of members of the opposite sex?" Responses were either yes or no. Individuals who responded "Yes" were further asked to specify the nature of the behavior and responses included mannerisms, dressing as the opposite sex, dancing and associating with the opposite sex. They were further asked to indicate their parents' responses to the behaviors and the options included "accepting," "indifferent," and "rejecting."

Clinical variables

Depression. This was assessed using the Zung Depression Scale (ZDS). The ZDS is a 20-item self-administered questionnaire graded on a 4-point Likert scale with scores ranging

from 1 to 4 (never, occasionally, sometimes, and mostly) (Zung, 1965). A cut-off of 50 was used in this study as recommended by Fountoulakis et al. (2001) to increase the correlation with a diagnosis of depression. A score of less than 50 was classified as normal, 50-59 as mild depression, 60-69 as moderate depression, and 70 or higher as severe depression. Total scores were also used in analysis.

Suicidal Ideation and Resilience. These were assessed using the Positive and Negative Suicide Ideation Inventory (PANSI). It is a 14-item self-report measure of positive and negative thoughts related to suicide attempts developed by Osman, Gutierrez, Kopper, Barrios, and Chiros (1998). Each item was rated for the previous two weeks using a 5-point Likert scale ranging from 1 (none of the time) to 5 (most of the time). It consists of two subscales—Positive Ideation (6 items), which assesses protective factors and resilience; and Negative Ideation (8 items), which assesses suicidal ideation. The Cronbach's alphas for the Positive Ideation and Negative Ideation subscales were 0.77 and 0.93, respectively. The participants' total score on each subscale was determined and used in subsequent analysis.

Alcohol Use. This was assessed using the CAGE questionnaire which is a widely used method of screening for alcohol use disorders developed by Ewing (1984). Its name is derived from an acronym of its four questions. Each positive response was rated as 1 while each negative response was rated as 0. It has been extensively validated as a tool in identifying alcohol use problems (Kitchens, 1994), with a test score of ≥ 2 having a sensitivity of 93% and a specificity of 76% for the identification of problem drinkers (Bernadt, Taylor, Mumford, Smith, & Murray, 1982; Stanley, Okeke, & Ukoli, 2007).

Lifetime Substance Use. Lifetime use of other psychoactive substances was ascertained by asking the participants to indicate how often they had ever used named substances including tobacco (cigarettes), marijuana (weed), opiates (heroin, codeine, morphine), cocaine, and any others which were to be specified. The options for each

substance ranged from 0 (never used) to 3 (regularly used). Lifetime substance use was derived from the number of substances with a score of at least 1 (Rarely used).

Sexuality-related variables

Sexual Orientation. This was ascertained in both groups of students utilizing three questions about their sexual fantasies, attraction, and behavior in the previous three years as follows: “What is the gender of the people you have been sexually attracted to?”, “What is the gender of the people you have had sex with?” and “What is the gender of the people you have fantasized about?” (Smolenski, Diamond, Ross, & Rosser, 2010). Responses to each question were scored on a 7-point Likert scale ranging from 0 (Opposite gender only) to 6 (Same gender only). All three questions demonstrated good internal consistency in this study with a Cronbach’s alpha of 0.94. The average of the responses to the three items was determined and matched against the Kinsey scale to determine the sexual orientation which ranged from 0 (Exclusively heterosexual) to 6 (Exclusively homosexual) (Kinsey, Pomeroy, & Martin, 1948). The averaged scores were significantly higher among gay students (3.7 ± 1.36) than in heterosexual controls (0.2 ± 0.27); (Cohen’s $d = 3.5$, $p < .001$).

Age at Awareness of Sexual Orientation (assessed only among gay students). A single question was asked about the age at which participants became aware of same-sex sexual attraction as follows: “How old were you when you first became aware of being attracted to someone of the same sex as yourself?”

Disclosure of Sexual Orientation and related information (assessed only among gay students). A single question was asked about which persons were aware of their sexual orientation as follows: “Who are the people who are aware of your sexual orientation?” and the options included “Parents,” “Siblings,” “Gay friends,” “Straight friends,” or “Nobody.” Participants could select multiple options. Confidants were categorized as “Gay friends” when the confidants included gay friends and as “Family and straight friends” when gay friends were not selected. Participants who had disclosed their sexual orientation were then asked whether this

disclosure was “Voluntary” or “Forced” as follows: “How did they become aware of your sexual orientation?” They were then asked what their reactions were as follows: “What was their reaction?” and the options included “Positive,” “Negative,” and “Indifferent.”

Internalized Homophobia (assessed only among gay students). This was assessed using the 9-item Internalized Homophobia scale which was adapted for self-administration by Meyer (1995) from interview items developed by Martin and Dean (1988). These items were originally derived from the diagnostic criteria for ego-dystonic homosexuality contained in the DSM-III (American Psychiatric Association, 1980). The items were scored using a 5-point Likert scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). The total scores were derived and used in subsequent analyses. Higher scores indicated higher internalized homophobia. The internal consistency was 0.86.

Perceived Stigma (assessed only among gay students). This was assessed using the 10-item Stigma Consciousness Questionnaire developed by Pinel (1999) to measure the expectation by an individual that they will be stereotyped irrespective of their actual behavior. The items were measured on a 7-point Likert scale with responses ranging from 1 (strongly disagree) to 7 (strongly agree). Higher scores are indicative of a higher expectation of being stigmatized and it has been validated for use among gay men and lesbians (Pinel, 1999) and total scores were used in subsequent analyses. The internal consistency was 0.72.

Data Analysis

The data were analyzed using the IBM Statistical Product and Service Solutions (SPSS) software version 23. The data were subjected to descriptive and inferential statistical analyses and summarized using appropriate measures of central tendency and corresponding measures of dispersion. Pearson correlation coefficients were calculated to determine the significant correlates of depression and suicidal ideation in gay participants and heterosexual controls, as well as the strength of these correlations. (Where variables were not normally

distributed, Pearson coefficients were compared with Spearman rank coefficients and the former reported when the coefficients were comparable.)

Multivariate hierarchical logistic regression analyses were conducted. An initial set of models were derived to determine the extent to which disparities between gay and heterosexual students accounted for the increased risk for depression among gay students. Sexual orientation was initially entered as the only explanatory variable; subsequent models were then derived in which variables that differed in both groups of participants in bivariate analyses at $p < .10$ were included in blocks as follows: sociodemographic, family-related, and clinical variables. Another set of hierarchical regression models were derived in each group of participants to determine the respective amounts of variance of depression explained by the different variables. Variables that showed bivariate associations with depression in either group at $p < .10$ were included in blocks as earlier described; sexuality-related variables were further included in the models for depression among gay students.

RESULTS

Sample Description and Differences by Sexual Orientation

Sociodemographic factors were comparable in both groups of students as shown in Table 1, although gay students were more likely to reside off-campus.

Gay students were marginally more likely to come from backgrounds in which parents were not married, and they were significantly more likely to report parental neglect in childhood. Gay students were also 9.5 times more likely to report gender atypical behavior in childhood compared to heterosexual students.

Gay students further had higher mean depression scores and were 3.7 times as likely as heterosexual students to be depressed. They also had significantly higher suicidal ideation scores, and significantly lower resilience scores compared to heterosexual students. There

were, however, no significant differences in alcohol and other psychoactive substance use in both groups of students.

Among gay students, the mean age at awareness of sexual orientation was 14 (± 1.7) years and 90% had disclosed their sexual orientation to other persons; other sexuality-related characteristics are shown in Table 1.

Correlates of Depression in Gay and Heterosexual Students

Depression was significantly associated with poorer academic performance in gay but not heterosexual students (Table 2); however, the effect sizes were similar in both groups and the correlation coefficients were not significantly different (Fisher's $z = 1.4$, $p = .17$). No other sociodemographic variables were significantly associated with depression in either group of students, however, on-campus accommodation had a stronger association with depression among heterosexual students while lower socioeconomic status had a stronger association with depression among gay students.

With respect to family-related variables, none of the variables were significantly associated with depression; however, the effect sizes were higher among heterosexual students.

There were significant positive correlations between suicidal ideation and depression in both gay and heterosexual students and the correlation coefficients were not significantly different (Fisher's $z = 0.3$, $p = .76$). Resilience was significantly negatively correlated with depression in both groups of students; however, the correlation coefficient was significantly higher among gay students (Fisher's $z = 2.0$, $p = .03$). Alcohol use significantly correlated positively with depression in both groups of students and the correlation coefficients were not significantly different (Fisher's $z = 0.0$). While lifetime substance use correlated positively with depression in both groups of students, this was significant only among gay students;

however, the correlation coefficients were only marginally different (Fisher's $z = 1.8$, $p = .07$).

Among gay students, depression was further significantly associated with non-disclosure of sexual orientation, non-positive responses to disclosure, higher perceived stigma, and lower internalized homophobia.

Multivariate Analysis

Whole sample

The unadjusted odds for depression was 3.7 in gay relative to heterosexual students (Table 3). Adjusting for sociodemographic variables in the second model increased the odds for depression in gay students, but did not result in a change in the variance explained. Adjusting for family-related variables in Model 3 resulted in an attenuation of the increased odds for depression in gay students and 5% increase in the variance explained, but this change was not statistically significant. When resilience was included in Model 4, the odds for depression were further attenuated and the variance explained significantly increased by 21%.

Within gay students

Table 4 shows the results of hierarchical logistic regression of factors associated with depression in gay and heterosexual students. Among gay students, sociodemographic variables (age, working to supplement income, and level of study) in Model 1 explained 11% of the variance of depression, but this was not statistically significant. The inclusion of parental neglect in Model 2 increased the variance explained by 1%. Inclusion of clinical variables (resilience, alcohol, and substance use) in Model 3 increased the variance of depression explained by 31%; and the inclusion of sexuality-related variables (age at awareness of homosexuality, disclosure of sexual orientation, perceived stigma, and internalized homophobia) in Model 4 further increased the variance explained by 14%.

Within heterosexual students

The results of hierarchical logistic regression for depression among heterosexual students are also shown in Table 4. Sociodemographic variables explained 2% of the variance in depression which was lower than that for gay students. Including parental neglect (Model 2) increased the variance explained by 14% which was higher than in gay students; inclusion of clinical variables in Model 3 increased the variance of depression explained by 31% which was comparable to that among gay students.

DISCUSSION

Prevalence of Depression

The prevalence rates of depression in gay and heterosexual students in this study were 14.9% and 4.9% and the former were about four times as likely as the latter to be depressed. This is consistent with findings from studies in the United States and Europe (Cochran & Mays, 2000; Fergusson et al., 1999; King et al., 2008; Marshal et al., 2011; Plöderl & Tremblay, 2015; Sandfort, de Graaf, Bijl, & Schnabel, 2001) and has been explained by minority stress (Meyer, 1995, 2003).

Factors which accounted for the increased rate of depression in gay students included lower resilience, parental neglect, and childhood gender atypical behavior. Consistent with previous research, gay students had lower resilience (Coulter, Herrick, Friedman, & Stall, 2016) and this contributed significantly to the higher rates of depression among gay students as was reported in the review by Saewyc (2011). Thus, diminished protective factors may be a mechanism for increased depression among gay individuals in developing countries.

Similar to the finding by Roberts et al. (2013), parental neglect and childhood gender atypical behavior also contributed to the increased risk for depression among gay students. Gay men are more likely to have experienced childhood gender atypical behavior and this

may trigger rejection by parents, especially fathers (Green, 1987). This rejection may be perceived as neglect and increases the risk for later depression (Roberts et al., 2013).

Factors Associated with Depression

Sociodemographic variables

None of the sociodemographic variables investigated in this study were significantly associated with depression among heterosexual students. This is consistent with studies which found no associations between depression and age and level of study in general student populations (Arslan et al., 2009; Bostanci et al., 2005). Consistent with the finding among heterosexual students in this study, Adewuya et al. (2006) found no significant association between depression and socioeconomic status among Nigerian university students; however, Bostanci et al. (2005) found that low socioeconomic status was associated with increased depressive symptoms among Turkish students. In contrast to heterosexual students, gay students who reported working to supplement their monthly allowance in this study were relatively more likely to be depressed.

Similarly, while level of study was not associated with depression among heterosexual students in this study, as has been previously reported (Adewuya et al., 2006; Bostanci et al., 2005), postgraduate gay students were relatively more likely to be depressed. Relatedly, a relationship between depression and poor academic performance which had been reported in previous studies (Adewuya et al., 2006; Bostanci et al., 2005) was found only among gay students in this study.

Sociodemographic factors made a larger contribution to the risk for depression among gay students compared to heterosexual students. Thus, while the individual relationships between many of the sociodemographic factors and depression were only slightly stronger among gay students, their cumulative contribution to the risk for depression was relatively larger in gay compared to heterosexual students. This may suggest that gay students are more

vulnerable to the negative impacts of sociodemographic risk factors compared to heterosexual students as was found by Oswalt and Wyatt (2011).

Family-related variables

Depression did not demonstrate significant relationships with any of the family-related variables assessed in this study and this may reflect the need for larger sample sizes. The observed patterns of associations are described as follows: Family backgrounds associated with parental neglect in childhood were associated with depression in both gay and heterosexual students, and this is consistent with the finding by Bennett et al. (2010). Parental neglect was more strongly associated with depression and made a larger contribution to the risk for depression among heterosexual compared to gay students. This suggests that such factors may be relatively more important in understanding depression among heterosexual compared to non-heterosexual individuals in developing countries.

Furthermore, gender atypical behavior in childhood was associated with depression only in heterosexual students. This pattern is consistent with the finding by Roberts et al. (2013) in which childhood gender atypical behavior had a stronger relationship with later depression among heterosexual individuals compared to sexual minority individuals, and this was more so among male participants. This increased risk for depression was explained by increased adverse experiences such as bullying, especially among boys. This indirect relationship was suggested in the present study by a significant association between childhood gender atypical behavior and lower resilience in heterosexual but not gay students. Sandfort et al. (2015) have further suggested that early gender atypical behavior may facilitate earlier recognition of sexual minority status and, consequently, the formation of a more intact minority identity which may be protective against depression in gay individuals. While this is supported in the present study by the significant association between childhood gender atypical behavior and earlier age of awareness of homosexual orientation, more

studies are needed in developing countries to clarify the relationships between sexual orientation, childhood gender nonconformity, and depression.

Clinical variables

Depression was significantly associated with increased suicidal ideation and alcohol use and decreased resilience in both groups of students as well as with increased use of other psychoactive substances in gay students. The relationship between depression and substance use has been reported among heterosexual students within and outside Nigeria (Adewuya et al., 2006; Arslan et al., 2009) as well as among gay individuals (Keogh et al., 2009). This differential association in gay and heterosexual students, despite comparable levels of use in both groups, suggests a stronger relationship among gay compared to heterosexual students. However, the coefficients were only marginally different in both groups; this highlights the need for larger future studies to clarify this difference. This relationship may be explained forward as substance use predisposing to depression and backward—with substance use being a form of self-medication (Cowen et al., 2012). Thus, minority stress may potentiate the depressogenic effects of psychoactive substances in gay students or increase the tendency to use psychoactive substances to cope with negative emotions as has been suggested by Hatzenbuehler (2009).

Suicidal ideation expectedly correlated positively with depression nearly equally in both gay and heterosexual students as has been reported among students both in African and non-African settings (Palmier, 2011; Schwenk, Davis, & Wimsatt, 2010) as well as among LGB individuals (Fergusson et al., 1999). Diminished resilience was also associated with increased depression in both gay and heterosexual students—marginally more so in the former. This suggests that while resilience is important as a general protective mechanism against depression, effects of its deficiency may be more marked among LGB individuals as has been suggested by Kwon (2013).

Sexuality-related variables

Sexuality-related factors further contributed to the risk for depression among gay students. Specifically, depression was associated with higher levels of perceived stigma, concealment of sexual orientation, and non-positive reaction to disclosure of sexual orientation. This directly supports Meyer's (1995) minority stress model in which the perception and expectation of stigma, and consequent concealment task the LGB individual's coping resources with consequent deterioration in mental health. We should stress here that disclosure in the context of our study is different from the concept of "outness" in Western societies whereby disclosure is followed by open adoption of a gay identity which is reflected in lifestyle choices such as living openly with sexual partners. Owing to the legislature and social climate in Nigeria, disclosure of sexual orientation is usually to a select few and is rarely accompanied by open adoption of minority sexual identity; thus, disclosure is used here in a more restricted sense.

The relationship between depression and non-disclosure of sexual orientation found in this study is also consistent with the finding by Schrimshaw et al. (2013) who suggested that the constant vigilance and concern required to conceal sexual orientation could serve as a chronic stressor and also that concealment could serve as a barrier to emotional support. Hatzenbuehler (2009) has also suggested that the continuous self-monitoring required for concealment places a strain on mechanisms for emotional and behavioral monitoring and, over time, this results in dysregulation of negative emotions resulting in disorders such as depression. Several researchers have highlighted the importance of disclosure and support in achieving a stable and integrated sexual identity (Carrion & Lock, 1997; Mosher, 2001). This importance is further borne out in our study by the significant association between a non-positive reaction to disclosure of homosexuality and depression. We suggest that this indicates the importance of selective disclosure and a supportive micro-environment in

developing a well-integrated identity which would buffer against the adverse mental health effects of minority stress in gay and bisexual individuals in developing countries. We note too that majority of the confidantes of the gay participants in our study were fellow gay friends who are more likely to be supportive.

A paradoxical finding in this study was the negative though small correlation between internalized homophobia and depression. This is in contrast to the minority stress framework which suggests that higher levels of internalized homophobia would be associated with higher levels of depression which has been confirmed in other parts of the world (Herek, Cogan, Gillis, & Glunt, 1998; Igartua, Gill, & Montoro, 2009; Newcomb & Mustanski, 2010). A possible explanation for our finding is that internalized homophobia may heighten the awareness of a likelihood of discrimination, which would inform protective strategies such as residence in environments that would minimize the risk of forced disclosure as has been suggested by Swank, Frost, and Fahs (2012). Higher internalized homophobia may thus be associated with the use of adaptive coping strategies such as appropriate situational appraisal, which are more conducive to well-being rather than the use of maladaptive strategies such as denial which are associated with a higher risk of subsequent distress (Carver, Scheier, & Weintraub, 1989). In support of this, higher internalized homophobia in this study was significantly associated with lower alcohol and lifetime substance use which can be maladaptive coping strategies; however, the specific correlates of internalized homophobia among gay and bisexual individuals in developing countries require further investigation.

Conclusion

Gay students in Nigeria were about four times more likely than heterosexual students to be depressed and disparities in resilience contributed significantly to the increased risk. This is the first study to demonstrate different patterns of risk factors associated with

depression in Nigerian gay and heterosexual male students as well as the mental health significance of minority stress factors in Nigerian gay individuals. We highlight the need to recognize minority stress in addition to other factors in the development of depression in non-heterosexual individuals in developing countries and the potential therapeutic role of strengthening resilience.

However, the following limitations need to be considered in interpreting the findings of the study. The cross-sectional nature of this study limits any causal inferences from being drawn and the wide confidence intervals suggest the need for larger sample sizes in future studies. The use of single questions to assess variables including childhood gender atypical behavior and lifetime substance use may also limit the validity of the assessments. Furthermore, the dynamics in lesbian women and older gay individuals in Nigeria may differ from that of our study sample and future studies in Nigeria may be improved by increasing the diversity of non-heterosexual populations studied.

CONFLICT OF INTEREST

The authors declare 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 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.

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Table 1: Sociodemographic and clinical characteristics of gay and heterosexual respondents

| Variables | Gay n=81 (%) or M (SD) | Heterosexual n=81 (%) or M (SD) | χ^2/t | <i>p</i> -value | Effect size: Cohen's d or Odds Ratio |
|--|---------------------------------------|--|------------|-----------------|---|
| Sociodemographic | | | | | |
| Age (years) | 25.8 (5.69) | 26.1 (6.79) | 0.26 | .79 | 0.0 |
| Tribe | | | | | |
| Yoruba | 61 (75.6) | 65 (79.3) | 0.57 | .45 | 0.8 |
| Other tribes | 20 (24.4) | 16 (20.7) | | | |
| Level of study | | | | | |
| Undergraduate | 60 (74.1) | 53 (65.4) | 1.43 | .23 | 1.5 |
| Postgraduate | 21 (25.9) | 28 (34.6) | | | |
| Academic performance ^a | 3.3 (0.61) | 3.5 (0.53) | 1.26 | .21 | 0.4 |
| Marital status | | | | | |
| Never married | 71 (87.7) | 76 (93.8) | 1.84 | .18 | 0.5 |
| Married | 10 (12.3) | 5 (6.2) | | | |
| Monthly allowance (₦,000) | 16.8 (7.31) | 16.9 (13.07) | 0.08 | .94 | 0.0 |
| Working to supplement monthly allowance | | | | | |
| Yes | 30 (37.0) | 24 (29.6) | 1.00 | .32 | 1.4 |
| No | 51 (63.0) | 57 (70.4) | | | |
| Accommodation | | | | | |
| Off-campus | 48 (59.3) | 18 (22.2) | 23.01 | <.001 | 5.1 |
| On-campus | 33 (40.7) | 63 (77.8) | | | |
| Family-related | | | | | |
| Parents' marital status | | | | | |
| Married | 52 (64.2) | 62 (76.5) | 2.96 | .09 | 0.5 |
| Not married | 29 (35.8) | 19 (23.5) | | | |
| Parental neglect | | | | | |
| Yes | 10 (12.3) | 3 (3.7) | 4.10 | .04 | 3.6 |
| No | 71 (87.7) | 78 (96.3) | | | |
| Childhood gender atypical behavior | | | | | |

| | | | | | |
|--|-------------|-------------|---------|-------|-----|
| Yes | 44 (54.3) | 9 (11.1) | 34.35 | <.001 | 9.5 |
| No | 37 (45.7) | 72 (88.9) | | | |
| Parents' reaction to childhood gender atypical behavior | | | | | |
| Non-rejecting | 38 (86.4) | 6 (66.7) | 2.06 | .15 | 3.2 |
| Rejecting | 6 (13.6) | 3 (33.3) | | | |
| <hr/> Clinical <hr/> | | | | | |
| Depression | 38.0 (9.15) | 33.1 (8.59) | 3.55 | .001 | 0.6 |
| Depressed | 13 (16.0) | 4 (4.9) | 5.32 | .02 | 3.7 |
| Not depressed | 68 (84.0) | 77 (95.1) | | | |
| Suicidal ideation | 12.5 (6.11) | 9.6 (4.47) | 3.43 | .001 | 0.5 |
| Resilience | 22.7 (5.04) | 24.9 (4.04) | 3.00 | .003 | 0.5 |
| Alcohol use^b | 0.0 (0.50) | 0 (0.00) | 3139.00 | .52 | 0.1 |
| Lifetime substance use^b | 0.0 (0.00) | 0 (0.00) | 3136.50 | .47 | 0.1 |
| <hr/> Sexuality-related <hr/> | | | | | |
| Sexual Orientation^b | 3.7 (1.67) | 0.0 (0.42) | 0.00 | <.001 | 0.9 |
| Age at awareness of homosexuality | 14.0 (6.01) | | | | |
| Disclosure of sexual orientation | | | | | |
| Disclosed | 73 (90.1) | | | | |
| Undisclosed | 8 (9.9) | | | | |
| Relationship with confidant | | | | | |
| Family and straight friends | 24 (32.9) | | | | |
| Gay friends | 49 (67.1) | | | | |
| Mode of disclosure | | | | | |
| Forced | 12 (16.4) | | | | |
| Voluntary | 61 (83.6) | | | | |
| Reaction of confidant | | | | | |
| Negative/Indifferent | 32 (43.8) | | | | |
| Positive | 41 (56.2) | | | | |
| Percieved Stigma | 40.5 (8.41) | | | | |
| Internalized homophobia | 29.2 (7.89) | | | | |

Note. ^a Only undergraduate students were included – 60 gay and 53 heterosexual students. ^b Median and interquartile range were stated and Mann-Whitney U Test was carried out.

| | | | | | | | | | | |
|---|-------------|-------------|------|------------|----------------------|-----------|----------|------|------|----------------------|
| Non-rejecting | 6 (85.7) | 32 (86.5) | 0.00 | 1.00 | 1.1 ^b | 1 (100.0) | 5 (62.5) | 0.56 | 1.00 | 0.5 ^b |
| Rejecting | 1 (14.3) | 5 (13.5) | | | | 0 (0.00) | 3 (37.5) | | | |
| Clinical | | | | | | | | | | |
| Suicidal ideation | | | | | 0.59** ^c | | | | | 0.62** ^c |
| Resilience | | | | | -0.70** ^c | | | | | -0.50** ^c |
| Alcohol use | | | | | 0.27* ^c | | | | | 0.27* ^c |
| Lifetime substance use | | | | | 0.43** ^c | | | | | 0.17 ^c |
| Sexuality-related | | | | | | | | | | |
| Age at awareness of homosexuality | 16.9 (6.33) | 13.5 (5.83) | 1.93 | .06 | 0.6 | | | | | |
| Sexual orientation Disclosure | | | | | 0.10 ^c | | | | | -0.07 ^c |
| Undisclosed | 4 (30.8) | 4 (5.9) | 7.59 | .02 | 7.1 | | | | | |
| Disclosed | 9 (69.2) | 64 (94.1) | | | | | | | | |
| Relationship with confidants^a | | | | | | | | | | |
| Family and straight friends | 5 (55.6) | 19 (29.7) | 2.39 | 0.14 | 3.0 | | | | | |
| Gay friends | 4 (44.4) | 45 (70.3) | | | | | | | | |
| Mode of disclosure^a | | | | | | | | | | |
| Forced | 3 (33.3) | 9 (14.1) | 2.13 | .16 | 4.6 | | | | | |
| Voluntary | 6 (66.7) | 55 (85.9) | | | | | | | | |
| Reaction to disclosure^a | | | | | | | | | | |
| Negative/Indifferent | 7 (77.8) | 25 (39.1) | 4.80 | .04 | 5.5 | | | | | |
| Positive | 2 (22.2) | 39 (60.9) | | | | | | | | |
| Perceived stigma | 46.0 (8.53) | 39.4 (8.02) | 2.69 | .01 | 0.8 | | | | | |
| Internalized homophobia | 25.1 (7.20) | 30.0 (7.82) | 2.09 | .04 | 0.7 | | | | | 0.22* ^c |
| | | | | | -0.18 ^c | | | | | |

Note. **Boldface** type indicates p -values for Chi-square and t tests less than .05.

^a $n = 73$, only gay students who had disclosed their sexual orientation were included. ^b Fisher's exact test carried out, ^c Pearson's correlation coefficients. *Significant at $p < .05$.

**significant at $p < .01$.

Table 3: Hierarchical logistic regression investigating effects of other variables on the relationship between sexual orientation and depression.

| Variable | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|------------------------------------|---------|--------|-------|---------|--------|-------|---------|--------|-------|---------|--------|------|
| | OR | 95% CI | | OR | 95% CI | | OR | 95% CI | | OR | 95% CI | |
| Sexual orientation | | | | | | | | | | | | |
| Gay | 3.68 | 1.15 | 11.82 | 3.93 | 1.15 | 13.50 | 2.96 | 0.76 | 11.55 | 2.09 | 0.53 | 8.29 |
| Sociodemographic | | | | | | | | | | | | |
| Off-campus accommodation | | | | 1.20 | 0.41 | 3.53 | 1.07 | 0.35 | 3.27 | 0.86 | 0.26 | 2.86 |
| Family-related | | | | | | | | | | | | |
| Parents not married | | | | | | | 1.56 | 0.50 | 4.83 | 1.14 | 0.32 | 4.08 |
| Parental neglect | | | | | | | 2.91 | 0.69 | 12.34 | 1.27 | 0.23 | 7.06 |
| Childhood gender atypical behavior | | | | | | | 1.18 | 0.38 | 3.66 | 0.91 | 0.27 | 3.03 |
| Clinical | | | | | | | | | | | | |
| Resilience | | | | | | | | | | 0.77 | 0.67 | 0.88 |
| NR² | 0.07 | | | 0.07 | | | 0.12 | | | 0.33 | | |
| Change in NR² | | | | 0.00 | | | 0.05 | | | 0.21** | | |

Note. OR = Odds Ratio. NR² = Nagelkerke R².

Suicidal ideation was not included in Model 4 as this would violate the direction of the theoretical relationship between depression and suicidal ideation.

Omnibus test of model coefficients significant at ** $p < .01$.

Table 4: Hierarchical logistic regression of factors associated with depression in gay and heterosexual students.

| Variable | Gay | | | | | | | | | | | | Heterosexual | | | | | |
|---|---------|-----------|---------|------------|---------|------------|---------|------------|---------|------------|---------|-------------|--------------|--------------|--|--|--|--|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 1 | | Model 2 | | Model 3 | | | | | |
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | | | | |
| Sociodemographic | | | | | | | | | | | | | | | | | | |
| Working to supplement monthly allowance | 2.68 | 0.74 9.73 | 2.59 | 0.71 9.51 | 2.22 | 0.48 10.31 | 2.20 | 0.34 14.41 | 0.59 | 0.05 6.70 | 0.48 | 0.04 5.65 | 0.12 | 0.00 5.32 | | | | |
| Postgraduate | 2.24 | 0.61 8.24 | 2.11 | 0.56 7.92 | 1.60 | 0.31 8.25 | 0.93 | 0.13 6.57 | 2.29 | 0.28 19.04 | 4.65 | 0.37 58.23 | 60.58 | 0.45 8092.51 | | | | |
| Family-related | | | | | | | | | | | | | | | | | | |
| Parental neglect | | | 2.11 | 0.43 10.33 | 1.19 | 0.15 9.50 | 0.56 | 0.03 9.93 | | | 27.72 | 1.17 655.95 | 28.17 | 0.50 1579.47 | | | | |
| Clinical | | | | | | | | | | | | | | | | | | |
| Resilience | | | | | 0.79 | 0.66 0.95 | 0.78 | 0.64 0.97 | | | | | 0.62 | 0.39 0.97 | | | | |
| Alcohol use | | | | | 0.81 | 0.36 1.82 | 0.43 | 0.14 1.33 | | | | | 1.00 | 0.21 4.77 | | | | |
| Lifetime substance use | | | | | 1.58 | 0.92 2.72 | 1.66 | 0.88 3.14 | | | | | 2.16 | 0.26 18.09 | | | | |
| Sexuality-related | | | | | | | | | | | | | | | | | | |
| Age at awareness of homosexuality | | | | | | | 1.14 | 0.92 1.41 | | | | | | | | | | |
| Non-disclosure of sexual orientation | | | | | | | 4.86 | 0.42 56.45 | | | | | | | | | | |
| Perceived stigma | | | | | | | 1.18 | 1.02 1.37 | | | | | | | | | | |
| Internalized homophobia | | | | | | | 0.97 | 0.85 1.09 | | | | | | | | | | |
| NR² | 0.11 | | 0.12 | | 0.43 | | 0.57 | | 0.02 | | 0.16 | | 0.47 | | | | | |
| Change in NR² | | | 0.01 | | 0.31** | | 0.14 | | 0.02 | | 0.14 | | 0.31* | | | | | |

Note. **NR²** = Nagelkerke R². OR = Odds Ratio.

Academic performance not included in Model 1 because this was assessed only in undergraduate students. Suicidal ideation was not included in Model 2 because this violates the direction of the theoretical relationship between suicidal ideation and depression. Model 4 was carried out only among gay students. Reaction of confidants to disclosure of sexual orientation was not included in Model 4 for gay students because this would exclude those who had not disclosed their sexual orientation.

Omnibus test of model coefficients significant at * $p < .05$, and at ** $p < .01$.