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Evaluation of the Correlations between Depression, Anxiety, and Stress as DASS-21 Subscales and High-Risk Behaviors in the Adolescents in Torghabeh and Shandiz Towns, Iran

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ABSTRACT

Introduction: Adolescence is a critical period in life, which is associated with tumultuous transitions and "storm and stress. The present study aimed to evaluate the correlation between depression, anxiety, and stress with the high-risk behaviors among the adolescents in Torghabeh and Shandiz towns, Iran.

Materials and Methods: This cross-sectional study was conducted on 90 adolescents from the high schools. Participants were selected via two-stage sampling. Data were collected using the validated Depression, Anxiety, and Stress Scale (DASS-21) and history of high-risk behaviors in the students. Data analysis was performed in SPSS version 16.

Results: Variable degrees of depression, anxiety, and stress were reported in 43.3%, 43.3%, and 38.9% of the students, respectively. Although the difference was not statistically significant, female students were more affected by the mentioned disorders compared to the male students. Among the high-risk behaviors, smoking cigarettes was significantly correlated with the depression, anxiety, and stress subscales. In addition, a significant association was observed between opium consumption and stress. However, no significant correlation was observed between smoking hookah and the DASS-21 subscales. Regular alcohol consumption was found to be significantly correlated with the higher rate of depression in the studied adolescents. Also, premarital sexual behaviors had a significant association with the stress and depression subscales.

Conclusion: Lack of attention to depression, anxiety, and stress and their risk factors in adolescents may lead to variable degrees of life dissatisfaction in the community. Therefore, it is recommended that on-school mental screening programs be performed for high-school students in order prevent these complications.

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Introduction

Adolescence is a critical period in life, which is associated with tumultuous transitions and heightened "storm and stress" (1).

Adolescents may face various stressors, such as concerns about family relations, school performance, friendships and relationships, and financial constraints. Inability to cope with the demands in these situations could increase the risk of depression, anxiety, and substance abuse in adolescents (2).

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According to statistics, the prevalence of anxiety increased from 7% in 2000 to 13% in 2007 among American young adults.

Previous studies have shown that if untreated, anxiety disorders may lead to several behavioral, mental, and physical complications in adolescents, such as alcohol dependence, nicotine addiction, drug abuse, suicide, and depression (3). According to the literature, some temporal, emotional, and behavioral disorders are associated with drug abuse, and 40% of drug addicts (opium or non-opium drugs) often show the diagnostic criteria of depression at some point in life (4).

Other findings also confirm stress and depression as the key predictors of addiction (5-7).

In addition, some researchers believe that drug use might be a mechanism to cope with stress in many cases (8).

According to the World Health Organization (WHO), some of the most important high-risk behaviors include smoking habits and cannabis use, consumption of fatty and low-fiber foods, physical inactivity, bullying and fighting, precarious sexual behaviors, and alcohol consumption (9).

Several studies have denoted the associations of depression, anxiety, and stress with specific behaviors in adolescents, such as violence (10-14), substance abuse (15), unprotected sexual intercourse and subsequent pregnancies (16), and smoking and eating habits (17, 18). Iran is a developing country, with adolescents constituting about one-third of its total population (19). Previous studies in Iran have reported that more than 60% of young adults are faced with behavioral problems during adolescence (20).

For instance, some findings have confirmed the prevalence of mental disorders such as depression and distress among Iranian young adults (21, 22).

Furthermore, evidence suggests that the rate of substance abuse is on the rise in Iran, particularly among adolescents. According to a study on the problematic health behaviors in the Iranian adolescents, the majority of this population have used cigarettes (42.3%), alcohol (37.5%), hashish (4.4%), and opium (4.1%) during this period (20). Reduction of maladaptive coping behaviors has been shown to have a remarkable impact on diminishing depression, anxiety, and stress in adolescents (23).

However, the effective strategies in this regard are debatable, and school healthcare providers are expected to assist students in decreasing these mental health issues (24-28). The present study aimed to evaluate the prevalence of depression, anxiety, and stress among the adolescents in Torghabeh and Shandiz towns, Iran, as well as the correlations between these disorders and high-risk behaviors, such as opium consumption, tobacco use and other smoking habits, alcohol consumption, and premarital sexual behaviors.

Materials and Methods

Sampling

This cross-sectional study was conducted during the first five months of 2013.

After coordination with the Education and Training Center of Torghabeh and Shandiz towns, which are located in Khorasan Razavi province (Iran), subjects were selected from the high schools of these towns via two-stage sampling. All the high schools were divided into two strata based on the students' gender, and three schools were randomly selected as the clusters of each stratum in final sampling.

After determining the sample size, 90 students aged 15-18 years were randomly selected from three high schools in each stratum. The participants were assured of confidentiality terms and anonymity regarding their personal information.

Data were collected using the Depression, Anxiety, and Stress Scale (DASS 21) (Persian translation), which was completed by the students under the supervision of a senior medical student, and clarifying comments were provided for the students during the process.

It is also notable that the students aged more than 18 years were not among the eligible subjects based on the expert opinion of a psychiatrist and were excluded from further evaluation.

Data Collection Tools

Data collection tools included the DASS-21 and a predesigned questionnaire consisting of the demographic characteristics and history of the high-risk behaviors in the students. Some of the high-risk behaviors defined in the research were opium and opioid consumption, regular smoking and other forms of tobacco use, regular alcohol consumption, and premarital sexual experiences.

Items in the DASS-21 were scored based on a Likert scale through individual structured interviews with the participants to assess the negative states of depression, anxiety, and stress.

Each subscale in the DASS-21 has seven items, and each item comprises of a statement replied with four options reflecting the severity of the mentioned mental disorders.

Accordingly, the lowest score for each item is zero (Not True/Does Not Apply to Me), and the maximum score is three (True/Completely Applies to Me). The severity of the mental disorders was defined based on the total score of a subscale consisting of seven items in this regard.

Validity and reliability of the DASS-21 have been confirmed for the Iranian population. For instance, in a study by Sahebi, which was performed on 970 students and armies, the authors have stated that the translated version of the scale is comparable to the original version, with the internal consistency estimated at 0.77, 0.79, and 0.78 for depression, anxiety, and stress, respectively (29).

Additionally, Moradipanah reported the Cronbach's alpha of the Iranian version of DASS-21 to be 0.94 for depression, 0.92 for anxiety, and 0.82 for stress (30).

Statistical Analysis

Data analysis was performed in SPSS version 16.0) (SPSS Inc., Chicago, IL) by a biostatistician who was blinded to the identity of the participants. Prior to statistical analysis, data cleaning was carried out in order to verify the quality of the dataset. Box plot and descriptive statistics were used to identify the possible outliers and missing values.

Following that, descriptive statistics were used to describe the demographic characteristics of the subjects and assess the frequency of depression, anxiety, and stress among the students.

In addition, the correlations between two qualitative variables were evaluated using Chi-square or Fisher's exact test, and probability values of less than 5% were considered significant.

Results

Participants

In total, 90 adolescents (40 boys and 50 girls) with the mean age of 15.01±0.83 years were selected from different high schools in Torghabeh and Shandiz towns and enrolled in the present study. According to the information in Table 1, mean age of the male and female students was 15.50±0.73 and 14.56±0.61 years, respectively, which showed no statistically significant difference in this regard.

With regard to the reproductive history of the subjects, 15 students (16.6%) were married, and none of them had children.

In terms of the employment status, 13 students (14.4%) had a job. Hookah smoking was reported in 29 participants (32.2%) as the most prevalent high-risk behavior among the studied adolescents, while smoking cigarettes was reported in four students (4.4%). Moreover, four students (4.4%) consumed alcohol regularly, and three students (3.3%) reported opium use. Also, 16 students (17.7%) had premarital sexual experiences.

Family history of cigarette smoking and opium use was reported in the case of 14 (15.5%) and three students (3.3%), respectively (either parent).

DASS-21 Subscales

Almost half of the students showed variable degrees of depression (n=39; 43.3%); among these cases, 21.1% (n=19) were male, and 22.2% (n=20) were female. Anxiety was reported in 39 students (43.3%), including 18 boys (20%) and 21 girls (23.3%). Furthermore, 35 students (38.9%) showed mild stress disorder, including 16 boys (17.7%) and 19 girls (21.1%).

No significant differences were observed in the scores of the depression and anxiety subscales, as well as the stress scores, between the male and female students.

Distribution of the severity of depression, anxiety, and stress among the investigated students in terms of gender is depicted in Figure 1.

Table1: Sociodemographic Data and Frequency of High-Risk Behaviors in Adolescents in Torghabeh and Shandiz Towns (Khorasan Razavi Province, Iran) (n=90)

	Total (N=90)	Male (N=40)	Female (N=50)
Sociodemographic Characteristics			
Age (year) (Mean±SD)	15.01±0.83	15.50±0.73	14.56±0.61
Body Mass Index (kg/m^2) (Mean±SD)	21.06±5.35	21.85±6.30	20.58±4.71
Marital Status Married	15 (16.66%)	4 (10%)	11 (22%)
Employment Status (in addition to school)	13 (14.44%)	13 (32.5%)	0 (0%)
Regular Physical Exercise Yes	75 (83.33%)	34 (85%)	41 (82%)
Family History of Cigarette Smoking	14 (15.55%)	8 (20%)	6 (12%)
Family History of Opium Consumption	3 (3.33%)	2 (5%)	1 (2%)
High-Risk Behaviors			
Cigarette Smoking	4 (4.44%)	4 (10%)	0 (0%)
Opium Consumption	3 (3.33%)	3 (7.5%)	0 (0%)
Alcohol Consumption	4 (4.44%)	4 (10%)	0 (0%)
Hookah Smoking	29 (32.22%)	22 (55%)	7 (14%)
Premarital Sexual Intercourse	16 (17.77%)	12 (30%)	4 (8%)

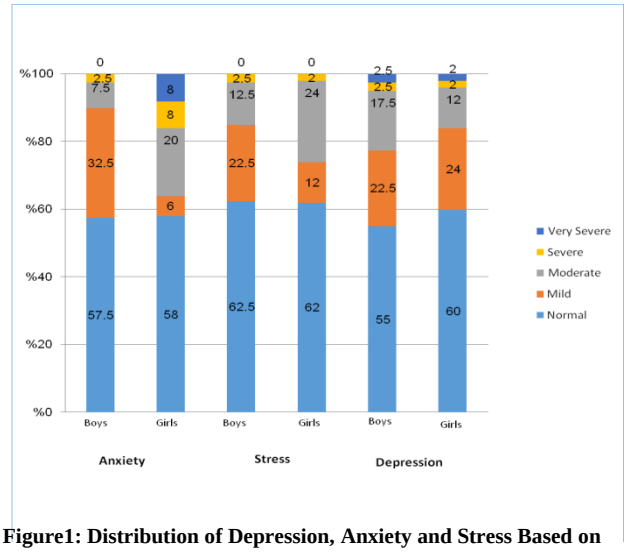

Figure1: Distribution of Depression, Anxiety and Stress Based on DASS-21 in Male and Female Adolescents in Torghabeh and Shandiz Towns (Khorasan Razavi Province, Iran) (n=90)

Correlations of DASS-21 Subscales and High-Risk Behaviors

Smoking cigarettes was significantly correlated with the depression (P=0.02), anxiety (P=0.02), and stress

subscales (P=0.01), so that the students presenting with any of these mental disorders reported regular cigarette or tobacco use. Associations between the subscales of DASS-21 and tendency for high-risk behaviors among the studied adolescents are shown in Table 2.

A significant correlation was observed between opium consumption and stress in the students (P=0.04). According to the information in Table 2, all the participants with opium consumption had variable degrees of stress. However, hookah smoking had no significant correlation with the DASS-21 subscales. Regular alcohol consumption was associated with a significantly higher rate of depression among the students (P=0.02). In fact, all the participants with regular alcohol consumption showed variable degrees of depression in the present study.

According to the findings, premarital sexual experiences had a significant correlation with the depression (P=0.01) and stress subscales (P<0.001). Among the students with depression, 11 cases (28.9%) had premarital sexual behaviors. Additionally, among the participants with the stress disorder, 12 cases (35.3%) had premarital sexual behaviors. Correlations between the DASS-21 subscales and obtained subjective data are summarized in Table 2.

Table2: Correlations between DASS-21 Subscales and Subjective Data of Male and Female Adolescents in Torghabeh and Shandiz Towns (Khorasan Razavi Province, Iran) (n=90)

	Depression (N=39)	No Depression (N=52)	P-value	Anxiety (N=39)	No Anxiety (N=52)	P-value	Stress (N=35)	No Stress (N=56)	P-value
Cigarette Smoking (N=4)	4 (10.5%)	0 (0%)	0.02	4 (10.5%)	0 (0%)	0.02	4 (11.8%)	0 (0%)	0.01
Opium Consumption (N=3)	3 (8.1%)	0 (0%)	0.07	3 (8.1%)	0 (0%)	0.07	3 (9.1%)	0 (0%)	0.04
Alcohol Consumption (N=4)	4 (10.5%)	0 (0%)	0.02	3 (7.9%)	1 (1.9%)	0.30	3 (8.8%)	1 (1.8%)	0.14
Hookah Smoking (N=29)	14 (36.8%)	15 (28.8%)	0.42	14 (36.8%)	15 (28.8%)	0.42	9 (26.5%)	20 (35.7%)	0.36
Premarital Sexual Intercourse (N=16)	11 (28.9%)	5 (9.6%)	0.01	9 (23.7%)	7 (13.5%)	0.21	12 (35.3%)	4 (7.1%)	<0.001
Gender (Male=40)	19 (48.7%)	21 (42.3%)	0.63	18 (46.2%)	22 (44.2%)	0.96	16 (45.7%)	24 (44.6%)	0.96
Marital Status Married (N=15)	6 (17.6%)	9 (17.6%)	0.95	4 (10.8%)	11 (22.9%)	0.14	6 (18.2%)	9 (17.3%)	0.91
Employed (N=13)	9 (23.7%)	4 (7.7%)	0.03	9 (23.7%)	4 (7.7%)	0.03	8 (23.5%)	5 (8.9%)	0.05
Family History of Cigarette Smoking (N=14)	9 (23.7%)	5 (9.6%)	0.07	8 (21.1%)	6 (11.5%)	0.21	9 (26.5%)	5 (8.9%)	0.02
Family History of Opium Consumption (N=3)	2 (5.3%)	1 (1.9%)	0.57	1 (2.6%)	2 (3.8%)	0.99	2 (5.9%)	1 (1.8%)	0.55

Discussion

According to the Health Behavior in School-aged Children (HBSC), which is an international coordination of the WHO, all the policymakers, practitioners, researchers, and healthcare providers who are interested in promoting the mental health and wellbeing of young adults need to discern the influence of families, schools, and socioeconomic environments on these indices (31). In the current research, we examined the mental wellbeing of 90 adolescent students in Torghabeh and Shandiz towns using the DASS-21 via cluster random sampling. DASS-21 is a self-report questionnaire, which is relatively easy to administer, making it a viable option for conducting the present study in educational settings.

According to the current research, the prevalence rate of depression and anxiety was 43.3% among the adolescents, while the frequency of stress was estimated at 38.9%. Evidence suggests that unmanaged anxiety may lead to depression and substance abuse (32-33). According to the American College Health Association (ACHA), the prevalence of depression in the young adults in the United States increased from 10% in 2005 to 15% in 2006 (34). Considering that depression in adolescents could elevate the risk of suicide in this group age, healthcare providers must pay special attention to this issue in high schools and other educational centers.

In a cross-sectional study performed on 4,599 adolescents in Tehran (Iran), Emami (2007) reported the prevalence of depression to be 19.5%, which was significantly higher in girls compared to boys (35). The mentioned study was conducted in the

capital city of Iran, while we evaluated the adolescent population in two small towns in Khorasan Razavi province. Therefore, although the rate of depression, anxiety, and stress was found to be comparatively higher among the female students, no statistically significant difference was observed between the rate of these mental disorders and gender.

In another research, Zakeri (2012) assessed 9,127 cases from all the provinces in Iran, denoting the significantly higher rate of depression and anxiety symptoms among male and female middle school and high school students, while the severity was found to be higher in the female adolescents (36). According to the literature, it seems that adolescent girls in Iran struggle more with these mental disorders compared to boys although this finding was not conclusively proven in our study. In fact, no significant differences were observed in the frequency of depression, anxiety, and stress in terms of gender, which is consistent with the results obtained by Wong (2007) and Mahmoud J.S. (2012) (37, 38). Although some studies have reported the increased risk of depression in female adolescents compared to males (38), these findings seem to be conflicting in the literature. In general, multidimensional studies must eliminate confounding variables in order to shed light on the effects of gender on mental health problems.

In the present study, some of the presumed high-risk behaviors were alcohol and opium consumption, smoking tobacco and hookah, and premarital sexual relationship. These behaviors were selected in accordance with the definition of high-risk behaviors by the WHO (9). However, modifications were made based on the cultural beliefs and geographical location of Iran. As opium has a higher consumption compared to the other addictive substances in Iran, it was added to the category of high-risk behaviors instead of cocaine, which is frequently administered in western countries (38). Moreover, high-risk sexual behaviors were defined as premarital sexual relationship in our questionnaire due to the dominant religious beliefs in Iran.

According to our findings, high-risk behaviors increased the risk of experiencing traumatic injuries by more than 10 times (9). In addition, they were observed to adversely affect the mental wellbeing of the young adults. Adolescents who were regular smokers were more likely to develop depression, anxiety, and stress disorders. In a community-oriented study conducted in Isfahan (Iran) in 2011, higher stress levels were associated with smoking habits among the sample population (39). In another research by Richardson (2012) in the United States, the authors investigated the correlations between no smoking habits (as opposed to regular smoking) with anxiety in a population of young adults aged 12-19 years (n=6,336), as well as depression in a population aged 12-15 years (n=1,884). The findings of the mentioned study indicated that the rates of anxiety and depression were higher in the subjects with regular smoking habits compared to those who never smoked (40).

According to the results of the present study, smoking hookah had no correlation with developing depression, anxiety, and stress. It has been previously reported that compared to smoking cigarettes, hookah smoking is more prevalent in the Iranian population (41). As this form of tobacco consumption is growing among the Iranian population and considering that tobacco use is a major risk factor for various life-threatening diseases, it is suggested that smoking cessation strategies be developed in schools effectively.

In the current research, regular alcohol consumption had a positive, bilateral correlation with depression, which may lead to other comorbidities, DSM-IV disorders, and even suicide (42, 43). Moreover, due to the rule of absolute prohibition of alcohol consumption in Iran, sidelong complications (e.g., delinquency and methanol toxicity) are more common in our country compared to the other regions in the world (44).

Therefore, early identification of the signs of alcohol consumption in adolescence could reduce the risk of the subsequent alcohol dependency.

According to our findings, premarital sexual behaviors were significantly correlated with the increased rate of stress among the adolescent students. In a study conducted on 403 women aged 14-25 years, Mazzaferro (2006) claimed that depression, stress, and low social support were associated with high-risk sexual behaviors, with a stronger association in adolescent girls compared to young women (45).

In the present study, outdoor working had a significant correlation with depression and anxiety among the students. According to the International Labor Organization (ILO), employment at a young age could be evidence of child labor, which is known to have adverse mental, physical, social or moral effects on adolescent students (46). However, some students may have to work due to the poor economic situation of their families, and this might lead to mental consequences in these young adults.

In general, findings of the present study demonstrated that adolescents are predisposed to some high-risk behaviors, each of which could lead to various mental disorders. Nevertheless, some confounding variables are often involved in the data collection in the studies in this regard. For instance, the frequency of some variable, such as smoking cigarettes or high-risk sexual behaviors, may be underrepresented by students due to rules and regulations of the school or religious considerations. Physical health, religion, detailed socioeconomic situation, family history, relations with the family and friends, and sexual tendency were among the confounding variables, which might have affected the final outcome of the present study.

Various other socio-demographic factors may also be involved in the mental wellbeing of adolescents, such as the economic status and religious beliefs (the latter

was similar in all our participants). Furthermore, seasonal differences and the timing of the study might have influenced some variables and should not be overlooked.

Conclusion

In line with the results of the previous studies in this regard, it is strongly recommended that on-school mental screening programs be implemented in order to raise the awareness of students and improve their mental health. Policymakers in the educational system are also expected to adopt effective strategies to follow the screenings regularly to increase the satisfaction of the students in the school environments. In addition, efforts to prevent smoking habits through a school-based program should be incorporated into mental health services. The present study aimed to investigate the correlations between high-risk behaviors and depression, anxiety, and stress among adolescent students in Iran. Lack of attention to these mental disorders and their risk factors may lead to variable degrees of life dissatisfaction in the community.

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