

Role of ethnicity in social anxiety disorder: A cross-sectional survey among health science students

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Disorders Identification Test and Drug Use Disorders Identification Test, and depression with the Centre for Epidemiological Studies Depression Scale.

RESULTS: Of 112 students who completed the E-SPIN questionnaire, 54.4% ($n = 61$) met criteria for SAD, with significantly more females than males meeting criteria. Ethnicity had a significant effect on SAD symptomatology, but there was no effect of ethnicity on the rates of drug and alcohol abuse in students with and without SAD. Overall significantly more students with SAD met criteria for depression compared with students without the disorder.

CONCLUSION: Among university students, SAD is prevalent regardless of whether interactions are with individuals of the same or different ethnic group. However, ethnicity may be an important determinant of social anxiety for some ethnic groups. SAD was significantly associated with major depression but not significantly associated with drug or alcohol abuse.

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Key words: Social anxiety; Social phobia; Ethnicity; Students; South Africa

Abstract

AIM: To investigate the influence of ethnicity in social anxiety disorder (SAD), and the relationship with symptom severity, depression and substance use or abuse, in health sciences' students .

METHODS: This was a cross-sectional survey of 112 1st, 2nd and 3rd year students from the Faculty of Medicine and Health Sciences at Stellenbosch University, Cape Town, South Africa. The self-reported Social Anxiety Spectrum questionnaire was used to assess for SAD. The Social Phobia Inventory (SPIN) was adapted to a version called the E-SPIN (Ethnic-SPIN) in order to evaluate the effects of ethnicity. Two sub-questions per stem question were included to assess whether SAD symptoms in social interactions were ethnicity dependent. Substance use was assessed with the Alcohol Use

Core tip: We investigated the relationship between social anxiety disorder (SAD) and ethnicity, as well as its association with depression and alcohol and drug abuse, among South African students. High levels of social anxiety were present and were significantly associated with major depression but not with drug or alcohol abuse. Ethnicity was found to independently influence social anxiety symptomatology, suggesting that it is an important factor in student interactions in this context. These results contribute to the extant literature by demonstrating that different risk factors may be uniquely associated with SAD for different ethnic/racial groups, and require further exploration given South Africa's historical context.

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INTRODUCTION

Social anxiety disorder (SAD), which is characterized by a persistent fear of social or performance situations (such as public speaking) where embarrassment might occur, is a common, psychiatric condition, with a lifetime prevalence ranging from 7% to 13% in the general population^[1]. Age of onset is generally early; by age 11 in about 50% individuals and by age 20 in approximately 80% of individuals^[2]. SAD is also highly comorbid with major depression, substance use disorders and other anxiety disorders, and the lifetime prevalence of any two of the aforementioned conditions ranges from 69% to 81%^[3]. A nationally representative household survey conducted in South Africa between 2002 and 2004 found the most prevalent group of disorders to be anxiety disorders (15.8%). After agoraphobia without panic, SAD was the second most common anxiety disorder. In addition, high lifetime rates of substance abuse (13.5%) and major depression (9.8%) with an early age at onset were documented^[2,4].

Psychological treatments and medication have been shown to be effective in the treatment of SAD, with a combination of the two seeming to be most beneficial^[5-7]. Despite this, the condition remains underdiagnosed and only a small proportion of those in need receive treatment^[8], possibly due to factors such as fear of stigmatization, inability to access care due to financial issues, and lack of awareness of the disorder by both patients and service providers.

The student population is diverse and provides many opportunities for social contact and support. Academic activities require social interaction and performance as part of students' learning and assessment, while interpersonal skills are key attributes of student academic success^[9]. University or college students fall in the age range of increased risk for the onset of SAD. As well as struggling with fundamental issues related to identity and self-management, students are particularly vulnerable to experiences of social anxiety^[10,11]. Fears of confirming negative stereotypes may also play a significant role in the symptoms of SAD. A related phenomenon is the occurrence of intergroup anxiety, where interracial relations or exchanges carry the potential for intense social anxiety^[12]. Stephan *et al.*^[13] term intergroup anxiety as an emotion that involves feelings of uneasiness and awkwardness in the presence of out-group members (people from different ethnic groups than oneself). Recent literature has shown that ethnicity and culture both have a big impact on how anxiety is experienced and how individuals deal with it. In a review by Hofmann *et al.*^[14], the authors con-

cluded that an individual's social concerns need to be examined in the context of cultural, racial, and ethnic background to adequately assess the degree and expression of social anxiety and SAD. South Africa is a multicultural and multi-ethnic society and, given the particular circumstances of the country's colonial and apartheid past, it is important to understand the role of ethnicity in social interactions.

This study investigated the influence of ethnicity on social interactions and SAD, and the association of SAD with symptom severity, depression and substance use in a student sample. We hypothesised higher rates of social anxiety and distress in interactions between different ethnic groups compared with same-ethnicity interactions. We further hypothesised that ethnicity would independently predict social anxiety symptomatology and that social anxiety and distress in different-ethnicity interactions would be positively correlated with depression, alcohol and drug abuse symptomatology.

MATERIALS AND METHODS

We conducted a cross-sectional survey among health science students (medical and allied health science students) at the Stellenbosch University Faculty of Medicine and Health Sciences, Cape Town (South Africa). We sampled 1st, 2nd and 3rd year students. The faculty is representative of all the main ethnic groupings in the country (Black, Coloured, Indian, White). The study was approved by the Health Research Ethics Committee of Stellenbosch University and was conducted in accordance with The Declaration of Helsinki and Medical Research Ethical Guidelines on Human Research. After obtaining permission from the respective student departments, an invitation was sent out *via* email to all students inviting them to complete an online questionnaire on a secure online site, SurveyMonkey.com. Carlbring *et al.*^[15] have demonstrated that anxiety measures completed *via* online questionnaires show similar psychometric properties when compared with questionnaires administered through conventional methods. Survey monkey is a secure service that stores all data in an encrypted, anonymous form. In total three email invitations were sent out. We also made use of other recruitment methods, such as handing out flyers to students after lectures and advertising the survey on the local student website and on television (LCD) screens at the faculty. Students were required to provide informed consent prior to completing the survey. The informed consent form was available online and in the e-mails sent to students, and provided study information (*i.e.*, aims), as well as contact details of investigators and the ethics committee.

We developed a socio-demographic data form that was used to elicit socio-economic status (SES) and socio-demographic profiles. The SES variable was based on questions pertaining to household access to basic needs, number of inhabitants and their educational level, as well as total income. A total score out of 44 was then calculated. Three SES categories were created by dividing the

SES scores into thirds: low: 6-19, medium 20-33, high 34-44. This indicator is similar to that currently used by Statistics South Africa and has been used by others in the South African context^[16].

The social phobia inventory (SPIN) is a brief 17-item self-report instrument for measuring SAD severity. A cut off score of 19 distinguishes those with SAD from those without^[17,18]. The SPIN consists of questions that evaluate fear, avoidance and physiological discomfort. Each of the 17 items is rated on a scale from 0 to 4: not at all, a little bit, somewhat, very much, and extremely (higher scores correspond to greater distress). Scores range from 0-68. The SPIN has proved to be a useful and valid self-rated scale to assess fear, avoidance and physiological aspects of SAD. It validly measures severity of illness, is sensitive to reduction in symptoms over time, and discriminates between treatments^[18]. The internal consistency (Cronbach's alpha) for individuals with SAD was 0.92 and for combined clinical and non-clinical samples the Cronbach's alpha has been shown to be 0.95^[18]. For the current study, we adapted the SPIN to evaluate the effects of ethnicity. The E-SPIN or Ethnicity-SPIN includes two sub-questions for each stem question to determine whether respondents experience an exacerbation of SAD symptoms and greater distress when interacting with individuals from a different ethnic group compared to interactions with their own ethnic group.

The Social Anxiety Spectrum Self-Report (SHY-SR) questionnaire is a self-report inventory, used to measure the spectrum of social anxiety. It was derived from the Structured Clinical Interview for Social Anxiety Spectrum, the SCI-SHY, an interview which has previously been validated in psychiatric samples and in control groups in a large Italian multi-center study^[19,20]. The version of the SHY-SR used in the current study was the "last month" questionnaire. This version includes an appendix on substances and three domains: (1) the interpersonal sensitivity domain, which assesses hypersensitivity to criticism, judgment and refusal, discomfort when the centre of attention, low self-confidence, feeling of inferiority, poor assertiveness, and interpersonal difficulties; (2) the behavioral inhibition and somatic symptoms (BI) domain which explores social behaviour and somatic symptoms associated with social anxiety; and (3) the specific phobias (SP) domain, which assesses situations that may trigger anticipatory anxiety and avoidance behaviours. The items of the SP domain are grouped into 14 subsections, ranging from talking on the phone to dating. These questions are dichotomous (yes/no) and refer to experiences that have occurred in the last month. The instrument is designed for administration in both adults and adolescents. A variety of cut-off scores have been determined using the receiver operating characteristic curve on data used to investigate the validity and reliability of the SCI-SHY. The diagnostic cut-off score of 68, which has a sensitivity and specificity of 84.8% and 85.6%, respectively, was used here^[21].

The Center for Epidemiological Studies Depression Scale (CES-D) is a short 20-item questionnaire^[22]. Each

item is rated on a four-point scale during the last seven-day period. The scales range from "rarely or none of the time" to "most or all of the time". Scores range from 0 to 60, with higher scores indicating more symptoms of depression. CES-D scores of 16 to 26 are considered indicative of mild depression and scores of 27 or more indicative of severe depression^[23]. The CES-D has been validated in a number of studies in community and primary care populations and has good test-retest reliability^[20]. The scale has very good internal reliability, with a Cronbach's alpha value of 0.85 in the general population and 0.90 in a psychiatric population^[22].

Alcohol Use Disorders Identification Test (AUDIT) detects hazardous and harmful alcohol use^[24]. The AUDIT contains 10 items referring to alcohol consumption and alcohol-related problems in the past 12-mo period with a cut off score of 8. Responses to each question are scored from 0 to 4, giving a maximum possible score of 40. The AUDIT was designed to measure three domains; consumption (3 items), dependence (3 items) and alcohol-related consequences (4 items). In its original psychometric evaluation, 92% of those diagnosed with alcohol abuse had a score of 8 or more, while 94% of those with non-hazardous consumption had a score of less than 8^[24]. In a study that assessed the psychometric performance of three alcohol use disorder tools including the AUDIT, the AUDIT had a Cronbach alpha of 0.75^[25].

The Drug Use Disorders Identification (DUDIT) (Berman *et al*^[26], 2005) is a self-report screening instrument that focuses on current drug-related problems. The eleven items of the DUDIT were chosen to yield information on the level of drug intake and fulfillment of selected criteria for substance abuse/harmful use and dependence according to the International Classification of Diseases, 10th edition (ICD-10) and Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) diagnostic systems. Responses to each question are scored from 0 to 4 with a maximum score of 44. In the general population, the DUDIT can screen for drug-related problems at a cut-off score of 6 (for men) and 2 (for women). The DUDIT predicts drug dependence with a sensitivity of 90% for both DSM-IV and ICD-10 with a respective specificity of 78% and 88%, and has an internal reliability of 0.80.

Statistical analysis

Only completed questionnaires were included in the data analysis. Demographic variables were compared between those with SAD and those without SAD on the E-SPIN using cross-tabulations with χ^2 statistics. The SHY-SR means and standard deviations of the sample were reported using the subscale cut-off scores of the instrument. Owing to missing data, 7 items were omitted from the SH-SR questionnaire. Domain scores were transformed to a 0-100 scale which facilitated comparison of domain scores with other studies. ANOVAs (analysis of variance tests) were conducted to determine differences between groups. Furthermore, we also compared AUDIT, DUDIT and CES-D cut off scores between

Table 1 Means and standard deviations of the Ethnicity-Social Phobia Inventory (with questions of same and different ethnicity interactions), Social Anxiety Spectrum Self-Report (with subscale groups high, middle and low), Drug Use Disorders Identification Test, Alcohol Use Disorders Identification Test and Center for Epidemiological Studies Depression Scale scores of respondents

	Mean	SD
E-SPIN	22.03	12.23
Interaction same ethnicity	20.36	11.31
Interaction different ethnicity	22.23	12.84
DUDIT	1.02	2.36
AUDIT	3.31	4.42
CES-D	17.12	12.89
SHY-SR cut-off	51.77	32.12
High > 67	87.79	22.15
Middle 59-67	66.00	1.73
Low < 59	31.48	15.01
SHY-SR sub-scale raw scores		
IPS	14.00	6.49
BI	5.58	4.12
SP	31.51	22.96
Transformed SHY-SR sub-scale scores (1-100 scale)		
IPS	48.3	22.4
BI	34.9	25.8
SP	31.6	23.4

N's vary from 89 to 112 due to missing data. The diagnostic cut-off score for the SHY-SR is 68, the cut-off score of 59 identifies subjects who score high on the social anxiety spectrum but do not meet the diagnostic criteria for the social anxiety disorder (SAD). SHY-SR: Sub-scale domains includes; IPS: Interpersonal sensitivity; BI: Behavioral inhibition; SP: Specific phobia. E-SPIN: Ethnicity-Social Phobia Inventory; DUDIT: Drug Use Disorders Identification Test; AUDIT: Alcohol Use Disorders Identification test; CES-D: Center for Epidemiological Studies Depression Scale; SHY-SR: Social Anxiety Spectrum Self-Report.

students with SAD and those without SAD using χ^2 tests. Multiple regression analysis was conducted with E-SPIN scores as the dependent variable and ethnicity as the independent variable. Variables such as age, gender, SES were used as covariates in the model. We used a linear regression model to determine if ethnicity predicts E-SPIN scores (*i.e.*, whether ethnicity provides additional explanatory power to explain social anxiety symptom severity). We selected a 5% increase in overall R-squared as our effect size. All statistical analyses were performed using the SPSS 19.0 software package (SPSS Inc., Chicago, IL)^[27].

RESULTS

Of the 958 students invited to participate, responses were received from 120 students (12.5%). Respondents had a mean age of 19.68 years (SD = 2.48) and comprised of 40 (33.3%) males and 80 (66.6%) females. Given that the gender distribution of students at the university is roughly 50/50 this shows that females were more likely to complete the survey. The ethnicity of respondents was similar to that in the general undergraduate student population for Black and Coloured students (16% each), but there were significantly more Indian/Asian respondents (15% *vs* under 3% in the student population), and fewer

White respondents (48% *vs* 65% in the student population).

The majority were studying for a Bachelor of Medicine and Surgery degree 101 (84.2%), with the remainder (15.8%) being Bachelor students in Dietetics, Physiotherapy, Occupational Therapy, and Speech Language and Hearing Therapy. Of this sample, 112 finished the E-SPIN questionnaire (same and different ethnicity interactions), 90 finished the SHY-SR and DUDIT, whereas the AUDIT and CES-D were completed by 89 students. The mean SES score was 33 (range: 19-44) with all ethnic groups falling into the "high" SES category. Despite this, the difference in SES between ethnic groups approached significance, with white and black participants endorsing a higher SES than Coloured and Indian participants, based on our scale [$F(3,43) = 2.804; P = 0.051$].

Table 1 differentiates students in the sample based on clinical cut-offs on the various measures of psychopathology, and presents the means and standard deviations of the original and transformed (0-100) scores of the SHY-SR. Of the 90 students who completed the SHY-SR, 28 (31.1%) scored above the diagnostic cut-off score of 68 and had a mean score of 51.77 (SD = 32.12). High scorers (5.6%) had a mean score of 87.79 (SD = 22.15) while low scorers (63.3%) students had a mean score of 31.48 (SD = 15.01). Ethnic groups did not differ significantly on total SHY-SR scores, but there was a significant difference in the SP domain $F(3,86) = 2.867, P = 0.041$, with Coloured students scoring significantly higher than White students.

Table 2 shows the association of SAD with socio-demographic and psychopathology variables. 54.5% ($n = 61$) of students met criteria for SAD, with significantly more females 63.2% ($n = 48$), than males 36.1% ($n = 13$). More students met criteria for SAD in the context of different ethnic interactions (59.8%, $n = 67$) than in the context of same ethnicity interactions (53.6%, $n = 60$). Gender differences were present with significantly more females than males meeting criteria for SAD, both in same ethnicity [60.5% females ($n = 46$) *vs* 38.9% males ($n = 14$) ($\chi^2 = 4.598, df = 1, P < 0.05$)], and different ethnicity [67.1% females ($n = 51$) *vs* 44.4% males ($n = 16$) ($\chi^2 = 5.222, df = 3, P < 0.05$)] interactions. Further, there was an association between ethnic group and SAD in the context of same ethnic interactions; Black students experienced significantly more anxiety in interactions with others of ($\chi^2 = 8.530, df = 3, P < 0.05$).

There was no effect of ethnicity on the rates of drug and alcohol abuse in students with and without SAD. Overall significantly more students with SAD met criteria for depression (73.8%) compared with students without the disorder (26.2%), ($\chi^2 = 7.512, df = 1, P < 0.01$). This was true both for same ethnicity (73.8% *vs* 26.2%, $\chi^2 = 10.041, df = 1, P < 0.01$) and different ethnicity (73.8% *vs* 26.2%, $\chi^2 = 5.751, df = 1, P < 0.01$) interactions (Table 2).

We conducted a multiple linear regression with the E-SPIN total score as the independent variable, ethnicity as the dependent variable, and SES, age and gender as covariates. The adjusted R^2 was 0.074. In subsequent

Table 2 Social anxiety (Ethnicity-Social Phobia Inventory scores): Socio-demographic variables and associated psychopathology in students with and without social anxiety disorder

Socio-demographic status:	E-SPIN (same ethnicity)			E-SPIN (different ethnicity)		
	No-SAD <i>n</i> (%)	SAD <i>n</i> (%)	χ^2 (<i>P</i>)	No-SAD <i>n</i> (%)	SAD <i>n</i> (%)	χ^2 (<i>P</i>)
Gender						
Male	22 (61.1)	14 (38.9)	4.60 ^a	20 (55.6)	16 (44.4)	5.22 ^a
Female	30 (39.5)	46 (60.5)		25 (32.9)	51 (67.1)	
Ethnicity						
Black	3 (17.6)	14 (82.4)	8.53 ^a	3 (17.6)	14 (82.4)	6.02 (0.11)
White	31 (56.4)	24 (43.6)		27 (49.1)	28 (50.9)	
Indian/Asian	8 (47.1)	9 (52.9)		7 (41.2)	10 (57.8)	
Colored	7 (36.8)	12 (63.2)		6 (31.6)	13 (68.4)	
SES						
Low	1 (50.0)	1 (50.0)	3.84 (0.15)	1 (50.0)	1 (50.0)	5.19 (0.08)
Medium	19 (36.5)	33 (63.5)		15 (28.8)	37 (71.2)	
High	32 (55.2)	26 (44.8)		29 (50.0)	29 (50.0)	
Clinical measures:						
DUDIT						
No drug related problems	31 (41.3)	44 (58.7)	1.76 (0.18)	30 (40.0)	45 (60.0)	0.23 (0.63)
Drug related problems	9 (60.0)	6 (40.0)		5 (33.3)	10 (66.7)	
AUDIT						
No alcohol related problems	32 (42.7)	43 (57.3)	0.26 (0.61)	29 (38.7)	46 (61.3)	0.09 (0.77)
Alcohol related problems	7 (50.0)	7 (50.0)		6 (42.9)	8 (57.1)	
CES-D						
No depression	28 (59.6)	19 (40.4)	10.04 ^b	24 (51.1)	23 (48.9)	5.75 ^a
Depression	11 (26.2)	31 (73.8)		11 (26.2)	31 (73.8)	

^a*P* < 0.05, 60.5% females (*n* = 46) vs 38.9% males (*n* = 14); different ethnicity 67.1% females (*n* = 51) vs 44.4% males; and anxiety in ethnic group and SAD in the context of same-ethnic interactions-Black students vs others of their own ethnicity; ^b*P* < 0.01, students with SAD met criteria for depression (73.8%) vs students without the disorder (26.2%); same ethnicity 73.8% vs 26.2%; and different ethnicity 73.8% vs 26.2%. SES Categories Low: 6-19; Medium: 20-33; High: 34-44; E-SPIN: Ethnicity-Social Phobia Inventory; DUDIT: Drug Use Disorders Identification Test; AUDIT: Alcohol Use Disorders Identification Test; CES-D: Center for Epidemiological Studies Depression Scale; SES: Social economic status; SHY-SR: Social Anxiety Spectrum Self-Report Scale.

multiple linear regression with ethnicity excluded, the adjusted *R*² was 0.068, (a decrease of 6%). We had selected a 5% change in overall *R*-squared as the effect size, thus ethnicity had sufficient explanatory power in predicting E-SPIN scores, when controlling for age, gender and SES.

DISCUSSION

We investigated the relationship between SAD and ethnicity in a student sample, as well as its association with depression and alcohol and drug abuse. This is, to our knowledge, the first study of this nature among South African students. South Africa is a multicultural and multi-ethnic society and, given the country's colonial and apartheid past, it is important to understand the role of ethnicity in social interactions. University or college students fall in the age group of increased risk for the onset of SAD. As well as struggling with fundamental issues related to identity and self-management, students are particularly vulnerable to experiences of social anxiety^[10,11].

First, more than half of the sample (54.4%) met criteria for SAD. This rate increased to 60.8% in response to questions regarding interactions with different ethnic groups. Although these rates are significantly higher than in the general population, our sample, as a whole, does not appear to suffer more from SAD than other student samples, as former studies have tended to report higher rates using the SPIN in student populations^[1,10,28]. Stewart *et al*^[29] also

found a high prevalence of SAD in college students and suggested that normative developmental and contextual issues in the lives of college students may be contributory.

Second, SHY-SR sub-scale domain scores were relatively high, and higher than in an Italian study of 520 high school students (mean age of 18.4 years) in their last year of school^[21]. Transition from high school to a tertiary setting with the additional academic and social adaptational pressures may partially explain the higher social anxiety symptomatology in the current study.

Third, SAD was more prevalent among females which is consistent with community samples internationally^[3,30]. However, findings from student samples indicate that gender differences are not common. For instance, there was no significant main effect for gender in a study by Stewart *et al*^[11]. Further, in a study that compared a clinical sample with a non-clinical undergraduate sample, although women in the clinical sample reported relatively higher fears of criticism/embarrassment and authority than a semi-colon men, suggesting that women with SAD may be more fearful of criticism/embarrassment and more fearful of authority than men, this was not shown in the non-clinical undergraduate sample^[31].

Fourth, we found that ethnicity independently influenced severity of social anxiety symptomatology, suggesting that it is an important factor in student interactions in the South African context. Previous research in the area of intercultural communication has suggested that

uncertainty as well as anxiety are important predictors of avoidance behaviour in intercultural encounters^[32,33]. Given that the expressions of racial bias are no longer socially acceptable^[9], research on intergroup prejudice, in particular, indicates that the idea of appearing prejudiced in front of others may elicit strong social anxiety, which may emerge in interracial interactions, as well as in same-race interactions in which an individual fears social sanctions from in-group members for expressing prejudice toward an out-group^[34].

Of interest was that Black students appear to fear social disapproval from others of their own ethnicity more than from those of other ethnicities. A possible explanation for this may be that this group of students experienced greater stereotype confirmation concern, a construct described as “a chronic experience of uncertainty and apprehension about appearing to confirm as self-characteristic, a stereotype about ones’ group”^[35], among their own ethnic group. Furthermore, Coloured students were found to experience significantly more anxiety in situations that triggered anticipatory anxiety and avoidance behaviours, such as talking on the phone (the SHY-SR specific phobias domain). These results, on the contribution of ethnicity in SAD, are not strongly significant but require further exploration given the historical context, and contribute to the extant literature by demonstrating that different risk factors may be uniquely associated with SAD for different ethnic/racial groups.

SAD was significantly associated with major depression but not significantly associated with drug or alcohol abuse. These findings are consistent with a study on the prevalence of SAD and comorbidities among Nigerian undergraduates, which found that both lifetime and 12 mo depression were significantly associated with lifetime and 12 mo SAD but that there was no significant relationship between SAD and alcohol abuse^[36]. This suggests that in the student population depression is more likely to be co-morbid with SAD than substance abuse. These findings are further supported by a study of 228 American college students which found that alcohol problems were more directly related to peer influence and social networks than to social anxiety^[37]. High rates of co-morbidity with depression among university students contribute to further disability (*e.g.*, academic achievement) and quality of life impairments.

Results of this study must be considered preliminary given the small sample size and the fact that self-report measures were used. Participant bias is also an important consideration, as this was a convenience sample and only 112 of a total of 958 first, second and third year students who were invited actually participated. It is therefore plausible that the sample is skewed toward students who were more symptomatic and who chose to participate. This survey could be extended to include health science students at other universities, especially those institutions characterised by greater ethnic diversity. Furthermore, it would be advantageous to explore ways to increase student participation while keeping anonymity intact. It would also be useful to conduct a comparative analysis of

first, second and third year students to elucidate whether SAD prevalence and symptom severity intensifies or is alleviated through the undergraduate student years, particularly with regards to in- and out-group interactions.

COMMENTS

Background

Social anxiety disorder (SAD) is a common psychiatric condition that is often comorbid with major depression, substance use disorders and other anxiety disorders. University students fall in the age range of increased risk for the onset of SAD. Recent literature has shown that ethnicity and culture both impact on the experience of anxiety and how individuals deal with it, and indicate that an individual's social concerns need to be examined in the context of cultural, racial, and ethnic background to adequately assess the degree and expression of social anxiety and SAD.

Research frontiers

South Africa is a multicultural and multi-ethnic society and, given the particular circumstances of the country's colonial and apartheid past, it is important to understand the role of ethnicity in social interactions.

Innovations and breakthroughs

Although the results on the contribution of ethnicity in SAD are not strongly significant, they do require further exploration given the historical context. This study contributes to the extant literature demonstrating that different risk factors may be uniquely associated with SAD for different ethnic/racial groups.

Applications

This study indicates that ethnicity has the potential to independently influence severity of social anxiety symptomatology, suggesting that it is an important factor in student interactions, particularly in the South African context, and as such should be considered when assessing for SAD.

Terminology

SAD or social anxiety disorder is a fairly prevalent anxiety disorder that causes extreme discomfort or fear regarding being judged or evaluated by others in social interactions.

Peer review

The manuscript aims to investigate the role of ethnic factors in SAD among South African medical students. The topic is interesting and of high scientific and social significance.

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