

# Posttraumatic Stress Disorder and Co-Existing Mental Health Disorders among LGBTQ Population in Selected Support Groups in Kenya

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**Abstract:** Posttraumatic stress disorder (PTSD) is common among lesbian, gay, bisexual, transgender and queer (LGBTQ) individuals. In addition to PTSD, the condition is likely to co-exist with additional psychiatric disorders (Livingston, Berke, Scholl, Ruben, & Shipherd, 2020). However, little is known about the additional psychiatric disorders with PTSD among the LGBTQ individuals. Therefore, this current cross-sectional survey examined the estimate of PTSD and other comorbidities among the LGBTQ individuals in selected support groups in Kenya. Researcher-generated sociodemographic questionnaire and standardized psychological tools namely, The Posttraumatic Stress Disorder Checklist (PCL-5), Becks Depression Inventory-II, Alcohol Use Disorders Identification Test (AUDIT) and Drug Abuse Screening Test (DAST-10) were used as research instruments to collect data from the sample size of 148 participants that were recruited using purposive sampling technique. Collected data was analysed using descriptive and inferential statistics, namely Fisher's Exact test, Chi-square test, Pearson correlation test, and Binary Logistic Regression. Results from the study showed that PTSD was 93% of the LGBTQ with PTSD equally have depressive disorder, 74% of the participants with PTSD similarly have alcohol use disorder, and that 89.3% of LGBTQ individuals with PTSD also use illicit drugs. Pearson correlation test indicated that there was a positive correlation between PTSD and depression, and drug use disorder. Also, a positive correlation was found between alcohol use disorder and depressive disorder. Binary logistic regression showed that LGBTQ individuals with PTSD are 15.9 adjusted odd ratio to developing depressive disorder (AOR: 15.92; 95% CI: 5.517-45.962). Conversely, alcohol use disorder was found to be a protective factor in this study (AOR: .87; 95% CI: .355 – 2.139). This suggests that participants used alcohol in this study for positive adjustment in coping with PTSD symptoms. In conclusion, the experience of discrimination, victimization, and minority stress by members of LGBTQ in Kenya have led to other psychiatric conditions besides PTSD.

**Keywords:** PTSD, comorbidities, co-existing, LGBTQ individuals, depressive illness, alcohol use disorder, drugs use disorder.

## I. INTRODUCTION AND BACKGROUND TO THE STUDY

Studies in epidemiology have shown that individuals whose sexual orientation and identity is lesbian, gay, bisexual, transgender, or queer (LGBTQ) are vulnerable to experience some degree of victimization, discrimination, violence and emotional trauma at higher rates than the general population (Seelman, Woodford, & Nicolazzo, 2017). Sequel to these traumatic experiences, the estimated prevalence of PTSD seems to be higher among LGBTQ individuals with rates reported to range from 17.8% to 47.6% (Walter, Levine, Highfill-McRoy, Navarro, & Thomsen, 2018; Henry, Perrin, Coston, & Calton, 2018). Likewise, Livingston, Flentje, Heck, Szalda-Petree, and Cochran (2017), highlights other stresses confronted by LGBTQ individuals such as stigma, lack of protections against discrimination at work, ejection from housing and harassment in public spaces, and microaggression experiences. These experiences according to Livingston et al, are traumatic and they serve as persistent reminders of their sexual and gender minority status, these are capable to trigger other mental health conditions besides PTSD.

Statistics have shown various predicaments confronted by members of the LGBTQ community, such as physical assault, some of them are exposed to sexual violence, one form of harassment and discrimination at school, place of work and even religious center. These experiences have serious impacts on mental health such as anxiety, depression, substance use and PTSD. The worst of their experiences is rejection and denial of access to medical facilities and health care services. The denial of access to healthcare, LGBTQ individuals are at high risk of negative health outcomes, these precipitate the LGBTQ population to higher rates of HIV infection, drug and alcohol use disorders and at risk of suicide attempts than the general population (American Psychiatric Association [APA], 2023). On this note, Moring et al (2020) argued that PTSD rarely occurs alone, 80% of PTSD comorbid with other conditions, in which 50% comorbid with major depression. According to Moring et al, depression symptoms reduce automatically when targeting PTSD in treatment, whereas, depression-focused treatment do not reduce the symptoms of PTSD automatically. In addition, Brewerton, Suro, Gavidia, and Perlman (2022), report that LGBTQ+ individuals had significantly higher rates of high impact lifetime traumas and presumptive PTSD. Findings from the same study suggest that prior trauma and PTSD occur significantly in individuals identifying as LGBTQ.

Further, an empirical cross-sectional survey among LGBTQ individuals to examine the association between substance use, PTSD and major depression indicated that substance use and depressive symptoms were positively associated with prior suicide attempts. The same study found a three-way interaction, whereby substance use, PTSD and major depression were found to increase the odds of attempted suicide in LGBTQ individuals (Smith, Armelie, Boarts, Brazil, & Delahanty, 2016). Likewise, Fulginiti et al (2021) in a criss-sectional survey among 572 sexual and gender minority youth found that minority stress was associated with depressive disorders and PTSD symptoms, which were linked with suicidal ideation and attempt through hopelessness. In other words, according to Fulginiti et al, minority stress was indirectly associated significantly with suicidality, but through multiple mental health symptoms pathways.

Regarding LGBTQ individuals and substance use, Drazdowski et al (2016), argued that LGBTQ discrimination led to internalized oppression, which was found to be responsible for illicit drug use. According to the researcher, findings from the same study indicated that there was a significant relationship between LGBTQ discrimination and magnitude of illicit drug use, mediated by internalized oppression. Results from a similar study showed that LGBTQ members use more of drugs and report drug dependence as opposed to heterosexual counterparts. Not only that, findings from the study similarly showed that LGBTQ individuals are more vulnerable to use tobacco, cannabis use and more of weekly or more frequent alcohol consumption compared to heterosexual individuals (Roxburgh, Lea, de Wit, & Degenhardt, 2016).

A study by Schuler and Collins (2020), revealed that both male and female sexual minority adults had significantly elevated rates of substance use as opposed to heterosexual adults. However, findings from the study showed that LGBTQ women exhibit more of marijuana use, illicit drug use, opioid misuse and alcohol use disorder compared to male counterpart. However, gay men had significantly elevated rates of cigar use compared to LGBTQ women. Similarly, Bourme and Weatherbum (2017) argued that a link exists between substance use and sexual risk behaviors, and most especially, a strong association exists between sexual minority stress and alcohol use disorder. Also, Angelakis and Nixon (2015), in a study reported a well established findings of comorbidity between PTSD and major depression. However, findings from recent studies highlight the connection between being a sexual and gender minority individuals, hazardous substance use, alcohol use, PTSD and major depression (Cardona, Madigan, & Sauer-Zavala, 2022; Hinds, Herbitter, Bryant, Newberger, & Livingston, 2022).

## II. METHODS

This study adopted cross-sectional survey research design and used quantitative approach to collect data from 148 samples aged 18 and above who met the inclusion criteria to participate in the study. Study population was drawn from selected support groups namely, Jinsiangu SGM support group in Nairobi County and LEHA SGM support group in Kiambu County, Kenya. The two support groups had similar demographic, socioeconomic, sexual and gender expression and identity characteristics. The researcher used both researcher-generated questionnaire and standardized psychological assessment tools to collect data from the respondents. The standardized instruments are Posttraumatic Stress Disorder Checklist for DSM-V (PCL-5), Becks Depression Inventory (BDI-II), Drug Abuse Screening Test (DAST -10), Alcohol Use Disorder Identification Test (AUDIT).

The Posttraumatic Stress Disorder Checklist for DSM-V (PCL-5) has been established to have outstanding psychometric properties that comprises internal consistency;  $\alpha$  ranging from .83 to .98, test-retest reliability that ranges from .66 to .96, convergent validity; associations with other PTSD evaluations ranging from .62 to .93, discriminant validity associations with measures of connected constructs below .87, and diagnostic efficacies oscillating between .58 to .83 (Wilkins, Lang, & Norman, 2011). A cut-off score of 31 and above on the PCL-5 was adopted indicated a provisional diagnosis of PTSD.

Also, Becks Depression Inventory (BDI-II), was used to measure depressive disorder among the respondents. BDI-II has been demonstrated to be an efficient instrument to measure the severity of depression and gauge medical variations in depressive symptoms in a period (Allen, Elhai, Fowler, Freuh, Kelly, Sharp & Subica, 2014). The tool's reliability was examined and based on Cronbach's alpha test sample, with an internal consistency of .85, Spearman's correlation coefficient of .70, and Guttman's split-half coefficient of .67. The interim correlations oscillated from .028 to .690, and the correlations ranged from .454 to .768.

Drug Abuse Screening Test (DAST -10) was another standardized instrument used in this study to assess drug dependency. DAST-10 is a 10-item questionnaire that is easy to administer as it has yes or no options. The total score for DAST-10 is achieved by summing up all the items in the questionnaire, and the score can range from 0 to 10. A study in Turkey established DAST-10 to be psychometrically sound for drug abuse screening tools with high convergent validity ( $r=0.76$ ) and a Cronbach's alpha of 0.92 ( Yilmaz et al., 2013). Other studies demonstratesensitivity in the range of 65% to 90% and specificity in 68% to 98% (Dum, Gioia, Simco, Sobell, Sobell & Voluse, 2012).

Alcohol Use Disorder Identification Test (AUDIT).AUDIT is a 10 item screening tool and is one of the most broadly used assessment tools for detecting alcohol dependence (Ustun et al., 2010). This makes the tool more adaptable and beneficial compared to the Michigan Alcoholism Screening (Selzer, 1971) and the 4-item CAGE questionnaire (Ewing, 1984). The items on the tool are scored from 0 to 4 and produce an unceasingly distributed total score that ranges from 0 to 40 (Endsley et al., 2017).Based on its original confirmation, totaled scores of 8–15, 16–19, and 20 or more signify a plausible diagnosis of hazardous use, harmful use, and alcohol dependence correspondingly (Higgins-Biddle & Babor, 2018). A tally of 8-14 indicated hazardous or harmful consumption of alcohol, whereas 15 and above denote alcohol dependency.

According to Conigrave, Hall, and Saunders ( 1995), a cut-off score of eight is recommended. The study adopted the same cut-off score of eight.

### III. RESULTS

The objective of this study was to assess other mental health conditions that co-exist with PTSD among the SGM individuals who participated in this study. Comorbidities in psychology refer to the presence of one or more additional mental conditions that co-occurring with a primary condition. On this note, this study examines whether depression, drug use and alcohol use disorder co-exist with PTSD among the participants.

Table 1: Levels of depressive disorders among SGM individuals

Variables	Frequency	Percent
≤ 17 = No depressive illness	74	50.0
≥ 18 = Depressive disorder	71	48.0
Non-responsive	3	2.0
Total	148	100.0

Table 1 shows the distribution of participant’s score on depression. Participants who scored 18 or greater was considered to have depressive disorder, whereas, participants who scored 17 or less did not have depression. As indicated on the Table, the proportion of depressive disorder among the participants was 48%. Similarly, 50% of

the participants were categorized to present no depressive illness. Also, 2.0% of the participant failed to respond to BDI-II. This implies that the frequency of depressive disorder among the SGM individuals who also have PTSD symptoms was 48%.

Table 2: Within PTSD groups presenting with depression

Participants with PTSD	Total	BDI-II scores		Chi-Square Test	
		No depression	Depressive Disorder	X <sup>2</sup>	Sig.
0-32 = No PTSD symptoms	47(32.4)	42(56.8)	5(7.0)	40.879	.000
≥ 33 = PTSD	98(67.6)	32(43.2)	66(93.0)		

Table 2 presents with distribution of within PTSD groups that co-exist with depression. As indicated in the Table, 93% of the participants within PTSD groups equally presented with depression unlike 7% of the participants within PTSD group that scored low in depression scale. Chi-

square test indicated that the relationship between PTSD and depression was significant (p=0.000). This implies that majority (93%) of the participants with PTSD also have depression.

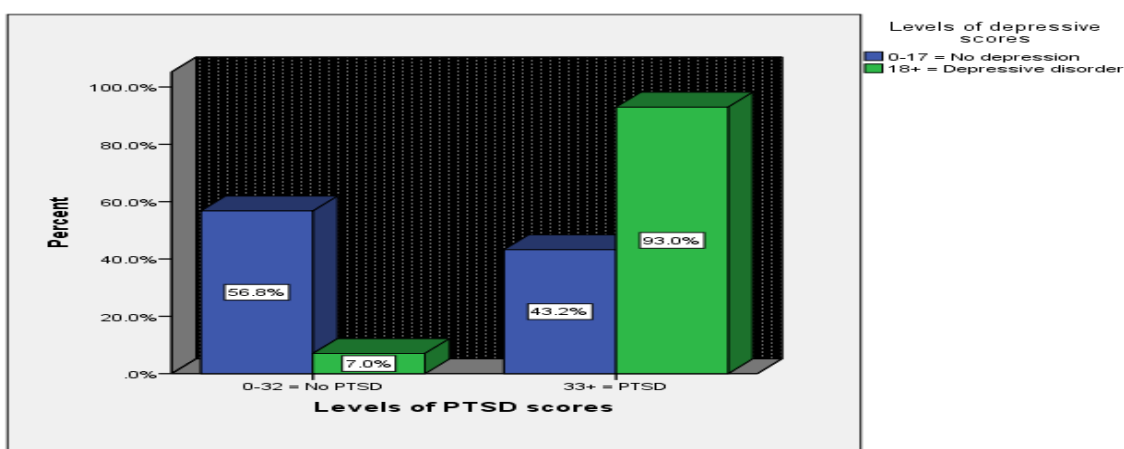


Fig. 1: Frequency of within PTSD group and scores on depression

Figure 1 illustrates the frequency of within PTSD group and their scores on depression. It shows the higher proportion (93%) of the PTSD group co-occurring with depression.

Table 3: Levels of drugs use among SGM individuals

Variables	Frequency	Percent
≤ 5 = Low drugs use	116	78.4
≥ 6 = Drugs use disorder	29	19.6
Non-responsive	3	2.0
Total	148	100.0

Table 3 presents the levels of drug use among SGM individuals. Participants who scored 5 or less were classified as having low drugs use, whereas participants who scored 6 or greater were presenting with drugs use disorder. Few of

the participants (19.6%) were classified to present with drugs use disorder, whereas, 78.4% of the SGM individuals scored below 5, which indicates that they have low drug use.

Table 4: Within PTSD groups presenting with drugs use disorder.

Participants with PTSD	Total	DAST-10		Chi-Square Test	
		Low drugs use	Drugs use Disorder	X <sup>2</sup>	Sig.
0-32 = No PTSD symptoms	47(32.6)	47(30.6)	3(10.7)	7.599	.006
≥ 33 = PTSD	98(67.4)	72(62.1)	26(89.3)		

Table 4 presents the frequency of within PTSD groups who co-occur with drug use disorder. The Table shows that majority of the participants within PTSD group (89.3%) also present with drug use disorder as opposed to 10.7% of the participants with no PTSD symptoms group who equally

present with drug use disorder. Chi-square test shows that drug use disorder is significantly related to PTSD (p=0.006). This implies that participants with PTSD are likely to present with drug use disorder among the SGM individuals.

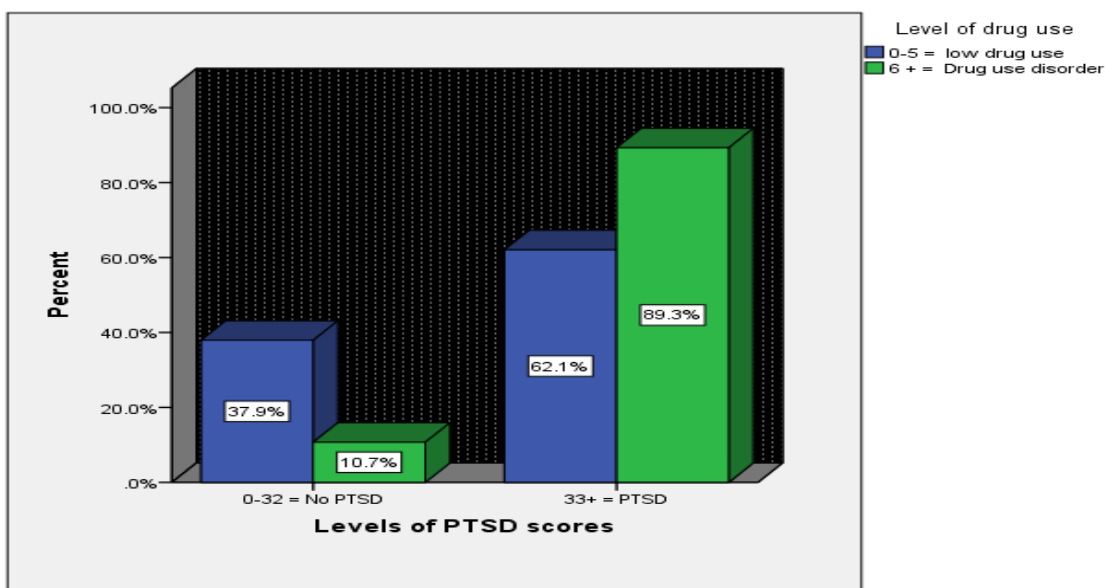


Fig. 2: Within PTSD group with drug use disorder

Figure 2 illustrates frequency of participants within PTSD groups with drug use disorder. Higher frequency of participants with PTSD (89.3%) equally have drug use disorder unlike 10.7% without drug use disorder.

Table 5: Levels of alcohol consumptions among SGM individuals

Variables	Frequency	Percent
1-7 = low risk consumption	68	45.9
8-15 = Hazardous alcohol consumption	43	29.1
16-19 = Harmful alcohol consumption	10	6.8
20+ = Alcohol dependence	22	14.9
Non-responsive	5	3.4
Total	148	100.0

Table 5 shows the severity of alcohol consumptions among SGM individuals who participated in this study. The frequency of hazardous alcohol consumption was higher at 29.1% compared to harmful alcohol consumption at 6.8%,

alcohol dependence at 14.9%. The implication of this findings was that many of the SGM individuals were also hazardous alcohol users.

Table 6: Levels of Alcohol use disorder among SGM individuals

Variables	Frequency	Percent
≤ 7 = Low risk alcohol use	68	45.9
≥ 8 = Alcohol use disorder	75	50.7
Non-responsive	5	3.4
Total	148	100.0

Table 6 displays the frequency of alcohol use disorder among the participants. Participants who scored 8 or greater were classified to have alcohol use disorder, and score of 7 or less had low risk alcohol use. As shown on the Table,

frequency of alcohol use disorder was slightly higher (50.7%) as opposed to low-risk alcohol use at 45.9%. It means that more than half of the participants similarly have alcohol intake condition.

Table 7: Within PTSD groups presenting with alcohol use disorder.

Participants with PTSD	Total	AUDIT		Chi-Square Test	
		Low risk consumption	AUD	X <sup>2</sup>	Sig.
0-32 = No PTSD symptoms	46(32.4)	27(40.3)	19(25.3)	3.619	.057
≥ 33 = PTSD	96(67.6)	40(28.2)	56(74.7)		

Table 7 contains data on participants in PTSD within group who equally presents alcohol use disorder (AUD). Data shows that 74.7% of the participants with PTSD similarly presents with AUD unlike 25.3% of the

participants with no PTSD symptoms but have AUD. The implication of this finding shows that majority of the PTSD participants (74.7%) also abuse alcohol.

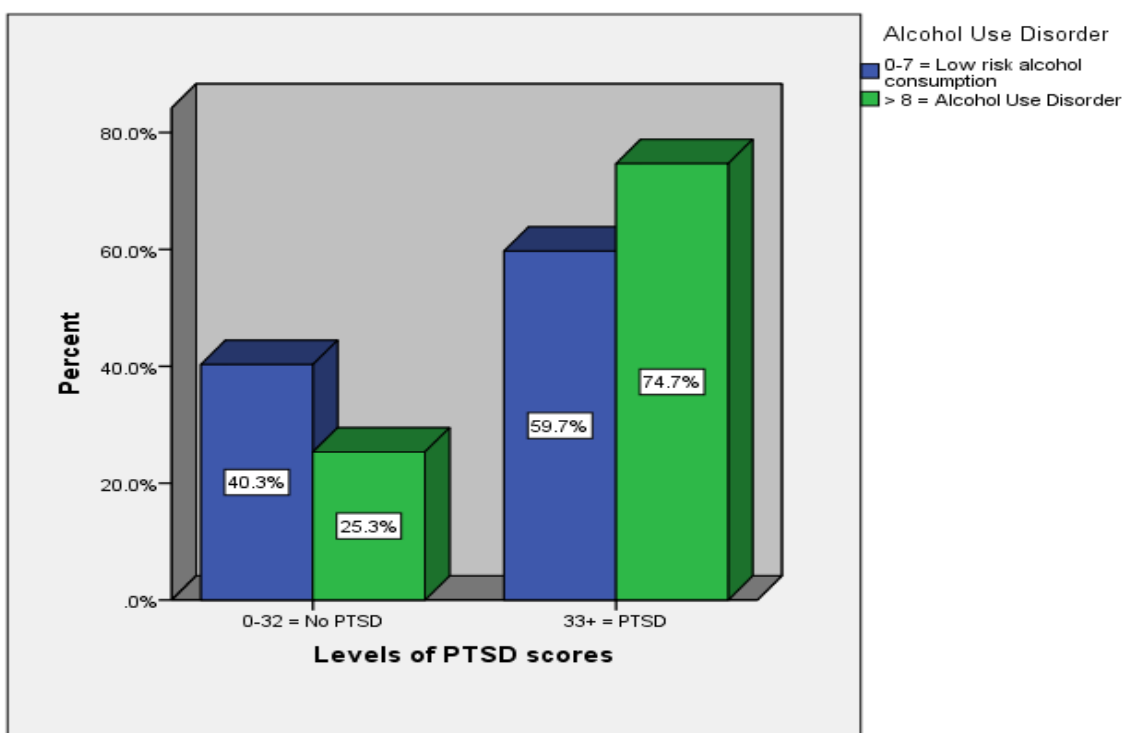


Fig. 3: Within PTSD group with AUD

Figure 3 illustrates the participants within PTSD group with AUD. Majority of the individuals with PTSD (74.7%) equally presents with AUD.

Table 8: Distribution of participant’s sociodemographic characteristics, PTSD, depression, drug use scores and alcohol use disorders

Variables	Total	PTSD scores		Depressive disorder		Drug Use		Alcohol Use	
		No PTSD	PTSD	Non	DD	Low	DUD	Low risk	AUD
<b>Participant’s age</b>									
18-23 years	69(47.3)	16(11.0)	53(36.3)	35(24.1)	33(22.8)	54(37.2)	14(9.7)	37(25.9)	30(21.0)
24-29 years	62(42.5)	22(15.1)	40(27.4)	30(20.7)	32(22.1)	50(34.5)	12(8.3)	25(17.5)	37(25.9)
30-35 years	13(8.9)	7(4.8)	6(4.1)	7(4.8)	6(4.1)	10(6.9)	3(2.1)	5(3.5)	7(4.7)
36-40 years	1(0.7)	1(0.7)	0(0.0)	1(0.7)	0(0.0)	1(0.7)	0(0.0)	0(0.0)	1(0.7)
41-46 years	1(0.7)	1(0.7)	0(0.0)	1(0.7)	0(0.0)	1(0.7)	0(0.0)	1(0.7)	0(0.0)
<b>Participant’s gender</b>									
Female	102(69.9)	32(21.9)	70(47.9)	56(38.6)	45(31.0)	87(60.0)	14(9.7)	52(36.4)	47(32.9)
Male	21(14.4)	7(4.8)	14(9.6)	8(5.5)	13(9.0)	15(10.3)	6(4.1)	9(6.3)	12(8.4)
Others	23(15.8)	8(5.5)	15(10.3)	10(6.9)	13(9.0)	14(9.7)	9(6.2)	7(4.9)	16(11.2)
<b>Participant’s current employment status</b>									
Employed	58(39.7)	20(13.7)	38(26.0)	32(22.1)	26(17.9)	47(32.4)	10(6.9)	25(17.5)	32(22.4)
Unemployed	88(60.3)	27(18.5)	61(41.8)	42(29.0)	45(31.0)	69(47.6)	19(13.1)	43(30.1)	43(30.1)
<b>Participant’s marital status</b>									
Married	13(8.9)	5(3.4)	8(5.5)	6(4.1)	7(4.8)	10(6.9)	4(2.8)	6(4.2)	7(4.9)
Singles	96(65.8)	28(19.2)	68(46.6)	44(30.3)	51(35.2)	77(53.1)	17(11.7)	46(32.2)	47(32.9)
Others	37(25.3)	14(9.6)	23(15.8)	24(16.6)	13(9.0)	29(20.0)	8(5.5)	16(11.2)	21(14.7)
<b>Participant’s sexual orientation</b>									
Lesbian	74(50.7)	22(15.1)	52(35.6)	38(26.2)	35(24.1)	55(37.9)	18(12.4)	30(21.0)	42(29.4)
Gay	17(11.6)	4(2.7)	13(8.9)	5(3.4)	12(8.3)	14(9.7)	3(2.1)	6(4.2)	11(7.7)
Bisexual	12(8.2)	2(1.4)	10(6.8)	4(2.8)	8(5.5)	10(6.9)	2(1.4)	6(4.2)	5(3.5)
Transgender	7(4.8)	4(2.7)	3(2.1)	4(2.8)	3(2.1)	5(3.4)	2(1.4)	3(2.1)	4(2.8)
Queer	33(22.6)	13(8.9)	20(13.7)	20(13.8)	13(9.0)	29(20.0)	4(2.8)	22(15.4)	11(7.7)
Others	3(2.1)	2(1.4)	1(0.7)	3(2.1)	0(0.0)	3(2.1)	0(0.0)	1(0.7)	2(1.4)
<b>Participant’s feelings about sexual identity</b>									
Accepted	62(43.1)	25(17.4)	37(25.7)	35(24.5)	26(18.2)	51(35.7)	10(7.0)	34(24.1)	27(19.1)
Guilt	6(4.2)	1(0.7)	5(3.5)	1(0.7)	5(3.5)	6(4.2)	1(0.7)	3(2.1)	4(2.8)
Shame	8(5.6)	3(2.1)	5(3.5)	5(3.5)	3(2.1)	6(4.2)	2(1.4)	3(2.1)	5(3.5)
Alone	35(24.3)	5(3.5)	30(20.8)	10(7.0)	25(17.3)	25(17.5)	10(7.0)	14(9.9)	20(14.2)
Others	33(22.9)	11(7.6)	22(15.3)	21(14.7)	12(8.4)	26(18.2)	6(4.2)	13(9.2)	18(12.8)

Table 8 presents the distribution of participant’s sociodemographic characteristics and comorbidities of PTSD. In terms of age distribution, frequency of PTSD was higher among the participants aged 18-23 years (36.3%) compared to other age categories. In the same way, the frequency of other comorbidities namely depressive disorders (22.8%), drug use (9.7%) was higher among the participants aged 18-23 years, but frequency of alcohol use disorder was higher among participants aged 24-29 years at 25.9% as opposed to other age categories.

Concerning gender distribution, PTSD was higher among the female participants at 47.9%, compared to other gender categories. Similarly, depressive disorder was higher among female participants at 31%. Frequency of drugs use disorder was also higher at 9.7% among female, and the proportion of alcohol use disorder was higher among female SGM individuals at 32.9% as opposed to other gender categories in this study. In relation to participant’s current employment status, frequencies of PTSD (41.8%), depressive disorder (31%), drug use (12.1%) and AUD (30.1%) were higher among unemployed participants as opposed to employed participants.

Additionally, distribution of participants’ marital status shows that frequencies of PTSD (46.6%), depressive disorder (35.2%), drug use (11.7%) and AUD (32.9%) among the single participants compared to the married and other unspecified marital status. Likewise, in terms of sexual orientation, higher frequencies of PTSD (26.2%), depressive disorder (24.1%), drug use (12.4%) and AUD (29.4%) were found among participants whose sexual orientation was Lesbian compared to other categories of sexual orientation of the participants. Regarding participant’s feelings about sexual identity, the frequencies were observed to be slightly different between the participants who accepted their sexual orientation/identity and those felt alone.

For example, frequency of PTSD was slightly higher at 25.7% among those who accepted their sexual identity compared to those who felt alone at 20.8%. Similarly, the frequency of depressive disorder was slightly higher among those who accepted their identity at 18.2% as opposed to those who felt alone at 17.3%. Drug use disorder was higher as well among those who accepted their sexual identity and those who felt alone at 7% respectively. In the same way, AUD was slightly higher among those who accepted their identity at 19.1% compared to those who felt alone at 14.2%.

Table 9: Pearson Correlation Test showing linear relationships between PTSD, Depression, Drug use disorder, AUD and key sociodemographic characteristics.

	PTSD	DD	Drug	AUD	Age	Gender	Employment	Marital	Sex.orient
PTSD	-								
DD	.531**	-							
Drug	.230**	.189*	-						
AUD	.160	.270**	.258**	-					
Age	-.250**	-.048	-.024	.101	-				
Gender	-.028	.114	.243**	.164*	.019	-			
employment	.040	.068	.049	-.060	-.198*	.005	-		
Marital	-.033	-.141	-.018	.035	-.069	.079	-.057	-	
Sex.orient	-.125	-.107	-.128	-.175*	.008	.244**	-.106	.144	-

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Table 9 presents the Pearson correlation test to show the linear relationship between PTSD, depression, drug use disorder and alcohol use disorder among the participants. Pearson correlation coefficient test is a colloquially correlation where it measures linear correlation between two or more sets of data. Relating to this study as shown on the Table, the test shows a strong positive correlation at 2-tailed between depressive disorder and PTSD ( $r = .531$ ;  $p = 0.01$ ). Positive correlation implies that the two-variable move in the same direction; that is, when one increases, the other variable similarly increases. This shows that the two variables co-exist and move in tandem. Finding from this study shows that changes in PTSD will relate to the same type of changes in depressive disorder.

Likewise, result from the Pearson correlation indicated that a strong positive correlation exists between drug use disorder and PTSD at 2-tailed ( $r = .230$ ;  $p = 0.01$ ). This also can be interpreted to mean the higher the intensity of PTSD, the higher the severity of drug use disorder. It also means

that when symptoms of PTSD go down, drug use also goes down. Another strong positive correlation coefficient at 2 tailed was shown between alcohol use disorder and depressive disorder ( $r .270$ ;  $p = 0.01$ ). This also means that alcohol use disorder and depressive disorder co-exists. The increase in symptoms of depression disorder will also cause increase in alcohol consumption. Equally, result from the Pearson correlation shows a strong positive correlation between AUD and drug use disorder at 2-tailed ( $r = .258$ ;  $p = 0.01$ ). This also interpreted that, the type of changes that occurs in AUD, also occurs in drug use. When one increases, the other also increases; and when one decreases, the other similarly decreases.

The scatterplot graph below demonstrates the linear correlation coefficients to illustrate the level of coexistence of PTSD, drug use and depression. Likewise, it demonstrates the co-occurrence of depression and alcohol use disorder, AUD and drug use disorder.

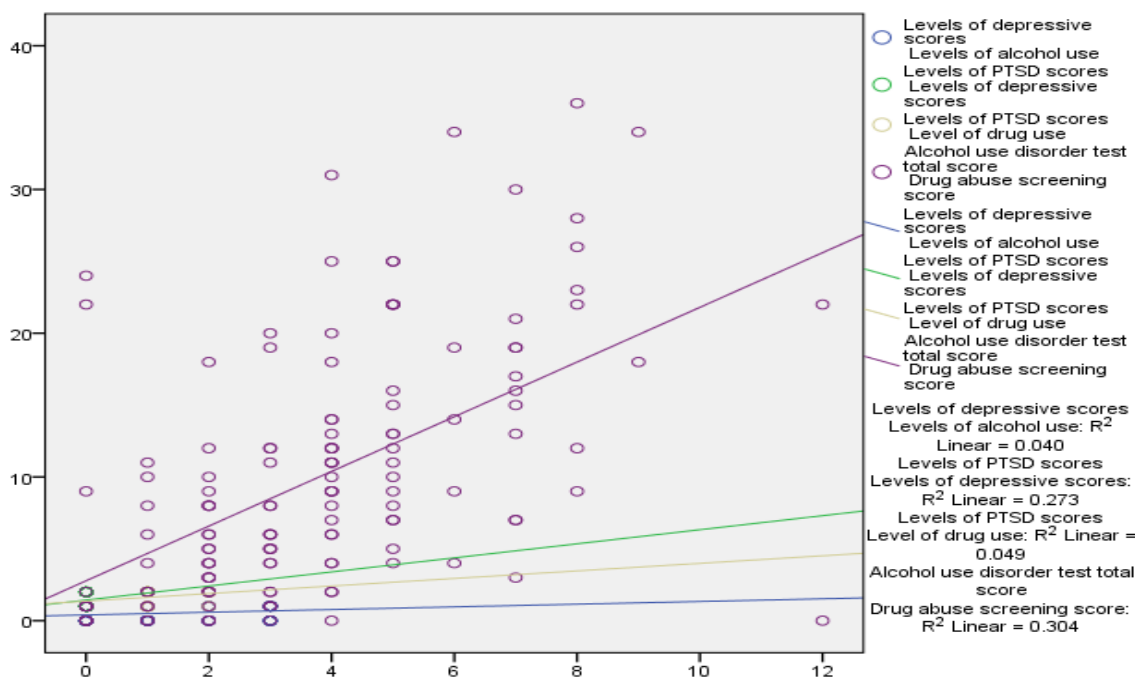


Fig. 4: Scatterplot to demonstrate strong linear correlations coefficient between PTSD and depression; depression and AUD; PTSD and drug use; AUD and drug use disorder

Figure 4 illustrates the significant linear co-existence of PTSD and depression; depression and AUD; PTSD and drug use disorder. It implies that the paired variables move in tandem. Furthermore, concerning the correlation between the sociodemographic characteristics and comorbid disorders. For instance, data shows a strong positive correlation coefficient between gender and drug use ( $r = .243$ ;  $p = 0.01$ ). It means that higher gender category, which is male gender co-exists with drug use. In addition, gender was also found to have a weak correlation at 2 tailed with

AUD ( $r = .164$ ;  $p = 0.05$ ). This also implies that a significant correlation occurs between gender and alcohol use disorder. However, caution should be exercised in making inferential statement. Also, this study found a negative strong correlation between participant's age and PTSD at 2 tailed ( $r = -.250$ ;  $p = 0.01$ ). Negative correlation coefficient means that the two variables move in opposite direction. This implies that when one variable increases, the other decreases and vice-versa. In relation to this study, as participant increases in age, the symptoms of PTSD decreases.

Table 10: Binary Logistic Regression showing the Adjusted Odds Ratio of comorbidities on PTSD

	$\beta$	S.E.	Wald	df	Sig.	Exp (B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 <sup>a</sup>								
Depression 1)	2.768	.541	26.194	1	.000	15.924	5.517	45.962
Drugs (1)	1.392	.727	3.668	1	.055	4.024	.968	16.724
AUD (1)	-.137	.458	.090	1	.765	.872	.355	2.139
Constant	-.361	.297	1.478	1	.224	.697		

a. Variable(s) entered on step 1: BDIRecoded, Dast\_Recoded, AUDrecoded.

Table 10 presents the adjusted odds ratio using binary logistic regression to analyse the likelihood of participants diagnosed with PTSD to exhibit symptoms of comorbid disorders. As indicated on the Table, participants who presents with depressive disorders are 15.92 times likely to also present with PTSD (AOR: 15.92; 95% CI: 5.517-45.962). This means that PTSD and depression comorbid and that the likelihood of the two variables to coexist was at 15.92 times.

In the same way, the result from the logistic regression indicates that drug use and PTSD similarly comorbid (AOR: 4.02; 95% CI: .968 – 16.724). This can be inferred that participants with PTSD are 4.02 likely to also use illicit drugs. This shows that PTSD comorbid with drugs use disorder. Conversely, alcohol use disorder was found to be a protective factor in this study (AOR: .87; 95% CI: .355 – 2.139). This suggests that participants used alcohol in this study for positive adjustment in coping with PTSD symptoms associated with their sexual orientations/identity.

#### IV. DISCUSSION

This present study found that 93% of the participants with PTSD equally exhibit depressive disorder and that a positive correlation exists between PTSD and depression. The Logistic regression in this present study showed that participants with PTSD have a 15.9 probability of developing depression. Result from this present study concurs with several other similar study that indicated that approximately half of people with PTSD also suffer from major depressive disorder (Flory & Yehuda, 2015). A recent study similarly found a positive correlation between PTSD and major depression among SGM individuals. The researchers in the same study found more than 90% of the SGM participants who were diagnosed with PTSD similarly exhibited major depression (Prince, Ray-Novak, Gillani, & Peterson, 2022). The comorbidity of PTSD and major depression could be understood because the comorbidity reflects the overlapping symptoms in the two conditions and that the co-occurrence of PTSD and depression represents a

trauma-related phenotype, possibly a subtype of PTSD (Cardona, Madigan, & Sauer-Zavala, 2022).

It is noteworthy noting that the prevalence of drug use disorder in this present study was 19.6%. Findings from this study showed that 89.3% of the participants with PTSD similarly have drug use disorder. Likewise, participants with PTSD are 4.02 likelihood to use drugs. Similarly, this present study found that 74% of the SGM individuals with PTSD similarly presented with AUD, and that there is a positive correlation between PTSD, alcohol use disorder and drug use disorder.

These findings are not different with hypothetical constructs that have been posited to explain the high comorbidity between PTSD and substance use disorders. For examples, results from a cross-sectional survey to examine the association between tobacco use, co-occurring substance use and psychological distress among sexual and gender minority population in Texas, USA showed that the SGM participants with PTSD were 3.0 odd ratio likely to use illicit drugs, and 2.27 odd ration likelihood to engage in hazardous drinking and 9.53 odd ratio probability to have participated in a substance use treatment program (Adzrago, Tami-Maury, Schick, & Wilkerson, 2021).

Likewise, a similar study conducted among 704 SGM adults to examine whether SGM-related discrimination, victimization and specific experiences predicted hazardous substance use and alcohol use disorder. The study found that there was a strong positive correlation between SGM-related sexual assault, victimization, harassment and hazardous alcohol and drug use among SGM adults that exhibited PTSD symptoms (Hinds, Herbitter, Bryannt, Newberger, & Livingston, 2022). Additionally, Livingston, Flentje, Heck, Szaida-Petree, and Cochran (2017), found greater odds of nicotine, substance use and PTSD in an empirical study among 50 SGM individuals aged 18-45 years from an Inland North-western University. The study further found that substance use was more likely to occur in relation to discrimination.



Further, in agreement with Livingston et al (2017), discrimination and victimization among SGM individuals better explain the use of substances probably as a coping mechanism to deal with PTSD symptoms and sexual minority stress. This also aligns with a study, which found that the SGM individuals had high rates of tobacco and marijuana use, substance use problems, depression, anxiety and PTSD. In addition, over 80% of the participants reported experiencing everyday or lifetime major discrimination (Ehike, et al., 2022).

Likewise, this present study found a strong positive correlation between AUD and depressive disorder among SGM individuals. This result is consistent with studies on relationship between depression and alcohol use disorder. For instance, an empirical study found high prevalence of depression at 63.8% among alcohol dependent persons with a significant association between depression and the mean AUDIT score (Kuria, et al., 2012). Similarly, another later study on the heterogeneity of AUD and depressive disorder stated that the two disorders move in the same direction (McHugh & Weiss, 2019).

There are two possible explanations for the association between alcohol use disorders and major depression. Firstly, it is possible that both disorders have common underlying genetic and environmental factors that jointly increase the risk of both disorders and secondly, the two disorders may have a causal effect with each other thereby increasing the risk of developing the other. This is also true among the SGM individuals. A meta-analysis result shows that depressed sexual minority adolescents are 2.55 times more likely to consume alcohol than their heterosexual peers (Kiekens, Baams, & Veenstra, 2022).

## V. CONCLUSION

Findings from this current study have shown that PTSD co-exists with other mental health conditions such as depressive disorder, drug use and alcohol use disorders. This implies that experiences of LGBTQ members are enormous and traumatic. This has triggers other mental conditions, which mental health service providers must put into consideration while working with this minority population and while planning for treatment options. A holistic evaluation will be needed so as to understand the magnitude of mental conditions of the SGM individuals and to determine the most appropriate psychotherapy approach to help the LGBTQ members.

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