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Adverse Childhood Experiences among South African University Students: Prevalence and Relationship with Mental Health

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Abstract

Adverse Childhood Experiences (ACEs) refer to chronic childhood events that are characterised by distress and harm. ACEs are consistently associated with poor mental health outcomes in young adulthood. However, the prevalence of ACEs among South African university students is not yet well-documented. Further, there is a lack of research on whether sociodemographic factors moderate the relationship between ACEs and mental health. This study examined the prevalence of ACEs and sociodemographic moderators of the relationship between ACEs and mental health in a sample of South African university students (n = 427), using data collected as part of the Project Cross-Cultural Addictive Behaviours Study (Project CABS). Measures included a sociodemographic questionnaire assessing gender, race, class and sexual orientation, the Adverse Childhood Experiences International Questionnaire (ACE-IQ) and the Inventory of Depression and Anxiety Symptoms (IDAS). We compared the prevalence of each ACE category and the total number of ACEs across race, socio-economic status, gender and sexual orientation groups and used regression analysis to examine the simultaneous contribution of these sociodemographic variables for predicting mental health outcomes. This study found statistically significant differences in cumulative ACE exposure across socio-economic status, race and sexual orientation. Results showed that ACEs notably forecasted total IDAS or mental health scores, with sexual orientation moderating this relationship. These findings may help to identify university students with a history of ACEs who are most susceptible to mental health difficulties.

Keywords: adverse childhood experiences, anxiety, depression, mental health, moderators.

University students globally are susceptible to common mental health difficulties such as depression and anxiety (Auerbach et al., 2018). Given that these difficulties are associated with reduced academic performance and overall well-being (Al-Qaisy, 2011; Bitsika et al., 2010), student mental health constitutes a crucial public health concern (Wörfel et al., 2016). Proximal factors during the university years, including economic hardship, academic stressors and familial and societal pressure to succeed, are associated with the development of common mental health problems in students (Beiter et al., 2015; Bitsika et al., 2010). Recent research has shown that distal factors, such as a history of exposure to adverse childhood experiences (ACEs), also increase students' vulnerability to mental health problems (Karatekin, 2018). To date, however, there has been little research investigating the role that sociodemographic factors play in the relationship between ACEs and mental health in university students.

ACEs refer to chronic childhood events that are characterized by distress and harm (Felitti et al., 1998; Kalmakis & Chandler, 2014). The prevalence rate of ACEs is substantially high internationally across various cultural contexts. Merians et al. (2019) found that 45% of American students have reported being emotionally abused, 32% have reported growing up among ill guardians and 26% reported separation between guardians. Additionally, in a study with East Asian university students, 28% had experienced childhood physical abuse, 23.33% had experienced domestic violence and 19.24% had experienced parental death or separation during childhood (Ho et al., 2020). Furthermore, a study by Kim (2017) found that, among Korean college students, most participants were exposed to domestic violence and emotional neglect, with over 50% having experienced the latter. There are numerous studies that have also reported similar prevalence rates for a variety of ACEs (El Mhamdi et al., 2016; Lee & Feng, 2021; Merians et al., 2019). Additionally, the prevalence rate of university students who have experienced at least one ACE in their lifetime

is high (>50%) across a number of studies (El Mhamdi et al., 2016; Grigsby et al., 2020; Hughes et al., 2017; Mall et al., 2018).

To date, studies of the prevalence of ACEs in university samples have largely been confined to higher-income countries (HICs) (Amone-P'Olak & Letswai, 2020). There have only been a few studies from lower- and middle-income countries (LMICs), which have also found high rates of ACEs (Kelifa et al., 2021; Kidman et al., 2019; Zhang et al., 2020). Only two South African studies have reported on the prevalence of ACEs in university students. Myers et al., (2021) reported that 48% of first-year students at two South African universities had experienced childhood maltreatment, with emotional abuse, followed by physical abuse, being the most common forms. In another sample of university students, 79% disclosed having, at minimum, one ACE, with parental psychopathology (47.6%), bullying (50.0%) and emotional abuse (37.2%) being the most common types (Mall et al., 2018). However, the range of ACEs examined in these two studies was limited, omitting a range of family adversities commonly found in the South African context.

In general adult samples, exposure to cumulative ACEs is associated with a higher risk of negative mental health outcomes (Hughes et al., 2017) and a similar pattern has been found in university students. Grigsby et al. (2020) reported that an increase in the number of ACEs was associated with a greater risk of depression and experiences of self-injury or suicide attempt/ideation among students in the United States. Similarly, Karatekin (2018) found that United States undergraduate students who had experienced two or more ACEs were more likely to experience suicidal ideation and meet screening criteria for anxiety or depressive disorders. Numerous other international studies have reported a significant correlation between cumulative ACEs and depression among university students (Kelifa et al., 2020; Lee & Feng, 2021; Windle et al., 2018). In South Africa, Myers et al., (2021) found that a history of emotional and physical abuse was associated with an increased risk for

generalized anxiety disorder, major depressive disorder and substance use disorders (Myers et al., 2021) and Mall et al. (2018) found that cumulative ACEs predicted severity of current depression.

While ACEs are common in university students, and consistently associated with poorer mental health status, the prevalence of both ACEs and mental health difficulties can vary according to certain sociodemographic factors, and the relationship between ACEs and negative mental health may therefore be stronger for some students than for others. Several studies have found that female students have higher rates of ACEs than males (Dorvil et al., 2020; Kim, 2017; Miranda-Mendizabal et al., 2019; Sciolla et al., 2019). On the contrary, research conducted in a Tunisian university sample found that male students reported significantly higher rates of ACEs than females (El Mhamdi et al., 2016), suggesting that gender patterns in ACE exposure may vary by context. For example, in countries where gender-based violence is particularly high, (e.g., South Africa (SA)), females are more at risk to be sexually abused (Mathews et al., 2016). Other studies have found that students belonging to racial and sexual minority groups are more likely to have experienced increased numbers of ACEs (Dorvil et al., 2020), possibly due to factors such as structural inequalities and discrimination. Studies have also consistently found that lower socio-economic status (which often intersects with race) is associated with higher rates of ACEs (Walsh et al., 2019), possibly because financial stress and lack of access to resources increases the likelihood of punitive parenting and of general family adversities (Bywaters et al., 2015).

Similarly, the prevalence of mental health disorders also differs according to demographic factors. With regard to gender, male university students in general have been reported to have better mental health than females (Karatekin & Ahluwalia, 2020). For example, Kelifa et al., (2021) found that female students are at an increased risk for developing depression. Furthermore, El Mhamdi et al. (2016) reported that 18.8% of female

students (in comparison to 13.6% of males) in their sample had been diagnosed with a mental disorder. Similar findings have also been reported by other researchers (Bantjes et al., 2019; Grigsby et al., 2020; Miranda-Mendizabal et al., 2019). International (Dorvil et al., 2020) and local (Bantjes et al., 2019) studies have found that students belonging to sexual minority groups have higher rates of mental health difficulties, as they may face rejection and stigma from family and friends. With regard to race and ethnic differences in mental health, Eisenberg et al. (2013) found that White students in a United States sample had a lower risk of screening positive for depression than all other ethnic groups, while Black students had a higher prevalence of suicidal ideation than other groups. This may be the result of systemic racism embedded within institutional practices and broader society.

Although various sociodemographic factors affect the prevalence rates of both ACEs and mental health, very little research has considered the ways in which sociodemographic factors may increase or reduce the degree to which ACE exposure predicts mental health difficulties in university students. Forster et al. (2018) found that the relationship between cumulative ACEs and substance use varied across university students from different ethnic groups in a United States sample. As the number of ACEs increased, the likelihood of an increase in alcohol consumption in the past 30 days was significant for African Americans, Hispanics, Asian Pacific Islanders and multiracial students, but not for non-Hispanic Whites or other groups (Forster et al., 2018). Grigsby et al. (2020) found that ACE-exposed females were more at risk of suicidality than ACE-exposed males, while the reverse pattern was found for substance use. However, other studies of these relationships, and on the role of other sociodemographic factors in the ACE-mental health relationship, are currently lacking. In the two South African studies that reported on ACE prevalence in university students, Mall et al. (2018) did not examine the role of sociodemographic factors, while Myers et al. (2021)

examined gender differences in ACE prevalence, finding no significant differences, but did not explore whether gender moderates the relationship between ACEs and mental health.

Overall, studies on ACE prevalence and its association with mental health difficulties have largely been conducted with Northern samples in higher-income settings (Dorvil et al., 2020; Karatekin & Ahluwalia, 2020; Miranda-Mendizabal et al., 2019; Sciolla et al., 2019; Windle et al., 2018), with only a few studies emerging from LMICs to date (Kelifa et al., 2021; Kidman et al., 2019; Kim., 2017; Mall et al., 2018; Myers et al., 2021; Zhang et al., 2020). A limitation of the two existing studies in SA (Mall et al., 2018; Myers et al., 2021) is that neither have reported on the full range of ACEs and the moderating role of sociodemographic factors was not explored.

It would be helpful to know which ACE-exposed university students in SA are most at risk of mental health difficulties, as this information could inform the development of student support programs with the aim of targeting these students who are most at risk for mental health difficulties. Early intervention may facilitate better academic outcomes, better mental health outcomes and associated life-time benefits. The current study aimed to explore sociodemographic differences in ACE prevalence and mental health among South African students and whether sociodemographic factors moderate the relationship between ACEs and mental health in this population.

Method

Study Design

The current study conducted a secondary data analysis of data obtained by the Cross-cultural Addiction Study Team (CAST) for the Project Cross-Cultural Addictive Behaviours Study (Project CABS). Project CABS was an international collaboration that aimed to examine (by means of cross-sectional cross-country surveys) cross-cultural differences in risk and protective factors, patterns and prevalence for varying addictive behaviours among

university students. The survey asked for data relating to, among other variables, mental health and ACEs. Data were collected from university students in Argentina, Canada, Spain, SA, United Kingdom, United States and Uruguay. The current study examined the relationship between ACEs and mental health for the South African sub-sample, by analyzing the data from the CABS survey. Cross-sectional survey designs are an efficient way to collect data regarding the relationship between different variables from a large number of participants, especially when few resources are available (Spector, 2019), such as in SA.

Sample

The study sample consisted of Psychology undergraduate students from the University of Cape Town (UCT). A total of 472 students were recruited via the Psychology Department's student research participatory programme (SRPP), after having received ethical clearance from the department (reference number; PSY2019-019 - see Appendix A). Each undergraduate student on the department's SRPP database was emailed and invited to take part in the study (see Appendix B). Once participants had completed the study, each received one SRPP point. Being at least 18 years of age was the only exclusion criterion (this was dictated by the larger Project CABS study, which collected data on illegal substance use in addition to other variables). A power analysis using G*Power software (Faul et al., 2007) indicated that the desirable sample size for the current study was 160.

Data Collection

From the entire Project CABS survey battery, data from the following three measures were used for this study:

Sociodemographic Questionnaire

This questionnaire was specifically developed for the purpose of the larger Project CABS study. It was used in order to gain information on participants' racial identification, gender, socioeconomic status and sexual orientation (see Appendix C), which have all

previously been found to be associated with both ACEs and mental health in university students.

Although a range of gender categories were provided in the questionnaire (see Appendix C), only participants who selected male or female were included in statistical analyses, as the number of participants who selected the other gender categories (n=9 in total) were too few to include as independent groups. The response options for socio-economic status (see Appendix C) were collapsed into two categories for statistical analysis: lower income (including participants who indicated that when they were growing up, they often did not have enough basic necessities or that their parents earned an income but were on a very tight budget) and higher income (including those who indicated that they grew up in a middle class or wealthy family). In the CABS study, sexual orientation was measured across a spectrum from 'exclusively heterosexual' to 'exclusively homosexual', along with an 'other' category. However, for purposes of analysis, two categories were created (viz., 'exclusively heterosexual' and 'not exclusively heterosexual') as previous studies involving sexual orientation and mental health have indicated that non-heteronormative sexuality is a risk factor for poor mental health outcomes, possibly due to experiences of discrimination and marginalisation (Wedell et al., 2021).

'Race' consisted of the categories 'White', 'Black African', 'Coloured','Asian', 'Indian', 'Other' and 'I prefer not to respond'. For the bivariate analysis, these last four categories were collapsed into a single 'Other' category, as few participants endorsed these categories. For the regression analysis, a binary race variable was used, comprised of, 'White' and 'Other' (including 'Black African, Coloured, 'Asian', 'Indian', 'Other' and 'I prefer not to respond'). This decision was made due to the complexity of including variables with more than two levels in regression analysis and the limited time frame available to complete and interpret the analysis. As noted in the literature review, previous research from

the United States suggests that White students are at lower risk of both ACEs and mental health difficulties than students from other ethnic groups, likely as a result of the systemic inequities and discrimination experienced by the latter. We explored whether the same pattern is evident in SA. However, the race variable will be further unpacked at a later stage by the Project CABS research team to explore more nuanced differences across all the groups.

Adverse Childhood Experiences International Questionnaire **(WHO, 2018)**

This measure assesses exposure to 12 different varieties of childhood adversity. This included questions relating to exposure to parental mental illness, incarceration, substance abuse or disappearance/separation/divorce, emotional and physical abuse or neglect, sexual abuse, domestic violence, peer violence and community violence (see Appendix D). This measure has previously demonstrated good internal consistency and concurrent and predictive validity (Kazeem, 2015; Kidman et al., 2019). The current study obtained a Cronbach's alpha score of 0.66 for ACE total binary and 0.67 for ACE total frequency (indicating that for both sub-scales, internal consistency is moderate). The ACE-IQ measures a range of different childhood adversities and it is not expected that all of these will be experienced by all respondents across different contexts, therefore a high alpha coefficient is not necessarily expected here. The measure has been used cross-culturally in East-Asian university students (Ho et al., 2020), Korean university students (Kim, 2017) and East African university students (Kelifa et al., 2020).

On the ACE-IQ, ACE exposure can be scored in two different ways. In the binary scoring method, any form of ACE exposure (e.g., single-level or multilevel exposure to any of the ACEs) is scored, while the frequency method only scores exposure to repeated experiences of abuse, neglect and violence, in addition to any form of exposure to the other ACEs (WHO, 2018). In all analyses that included the summed total number of ACEs, the

frequency scoring method was used, as it provides the better indicator of repeated childhood violence exposure.

Inventory of Depression and Anxiety Symptoms **(IDAS; Watson et al., 2007)**

This 64-item inventory assesses the severity of depression and anxiety symptoms. Each item had a 5-scale Likert response format (1 = *not at all*, 5 = *extremely*). This measure elicits information on appetite loss, appetite gain, traumatic intrusions, suicidality, well-being, ill temper, lassitude, panic, insomnia, social anxiety, general depression and dysphoria (IDAS; Watson et al., 2007). However, the Project CABS study only assessed the following dimensions: traumatic intrusions, suicidality, well-being, ill temper, panic, insomnia, social anxiety and general depression (see Appendix E). These 54 items were summed to generate a total score, with a total possible score of 270.

The IDAS has previously displayed good internal consistency and high temporal stability (De la Rosa-Cáceres et al., 2020; Watson et al., 2007), as well as strong convergent validity, discriminant validity and incremental validly, as well as sufficient criterion validity (Watson et al., 2007, 2008). This measure was selected for Project CABS as it has been adapted for use in Spanish-speaking samples (De la Rosa-Cáceres et al., 2020) and several Spanish-speaking countries were included in the larger Project CABS study. This measure has not previously been used in South Africa. Cronbach's alpha for the total score for the current study was 0.75, indicating good internal consistency.

Procedures

An online survey was constructed by the Project CABS research team. An announcement was sent via email to all undergraduate students in the UCT Psychology department, inviting them to volunteer to participate in this research (see Appendix B). The invitation informed participants that the survey would take about an hour to complete. Participants were also informed that upon completion of the survey they would receive one

SRPP point. The email that was sent to students contained the hyper-link to the research survey. Before participants were able to start the survey, they were asked to read the on-screen consent form (see Appendix F). Participants were told that by clicking 'NEXT' they were acknowledging that they had read the consent form and gave their consent to participate.

Following the survey, participants were presented with a debriefing form containing relevant contact information for resources relating to mental health difficulties and substance use (see Appendix G). The last stage in the survey asked that participants (via another hyper-link) provide their name, student number and the Psychology course code to which the SRPP point must be allocated. The debriefing form was also attached to the initial invitation in the event that some participants chose to withdraw participation at any point in the survey. Hence, the debriefing form was accessible to every participant.

Data Analysis

Data analysis was conducted in the R statistical programming language (R core team, 2020). Descriptive statistics were generated to provide the frequency and percentage of participants in each demographic category that were exposed to each of the ACEs. To determine how many ACEs, on average, were experienced by each sociodemographic group, the mean cumulative ACE score in relation to gender, race, sexual orientation, and SES group, was computed.

Chi-squares were computed to test for statistically significant differences in exposure to specific ACE categories across each sociodemographic groups, and the Bonferroni correction (VanderWeele & Mathur, 2019) was applied for the 48 tests that were conducted.

To compare the total ACE score and IDAS total score across gender, race, sexual orientation, and SES groups, two-tailed t-tests and ANOVAs were conducted with the Bonferroni correction being applied where necessary. Thereafter, regression analyses were

performed to determine whether the total ACE score predicted the severity of mental health difficulties on the IDAS and whether each sociodemographic variable moderated this relationship.

Ethical Considerations

Ethics approval for Project CABS was originally obtained from the University of New Mexico (the institution of the Principal Investigator) in January 2019 (see Appendix H). In May 2019, the Faculty of Humanities Ethics Committee permitted approval of ethics for the gathering of data from the UCT sample for the broader Project CABS study (PSY2019-019; see Appendix A).

As noted above, informed consent was obtained from all participants. All data were de-identified to ensure anonymity. There was a minimal risk that the participants would encounter some uneasiness or worry during the completion of the online survey, as the survey presented questions about substance use, adverse childhood experiences, and mental health symptoms. Participants were informed about the survey's content on the advert and consent form and could choose to decline participation, as their SRPP points could be obtained through other means. Those who decided to participate could terminate their completion of the survey at any time. Participants could also choose to leave out responses to questions that they did not want to answer. A debriefing form consisting of several referral resources, within and outside of campus, was given to all students invited to participate in the study.

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Results

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Sample Characteristics

As shown in Table 1, the sample included many more females than males. Additionally, White individuals formed the majority of this sample, while individuals from the 'Other' racial category were least represented. This sample reflects the trend for UCT Psychology students to skew towards White females. Regarding socio-economic status, the

number of individuals from the higher income category were approximately four times the size of individuals from the lower income category. Regarding sexual orientation, the number of participants endorsing the 'exclusively heterosexual' category was just below double the number of individuals who endorsed the 'not exclusively heterosexual' categories.

Table 1

Sample Characterisitics

	n	%
Gender		
Male	78	16.53
Female	391	82.84
Race		
Black African	97	20.55
Coloured	129	27.33
White	194	41.10
Other	52	11.02
Soci-economic status		
Lower income	96	20.34
Higher income	375	79.45
Sexual Orientation		
Exclusively heterosexual	293	62.08
Not exclusively heterosexual	178	37.72

Note: 'Other' in Race represents the following groups; other, Asian, Indian, Prefer not to respond. 'Not exclusively heterosexual' in sexual orientation represents the following groups; Mostly heterosexual, Equally heterosexual and homosexual, Mostly homosexual, Exclusively homosexual, Other and I prefer not to respond

As shown in Table 2, about a fifth of the sample reported sexual abuse, over 80% reported exposure to at least one incident of household violence and over 60% reported some exposure to physical abuse, emotional abuse, bullying and community violence, while about a third had some experience of physical neglect. Additionally, at least 98% of the sample had experienced at least one ACE. When frequent or repeated exposure was considered, at least a third of the sample experienced repeated household violence, emotional neglect and having a

physically or mentally ill guardian. Furthermore, about one-tenth of the sample was

repeatedly exposed to bullying and community violence. When repeated exposure to violence

and abuse is considered, rather than single or occasional exposure, about 79% of the sample

have been exposed to at least one ACE.

Table 2

Exposure to ACE's

Exposure to ACE	Experienced		Full Sample
	n	%	n
ACE binary type			
Household violence	381	81.41	468
Emotional abuse	345	74.51	463
Community violence	325	70.5	461
Exposure to bullying	297	64.01	464
Physical abuse	288	61.94	465
Separation of guardian	174	39.1	445
Ill guardian	147	31.41	468
Physical neglect	139	29.57	470
Sexual abuse	102	21.94	465
Exposure to drugs	93	19.83	469
Emotional neglect	34	7.22	471
Incarcerated guardian	30	6.4	469
Any	464	98.31	472
Repeated ACE exposure			
Household violence	159	34.05	467
Emotional neglect	145	30.79	471
Emotional abuse	68	14.72	462
Exposure to bullying	53	11.42	464
Community violence	46	10.0	460
Physical abuse	36	7.74	465
Physical neglect	33	7.04	469
Any	372	78.81	472

Table 3

Percentage of experienced ACEs relating to abuse and neglect

	Physical abuse		Emotional abuse		Physical neglect		Emotional neglect		Any Sexual abuse
	Any	frequent	Any	frequent	Any	frequent	Any	frequent	
Gender									
Male	68,06	9,72	73,61	20,83	45,83	8,33	8,33	38,89	12,50
Female	60,36	7,16	73,91	13,55	26,85	6,91	7,16	29,41	23,53
Race									
Black African	71,13	14,43	71,13	16,49	25,77	11,34	15,46	44,33	24,74
Coloured	64,34	7,75	81,40	13,18	29,46	3,88	9,30	37,98	25,58
White	53,61	3,61	68,56	10,82	30,93	5,15	2,06	16,49	20,10
Other	61,54	9,62	73,08	26,92	30,77	13,46	5,77	40,38	11,54
Soci-economic status									
Lower income	69,79	15,63	75,00	26,04	40,63	11,46	11,46	45,83	29,17
Higher income	58,93	5,60	72,80	11,47	26,40	5,60	6,13	26,93	19,73
Sexual Orientation									
Exclusively heterosexual	59,04	7,17	72,01	12,97	27,99	6,48	5,46	25,26	16,72
Not exclusively heterosexual	64,61	8,43	75,28	16,85	31,46	7,30	10,11	39,89	29,78

Table 4

Percentage of experienced ACEs relating to the family and the community

	Household violence		Community violence		Bullying		Any Separation	Any drug	Any Incarceration	Any ill
	Any	frequent	Any	frequent	Any	frequent				
Gender										
Male	81,94	44,44	90,28	11,11	58,33	6,94	43,06	20,83	4,17	34,72
Female	81,59	32,23	65,98	9,46	64,45	12,02	36,57	19,44	6,65	30,69
Race										
Black African	73,20	44,33	79,38	18,56	58,76	6,19	40,21	19,59	9,28	17,53
Coloured	86,05	35,66	82,95	15,50	60,47	16,28	35,66	24,81	9,30	25,58
White	79,90	21,65	53,61	2,06	67,53	8,76	38,14	18,56	2,58	39,69
Other	84,62	53,85	71,15	7,69	59,62	17,31	28,85	11,54	7,69	38,46
Soci-economic status										
Lower income	85,42	54,17	84,38	29,17	54,17	15,63	50,00	32,29	16,67	30,21
Higher income	79,47	28,53	64,80	4,80	65,07	10,13	33,33	16,53	3,73	31,47
Sexual Orientation										
Exclusively heterosexual	80,55	31,74	66,89	10,24	60,75	8,87	32,76	17,06	6,48	26,28
Not exclusively heterosexual	80,90	37,08	71,91	8,99	66,29	15,17	43,26	24,16	6,18	39,33

Differences in ACE Exposure Across Sociodemographic Groups

As summarized in Table 5, chi-Square Tests of Independence were run to test for statistically significant differences in exposure to specific ACE categories across each sociodemographic group. The Bonferroni correction was applied for 48 tests, as recommended by VanderWeele and Mathur (2019). Therefore, the significance level for this analysis was set to $p < .001$.

There were several differences in ACE exposure across income groups. Participants in the lower income group were more likely to have experienced repeated emotional abuse and neglect, family and community violence, and parental substance abuse, incarceration and separation during childhood than participants in the higher income group.

There were also several differences in ACE exposure across racial groups. White participants were more likely to have been exposed to a household member who was depressed, mentally ill or suicidal in childhood in comparison to Black and Coloured individuals. White participants also had a higher likelihood of not having been exposed to household violence, community violence and emotional neglect frequently in childhood compared with participants from the other racial groups. Furthermore, participants from the 'Other' racial category were more likely to experience emotional neglect frequently in their childhood compared to the 'Coloured' racial group.

With regards to sexual orientation, individuals who were not exclusively heterosexual had a higher possibility of having been exposed to sexual abuse and emotional neglect in childhood compared with the exclusively heterosexual individuals

Table 5

Chi-square statisics for ACEs

Sociodemograpic factor	Gender				Race				Socio-economic status				Sexual Orientation			
	n	df	X^2	p	n	df	X^2	p	n	df	X^2	p	n	df	X^2	p
ACE binary type																
Separation of guardians	443	1	0.4	0.542	445	3	3.5	0.324	444	1	12.0	0.001	444	1	6.1	0.013
Ill guardian	465	1	0.1	0.725	468	3	18.0	0.001	467	1	0.1	0.823	467	1	9.0	0.003
Sexual abuse	462	1	53	0.021	465	3	5.2	0.157	464	1	3.6	0.056	464	1	10.9	0.001
Exposure to drugs	466	1	0.0	0.96	469	3	4.3	0.231	468	1	12.2	0.001	468	1	3.5	0.062
Incarcerated guardian	466	1	0.8	0.369	469	3	8.1	0.044	468	1	21.2	0.001	468	1	0.0	0.893
Repeated ACE exposure																
Household violence	464	1	2.6	0.105	467	3	27.7	0.001	466	1	21.6	0.001	466	1	1.4	0.231
Emotional neglect	468	1	1.5	0.226	471	3	32.8	0.001	470	1	12.7	0.001	470	1	11	0.001
Emotional abuse	459	1	1.9	0.167	462	3	9.0	0.029	461	1	12.3	0.001	461	1	1.4	0.240
Exposure to bullying	461	1	2.1	0.146	464	3	8.9	0.031	463	1	2.2	0.136	463	1	4.6	0.033
Community violence	457	1	0.0	0.828	460	3	27.0	0.001	459	1	51.2	0.001	459	1	0.2	0.668
Physical abuse	462	1	0.3	0.556	465	3	11.3	0.010	464	1	10.5	0.001	464	1	0.3	0.612
Physical neglect	466	1	0.1	0.790	469	3	9.3	0.025	468	1	4.2	0.040	468	1	0.1	0.715

Note: Significance value was set to p<0.001

Sociodemographic Differences in Cumulative ACE Exposure

Table 6 reports the mean differences in cumulative ACE exposure across the different sociodemographic categories. The mean for the overall sample was 2.3.

Table 6

Descriptives for cumulative ACEs

	M	SD	n	95% CI LL	UL
Gender					
Male	2.4	2	78	1.91	2.81
Female	2.3	2.1	391	2.07	2.49
Race					
Black African	2.7	2.1	97	2.25	3.09
Coloured	2.5	2.2	129	2.13	2.9
White	1.9	1.8	194	1.62	2.13
Other	2.7	2.5	52	2	3.35
Soci-economic status					
Lower income	3.6	2.4	96	3.09	4.04
Higher income	2	1.9	375	1.79	2.17
Sexual Orientation					
Exclusively heterosexual	2	1.9	293	1.8	2.24
Not exclusively heterosexual	2.8	2.3	178	2.43	3.1

Two tailed t-tests were used to examine differences between gender, SES and sexual orientation groups on ACE total frequency score, while ANOVA was used to examine differences between race groups. The Bonferroni correction was applied for four tests, as recommended by VanderWeele and Mathur (2019). Hence, the significance level was set to p < .0125.

There was no statistically significant effect for gender, $t(467) = -0.32$, $p = 0.75$, even though men ($M = 2.4$, $SD = 2$) had a higher ACE frequency score than women ($M = 2.3$, $SD = 2.1$). However, given that the ACE total frequency was not normally distributed, a boot-strapped t-test was also run for all sociodemographic factors. Bootstrapping is a re-sampling technique which is used when the assumptions

of a normal parametric test (e.g., the assumption of normal distributions) is not met (Tredoux & Durrheim, 2019). The bootstrapped t-test for gender still produced a non-significant test result ($p = .73$).

The original t-test for socio-economic status produced a significant effect, $t(128.05) = 6.09$, $p < .001$, hence demonstrating that lower income individuals ($M = 3.6$, $SD = 2.4$) experience ACE's more frequently than do higher income individuals ($M = 2$, $SD = 1.9$). Given that the variance between the two groups was not equal, a Welch t-test was conducted (Keselman et al., 2004). The new boot-strapped p-value still resulted in a significant result, $p < .001$.   The original t-test for sexual orientation also produced a significant effect, $t(369) = -3.79$, $p < .001$, hence demonstrating 'not exclusively heterosexual' individuals ($M = 2.8$, $SD = 2.3$) experience ACE's more frequently than do exclusively heterosexual individuals ($M = 2$, $SD = 1.9$). The bootstrapped t-test still resulted in a p-value of < .001.

The ANOVA for Race with ACE total frequency as the dependent variable was also bootstrapped with trimmed means. Trimmed means refer to the disposal of a certain percentage of the sample distribution at both ends (Mair & Wilcox, 2019). The trimmed mean was set to 20% and the number of booted samples drawn was 10 000. The model was found to be significant, $p = 0.006$, with a test statistic of 4.64, an effect size of 0.18, and an explained variance of 0.03. Post hoc comparisons indicated that individuals belonging 'other' category ($M = 2.7$, $SD = 2.5$) significantly experience ACES more frequently than do White individuals ($M=1.9$, $SD = 1.8$).

Sociodemographic Differences in Mental Health Symptoms

Table 7 reports the mean differences in total mental health score across the different sociodemographic categories. The mean for the entire sample was 111.3.

Table 7

Descriptives for IDAS total

	M	SD	n	95% CI LL	95% CI UL
Gender					
Male	109.4	24.1	78	104.03	114.71
Female	111.8	25.9	391	109.24	114.37
Race					
Black African	113.92	26.2	97	108.7	119.14
Coloured	111.88	25.5	129	107.48	116.27
White	109.59	24.7	194	106.12	113.07
Other	111.39	27.5	52	103.91	118.86
Soci-economic status					
Lower income	117.3	29.9	96	111.36	123.33
Higher income	109.8	24.1	375	107.32	112.2
Sexual Orientation					
Exclusively heterosexual	109.2	24.3	293	106.36	111.94
Not exclusively heterosexual	114.8	27.1	178	110.86	118.83

T-tests were also conducted for IDAS total score as the dependent variable, with socio-economic status, sexual orientation and gender as the independent variable. Given that race was divided into four categories for this section too, an ANOVA was conducted for IDAS total score as the dependent variable with race as the independent variable. The Bonferoni correction was applied for four tests (VanderWeele & Mathur, 2019), and hence was also set to $p < .0125$.

There was no statistically significant effect for gender, $t(466) = -0.77$, $p = 0.444$, even though women ($M = 111.8$, $SD = 25.9$) had a higher IDAS total score in comparison to men ($M = 109.4$, $SD = 24.1$). However, given that the IDAS total scores were not normally distributed, a boot-strapped t-test was also run for all

sociodemographic factors. The bootstrapped t-test for gender still produced a non-significant test result (p = .457).

The original t-test for socio-economic status revealed that although lower income individuals (M = 117.3, SD = 29.9) have a higher IDAS total score than higher income individuals (M = 109.8, SD = 24.1), the effect was not significant, t(128.43) = 2.3, p = .023. Given that the variance between the two groups was not equal, a Welch t-test was conducted. The new boot-strapped p-value still resulted in a non-significant result, p = 0.017. Bonferroni corrections are however overly cautious and hence, although the test did not meet the Bonferroni correction for significance, it still tended towards or approached significance. However, one should be cognizant of an increasing likelihood of a type 2 error.

The original t-test for sexual orientation showed that although individuals from the 'not exclusively heterosexual' category (M = 114.8, SD = 27.1) experience a higher IDAS total score than do exclusively heterosexual individuals (M=109.2, SD =24.3), the effect of the test was not significant, t(468) = -2.35, p = 0.019. The bootstrapped t-test resulted in a p-value of .016. Again, although the test did not meet the Bonferroni correction for significance, it still tended towards or approached significance.

The ANOVA for Race with IDAS total score as the dependent variable was also bootstrapped with trimmed means. The trimmed mean was set to 20% and the number of booted samples drawn was 10 000. The model was not significant, p =.497, with a test statistic of 0.8, an effect size of 0.12, and an explained variance of 0.01.

Regression Analysis

Regression models were conducted in order to investigate the relationship between IDAS total score as a function of ACE total frequency score, with each

sociodemographic variable as a moderator of this relationship. The first regression model did not include any moderators as this was used as the base model with which to compare others to. The Boneferroni adjustment (VanderWeele and Mathur, 2019). was applied for 5 tests as this was the foreseen number of tests that were going to be conducted (i.e., transformations were not accounted for). Hence, the significance level was set to p<0.01.

IDAS Total as a Function of ACE Total Frequency Without Any Moderators

IDAS total score and ACE total frequency were weakly positively correlated ($r(469) = .24$, $p < .001$), indicating that as ACE total frequency score increased, the IDAS total score minimally increased too. After running the regression analysis, it was found that the model was statistically significant ($R^2 = 0.06$, $F(1, 469) = 28.86$, p <.001), accounting for 6% of the variation in IDAS total scores. ACE total frequency significantly predicted IDAS total score (B = 2.94, p <.001). The equation for the model was IDAS total score = 104.53 + 2.94(ACE total frequency), indicating that for any 1-point increase in ACE total frequency, the total IDAS score will increase by 2.94. All assumptions were met.

IDAS Total as A Function of ACE Total Frequency with Socio-economic Status as a Moderator

The regression equation for this model was: IDAS total score = 109.85 + 2.1(ACE total frequency) - 6.04(socio-economic status) + 0.89(ACE total frequency x socio-economic status). Although the regression model was statistically significant (R^2 =0.06, Adjusted R^2 = 0.06, $F(3, 466) = 10.15$, p <.001), neither ACE total frequency ($B = 2.1$, $p = 0.052$), socioeconomic status ($B = -6.04$, $p = 0.225$), or their interaction ($B = 0.89$, $p = 0.483$), significantly predicted IDAS total score when the

other predictors were equal to 0. The intercept ($B = 109.85$, $p < .001$) however was significant. All assumptions were met.

IDAS Total as A Function of ACE Total Frequency with Sexual Orientation as a Moderator

The regression equation for this model was: IDAS total score = 106.41 + 1.35(ACE total frequency) - 4.11(sexual orientation) + 3.19(ACE total frequency x sexual orientation). The regression model was statistically significant ($R^2 = 0.08$, Adjusted $R^2 = 0.07$, F (3,466) = 13.33, $p < .001$). Although the model was significant, neither ACE total frequency ($B = 1.35$, $p = 0.07$) nor sexual orientation ($B = - 4.11$, $p = 0.252$) significantly predicted IDAS total score when the other predictors were equal to 0. The interaction between ACE total frequency and sexual orientation ($B = 3.19$, $p = 0.004$) however was significant, indicating that this interaction does significantly predict IDAS total score. The intercept for the model ($B = 10.6.41$, p $< .001$) was also significant. However, there may have been issues with homogeneity of variance and linearity in this model which may have affected results. Hence, a square root transformation of ACE total frequency was run, as this variable was positively skewed. A square root transformation of data can be used when variances between two groups are not equal (Bartlett, 1936).

A multiple linear regression was conducted in order to test if the new transformed ACE total frequency score better predicted IDAS total score, with sexual orientation as the moderator. The regression equation for this model was: IDAS total score = 105.41 + 3.19(square root of ACE total frequency) - 8.88(sexual orientation) + 9.39(square root of ACE total frequency x sexual orientation). The model was found to be statistically significant ($R^2 = 0.07$, Adjusted $R^2 = 0.07$, F(3,466) = 13.33,

p <.001). However, although the model was significant, neither the square root of ACE total frequency (B = 3.19, p = 0.075) nor sexual orientation (B = -8.88, p = 0.054) significantly predicted IDAS total score when the other predictors were equal to 0. The intercept (B = 105.41, p <.001) was significant, as was the interaction between the square root of ACE total frequency and sexual orientation (B = 9.39, p = 0.001), indicating that this interaction does significantly predict IDAS total score. The interaction was dis-ordinal. More specifically, it was found that as the 'not exclusively heterosexual' group's ACE total frequency score increases, their IDAS total score increases at a much more rapid rate than what the 'exclusively heterosexual' category does, as the slope for the 'not exclusively heterosexual' category was much steeper than the slope of the 'exclusively heterosexual' category. Assumptions were improved after having performed the square root transformation on ACE total frequency.

This model seems to be the better of the two models with sexual orientation as a moderator. While both seem to account for relatively the same amount of variance in IDAS scores, the p-values for each predictor in this model lie closer to significance than the p-values in the model without the transformed ACE total frequency score.

IDAS Total as a Function of ACE Total Frequency with Gender as Moderator

The regression equation for this model was: IDAS total score = 97.82 + 4.9(ACE total frequency) +7.95(gender) - 2.25(ACE total frequency x gender). The model was statistically significant (R^2 =0.07, Adjusted R^2 = 0.06, $F(3, 464)$ = 10.83, p <.001). However, although the model was significant, gender (B = 7.95, p = 0.092), as well as the interaction between ACE total frequency and gender (B = -2.25, p = 0.138), did not significantly predict IDAS total score when the other predictors were equal to 0. Conversely, total ACE frequency (B = 4.9, p <0.001) was significant at

predicting IDAS total score when other predictors were equal to 0. This was also true for the intercept ($B = 97.82$, $p < .001$). However, there may have been issues with homogeneity of variance in this model and hence, a square root transformation of ACE total frequency was run as this variable was positively skewed.

The new regression equation for IDAS total score as a function of the transformed ACE total frequency, with gender as a moderator, was: IDAS total score = 93.78 + 11.98(square root ACE total frequency) + 10.03(gender) -5.69(square root ACE total frequency x gender). The model was found to be statistically significant (R^2 =0.06, Adjusted R^2 = 0.05, $F(3,464) = 9.74$, $p < .001$). Gender ($B = 10.03$, $p = 0.084$) however did not significantly predict IDAS total score when the other predictors were equal to 0. The interaction between the square root of ACE total frequency and gender ($B = -5.69$, $p = 0.134$) was also not significant when other predictors were equal to 0. However, the square root of total ACE frequency ($B = 11.98$, $p < .001$) alone was significant at predicting IDAS total score when other predictors were equal to 0. This too was true for the intercept ($B = 93,78$, $p < .001$). Assumptions were improved after having performed a sqrt transformation on ACE total frequency.   The former model, sexual orientation as a moderator with no transformation to ACE total frequency, may be the better model of the two. While the p-values for all predictors in both models approach significance, the previous model accounts for an increase in 1% of the (adjusted) variance between IDAS total scores.

IDAS total as a Function of ACE Total Frequency with Race as a Moderator

The regression for this model was: IDAS total score = 107.1 + 2.08(ACE total frequency) - 6.49(race) + 2.68(ACE total frequency x race). The regression model was statistically significant (R^2 =0.07, Adjusted R^2 = 0.06, $F(3, 467) = 11.4$, $p < .001$).

Race ($B = $ -6.49, p = 0.06) and the interaction between race and ACE total frequency ($B = 2.68$, $p = 0.026$) did not significantly predict IDAS total score when the other predictors were equal to 0. However, as stated earlier, Bonferroni corrections are overly cautious and hence, although the interaction did not meet the Bonferroni correction for significance, it still tended towards or approached significance, one should however be cognizant of an increasing likelihood of a type 2 error. ACE total frequency ($B = 2.08$, $p = 0.002$) and the intercept ($B = 107.1$, $p <.001$) did significantly predict IDAS total score when other predictors were equal to 0. All assumptions were met.

Discussion

This study examined sociodemographic patterns in exposure to ACES and whether sociodemographic factors moderate the relationship between ACEs and current mental health. Using the more conservative ACE-IQ measure that takes repeated exposure into account, almost 80% of the sample had experienced at least one ACE and the mean number of ACEs across the sample was 2.3. Using the repeated exposure measure, family violence was the most common form of violence or abuse reported by the sample, followed by sexual abuse and then emotional abuse. While emotional abuse was also highly prevalent in the Mall (2018) and Myers (2021) studies, our rates for repeated physical abuse are much lower than Myers (2018) and Mall (2021) (both about 20%) but they both used a less conservative measure (including any or occasional physical abuse). Neither Myers (2021) nor Mall (2018) assessed family violence, which is the most common form of violence reported by our sample and clearly an important one to include in future research in ACEs in our context

Where international student samples are concerned, this study's findings do not completely reflect those from international student samples. For example, the current study found that emotional neglect was the second least experienced ACE reported by UCT Psychology students (7.22%), however, in a sample of Korean college students, it was found that over 50% of the student sample reported having experienced emotional neglect in their childhood (Kim, 2017). This may be because the latter study used a different scoring system for emotional neglect in comparison to the current study. Furthermore, in a sample of East Asian university students, it was found that 28% of students had experienced physical abuse and 23.33% had experienced domestic violence during childhood (Ho et al., 2020). However, in the current study's sample, the proportion of students who reported having experienced these aforementioned ACEs, were high (61.94% and 81.41% respectively) compared to this East Asian sample. This may be because SA is a country characterized by the highest rates of gender-based violence globally (Graaf & Heinecken, 2017), and this violence, that so often occurs within households, has been found to coincide with physical child abuse (Vetten, 2014).

Our study also found sociodemographic differences in prevalence of ACE exposure. Lower income status during childhood was associated with a greater likelihood of exposure to several different forms of violence and abuse (including household violence, emotional abuse and neglect and community violence) as well as a range of other family adversities (parental drug abuse, incarceration and separation). These findings are in line with several previous studies in other countries (Doidge et al., 2017; Houchin, 2005, Peltzer et al., 2010; Ulukol et al., 2014) and likely reflect the pernicious influence of economic adversity on family stress levels, parenting capacities and community risk factors. For example, it has been found that the stress

accompanying financial insecurity can lead to the use of negative coping mechanisms such as drug abuse and crime (Galvão et al., 2018; Lilenstein, 2017). However, economic status only approached significance as a moderator of the relationship between cumulative ACES and mental health outcome, so may exert more of an effect on exposure to specific types of ACEs than on the cumulative number of ACEs experienced.

In relation to race, while White participants were notably more likely to have lived with someone who was ill in childhood, compared with Black African participants and Coloured participants, Coloured participants were notably more likely to have experienced community violence in childhood compared with White participants and participants from the 'Other' category. These finding coincide with the results from the American "2016 National Survey of Children's Health (NSCH)" which reported that living with a mentally ill adult, was the second most common ACE experienced by White children, while experiencing community violence was less commonly experienced by White children in relation to other races, such as Hispanic individuals (Slopen et al., 2016). Exposure to community violence in childhood may be higher in our Coloured student sample, compared with the White and 'other' racial categories, because gangsterism, which is characterized by violence and is associated with poverty (Daniels & Adams, 2010), is most prevalent in poorer stereotypically 'Coloured communities' followed by Black communities (Bowers Du Toit, 2014). Similarly, with regards to American individuals, gangsterism is often rife among Hispanic cummunities, and hence, these individuals are likely exposed to more community violence (Guarduno & Brancale, 2016). Although Forster et al. (2018) found that the relationship between cumulative ACEs and mental health difficulties (e.g., substance use) differed across certain ethnic

groups, the current study did not. This may be because the current study is based on a South African sample (taken from a single university), whereas the latter primarily consists of American students, and both have very different racial population ratios.

Regarding sexual orientation, it was found that individuals who did not belong to the 'exclusively heterosexual' category experienced more ACEs. Comparable results have been found in other studies (Dorvil et al., 2020). This susceptibility to an increased rate of ACEs may be attributed to the abandonment and ostracization non-exclusively heterosexual individuals have faced from their families, resulting in ACEs such as emotional, physical neglect, bullying, and sexual abuse (e.g., 'corrective' rape) (Koraan & Geduld, 2015). In line with international (Andersen & Blosnich, 2013; Dorvil et al., 2020; Lehavot et al., 2012) and local (Bantjes et al., 2019) studies, participants from the current study who identified as being 'not exclusively heterosexual' were almost twice as likely to have experienced sexual abuse in childhood while exclusively heterosexual individuals were associated with a significantly lower likelihood of having experienced frequent emotional neglect in childhood. These findings can be attributed to the scarcity of safe spaces within which LGBTQI+ children can explore and consider their sexuality (resulting in potential sexual abuse) (Balsam et al., 2010). Furthermore, these findings can be explained by research which shows that many children who deviate from their assigned gender and sexuality often experience stigma from peers and emotional neglect from family members who do not condone their 'deviant' behaviours (resulting in emotional neglect) (Katz-Wise et al., 2016). The current study found that the interaction between sexual orientation and cumulative ACE score do significantly predict mental health or total IDAS score. Belonging to the 'not exclusively heterosexual' category and having a high cumulative ACE total frequency score

resulted in a higher total IDAS in comparison to those belonging to the exclusively heterosexual category. As stated earlier, this may be because individuals belonging to sexual minority groups often experience physical and emotional neglect, sexual abuse (Kapp, 2008) and victimization, which further contribute to poor mental health (Burton et al., 2013).

The current study did not find any significant relationship between the type of ACE experienced and differences in prevalence by gender. This may be because the sample consisted of about 83% females and 17% males from the Humanities faculty, specifically Psychology, whereas the current South African student population consists of about 63% female and 37% male Humanities students (Department of Higher Education and Training, 2020). This may also be why the current study did not find any significant relationship between cumulative ACE score and gender in predicating mental health. A more representative sample may produce different results.

Conclusion

Existing research revealed that proximal factors such as a record of ACEs, increases students' susceptibility to mental health issues (Karatekin, 2018). Previous research has found that females, minority racial groups and lower socio-economic status has been linked to increased rates of ACEs. There has however, been a dearth of research exploring the contribution sociodemographic factors make towards the relationship between ACEs and mental health in university students, as well as the prevalence of ACEs in university samples in LMICs. Studies by Myers et al. (2021) and Mall et al. (2018) have been the only existing studies on the prevalence of ACEs in South African university student samples.

The current study aimed to investigate sociodemographic differences in ACE prevalence and mental health among South African students and to explore the weather sociodemographic factors moderate the relationship between ACEs and mental health in this population. Emotional abuse during childhood was found to be the second most reported ACE. The study found that there are statistically significant differences in cumulative ACE exposure across socioeconomic status, race and sexual orientation. Furthermore, it was found that ACEs notably forecasted total IDAS or mental health scores, with sexual orientation moderating the relationship.

There are certain limitations to this study. It will not be able to confirm causal relationships due its cross-sectional design. Further, there are problems with retrospective recall concerning events that occurred during childhood, which may also reduce the data reliability and validity. Lastly, this study refers to South African students, however, only UCT students were included in the study sample and is therefore not representative of all South African students.

Future studies should explore sociodemographic differences in ACE prevalence and mental health among a wider, more representative South African sample, as well as the moderating role of sociodemographic factors in the relationship between ACEs and mental health. This would lead to the formation of fruitful intervention programmes for university students nationwide.

The current study has made an invaluable contribution towards South African literature regarding ACEs, mental health and sociodemographic factors, as there have only been two studies exploring the relationship between these variables (both did not investigate the full range of ACEs, nor the moderating role of sociodemographic factors). Such a study can possibly inform the development of student support

programs with the aim of targeting students who are most at risk for mental health difficulties.

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Appendices

Appendix A
Ethics approval letter from UCT.

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

10 May 2019

A/Prof. D. Kaminer
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Prof. Kaminer

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *Prevalence, patterns, risk and protective factors for alcohol and drug use amongst South African university students*. The reference number is PSY2019-019.

I wish you all the best for your study.

Yours sincerely

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

INVITATION TO TAKE PART IN A RESEARCH STUDY ON SUBSTANCE USE AMONG UNIVERSITY STUDENTS – EARN 1 SRPP POINT

We invite you to volunteer to take part in a new research study on substance use among UCT students. This study is part of an international research study examining patterns of substance use among university students across different countries.

What will my participation involve?

Your participation will involve completing an online survey. The survey should take about 60 minutes to complete. The survey includes questions about your alcohol and drug use, gaming and social media activities, personality traits, childhood events, mental health, and beliefs and attitudes.

Who can take part?

Any UCT Psychology student 18 years or older can take part in this study. You do not have to use alcohol, marijuana, or prescription drugs to participate in this study.

Do I have to take part?

Your involvement in the study is entirely voluntary, and you may choose not to participate. There are other ways you can earn SRPP points if you prefer.

Will my answers to the survey be confidential and anonymous?

Your survey responses will not be linked to your identifying information. At the end of the survey, you will need to link to a separate site to give your name, student number and course code in order to get your SRPP credit. This information cannot be linked to your survey responses. Your survey responses will be totally anonymous.

Are there any risks involved?

There are no known risks in this study, but some individuals may experience discomfort when answering questions about their substance use, mental health or childhood experiences. Because your answers cannot be linked to your student number or course code, your survey responses are completely anonymous. You can also choose to withdraw from the survey at any time, but the SRPP credit will only be awarded for students who get to the end of the whole survey.

Are there any benefits to taking part?

You can earn 1 SRPP point if you complete the survey. The study will help UCT to plan prevention and intervention strategies to address harmful substance use on campus.

Who can I contact if I have questions about this study?

If you have any questions about taking part in this study, please feel free to contact A/Prof. Debbie Kaminer at 021 6503900 or debbie.kaminer@uct.ac.za.

Appendix C

Sociodemographic questionnaire

Your age (in years): [   ]

Which option best describes your gender? {Choose one}

( ) Male   ( ) Female   ( ) Transgender   ( ) Other _____

( ) Prefer not to respond

University level of study: {Choose one}

( ) First year undergraduate   ( ) Second year undergraduate   ( ) Third year undergraduate

( ) Fourth year undergraduate ( ) Fifth year undergraduate ( ) Postgraduate

( ) Other

Which option best describes your racial identification?

( ) Black African   ( ) Coloured   ( ) Asian   ( ) Indian ( ) White   ( ) Other

( ) Prefer not to respond

Which option best describes your sexual orientation:

{Choose one}

( ) Exclusively heterosexual

( ) Mostly heterosexual

( ) Equally heterosexual and homosexual

( ) Mostly homosexual

( ) Exclusively homosexual

( ) Other

( ) I prefer not to respond

How would you describe your socioeconomic status when you were growing up?

( ) We often did not have enough basic necessities (like food, shelter or clothes)

( ) My parents/caregivers earned an income but we were always on a very tight budget

( ) Middle class

( ) Upper middle class

( ) Wealthy

When you were growing up, during the first 18 years of your life . . .

4.1 Did you live with a household member who was a problem drinker or alcoholic, or misused street or prescription drugs?

Yes

No

4.2 Did you live with a household member who was depressed, mentally ill or suicidal?

Yes

No

4.3 Did you live with a household member who was ever sent to jail or prison?

Yes

No

4.4 Were your parents ever separated or divorced?

Yes

No

Not applicable

4.5 Did your mother, father or guardian die?

Yes

No

Don't know/not sure

These next questions are about certain things you may actually have heard or seen IN YOUR HOME. These are things that may have been done to another household member but not necessarily to you

When you were growing up, during the first 18 years of your life . . .

4.6 Did you see or hear a parent or household member in your home being yelled at, screamed at, sworn at, insulted or humiliated?

4.7 Did you see or hear a parent or household member in your home being slapped, kicked, punched or beaten up?

4.8 Did you see or hear a parent or household member in your home being hit or cut with an object, such as a stick (or cane), bottle, club, knife, whip etc.?

Response scale for these Questions:

Many times

A few times

Once

Never

These next questions are about certain things YOU may have experienced.

When you were growing up, during the first 18 years of your life . . .

5.1 Did a parent, guardian or other household member yell, scream or swear at you, insult or humiliate you?

5.2 Did a parent, guardian or other household member threaten to, or actually, abandon you or throw you out of the house?

5.3 Did a parent, guardian or other household member spank, slap, kick, punch or beat you up?

5.4 Did a parent, guardian or other household member hit or cut you with an object, such as a stick (or cane), bottle, club, knife, whip etc?

5.5 Did someone touch or fondle you in a sexual way when you did not want them to?

5.6 Did someone make you touch their body in a sexual way when you did not want them to?

5.7 Did someone attempt oral, anal, or vaginal intercourse with you when you did not wantthem to?

5.8 Did someone actually have oral, anal, or vaginal intercourse with you when you did not want them to?

Response scale for these Questions:

Many times

A few times

Once

Never

PEER VIOLENCE

These next questions are about BEING BULLIED when you were growing up. Bullying is when a young person or group of young people say or do bad and unpleasant things to another young person. It is also bullying when a young person is teased a lot in an unpleasant way or when a young person is left out of things on purpose. It is not bullying when two young people of about the same strength or power argue or fight or when teasing is done in a friendly and fun way.

When you were growing up, during the first 18 years of your life . . .

6.1 How often were you bullied?

Many times

A few times

Once

Never (Go to 6.3)

 6.2. How were you bullied most often?

I was hit, kicked, pushed, shoved around, or locked indoors

I was made fun of because of my race, nationality or colour

I was made fun of because of my religion I was made fun of with sexual jokes, comments, or gestures

I was left out of activities on purpose or completely ignored

I was made fun of because of how my body or face looked

I was bullied in some other way

This next question is about PHYSICAL FIGHTS. A physical fight occurs when two young people of about the same strength or power choose to fight each other.

When you were growing up, during the first 18 years of your life . . .

6.3 How often were you in a physical fight?

Many times

A few times

Once

Never

WITNESSING COMMUNITY VIOLENCE

These next questions are about how often, when you were a child, YOU may have seen or heard certain things in your NEIGHBOURHOOD OR COMMUNITY (not in your home or on TV, movies, or the radio).

When you were growing up, during the first 18 years of your life . . .

7.1 Did you see or hear someone being beaten up in real life?

7.2 Did you see or hear someone being stabbed or shot in real life?

7.3 Did you see or hear someone being threatened with a knife or gun in real life?

Response scale for these Questions:

Many times

A few times

Once

Never

Inventory of Depression and Anxiety Symptoms (IDAS)

Below is a list of feelings, sensations, problems, and experiences that people sometimes have. Read each item to determine how well it describes your recent feelings and experiences. Then select the option that best describes <u>how much</u> you have felt or experienced things this way <u>during the past two weeks, including today</u>. Use this scale when answering:

_____

_____

1	2	3	4	5
Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**

_____

_____

1. I was proud of myself

2. I felt exhausted

3. I felt depressed

 4. I felt inadequate

 5. I slept less than usual

 6. I felt fidgety, restless

 7. I had thoughts of suicide

 8. I slept more than usual

 9. I hurt myself purposely

10. I slept very poorly

11. I blamed myself for things

12. I had trouble falling asleep

13. I felt discouraged about things

14. I thought about my own death

15. I thought about hurting myself

16. I did not have much of an appetite

17. I felt like eating less than usual

18. I thought a lot about food

19. I did not feel much like eating

20. I ate when I wasn't hungry

21. I felt optimistic

22. I ate more than usual

23. I felt that I had accomplished a lot

24. I looked forward to things with enjoyment

25. I was furious

26. I felt hopeful about the future

27. I felt that I had a lot to look forward to

28. I felt like breaking things

29. I had disturbing thoughts of something bad that happened to me

30. Little things made me mad

31. I felt enraged

32. I had nightmares that reminded me of something bad that happened

33. I lost my temper and yelled at people

34. I felt like I had a lot of interesting things to do

35. I felt like I had a lot of energy

36. I had memories of something scary that happened

37. I felt self-conscious knowing that others were watching me

38. I felt a pain in my chest

39. I was worried about embarrassing myself socially

40. I felt dizzy or light headed

41. I cut or burned myself on purpose

42. I had little interest in my usual hobbies or activities

43. I thought that the world would be better off without me

44. I felt much worse in the morning than later in the day

45. I felt drowsy, sleepy

46. I woke up early and could not get back to sleep

47. I had trouble concentrating

48. I had trouble making up my mind

49. I talked more slowly than usual

50. I had trouble waking up in the morning

51. I found myself worrying all the time

52. I woke up frequently during the night

53. It took a lot of effort for me to get going

54. I woke up much earlier than usual

55. I was trembling or shaking

56. I became anxious in a crowded public setting

57. I felt faint

58. I found it difficult to make eye contact with people

59. My heart was racing or pounding

60. I got upset thinking about something bad that happened

61. I found it difficult to talk with people I did not know well

62. I had a very dry mouth

63. I was short of breath

64. I felt like I was choking

Consent Form

Study title: Prevalence, patterns, risk and protective factors for alcohol and drug use amongst South African university students

What is the study about?

Adrian J. Bravo, from the Center on Alcoholism, Substance Abuse, and Addictions at the University of New Mexico, USA, is conducting a cross-cultural research study in collaboration with universities across 6 countries; University of Cape Town is one of the collaborating institutions. At the University of Cape Town, the Co-Principal Investigator is Debbie Kaminer, Ph.D., Associate Professor, Department of Psychology. The purpose of the research is to examine alcohol, marijuana, and prescription drug use among university students across different countries. You do not have to use alcohol, marijuana, or prescription drugs to participate in this study. You are being asked to participate in this study because you are a university student 18 years of age or older.

What will my participation involve?

Your participation will involve completing an online survey. The survey should take about 60 minutes to complete. The survey includes questions about your alcohol use, marijuana use, prescription drug use, internet/videogame use, personality traits, childhood events, mental health, and beliefs and attitudes.

Do I have to take part?

Your involvement in the study is entirely voluntary, and you may choose not to participate. There are other ways you can earn SRPP points if you prefer**.**

Will my answers to the survey be confidential and anonymous?

Your responses to the survey cannot be linked to your identifying details. At the end of the survey, you will be directed to a separate link to give your name, student number and course code in order to get your SRPP credit. This information cannot be linked to your survey responses. Therefore your survey responses will be completely anonymous. Once all survey responses have been collected, only the researchers on this study are allowed to have access to the anonymous, de-identified survey responses. No one will be able to identify any individual participant.

Are there any risks involved?

There are no known risks in this study, but some individuals may experience discomfort when answering questions about their substance use, mental health or childhood experiences. You can skip specific questions that you do not wish to answer. Because your answers cannot be linked to your identifying information, your survey responses are completely anonymous.

How will the information from this study be used?

The findings from this project will provide information on factors that influence students' decision to use alcohol/marijuana/prescription drugs, the way in which they use alcohol/marijuana/prescription drugs, and the experiences associated with use of alcohol/marijuana/prescription drugs. This will help UCT and other universities to plan substance use prevention and intervention strategies. The results may also be published in academic journals. If published, results will be presented in summary form only.

Who can I contact if I have questions about this study?

If you have any questions about this study, please feel free to contact Debbie Kaminer at 021 6503900 or debbie.kaminer@uct.ac.za. If you have questions regarding your rights as a research subject, or about what you should do in case of any harm to you arising from this study, you may contact Rosalind Adams at ph. 021 6503417 or rosalind.adams@uct.ac.za.

By clicking "Next", you will be agreeing to participate in the above described research study. If you do not wish to participate, do not click "Next", just exit the survey.

<p align="center">**Appendix G**</p>

<p align="center">**Debriefing Form**</p>

Some students use substances recreationally without experiencing any negative impacts, while for others their use of substances can cause difficulties in their academic or social functioning. Similarly, some students feel a bit sad or down some days without it having any long-lasting negative impact, while others feel sad or down for many weeks and are not able to keep up with their academic and social functioning as a result of this.

If the survey questions have left you feeling uncomfortable or worried about your substance use, or about your mood, and how these are impacting on how you are coping, please contact any of the following resources.

UCT STUDENT WELLNESS SERVICE: Health service: 021 6501020Counselling service: 021 6501017http://www.students.uct.ac.za/students/support/health-counselling/student-wellness

UCT STUDENT CARELINE:0800 24 25 26 (free from a Telkom line) or send an SMS to: 31393 for a "call-me-back" service.

CAPE TOWN DRUG COUNSELLING CENTRE (OBSERVATORY):021 4478026 or http://www.drugcentre.org.za/0214478026 0214478026 0214478026

DEPARTMENT OF SOCIAL DEVELOPMENT SUBSTANCE ABUSE LINE 24HR HELPLINE

 0800 12 13 14

 SMS 32312

LIFELINE WESTERN CAPE:*Telephone counselling*: WHATSAPP – 063 709 2620 or 021 4611111 (landline call subject to normal Telkom rates)between (09h30 to 22h00) daily*Face to face counselling*:Call 021 4611113 (town) or 021 361 9197 (Khayelitsha) to book an appointment

SADAG:011 234 4837 or http://www.sadag.org/

Destiny Helpline for Youth & Students: 0800 41 42 43

Appendix H

Ethics approval letter

DATE: January 24, 2019
IRB #:   21018
IRBNet ID & TITLE: [1357905-2]   Project CABS
PI OF RECORD: Adrian Bravo, PhD
SUBMISSION TYPE: Response/Follow-Up

BOARD DECISION: APPROVED EFFECTIVE
DATE: January 24, 2019
EXPIRATION DATE: N/A
RISK LEVEL: MINIMAL RISK
PROJECT STATUS: ACTIVE - OPEN TO
ENROLLMENT

DOCUMENTS: • Letter - Response letter (UPDATED: 01/24/2019)
                  • Other - Automatic Sona Credit through Qualtrics (UPDATED:
     01/24/2019)
                  • Other - Resources Sheet (UPDATED: 01/24/2019)
                  • Protocol - Protocol (UPDATED: 01/24/2019)
                  • Questionnaire/Survey - Questionnaire (UPDATED: 01/24/2019)

 Thank you for your Response/Follow-Up submission. The UNM IRB has
APPROVED your submission. This approval is based on an acceptable risk/benefit
ratio and a project design wherein the risks to participants have been minimized. **This
project is not covered by UNM's Federalwide Assurance (FWA) and will not
receive federal funding.**

The IRB has determined the following:

• Informed consent must be obtained and documentation has been waived for this
project. <u>To obtain consent, use only approved consent document(s).</u>

 This determination applies only to the activities described in the submission and does
not apply should any changes be made to this research. If changes are being
considered, it is the responsibility of the Principal Investigator to submit an
amendment to this project and receive IRB approval prior to implementing the
changes. A change in the research may disqualify this research from the current
review category. **If federal funding will be sought for this project, an amendment
must be submitted so that the project can be reviewed under relevant federal
regulations**.

All reportable events must be promptly reported to the UNM IRB, including: UNANTICIPATED PROBLEMS involving risks to participants or others, SERIOUS or UNEXPECTED adverse events, NONCOMPLIANCE issues, and participant COMPLAINTS.

If an expiration date is noted above, a continuing review or closure submission is due no later than 30 days before the expiration date. **It is the responsibility of the Principal Investigator to apply for continuing review or closure and receive approval for the duration of this project.** If the IRB approval for this project expires, all research related activities must stop and further action will be required by the IRB.

Please use the appropriate reporting forms and procedures to request amendments, continuing review, closure, and reporting of events for this project. Refer to the OIRB website for forms and guidance on submissions.

Please note that all IRB records must be retained for a minimum of three years after the closure of this project.

 The Office of the IRB can be contacted through: mail at MSC02 1665, 1 University of New Mexico, Albuquerque, NM 87131-0001; phone at 505.277.2644; email at irbmaincampus@unm.edu; or in-person at 1805 Sigma Chi Rd. NE, Albuquerque, NM 87106. You can also visit the OIRB website at irb.unm.edu.