

# Prevalence and Social Determinants of Depression and Anxiety in International Residential University Students

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**Abstract:** This study has been undertaken to investigate the prevalence and social determinants of depression and anxiety in international residential students. A cross-sectional study was undertaken to investigate the prevalence and social determinants of depression and anxiety in International residential university students in Central Gujarat, India. Convenience sampling was used in this study as all the eligible subjects willing to participate in the study were admitted into the study.

**Keywords:** Depression, anxiety, prevalence, social determinants

## 1. INTRODUCTION

Mental health disorders are one of the most prevalent, chronic health conditions and depression is one of four major diseases in the world and is the most common cause of disability from disease ranking after cardiac and respiratory diseases. The prevalence and social determinants of depression and anxiety have been well documented in high-income countries whereas there is growing recognition of the problem in low- and middle-income countries. A significant gap still exists in research to measure the problem, and in strategies, policies and programs to prevent mental disorders. There is a considerable need to raise the priority given to the prevention of mental disorders and to the promotion of mental health through action on the social determinants of health.

The burden of depression and anxiety cannot be ignored as it has become a common health problem, ranking third after cardiac and respiratory diseases as a major cause of disability. According to a study published in Asian Journal of Psychiatry, 37.7%, 13.1%, and 2.4% of the students were suffering from moderate, severe, and extremely severe depression in Indian Universities. University students are at higher risk of depression, despite being a socially advantaged population, but the reported rates have shown wide variability across settings. University students are a special group of people that are enduring a critical transitory period in which they are going from adolescence to adulthood and can be one of the most stressful times in a person's life. Trying to fit in, maintain good grades, plan for the future, and be away from home often causes anxiety for a lot of students especially international students. According to Bayram & Bilgel<sup>1</sup>, the issue of students' mental health is a global problem that covers all developed and non-developed societies, both modern and traditional. Young people may face many contradictions and obligations to succeed during their academic life, especially at university. A number of studies by Yusoff<sup>2</sup> have indicated a high prevalence of mental health problems among students, including depression, compared to the rest of the population. More importantly, recent studies in this area indicate that the psychological and mental problems of students continue to increase (Field et al)<sup>3</sup>.

Social experiences influence the occurrence of depressive disorders and subsequent adverse outcomes. Social determinants such as income inequality, is associated with a higher prevalence of mental disorders, and the degree of socioeconomic disadvantage is proportionate to the risk of developing such a disorder. Moreover, when socioeconomic inequalities are perpetuated through generations, inequalities are further entrenched in depressive disorders over. The World Health Organization (WHO) Commission on the Social Determinants of Health (CSDH) has highlighted the role of health research in understanding health inequalities and inequities, and through the 2011 Rio Political Declaration, countries have committed to monitoring, understanding and addressing health inequities. The socio-demographic factors of age, gender, marital status, education and income are important factors, in explaining the variability in depression prevalence rates. Social Support and Social Cohesion have been identified as playing major roles in the transmission and progression of depression especially in International Students.

## 2. METHODS

The study was conducted with the participation of a sample comprised of 206 students (females, n=102; male, n=104) studying in Gujarat, India. This study was done on international students from 15 different countries namely Afghanistan, Bhutan, Burundi, Cameroon, Ethiopia, Ghana, Ivory Coast, Mozambique, Nepal, Nigeria, Rwanda, Sudan, Uganda, Zambia and Zimbabwe. A cross-sectional study was undertaken to investigate the prevalence and social determinants of depression and anxiety in International residential university students. Convenience sampling was used in this study as all the eligible subjects willing to participate in the study were admitted into the study. A predesigned, pretested questionnaire will be used in this research. This chapter will cover research design, methodology, target population, sampling and sampling methods, procedures for recruitment, participation, and data collection, research instruments as well as ethical considerations.

A predesigned, pretested questionnaire was used in this research. The first part of the questionnaire was designed to determine the socio-demographic profile of the respondent. The second part of the questionnaire will make use of the Berk Depression

Inventory – BDI which was created by Dr Aaron T. Beck<sup>4</sup> is one of the most widely used instruments for measuring the severity of depression and can be used as a depression screening in non-clinical people. The Beck Depression Inventory (BDI), a scale that measures the latent trait intensity of depression symptoms, can be assessed by the Item Response Theory (IRT). The 21 items of the BDI are representative of the symptoms most frequently observed in depressed people. Each statement in this inventory has a possible score range of 0 to 3, with the total score being 63 and since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. The third part of the questionnaire will use the Generalised Anxiety Disorder Assessment which was created by Dr R. L Spritzer<sup>5</sup> for assessing generalized anxiety disorder and is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of 'not at all', 'several days', 'more than half the days', and 'nearly every day', respectively, and adding together the scores for the seven questions. Scores of 5, 10, and 15 are taken as the cut-off points for mild, moderate and severe anxiety, respectively.

### 3. RESULTS

Upon first glance, the age range of the participants looks barely varied but with a closer look one can see the difference between the largest and smallest value is a range 27. The highest number of respondents had 21 years of age; in fact the age range between 21 and 23 boasts a 39.2% of the participants in the study. Age 44 is an outlier meaning an observation whose observation whose value exceeds the third quartile by a magnitude greater than the 1.5 IQR or less than the first quartile by a magnitude less than 1.5 IQR. The age mean was affected by the outlier therefore the measure of central tendency to consider in this case is the median which came up to 23.0 with a standard deviation of 3.321.

#### i. Sex

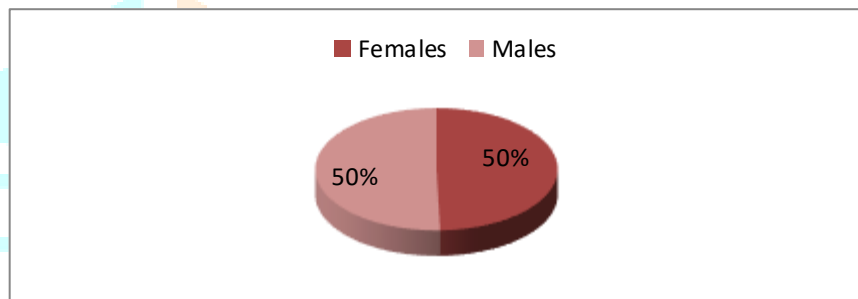


Figure 3.1 Pie chart showing the sex distribution of the study participants

The study boasts equal representation of both sexes with 102 participants being female and 104 participants being male rounding it all up to 50% for adequate representation of the sexes. In the early 1990s, it was recognized that women were represented poorly in research and that this was doing a disservice to the delivery of health care for both sexes.

#### ii. Sex and Depression

Table 3.1 Cross tabulation by sex and BDI categories

BDI Category	Females	Males	Total
Normal	74	68	142
Mild Mood	16	23	39
Borderline Clinical Depression	8	4	12
Moderate Depression	3	7	10
Severe Depression	1	2	3
Total	102	104	206

68.9% of the sample population is in the normal range as these ups and downs are considered normal, 18.9% is in the mild mod category, 5.8% are borderline clinically depressed whereas 4.9% are moderately depressed and 1.5% of the sample population tested positive for severe depression. None of the 206 participants tested positive for extreme depression. As shown in Figure 5.3.2 there are more females than males in the normal category and borderline clinical depression category however more males are in the mild mood category, moderate depression and the severe depression categories comparatively.

iii. Sex and anxiety

Table 3.2 Cross tabulation by sex and GDI categories

GAD-7 Categories	Female	Male	Total
Mild	87	76	163
Moderate	14	19	33
Severe	1	9	10
Total	102	104	206

79.1% of the sample under study is mildly depressed, 16.0% moderately depressed and 4.9% of them tested positive for severe generalised anxiety disorder. Of those who are severe, 8.7% are male compared to the 1% which is from the female population. Figure 5.3.3 shows that the majority of the females are in the mild anxiety category, whereas men tested positive for moderate and severe anxiety is high comparatively.

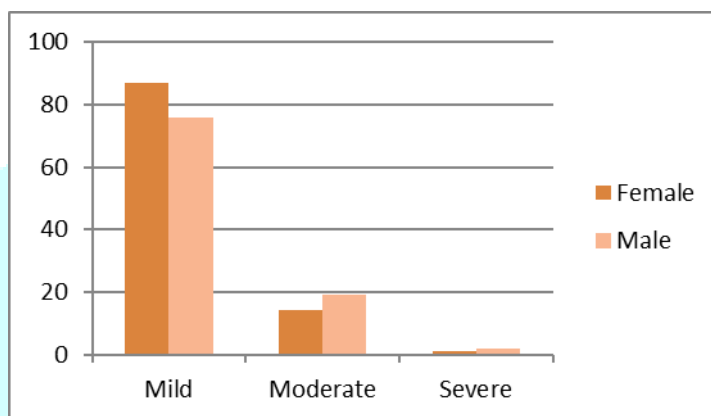


Figure 3.2 Graph on anxiety distribution of males and females

iv. Weight

The majority of the sample (61.8%) is in the normal weight range. 9.3% of the participants were underweight whilst 17.2% were overweight and 11.8% were classified as obese. The range is 71 with a highest weight of 110kg and a lowest weight of 39kg. The mean weight is 67Kg with a standard deviation of 12.843. Figure 3.3 shows the majority of the participants are in the normal weight range. More males are in the underweight range however more female participants are in the overweight, class I and II obesity range than the males.

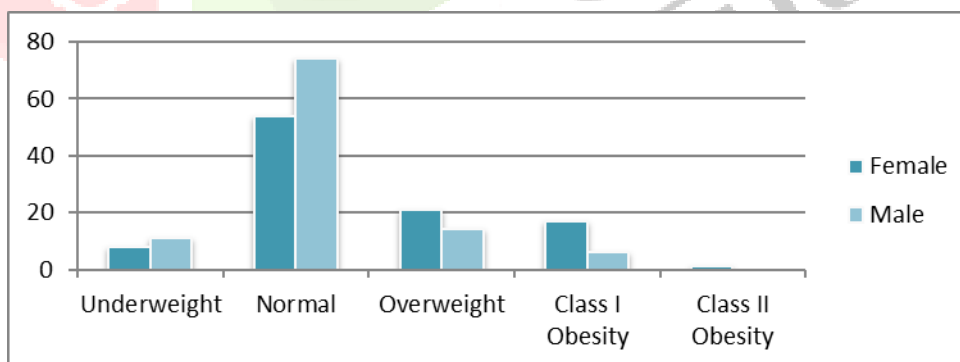


Figure 3.3 Graph distribution of weight in sexes

As shown in figure 4.5 the majority of the normal in the BDI categories are also considered as normal in terms of Body Mass Index (BMI). Also those who are considered of normal weight are also the majority in mild mood category followed by overweight category then Class I Obesity. Overweight individuals have the highest Borderline Clinical Depression category, while those considered as normal BMI are also majority in the moderate depression and severe depression.

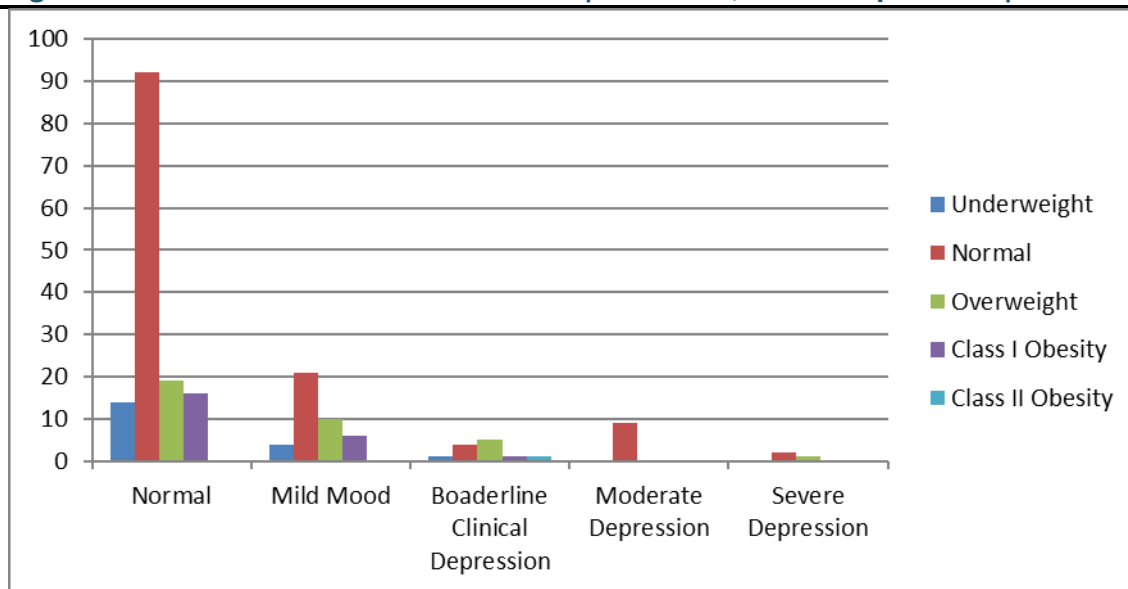


Figure 3.4 Graphical representation of association of weight and depression scores

The null hypothesis of this variable is that depression and weight are correlated. The statistical test administered was Chi-square tests and the value of the test statistic is 33.272 with degrees of freedom 16 and the p value with the calculated and the significance level came to .007. P value (0.05) > Calculated value therefore we accept null meaning there is significant association between the two variables.

Table 3.3 GAD and BMI Cross tabulation

GAD & BMI Categories	Underweig ht	Normal ht	Overweig ht	Class I Obesity	Class II Obesity	Total
Mild	18	98	29	18	0	163
Moderat e	1	20	6	5	1	33
Severe	0	10	0	0	0	10
<b>Total</b>	<b>19</b>	<b>128</b>	<b>35</b>	<b>23</b>	<b>1</b>	<b>206</b>

79.1 % of the sample under study tested positive for the mild generalised anxiety disorder category while 16.2% were screened positive for the moderate category and 4.9% for the severe category. As shown in table 3.3, the 10 people who tested positive for severe generalised anxiety disorder were all categorised as normal in the BMI categories, 20 out of 33 people who tested positive for moderate anxiety disorders were also in the normal weight range and the same goes for the 98 people who tested positive for mild generalised anxiety disorders. Of the 35 overweight individuals in the sample 29 were in the mild GAD category, and of the 23 individuals in the class I obesity 18 were in the mild GAD category whereas the one individual in the class II obesity was in the moderate GAD category. Therefore the chi-square test used for categorical data to check significant association between GAD and BMI turned out negative as p value .082 > 0.05 meaning there is no association between weight and generalised anxiety disorders.

v. Degree level and depression

Table 3.4 BDI and level of education cross tabulation

BDI Categories	Bachelors	Masters	Total
Normal	94	48	142
Mild Mood	31	8	39
Borderline Clinical Depression	7	5	12
Moderate Depression	9	1	10
Severe Depression	3	0	3
<b>Total</b>	<b>144</b>	<b>62</b>	<b>206</b>

144 of the 206 respondents are enrolled for bachelor's degrees whereas 62 of them are at Master's level. Of the 206 participants, 45.6% of those in bachelor level are in the normal range and 23.3% are in master's level. Due to the number of bachelor students being higher than masters level students they top the number in different BDI categories. Notable is that all 3 participants who are in the severe depression category are in bachelor level and the 9 out of 10 participants in moderate depression category are in bachelor level as well. The chi-square test was used for categorical data to check significant association between BDI and level of degree and the p value calculated was .158 which is greater than .05 meaning there is no significant association between the two variables.

#### vi. Degree level and anxiety

Table 3.5 GAD and level of education cross tabulation

GAD Categories	Bachelors	Masters	Total
Mild	116	47	163
Moderate	20	13	33
Severe	8	2	10
Total	144	62	206

79.1% of the respondents are in the mild generalised anxiety disorder category, 16.0% in the moderate category and 4.9% in the severe generalized anxiety disorder. Of the 10 in the severe category 8 are bachelor students; however of the 33 who are in the moderate category 13 are Masters Students. The chi-square test was used for categorical data to check significant association between GAD and level of degree and the p value calculated was .375 which is greater than .05 meaning there is no significant association between the two variables.

## 4. DISCUSSION

While searching literature related to depression and anxiety one cannot fail to notice a number of studies insinuating late onset of depression because physical dysfunction and low personal control add to personal and status losses. According to the Anxiety and Depression Association of America (ADAA) the median age at onset is 32.5 years old. Studies of depression and anxiety have been conducted across different populations of interest. In younger populations depression and anxiety is triggered by genetics, attention deficit and hyperactivity while in adults it is due to traumatic life events, personality, socio-economic status and stress. As this study was aimed at university students whose mean age was 23 one cannot assume any variability in terms of age of the participants in the study. However, interestingly the oldest of the sample was 44 years of age (male) with a BDI score of 9 and a GAD score of 4 while the youngest was 17 years of age (female) with a BDI score of 0 and a GAD score of 3. Both are in the normal category of BDI as well as GAD however the former's score is notably higher than the later so one may conclude that while depression can occur at any age, its onset is noticeably higher in the middle aged and elderly.

It is to be expected that the prevalence of depression and anxiety is higher in females than in males. Earlier studies have shown that Major Depressive Disorders (MDDs) affect 10% men than women due to possibly the hormonal differences between genders as women experience specific forms of depression-related illness such as premenstrual dysmenoria disorder, postpartum depression and postmenopausal depression and anxiety, that are associated with changes in ovarian hormones and could contribute to the increased prevalence in women. There is also notable disparity between rates of depression in men and women which may reflect behaviours based on learned gender roles such as learned helplessness and socioeconomic stressors which may result in depression in women. The socialisation of men which demands lack of emotion, toughness and self-sufficiency may hinder men to seek treatment due to social stigma. In this study however males had more depression and anxiety scores than females with 3:7 female to male ratio in the moderately depressed category and 1:2 in the severely depressed category as well as 1:9 in the severe generalised anxiety disorder category. Therefore, the higher scores reported by females in previous studies may be due to a greater willingness to report anxiety and depression by females or differences in settings.

Another variable of interest in the study of depression and anxiety was weight as a cause. Although weight gain is commonly associated with depression severe weight loss may also be a trigger. There has been conflict of cause and effect with many scholars debating whether depression caused weight issues or weigh issues caused depression. In this study BMI was calculated to take into account both height and weight and the result was the majority of the sample was in the normal weight range. 9.3% of the participants were underweight whilst 17.2% were overweight and 11.8% were classified as obese. The range is 71 with a highest weight of 110kg and a lowest weight of 39kg. The study found a significant association between weight and depression due to the fact that perhaps when you're depressed, you tend to be inactive and not to exercise as much, and you tend to eat more or loss of appetite may occur. Either way there seems to be a constant theme of change of eating habits recurring in these studies. The study however showed no association between weight and anxiety.

The study also attempted to find if level of education was a determinant of depression and anxiety. Numerous studies document have shown that higher education is associated with a reduced likelihood of depression through the development of a sense of mastery and self-efficacy, which in turn helps people cope with life's problems and stresses. Low education levels are also associated with low socio-economic status though this is subject to debate. Some argue that some degree programs maybe too stressful and may cause an increase in stress levels. However one cannot argue with the fact that education influence SES indicators like income and occupation. Most available theories on social determinants of health have assumed that a high socioeconomic status (SES) is universally protective across populations. Unfortunately in this study we could not measure the SES of the students as most are getting pocket money from home and the variations in amount are more or less the same therefore we could not measure its influence on depression and anxiety.

Education was available in most studies found during literature search and some studies even looked at the participants' parents' level of education as a variable in the prevalence of depression and anxiety. Studies also show that students who are from a higher socio-economic position such as a high level of social class, an educated background and economic situation, are more likely to have a sense of control. This sense of control can provide students better protection against mental health problems, namely depression, associated with moving to a university environment. While some studies found there was some form of association between education and anxiety, most studies found a negative association between education and anxiety. In this study even though there were fewer masters students than bachelor students the comparison of the highest BDI and GAD scores was enough to go by as it showed higher prevalence of depression and anxiety in bachelor students than in masters level students.

Another variable that has often been measured in previous studies looking at the prevalence of anxiety and depression of University students is support system; this may be in terms of spouses, friendships, parents and even the community. University students often leave their in bred societies to go a new place and in the case of international students they will be immersed to a different environment altogether therefore the need for building strong support systems like friendships. One of the things has to be looked at in the prevalence of anxiety and depression is social withdrawal otherwise known as loss of interest in other people and the BDI had a question for this variable. The Beck Depression Inventory (BDI) is a 21-item self-report instrument for measuring severity of depression during the past week. The first 14 items measure psychic (affective-cognitive) depressive symptoms and the last 7 items measure somatic symptoms of depression. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression (Beck et al<sup>6</sup>. In the BDI self-inventory to try and determine the prevalence of depression the question of interpersonal interest is one that is important and results showed that those people who had lost all interest in other people had comparatively higher BDI scores. Therefore social support or lack thereof is an important variable in the study of prevalence of and social determinants of depression and anxiety in residential university students.

Another variable equally important in the study of prevalence of and social determinants of depression and anxiety in residential university students is suicidal thoughts as untreated depression often leads to suicide. There is a question in the BDI asking is participants have had any thoughts about killing themselves with other options like I would like to kill myself and I would if I had the chance. Expectations would be no one would ever admit to it because of social stigma but interestingly 37 respondents admitted to having though about it but would not get through with it whereas while 6 said they would like to kill themselves and another 6 said they would if given the chance to. These thoughts are often linked to other items analysed in the BDI like feelings of guilt, low self-worth, disappointment, sadness, pessimism etc. All these variables in the BDI are equally important in the study of prevalence of and social determinants of depression and anxiety in residential university students.

Factor like excessive worrying, restlessness and intense fear may also influence prevalence of anxiety and depression in international students. One might argue these factors may also be directly linked to social support; also social media has contributed to feelings of inadequacy as people compare their reality to curated virtual lives posted by peers. Other feelings linked to the prevalence of depression and anxiety are irritability or being easily annoyed, fatigue which comes easily from doing almost nothing, change in sleep patens which may lead to insomnia or excessive sleeping as well as change in appetite. This study asked questions in each of these factors to find out the prevalence of depression and anxiety in international residential students. All the 5 participants who tested positive for severe GAD complained of getting tired from doing almost nothing, worrying too much about different things and feeling afraid as if something awful might happen, being easily irritable as well as being so restlessness that they found it hard to sit still nearly every day for the past two weeks. And these are some of the factors found in the study of prevalence of and social determinants of depression and anxiety in residential university students.

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