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Comparative Study of State and Trait Anxiety of Undergraduate Smokers and Non-smokers in University of Jos, Nigeria

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Abstract: Attempt was made to compare smokers and non-smokers on levels of state and trait anxiety. Total 100 undergraduate students were assessed using the modified state/trait anxiety inventory and a questionnaire containing demographic questions and questions on respondent smoking status, smoking history and smoking behavior. The study used a two way ANOVA design and statistics to analyze the data and findings revealed a significant mean difference between smokers and non-smokers in levels of state anxiety ($F = 9.082$, $p<0.05$) and no significant mean difference in the following; between smokers and non-smokers in levels of trait anxiety, between males and females in the level anxiety ($F = 2.823$, $p>0.05$; $F = 0.143$, $p>0.05$). No significant relationship was also observed between respondents' level of smoking and level of anxiety ($r = 0.22$, $p>0.05$).

Key words: Smoking, anxiety, smokers, nonsmokers, undergraduates, Nigeria

INTRODUCTION

The main purpose of this study is to find out whether undergraduate smokers and nonsmokers are different in their level of trait and state anxiety.

It is a common knowledge that smoking causes cancer and heart disease yet many individuals regardless of their age still indulge in the habit. Smoking contributes to anxiety, blindness and infertility, to name just a few of the many health consequences (Levin and Zuckerman, 2004). Smoking is a habit that almost begins in youth-usually before age 16. If a teen graduates from high school without ever smoking, he or she probably never will (Levin and Zuckerman, 2004).

In Nigeria, smoking is more or less perceived by young people as something glamorous. A recent survey conducted by the United states centre for disease control in cross River state in Nigeria, found that as many as 45% of the young people surveyed think boys who smoke and 28% think girls, who smoke have more friends. Again, 17% think boys who smoke and 16% think girls who smoke look more attractive (Odigwe, 2003). Many smokers believe that smoking is relaxing, but recent research indicated that smoking tends to increase a young person's stress level rather than reducing it. Nicotine in itself increases feelings of anxiety but trick the smoker into believing that smoking is relaxing (Levin and Zuckerman, 2004).

A number of studies has implicated anxiety as an integral component of the nicotine withdrawal syndrome (Gilbert *et al*., 1998a, b; Hughes, 1992; Hughes *et al*., 1991; Hughes and Hatsukami, 1986). Anxiety and anxiety disorders have been associated with increased prevalence of smoking in some cross-sectional research (Patton *et al*., 1996). The relationship between anxiety and smoking appears more tenable in adults. Hughes and Hatsukami (1986) found that 47% of psychiatric outpatients with an anxiety disorder also smoked, which was significantly higher than in a population based control group.

Some research has contended that smokers feel anxious because they smoke and other research has contended that anxious people are more likely to smoke. Delfino *et al*. (2001) conducted a study that addressed this controversy. Their study required adults to keep track of their moods in a diary during two, 24 h ambulatory monitoring sessions. Their study found that smokers were more likely to report an urge to smoke when they were feeling anxious as opposed to when they were not feeling anxious. These results suggest that anxiety would lead to smoking. One drawback of this study, though, was that all measurements were taken among those who were smokers and therefore, no comparison could be made between anxiety levels in smokers versus non-smokers.

A different study conducted among young adults by Breslau *et al*. (1991) included non-smokers. This study, conducted through a home interview, found a significant relationship between anxiety disorders and both mild nicotine dependence and moderate nicotine dependence. Furthermore, Breslau *et al*. (1991) found that those participants with moderate nicotine dependence had a

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significantly higher prevalence rate of anxiety disorders than those with mild nicotine dependence. These findings did not only support the relationship between smoking and anxiety but they also showed that a higher level of smoking or nicotine dependence was related to a greater prevalence of anxiety disorders.

Several studies indicated that there was no relationship between anxiety disorders and smoking initiation. Brown *et al.* (1996) conducted longitudinal analyses that revealed no relationship between any psychiatric disorder and subsequent smoking initiation in adolescents. Similarly, Dierker *et al.* (2001) found no significant links between the presence of any anxiety disorder and later nicotine dependence. Rohde *et al.* (2004), also observed that the presence of any anxiety disorder did not predict later progression to daily smoking in individuals whose mean age was 16.6 years at baseline and 24 years at final evaluation. Similar to these findings were findings by Roy *et al.* (2001) conducted in a subset of depressed patients. Among these patients, Roy *et al.* (2001) failed to find a relationship between smoking and anxiety.

Other studies have had mixed results. Johnson *et al.* (2000) conducted a longitudinal study spanning from early adolescence to early adulthood that also supported the idea that smoking could lead to anxiety disorders. By conducting home interviews at three different ages, Johnson *et al.* (2000) found that adolescent anxiety disorders were not associated with later smoking in early adulthood. They did however, find that adolescent smoking was associated with generalized anxiety disorder later in life. These findings lent a great deal of support to the idea that smoking could lead to an anxiety disorder.

Considerable research has been conducted on the relationship between smoking and anxiety. The expanse of this research, though, it has not drawn scientists any closer to defining the relationship. Some studies support differences between smokers and non-smokers with regard to anxiety and the relationship between levels of smoking and anxiety (Delfino *et al.*, 2001; Johnson *et al.*, 2000; McCrae *et al.*, 1978). Other studies, though, have found that there is no relationship between the two (Canals *et al.*, 1996; Roy *et al.*, 2001). The findings have not always been consistent. There is little or no research that has been done or conducted in Nigeria combining these variables and assessing differences between smokers and nonsmokers in levels of anxiety.

This research will evaluate and further scientific knowledge on the comparisons between smokers and non-smokers in levels of anxiety of the participants in University of Jos. Based on the literature and the variables available within an established data set, the following untested assertions can be made. There will be a significant mean difference between smokers and non-smokers in levels of trait anxiety, there will be a significant mean difference between smokers and non-smokers in levels of state anxiety, there will be a significant gender difference in levels of smoking and anxiety, the participants' level of smoking and levels of anxiety will be significantly correlated.

MATERIALS AND METHODS

The population reached in this study was students from the University of Jos. From this population, the sample of participants drawn consisted of 100 undergraduate students from the same University. There were 57 males and 43 females with the minimum age of 18 and maximum age of 28 years, respectively. The sample also consisted of 56 self-proclaimed non-smokers (28 males and 28 female) and 44 self-proclaimed smokers (29 males and 15 females). Ninety nine percent of the participants were singles, while only 1% of the participants was married. All participants were used for the study.

The study used a 2×2 factorial design with 2 levels each, using two independent samples. The independent variables were smoking (smokers and nonsmokers). The dependent variable was the state and trait anxiety scores. The study was also correlational in nature, testing the relationship between the average number of cigarettes smoked per day and scores on the trait and state anxiety scales.

The material used in this study was a questionnaire, containing instructions, biographic section and two psychological instruments which were subsequently distributed. The materials enclosed in the questionnaire are described.

Section one of the material was made up of instructions on answering research statements on demography questions like gender, age, department, marital status, etc. Also, information about smoking was assessed. Qualification for been a smoker was assessed using the question, do you smoke cigarettes? to which participants responded either yes or no. Number of cigarettes smoked was assessed by a follow-up question asking If so, what is the average stick per day? Participants were to respond to this question with a number. Both questions were adopted from Palladino and Pritchard (2000).

Section two of the material was also made up of instructions on answering research statements on the State-Trait Anxiety Inventory (STAI). Participants in this study were given the State-Trait Anxiety Inventory (STAI). This self-report assessment consists of 20 questions pertaining to state anxiety and another 20 questions pertaining to trait anxiety. Participants rate the degree to which each item reflects how they feel at the moment (state form) or in general (trait form) on a 4-point Likert scale. State anxiety: 1 (not at all) to 4 (very much so), while trait anxiety: 1 (almost never) to 4 (almost always).

Both forms of the STAI demonstrate good to excellent internal consistency (as range from 0.86-0.95) and adequate 30 day test-retest reliability (as range from 0.71-0.75). The trait form of the STAI demonstrates good convergent validity (i.e., it correlates significantly with other measures of anxiety), it discriminates between anxious and non-anxious samples and it is sensitive to change in treatment.

Scores on the STAI have a direct interpretation: high scores on their respective scales mean more trait or state anxiety and low scores mean less trait or state anxiety.

All participants completed the questionnaires on STAI independently and information on health related issues. However, the only rand om effect for the subject condition was the involvement of both males and females with equal representation from several fields of study in the University of Jos. All participants in the study were students.

The STAI took approximately 30 min to complete. Whether, the students had state or trait anxiety was determined through a stand ardized scoring procedure. Their consent was obtained before the commencement of the research. Participants were not compensated for their participation.

RESULTS

From the Table 1, it can be seen that smokers significantly scored higher than nonsmokers on state anxiety: $F = (1.98) = 9.082$, $p<0.01$. In other words, the result obtained was statistically significant and therefore confirms hypothesis 1, which states that there will be a significant mean difference between smokers and non-smokers in levels of state anxiety. The Table 1 indicated that smokers significantly scored lower than nonsmokers on trait anxiety: $F = (1.98) = 2.823$, $p>0.05$. In other words, the result obtained was not statistically significant and did not confirm hypothesis 2, which states that there will be a significant mean difference between smokers and non-smokers in levels of trait anxiety. Nether was there a significant gender difference in levels of smoking and anxiety: $F = (1.98) = 0.143$, $p>0.706$, $p>0.05$. This did not confirm with hypotheses 3.

From the Table 2, it can be seen that for the relationship between the levels of smoking and state anxiety persons correlation yielded $r_2 = 0.22$, $p>0.826$, $p>0.05$. While, for the relationship between the levels of smoking and trait anxiety persons correlation yielded $r = 0.306$, $p<0.535$, $p>0.05$. Both results were not statistically significant and did not confirm with hypotheses 4.

Table 1: ANOVA summary table showing the effect of gender difference in levels of smoking and anxiety

	Tests of between-subjects effects					
Source	Dependent	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	Levels of smoking	3.297 (a)	1	3.297	0.143	0.706
	State	729.104 (b)	1	729.104	9.082	0.003
	Trait	137.961 (c)	1	137.961	2.823	0.096
Intercept	Levels of smoking	939.537	1	939.537	40.827	0.000
	State	231774.224	1	231774.224	2887.185	0.000
	Trait	217641.401	1	217641.401	4453.915	0.000
Gender	Levels of smoking	3.297	1	3.297	0.143	0.706
	State	729.104	1	729.104	9.082	0.003
	Trait	137.961	1	137.961	2.823	0.096
	Levels of smoking	2255.213	98	23.012		
	State	7867.136	98	80.277		
	Trait	4788.789	98	48.865		
	Levels of smoking	3201.000	100			
	State	241306.000	100			
	Trait	225357.000	100			
	Levels of smoking	2258.510	99			
	State	8596.240	99			
	Trait	926.750	99			

Table 2: Showing relationship between quantity of smoking and state and trait anxiety

		Levels of smoking	State anxiety	Trait anxiety
Levels of smoking	Person correlation	1	0.022	0.306
	Sig. (2-tailed)		0.826	0.535

DISCUSSION

In this study, 4 hypotheses were generated and tested. The results obtained from the various statistical tests for each hypothesis are discussed.

The first hypothesis which stated that there would be a significant mean difference between smokers and non-smokers in levels of state anxiety was tested using the one-way Analysis of Variance (ANOVA). The result obtained was statistically significant. In other words, smokers were found to have been significantly more anxious than non-smokers in levels of state anxiety. This is because, smoking has an effect on the levels of state anxiety and the levels of state anxiety were higher among those that smoke than those that do not smoke which may suggest that smoking is the cause of these differences. This study's finding is in conformity with similar findings by Delfino *et al.* (2001), Johnson *et al.* (2000) and McCrae *et al.* (1978), who reported differences between smokers and non-smokers with regard to state anxiety. One possible explanation for the results could be that smokers experience higher levels of state anxiety because they use smoking as an escape from their problems. By using smoking in such a manner, smokers do not deal with the problem directly rather; the problem remains and continues to cause the smoker more state anxiety. Another possible explanation could be that a lot of smokers are stressed and pressurized by economic and personal problems. They may be unemployed or working but not making enough money to take care of them. They may also be dealing with alcohol or cocaine/heroin addictions. Some may be in bad relationships in which there is physical and/or verbal abuse. All these people may smoke to feel relaxed or to give them energy while going through a hard time.

Secondly, the hypothesis which stated that there would be a significant mean difference between smokers and non-smokers in levels of trait anxiety was tested using the one-way Analysis of Variance (ANOVA). The result obtained was not statistically significant. In other words, smokers were found to have been significantly less anxious than non-smokers in levels of trait anxiety because smoking has little or no effect on the levels of trait anxiety and the levels of trait anxiety were lower among those that smoke versus those that do not smoke. They examined the relationship between trait anxiety and smoking cessation in over 2000 male Japanese government employees using a Japanese translation of the STAI. At the end of their findings, they reported that high trait anxiety did not increase the risk for smoking initiation but did predict unsuccessful plans to quit smoking. In other words, there is no liner relationship between smokers and non-smokers in the levels of trait anxiety. A possible explanation for the results could be that personality trait distinguishes a person' qualities or characteristics, while trait anxiety characterizes an individual's general tendency towards worry or anxiety and high trait-anxious people tend to be the most state-anxious on any given task.

Thirdly, the hypothesis which stated that the participants level of smoking and levels of state and trait anxiety would be significantly correlated was tested using the correlation analysis. The result obtained was not statistically significant. The findings were in line with the findings by Canals *et al.* (1996), which tested differences in anxiety between smokers and non-smokers and found no significant difference between the 2 groups. It can therefore be deduced from this findings that there is no linear relationship between the levels of smoking and levels of trait and state anxiety and an individuals' levels of smoking does not correlate with such an individual's level of state and trait anxiety. Similar to these findings, were findings by Roy *et al.* (2001), in a study conducted in a subset of depressed patients. Among these patients, Roy *et al.* (2001) failed to find a relationship between levels of smoking and anxiety. For example, a person may be a casual smoker or smokes a stick of cigarette per day, this does not determine such a persons level on state or trait anxiety.

Finally, the hypothesis stating that there would be a significant gender difference in levels of smoking and anxiety was tested using the two way Analysis of Variance (ANOVA). The results obtained were not statistically significant. The findings in the study are inconsistent with the literature by Alati *et al.* (2004), who reported gender differences in the relationships between alcohol, tobacco and mental health in patients attending an emergency department. They interviewed 812 patients; gender differences in results were evident. For men, there was a U-shaped relationship between alcohol consumption and anxiety/depression and a linear association between smoking and anxiety. For women, alcohol consumption and anxiety/depression showed a more linear relationship, but there was no significant relationship between tobacco use and anxiety/depression.

CONCLUSION

In conclusion, based on the findings in this research, the results obtained revealed that smoking has a significant main effect on state anxiety. In other words, smokers were found to have been significantly more anxious than nonsmokers on levels of state anxiety.

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