Evaluating Prevalence of Depression and Related Factors Among Students of an Iranian University (Case Study: Quchan University of Technology)

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Abstract
Psychological disorders such as depression are common. Many of these disorders can be evaluated and diagnosed, and above all they are preventable. This study was conducted with the aim of determining depression prevalence rate and its related factors among students of Quchan University of Technology, Quchan, Iran. In a cross-sectional study, 359 students were selected by using simple random sampling. Demographic characteristics were gathered and subjects were evaluated by the Beck’s Depression Inventory (BDI) and the Beck’s Anxiety Inventory (BAI). SPSS software was used for statistical analysis and logistic regression, Chi-square and Mann-Whitney tests were utilized for this purpose. The age mean of students was 21.02±2.57 (Mean, SD). 93 (25.9%) subjects suffer from depression and 266 (74.1%) subjects are not depressed.

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There is no significant difference between depression and each of these variables: gender, body mass index (BMI), marital status, field of study, living in dormitory, and depression (p-value >0.05); but there was significant difference between depressed and non-depressed students in terms of salary, anxiety, educational level, and satisfaction with field of study (p-value <0.05). According to the results, anxiety (OR=0.2), educational level (OR=5.03), satisfaction with field of study (OR=0.5) and monthly income (OR=3.76) impact depression. Improving the students' consultancy in universities can be helpful to decrease anxiety. In addition, consultants can prepare students for selecting their favorite field of study. Also, it is suggested that university officials provide financial facilities such as interest-free loan for students.

Keywords
Depression, Beck, College students, anxiety.

1. Introduction
Depression is the most common mental disorder in the world and has a high burden of disease in many countries (Veerman et al., 2009). Depression is the fourth field of study cause of the burden of disease in the world, that is considered as the largest share of non-lethal disease by itself (Lopez et al., 2006; Murray and Lopez, 1997). According to estimation of WHO, after cardiovascular disease, depression will be the second health and life-threatening disease across the world by 2020.

In Iran, the national study on the burden of disease and injury also suggests that mental disorders are the major health problem after deliberate and intentional event due to disability-adjusted life year measure (Naghavi et al., 2009).

However, students are usually considered as an asset in society. Multiple studies indicate that depression is common among students and as a disabling disease, it has a negative effect on academic performance (Mohammadzadeh, 2011). Students suffer from a variety of psychological disorders in a way that the prevalence of depression among students is estimated from 10.54 to 62.9 %, based on studies (Foroutani, 2005).

According to a study in Ilam University that assessed the prevalence of depression and its symptoms among college students, 76.1 % of college students have symptoms of depression (Mohammadzadeh, 2011). Another
study was conducted to assess depression among college students in the Larestan Institute of Higher Education, Larestan, Iran. The results of this study indicate a 42.5% prevalence of depression among students living in dormitories (Foroutani, 2005). There is also a study conducted by Rahimi on students at the Shiraz University to assess depression. The results show that 11.8% of students suffer from depression (Rahimi, 2014).

There are several factors that cause depression among students. For instance: age, gender, socioeconomic status, internet usage, the pressure of education, anxiety about passing the exam, growth and maturity issues, ignorance of the atmosphere of university or the dominant culture in a region that is not native to them, separation from the family, lack of interest in the field of study and not getting on with other people, may lead to a mental illness such as depression among students (Zohor and Mosakhani, 2001; Zahir et al., 2004).

Considering the prevalence of psychological disorders such as depression and the age of the onset of these disorders, and the fact that the majority of these disorders could be evaluated, diagnosed, followed up and above all prevented, it is necessary to conduct research in order to figure out the problems of students, to identify vulnerable and suspected individuals with a depression disorder. So it is possible not only to provide mental health services but also to improve the mental health of college students by consulting, psychotherapy and medication to prevent negative consequences such as educational failure and the loss of human and economic power of these active youths.

This study is done with the aim of assessing the prevalence of depression rate and related factors among students of Quchan University of Technology, Quchan, Iran.

Note. Quchan University of Technology is a state university, established in 2006. The university is officially accredited and/or recognized by the Ministry of Science, Research and Technology, Iran. Quchan University of Technology offers courses and programs leading to officially recognized higher education degrees such as bachelor’s and master’s degrees in several areas of study.
2. Materials and Methods

In this cross-sectional study 359 students out of 2000 (the total number of active students at the university) were selected according to Cochran's sample size formula. Then, the intended information is collected by using demographic questionnaire consisting of information such as age, sex, marital status, field of study, education level, height, weight, accommodation, monthly income of the family, satisfaction with the field of study as well as BDI and BAI (explained below).

BDI is one of the most common methods for measuring depression which has two forms: a short one and a long one. The long form is used in this study, which consists of 21 questions in a way that each question has scores of 0 to 3, considering different options. Hence the total score is in the range to 0 to 63. In the end, according to the instruction of the questionnaire, the cut-off point 19 is considered for determining the prevalence of depression (Hajnasiri et al., 2016). The reliability and the validity of BDI have been reported in several cases (Bonicatto et al., 1998).

BAI is a 21-question inventory that the individuals should select one of the options for each question which displays their severity of anxiety. In addition, these four options for each question is graded in four scores in the range of 0 to 3, thus its total score is in the range of 0 to 63. In this questionnaire the cut-off point 16 is used for differentiating depression (Hajnasiri et al., 2016).

BAI is designed without any depression symptoms (Beck and Steer, 1991). The validity of BAI on different occasions is confirmed by various researches (Osman et al., 2002; Vazquez Morejon et al., 2014).

Moreover performing these two questionnaires (BAI and BDI) simultaneously includes a good concurrent validity. The reliability of these two questionnaires (BAI and BDI) in internal studies estimated by Cronbach’s alpha coefficient is 0.93 and 0.92, respectively (Osman et al., 2002; Vazquez Morejon et al., 2014; Hossein Kaviani and Mousavi, 2008).

According to WHO guidelines, individuals with BMI<18.5 are underweight, a BMI between 18.5 and 25 is considered as normal weight, and individuals with BMI >= 25 are overweight (Schmatz et al., 2010).

Data extracted from questionnaires are coded and entered into the SPSS
software (version 16). Data are analyzed by descriptive statistics, Chi-square and Mann-Whitney test, as well as logistic regression. For all tests, alpha less than 0.05 is considered significant.

3. Results

Totally 359 students from various fields of study participate in this research. The age mean of the subjects is 21.02±2.57 years, 106 of which (30.3%) live in a dormitory and 244 of them (69.7%) do not live in a dormitory. Among these students, 30 (8.4%) are Master’s students and the rest (327 students, 91.6%) are Bachelor’s students. Depression status of students is assessed by standard BDI that indicates 93 of subjects (25.9%) suffer from depression and the rest (266 of the students (74.1)) are healthy.

BMI is calculated by weight and height; 37 students (10.3%) are underweight, 250 of them (69.8%) have a normal weight and 71 of them (19.8%) are overweight, and the BMI mean is 22.42±4.05. In terms of internet usage, according to students' declaration, internet usage mean is 3.71±2.76.

Since the data distribution in both depressed and healthy groups is not normal (p-value<0.05), Mann-Whitney test is used to compare age mean with internet usage mean in both healthy and depressed group. Based on Table 2, it is readily seen that there is no significant relationship between depression and both mean separately (p-value>0.05).

The results of the Chi-square test indicates that statically, there is no significant difference in terms of gender in both depressed and healthy groups (p-value=0.9). Moreover, students living in a dormitory suffer from depression more than those who do not live in a dormitory (27.9% in comparison with 21.7%), although this difference is not statistically significant (p-value=0.22).

Underweight and overweight students suffer from depression more than those with normal weight, however this difference is also not statistically significant (p-value=0.6). The results in Table 1 show that the depression rate is significantly higher for students with a low income in comparison with the others; the higher the income, the lower the depression rate (p-value=0.01).

The results also indicate that statistically, there is no significant difference in terms of marital status and field of study in both depressed
and healthy groups (p-value=0.92 and p-value=0.89, respectively). However, there is a significant difference in both groups when the educational level is considered. 27.5% of Bachelor’s students and 10.0% of Master’s students suffer from depression disorder (p-value=0.02).

Those who are satisfied with their field of study suffer from depression less (23.0%) in comparison with the ones who do not have satisfaction in their field of study (41.1%). This difference is statistically significant (p-value=0.005).

Finally, evaluating the relationship between depression and anxiety among students shows that students who are anxious (51.9%) suffer from depression significantly more than those who are not anxious (18.3%) (p-value=0.001).

In order to evaluate factors associated with depression, logistic regression is fitted with all variables and then stepwise method (backwardwald) is used. Finally, four variables are expressed as statistically significant in terms of depression: anxiety, education level, satisfaction with field of study, and income.

Table 3 shows that the odds for individuals without anxiety in comparison with anxious ones are 0.2 times more. The possibility for Bachelor’s students to develop depression is five times higher than among Master’s ones.

As for satisfaction with field of study, the odds for students with field of study satisfaction is 0.5 times more than for those who are not satisfied with their field of study. The results also show that among students with a family income below 400 dollars, the possibility of becoming depressed is 3.76 times higher than among those whose family income is 800 dollars, and also this possibility for students with a family income ranging between 400 and 800 dollars is approximately equal with the one of students whose family income is of 800 dollars (Table 3).

Table 1. Frequency and percentage of factors associated with depression

<table>
<thead>
<tr>
<th>Result</th>
<th>No Frequency (%)</th>
<th>Yes Frequency (%)</th>
<th>Depression Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2 = 1.005$</td>
<td>25 (67.6)</td>
<td>12 (32.4)</td>
<td>Lightweight</td>
</tr>
<tr>
<td>p-value</td>
<td>Count (Percentage)</td>
<td>Category</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>0.60</td>
<td>188 (75.2)</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>52 (73.2)</td>
<td>Obese</td>
<td></td>
</tr>
<tr>
<td>0.001</td>
<td>111 (74.0)</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>0.97</td>
<td>155 (74.2)</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>0.01</td>
<td>231 (74.0)</td>
<td>Single</td>
<td></td>
</tr>
<tr>
<td>0.92</td>
<td>33 (73.3)</td>
<td>Married</td>
<td></td>
</tr>
<tr>
<td>0.89</td>
<td>28 (73.7)</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 (68.5)</td>
<td>Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>48 (78.7)</td>
<td>Computer Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (72.7)</td>
<td>Chemistry Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34 (75.6)</td>
<td>Mechanic Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22 (73.3)</td>
<td>Civil Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>44 (77.2)</td>
<td>Industrial Engineering</td>
<td></td>
</tr>
<tr>
<td>0.024</td>
<td>237 (72.5)</td>
<td>Bachelor of Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27 (90.0)</td>
<td>Master of Science</td>
<td></td>
</tr>
<tr>
<td>0.227</td>
<td>176 (72.1)</td>
<td>No Dormitory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>83 (78.3)</td>
<td>Dormitory</td>
<td></td>
</tr>
<tr>
<td>0.005</td>
<td>231 (77.0)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>33 (58.9)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>0.005</td>
<td>20 (55.6)</td>
<td>Lower than 400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 (44.4)</td>
<td>Monthly income</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Mann-Whitney test results for testing abnormal quantitative variables

<table>
<thead>
<tr>
<th>Result</th>
<th>No</th>
<th>Yes</th>
<th>Depression</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>$z = -0.945$</td>
<td>183.01</td>
<td>171.38</td>
<td>Mean rank</td>
<td>Age</td>
</tr>
<tr>
<td>$z = -1.742$</td>
<td>157.81</td>
<td>178.64</td>
<td>Mean rank</td>
<td>Internet</td>
</tr>
</tbody>
</table>

Table 3. Logistic regression analysis results to examine the factors associated with depression

<table>
<thead>
<tr>
<th>95% C.I. for Exp (B)</th>
<th>Exp (B)</th>
<th>Sig</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.114, 0.386)</td>
<td>0.210</td>
<td>0.001</td>
<td>Anxiety (No)</td>
</tr>
<tr>
<td>(1.088, 23.274)</td>
<td>5.033</td>
<td>0.039</td>
<td>Education level (Bachelor)</td>
</tr>
<tr>
<td>(0.245, 1.010)</td>
<td>0.498</td>
<td>0.05</td>
<td>Satisfaction (Yes)</td>
</tr>
<tr>
<td></td>
<td>0.011</td>
<td></td>
<td>Income (more than 800)</td>
</tr>
</tbody>
</table>
According to Figure 1, which illustrates the area under an ROC curve for evaluating prediction rate by using significant variables of logistic regression, the prediction rate is 0.714, which is considered a good prediction rate of the model.

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Income (lower than 400)} & 3.726 & 0.003 \\
\hline
\text{Income (400 to 800)} & 1.112 & 0.754 \\
\hline
\text{Constant} & 0.339 & 0.19 \\
\hline
\end{array}
\]

Figure 1. Rock Curve for Dependent Effects on Depression

4. Discussion

The results of this study indicate that the majority of the subjects are girls (58.2%) and single individuals (87.3%) with the age mean (21.02±2.57). According to the BDI, the prevalence of depression rate is 25.9 in this study.

The results show that the depression rate among native students is higher than among non-native ones, however the difference is not
statistically significant, that is similar to the results of the research by Hadavi and Rostami (2012). However, these results are in contradiction with the other study by Zamanian et al. (2016) and Ildarabady et al. (2004). Due to the fact that the majority of the students come from neighboring cities, cultural similarities may be the reason of different results between this study and the others.

In the study by Sharifi et al. (2001), there is no statistically significant difference between the prevalence of depression among students who live in a dormitory and native students who do not live in a dormitory.

The findings of this study, similar to these two studies by Zamanian et al. (2016) and Sarokhani et al. (2013), indicate that the depression rate is higher among single individuals. The reason may be because of insufficient emotional support as single individuals receive less emotional support than married ones; however, this difference is not statistically significant.

Moreover, the results of this study, similar to research by Zamanian et al. (2016) and Rezaee Adriani et al. (2007), show that the number of depressed Master’s students who are married is significantly lower than the number of BA students due to students' judgment and comparison of their own field of study with the others.

The results show that statistically, there is a significant relationship between the depression score and satisfaction with field of study, similar to the result of some other researches by Zamanian et al. (2016), Baghiani Moghaddam et al. (2012), Rezaee Adriani et al. (2007), Azizi et al. (2016) and Pourmovahed et al. (2015).

Satisfaction with the field of study is considered as a strong driving force for creating motivation and reducing the incidence of depression. Any kind of activities that lead to hope in the future also have a good end impact on motivation and the capability to prevent any failure (Salehi and Pirhadi, 2002). Disappointment and dissatisfaction with the field of study have a negative effect on performance and lead to depression (Ildarabady et al., 2004).

The results of the Chi-square test show that underweight individuals suffer from depression more than those with a normal weight and than overweight ones. However, the difference is not statistically significant (p-value=0.605). The findings are consistent with the results of the research by Pasdar et al. (2013).
The results indicate a significant relationship between depression and family income, similar to the results of the study by Hasanzadeh et al. (2011). The prevalence of depression among students with a family income lower than 400 dollars is 44.4%, among those with a family income ranging between 400 and 800 dollars is 26.2%, and among those with a family income higher than 800 dollars, it is 21.8%.

In the study by Zohor and Mosakhani (2001), students with high income suffer from depression less than the others. In the study by Ibrahim et al. (2012), a significant difference between the prevalence of depression and family income was reported. The more family income increases, the lower the depression rate is. It is reasonable that having sufficient family income gives you peace of mind.

In this study the results indicate that anxious individuals suffer from depression significantly more than those without anxiety.

The studies by Dehdari et al. (2013) and by Rezaee Adriani et al. (2007), show a significant difference as well as a positive correlation between the mean score of anxiety and the mean of depression, meaning that the increase in any of these variables leads to increase in another mean.

According to the reference book, depression is more prevalent among those aged 20 to 40 (Kaplan and Sadock, 1988). In terms of the age range, the subjects of this study are in danger of becoming depressed more, although there is no significant relationship between the age and prevalence of depression due to lack of different range of ages, that is consistent with the results of the study by Amani et al. (2004) and Rashidi (2001).

There is no significant relationship between the field of study and depression, which is in contradiction to the results of the study by Elyasi (1991) and Mohammadzadeh (2011).

In the study by Elyasi (1991) a significant relationship was found between depression and two fields of study: educational sciences and the humanities, in comparison with natural and technical sciences. There is an attitude toward humanities in the society, that the former deal with subjective and mental aspects, while the latter are objective and practical. Since all the respondents in our study are students of the Faculty of Engineering and Technology, our findings might contradict this attitude. There is no significant relationship between depression and any of these variables: gender, marital status and internet usage.
In order to determine the strongest predictors of depression among independent variables (BMI, gender, marital status, field of study, anxiety, educational level, accommodation, satisfaction with the field of study, age, income and internet usage) logistic regression is fitted by using stepwise method (backwardwald).

Finally, the variables of anxiety, educational level, life satisfaction and income impact on depression.

The study by Jahanian Sadatmahalleh et al. (2014) also shows that there is a significant relationship between low education and depression by using multiple linear regression. In addition, the study by Ahmadi et al indicates that there is no significant relationship between gender and depression by using stepwise regression.

5. Conclusion

Due to the relatively high prevalence of depression among students (25.9%), some measures should be taken to reduce the incidence of these disorders. Improving the students' consultancy and psychiatric services in dormitories and also in colleges, as well as the periodic assessment of students’ mental health for timely diagnosis and treatment, can reduce these disorders.

On the one hand, counselors' planning for students’ psychological preparation for entering the universities at high school as well as for choosing their favorite field of study, and on the other hand, university officials’ planning for assessing jobs to students and preparing financial facilities such as interest-free loan, are recommended for solving the financial problems.

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Conflicts and interest
The authors declare that there are no conflicts of interest.

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