

Behavioral and Psychiatric Health Problems in Iranian Students During the COVID-19 Pandemic

Seyedeh Belin Tavakoly Sany

Mashhad University of Medical Sciences

Mohammad Ali Kiani

Mashhad University of Medical Sciences

Mahdi Talebi

Mashhad University of Medical Sciences

Darab Layeghi

Department of education Falavarjan

Mehri Ghasemi

Department of Education falavarjan

Maryam Taheri

Department of Education falavarjan

Ahmad reza Taheri

Department of education Falavarjan

Nooshin peyman (✉ Peymann@mums.ac.ir)

Mashhad University of Medical Sciences

Research article

Keywords: Psychiatric symptoms, COVID-19, student, Behavioral disorders, public health

Posted Date: May 13th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-506440/v1>

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Abstract

Background

the study of behavioral and psychiatric health problems in space and time, can help to improve health services for adolescents and children by increasing understanding of causes, development, and course of psychiatric disorders.

Methods

This cross-sectional study has been carried out through cluster sampling design on 322 normal students aged 12–18 attending in public high and elementary school in Esfahan, Iran. They completed study instrument that included the 110-item The Child Symptom Inventory-4 (CSI-4) and those inquiring the students' demographic information.

Results

Findings showed that 58% students met criteria for all psychiatric symptoms except of the autism and Asperger's disorders, and 39.5% suffered from more than one comorbid categories of psychiatric disorders. The most common psychiatric disorders in boys and girls were ADHD (18.5%), ODD (15%), ADHD-C (13.5%), GAD (12.8%), ADHD: HI (11.5), and MDD (10.8%).

Conclusion

Most of students suffered from more than one co-morbid category of psychiatric disorders. It is better to develop effective strategies and interventions, train students about self-protection, and establish a psychological crisis intervention team to minimize the psychological impact of the COVID-19 pandemic.

Background:

Adolescence and childhood are main stages of life for behavioral, physical and mental health (1, 2). Since, development and rapid growth of the brain take place during this time, adolescents and child obtain social-emotional and cognitive skills or abilities that form their behavioral and mental health in future and are critical for developing adult roles in community (2, 3). Psychiatric health condition (e.g., developmental disabilities, anxiety, childhood epilepsy, and depression) is considered as the important determinants of public health, and are major causes of disability and illness among children and adolescents (4, 5).

In spite of the difficulty to estimate adolescents and child's psychiatric and behavioral problems, the few available epidemiological studies indicated that 10–20% of adolescents and children experience psychiatric and behavioral problems worldwide (5). It was evidence that 50% of all psychiatric and behavioral problems start by 14 years of age (6, 7). The outcomes of not addressing psychosocial development, psychiatric health and behavioral problems for adolescents and child extend to adulthood and relevant opportunities for fulfilling lives is limited(8). Cultural, political, economic and social changes as well as the quality of the environment shapes

behavioral, mental and physical health in children and adolescents (2, 3). Early negative experiences in school, digital spaces, and homes such as the mental illness of caregiver or parents, exposure to violence, poverty and bullying, increase the risk of behavioral and psychiatric disorders and illness (9, 10).

Since December 2019, the novel coronavirus (COVID-2019) has spread rapidly all over Iran and other countries in world, and became an outbreak of acute infectious pneumonia. This pandemic has resulted in the death of 383,000 persons worldwide by January 2021 (11). This large scale public health event brought not only the risk of death from the novel coronavirus but also insufferable psychological pressure to people in Iran and the rest of the world (12). The continuous spread of strict isolation, lockdown, epidemic and delays in starting colleges, universities, and schools is expected to have multiple consequences on adolescents' behavioral and psychiatric health such as acute and chronic stress, unexpected bereavements, overuse of the Internet and social media, extended home confinement, interfamilial violence, and brutal grief (11, 12). Adolescents with psychiatric behaviors problems are at risk of a change or break in their management and care, and they may experience increased symptoms. Adolescents are vulnerable population and need careful consideration by health care systems and caregivers to allow for psychiatric health support despite the strict isolation and pandemics (11, 13). There have been reports on the psychiatric and behavioral disorders in health providers, patients, older adults, and children during the COVID-19 Pandemic (13, 14). There is no detailed study on the status of psychiatric and behavioral health condition of Iranian adolescence facing the COVID-19 pandemic has been conducted to date. Research on adolescent behavioral and psychiatric health condition in times of isolation and lockdown is necessary, as such a global pandemic could be repeated and prolonged(13).

Therefore, this study aimed to examine the behavioral and psychiatric status of adolescences during the pandemic for the addressing following questions: What is the effect of the pandemic and isolation on adolescent behavioral and psychiatric health? Could this condition increase the risk of worsening or developing behavioral and psychiatric problems? Likewise, we tried to provide a basis for psychological interventions with adolescences to regulate their behavior and emotions during outbreak and emergencies situations and decrease crisis events in society.

Methods:

Sample Size Determination and Sampling

This survey was analytical and cross-sectional study that was examined the mental health statues among Iranian adolescents during the COVID-19 pandemic from November 2020 to January 2021. Participants in this study comprised independent sample, including 322 normal students aged 12-18 attending public high and elementary school in Esfahan, Iran. Students were included if their parents have appropriate physical conditions to complete all relevant questions, they lived in Esfahan during the previous eight months, over 12 years and willingness to participate in the study. Participants were excluded if their parents were unable to give informed consent or they had suffered visual impairment or physical disability. The sample size was measured using the following formula:

$$n = \frac{Z_{1-\alpha/2}^2 \sigma^2}{d^2}$$

Where, standard normal value (Z) equal to 5%, the accuracy (d) of 0.6, standard deviation of 4.31 and the first type error was $p < 0.05$. According to the information in the study of Haleh Heizomi et al. regarding mental health status in Iranian adolescent, actual proportion of mental health status may not be more than 38%(15). After adjusting for non-response of 20%, 322 students were included as sample size.

The sampling method was cluster sampling with proportional allocation so that 12 schools were randomly selected from the public high and elementary schools of Isfahan. we initially divided Esfahan into three clusters namely central, western, and eastern, and selected 2 boys' schools and 2 girls' schools from each cluster. The first step was done on a sample consisting of 370 normal students selected proportionate to number and gender of students in each grade. Then students in each grade (students aged 12-16) were randomly selected based on proportional allocation. Overall, 370 students were enrolled, of whom 48 students did not meet the inclusion criteria, or refused to participate and finally, 322 students were included in the data analysis and completed the consent form and study instruments in a written format. A copy of demographic data questionnaire (gender, age, and live with parents) and Child Symptom Inventory-4 (CSI-4), encoded in a closed envelope, was given to the student to have his/her parents fill out and return it to the school.

Measures

The Child Symptom Inventory-4 (CSI-4) is a screening tool for monitoring the most prevalent behavioral and emotional symptoms in adolescence and children with two forms: teacher and parents report(16, 17). The psychiatric symptom count procedure allows the clinicians to recognize whether the adolescent or child is currently showing the sufficient number of psychiatric symptoms essential for CSI-4 diagnosis (17). It was evidenced that the Parent checklist has more specificity and sensitivity than the teacher checklist. Therefore, we used the parent checklist that include 17 categories of disorder symptoms and 110 items(17).

It designed by Gado and Sprafkin and consists symptom classifications for the following Diagnostic and Statistical Manual of Mental Disorders (DSM-IV): attention deficit hyperactivity disorder, Inattentive type (ADHD: I; 9 items); ADHD, hyperactive-impulsive (ADHD:HI; 9 items); oppositional defiant disorder (ODD: 8 items); ADHD, Combined type (ADHD:C; 18 items); generalized anxiety disorder (GAD: 8 items); conduct disorder (CD: 15 items); separation anxiety disorder (SAD: 6 items); schizophrenia (5 items); dysthymic disorder (8 items); major depressive disorder (MDD: 10 items); social phobia (3 items); Asperger's disorder (8 items); autistic disorder (12 items). Likewise, this tool contains single items to monitor for enuresis, encopresis, simple phobias, motor tics, vocal tics, obsessions, and compulsions. All items are scored by a two-degree scale ranged from 0 for 'never/sometimes and 1 for often/very often, indicating how often the disorder is observed. Dr Mohama Esmail et al., has examined content validity and reliability of the parent form of the CSI-4 in Iranian children, and they have confirmed its suffusion sensitivity and specificity (Cronbach's alpha: 0.78, CVI: 0.82, and CVR: 0.78)(18).

Statistical Analyses

Data were analyzed with SPSS (Chicago, Illinois, version 16.0). A descriptive statistics tests was used to describe the characteristics of the respondents. An analysis of univariate statistics was conducted to examine the significant associations between the disorders level and sample characteristics during the COVID-19 epidemic. A multivariate logistic regression analyses was used to with the objective of examining the strengths of associations between variables. A two-tailed $p < 0.05$ was considered statistically significant.

Results:

Among a total of 322 students who screened, 44.7% were female and 55.3% were male. The behavioral and psychiatric status of adolescences were determined based on CSI-4 criteria. Table 1 shows the prevalence of psychiatric disorders and its differences in boys and girls. According to the CSI-4, the autism and Asperger's disorders were not diagnosed, while other disorders were diagnosed among student population. Therefore, we interviewed with this student to confirm or reject this diagnosis. The most common psychiatric disorders in boys and girls were ADHD (18.5%), ODD (15%), ADHD (13.5%), GAD (12.8%), ADHD: HI (11.5), and MDD (10.8%). The prevalence of other disorders in this study lower than 10% among participants. As Fig. 1 shows, 42% of students reported no symptoms, 18.5% suffered from one disorder and 39.5 suffered from more than one co-morbid categories of psychiatric disorders (Fig. 1). There was significant difference between boy and girls' groups on GAD ($p = 0.042$), MDD ($p = 0.034$), enuresis ($p = 0.033$), and Encopresis ($p = 0.041$). In other words, the prevalence of GAD and MDD disorders in girl's group was much higher than boy, while the prevalence of enuresis and Encopresis disorders in boy's group was significantly high compared with girls' group. However, the prevalence of other disorders did not differ significantly between genders (Table 1).

Table 1
Frequency of psychiatric symptoms in normal students by comparing the genders

Disorders	Number of items	Acceptable score	Gender <i>n</i> (%)			χ^2
			Total (<i>n</i> = 322)	Boy (<i>n</i> = 178)	Girl (<i>n</i> = 144)	
ADHD	9	6	58 (18.5%)	25 (14.04)	23 (15.9)	0.42
ADHD:HI	9	6	35 (11.5)	19 (10.6)	16 (11.3)	0.75
ADHD:C	18	12	43 (13.5%)	20 (11.2)	23(15.9)	0.16
ODD	8	4	48 (15)	28 (15.7)	20(13.8)	0.26
CD	15	3	8 (2.4)	4(2.2)	4(2.7)	0.82
GAD	8	1	41 (12.8)	18(10.1)	23(15.9)	0.042
SAD	8	3	20 (6.3)	10 (5.6)	10 (6.9)	0.26
Schizophrenia	5	2	9 (2.9)	5(2.8)	4(2)	0.08
MDD:	10	5	35 (10.8)	15(8.4)	20(13.8)	0.034
Dysthymic disorder	8	3	4 (1.24)	1(0.56)	3(2)	0.065
Autistic disorder	12	6	0	0	0	0
Asperger's disorder	8	3	0	0	0	0
Social phobia	3	3	26 (8.2)	14(7.8)	12(8.3)	0.43
Enuresis	1	1	14 (4.3)	10(5.6)	4(2.7)	0.033
Encopresis	1	1	3(1)	2(1.1)	1(0.69)	0.041
Specific phobias	1	1	11 (3.4)	5(2.8)	6(4.1)	0.072
Obsessions act	1	1	18 (5.7)	10(5.6)	8(5.5)	0.48
Obsessions thought	1	1	25 (7.8)	11(6.1)	13(9)	0.11
Motor tics	1	1	21 (6.4)	11(6.1)	10(6.9)	0.87
Vocal tics	1	1	8 (2.4)	3(1.7)	5(3.4)	0.062

n = number of participants; ADHD = attention deficit hyperactivity disorder; I = inattentive; HI = hyperactive-impulsive; C = combined; ODD = oppositional defiant disorder; CD = conduct disorder; GAD = generalized anxiety disorder; SAD = separation anxiety disorder; MDD = major depressive disorder; *p-value: estimated significant differences of disorders between boy and girl's group at $p < 0.001$ and $p < 0.05$.

Table 2 shows the occurrence of psychiatric disorders and its differences in different age groups. Mean age of students was 13.67 ± 4.8 , 55.3% of them were 12–15 years and 44.7 were 16–18 years. As shown, the two most prevalent disorders in student ages 12 to 15 years were related to ADHD, ADHD: HI, ADHD: C, ODD, and GAD. In student ages 16 to 18 years, the most frequent disorders were related to ADHD, ODD, GAD, and MMD. There was significant difference between these groups on MDD ($p = 0.041$), enuresis ($p = 0.023$), and Encopresis ($p = 0.031$). The prevalence of MDD disorders in student 16–18 years of age was much higher than students ages 12 to 15 years, while the prevalence of enuresis and Encopresis disorders were significantly high in students ages 12 to 15 years compared with other students. Other psychiatric disorders were compared between two age group and no statistically significant differences were observed (Table 2).

Table 2
Frequency of psychiatric symptoms in normal students by comparing the age group

Disorders	Age, (years)		χ^2	
	n (%)			
	Total (n = 322)	12–15 (n = 170)	16–18 (n = 152)	p-value
ADHD	58 (18.5)	31 (18.2)	27 (17.8)	0.77
ADHD:HI	35 (11.5)	21 (12.3)	14 (9.2)	0.38
ADHD:C	43 (13.5)	27(15.8)	15 (9.8)	0.076
ODD	48 (15)	23 (13.5)	25(16.4)	0.36
CD	8 (2.4)	3(1.76)	5(3.2)	0.061
GAD	41 (12.8)	21 (12.3)	20(13.1)	0.81
SAD	20 (6.3)	7 (4.1)	13 (8.5)	0.26
Schizophrenia	9 (2.9)	6(2.8)	3(2)	0.08
MDD:	35 (10.8)	15(8.4)	20(13.8)	0.041
Dysthymic disorder	4 (1.24)	1(0.56)	3(2)	0.065
Autistic disorder	0	0	0	0
Asperger's disorder	0	0	0	0
Social phobia	26 (8.2)	14(7.8)	12(8.3)	0.43
Enuresis	14 (4.3)	10(5.6)	4(2.7)	0.023
Encopresis	3(1)	2(1.1)	1(0.69)	0.031
Specific phobias	11 (3.4)	5(2.8)	6(4.1)	0.072
Obsessions act	18 (5.7)	10(5.6)	8(5.5)	0.48
Obsessions thought	25 (7.8)	11(6.1)	13(9)	0.11
Motor tics	21 (6.4)	11(6.1)	10(6.9)	0.87
Vocal tics	8 (2.4)	3(1.7)	5(3.4)	0.062

n = number of participants; *p-value: estimated significant differences of disorders between boy and girl's group at p < 0.001 and p < 0.05.

Table 3 shows the prevalence of psychiatric disorders in different studies that conducted in Iran.

Table 3

Frequency of psychiatric symptoms in different studies that conducted on Iranian child and adolescents

Disorders (%)	Other study in Iran (%)							
	In this study	Paveh (20)	*Tehran (3)	**Tehran (21)	Bandar Abbas (22)	Shahrekord (4)	Systematic Review (5)	Meta-analysis (6)
ADHD	18.5	11.9	27.1	8.6	5.5(1.5–5.4)	2.5(1.3–3.7)	3.7 (1.26–8.3)	12 (9–15)
ADHD:HI	11.5		23.4	–	3.1(1.9–4.3)	3.3(1.9–4.7)	2.7(1.05–9.8)	4.1(3–5.7)
ADHD:C	13.5	–	20.6	–	3.6 (2.3–4.9)	3.5 (2.1–4.9)	2.5 (0.84–6.7)	3.5 (1.8–5.2)
ODD	15	6.2	22.4	7.3				
CD	2.4	0.3	7.5	2.6				
GAD	12.8	11.3	23.4	4.4				
SAD	6.3	1.6	15	5.9				
Schizophrenia	2.9	–	–	–				
MDD:	10.8	4.6	4.7	4.5				
Dysthymic disorder	1.24	0.8	0.9	–				
Autistic disorder	0	–	–	–				
Asperger's disorder	0	–	–	–				
Social phobia	8.2	6.2	12.1	3				
Enuresis	4.3	2.2	12.1	3.1				
Encopresis	1	0.5	12.1	1.8				
Specific phobias	3.4	2.4	15	–				
Obsession act	5.7	2.4	12.1	2.1				
Obsessions thought	7.8	2.4	12.1	2.1				
Motor tics	6.4	0.8	18.7	0.6				
Vocal tics	2.4	0.8	17.8	1.6				

* This study was conducted in students with specific learning disabilities; ** this study was conducted in normal students

Seven studies examined the prevalence of psychiatric disorders in Iranian students from 2014–2019. However, two studies were systematic review and meta-analysis that was conducted to identify the prevalence of ADHD among Iranian students and adults. Likewise, only 3 studies reported the prevalence rates of all psychiatric disorders based on the CSI-4 in Iranian student, and other studies only examined prevalence of ADHD, ADHD:HI, and ADHD:C. The total prevalence of all psychiatric symptoms in the study of Nasrin Dodangi et al in Paveh and Alavi et al in Tehran were lower than our finding in this study, while trends for all symptoms were higher in the study of Karamali Esmaili et al in Tehran in comparison with our results. This could be related to the type of study population that only included students with learning disabilities in Tehran. Likewise, total prevalence of ADHD, ADHD:HI, and ADHD:C in our study were also higher than other studies that were conducted in Iran from 1990 to 2016.

Discussion:

Studies reported that externalizing and internalizing behavior problems are the main concern in children and adolescence that influence their health, families, and society (8, 19). Therefore, monitoring psychiatric symptoms based on valid scales and questionnaires is essential to diagnose the psychiatric health problems in adolescents' life, as well as prevent problems and difficulties in future and help individuals have a better lifestyle(1, 6). Given this literature, assessing youth externalizing and internalizing behavior problems is a critical need to control and prevent these behavior problems within the school context (11–13). The main aim of this survey was to examine the frequency of psychiatric disorders in Iranian Student during the COVID-19 pandemic.

The current study shows that 58% students met criteria for all psychiatric symptoms except of the autism and Asperger's disorders, and 39.5% suffered from more than one co-morbid categories of psychiatric disorders. Several studies with a variety of methods and tools have also reported prevalence of co-morbid psychiatric disorders in different regions of Iran (3, 4, 15, 18). In Esmaili's study, 82.8% of student with learning disabilities in Tehran were diagnosed with co-morbid psychiatric disorders (3). However, the overall frequency of co-morbid psychiatric disorders in normal students in Tehran and Paveh (Western city in Iran) has been estimated at 34 % (20)and 27.8%(21), respectively. The ongoing shifts in the socio-cultural behaviors and the rapid change in cultural and social context in Iran as a developing country could be main factors that cause these psychiatric disorders(1, 3). However, similar reports regarding the frequency of co-morbid psychiatric symptoms in children and youth exist in worldwide studies (7). In China, USA, and India adolescents, the frequency of behavioral problems was 10.5%, 21.9%, 15.5%, respectively(5, 13).

Our finding showed that the most frequency of psychological disorders (except of MDD, enuresis, encopresis, and GAD) did not differ significantly between genders and the age distribution of the studied students. Likewise, the findings revealed that the disorders of ADHD, ODD, ADHD-C, GAD, ADHD: HI, and MDD were the most common disorders in students. The disruptive behavior disorders (ADHD, ADHD: HI and ADHD-C) in Iranian students has been previously discussed, and these studied confirmed the high rate of ADHD, ADHD: HI and ADHD-C in Iranian student(3, 15, 18). Further, two systematic and met-analysis studies assessed the prevalence of ADHD, ADHD: HI and ADHD-C in Iranian school-aged children and adolescents(5, 6). Their results showed that total prevalence of ADHD was 3.17% in the study of Hakim et al and 12%(5) in the study of Yadegari et al (6). It was evidenced that this differences are not acceptable based on biological setting, and cultural contexts, social facility, access rate to mental health services, and parent education and occupation could explain them better (5, 6).

In this study, the overall frequency of all disorders was higher than all previous studies in Iran (Table 3). Several surveys have indicated that public health emergencies such as COVID-19 outbreak affect mental and physical health among students and adolescence population, which expressed as fear, anxiety, stress, hyperactivity and depression(13, 14). Students' psychological disorders about COVID-19 could have been associate to the effect of the virus on student' studies quality because of increasing social distances between individuals, sedentary lifestyle, fear of infecting family, cancellation and postponing of anticipated events, and family financial loss due to lockdown(11, 12). The mental health of students may be negatively affected by suspension of the semester-end final examinations, shifting face-to-face classes to online, and unavailability of computers, high-speed internet connection, and books at home (9, 13). Therefore, it is critical need to train students about self-protection, develop effective educational interventions, and organize a psychological crisis intervention program to decrease the psychological effect of the COVID-19 pandemic.

Limitations

The findings in this survey are subject to several limitations. First, since a self-reported questionnaire based on parental reports has been used in this survey, the frequency of such symptoms in some samples could have been under or over diagnosed. A second limitation is that our findings may not be generalizable to other countries because of the cultural and social differences. Third, the physical risk factor, demographic factors (except of age and gender), and teacher's information were not examined, which were lead to bias in interpretations in the present study. Furthermore, making precise comparisons among studies is very difficult because type of sampling and the assessment tools and method, which may influence frequency of estimates.

Conclusion:

This is the first study that has documented the frequency of psychiatric disorders in Iranian Student during the COVID-19 pandemic in Esfehan, Iran, using based on CSI-4 criteria. Most of students met criteria for all psychiatric symptoms except of the autism and Asperger's disorders, and they suffered from more than one co-morbid category of psychiatric disorders. The overall frequency of psychiatric disorders in students who were attended in this study during the COVID-19 pandemic was significantly higher than that of previous studies in Iran. Category of symptoms related to ADHD, ODD, ADHD-C, GAD, ADHD: HI, and MDD disorders were the most common disorders. The findings in this recommend educational and clinical attention to co-morbid disorders following with psychosocial and pharmacological interventions program integrated with educational strategies to minimize the psychological impact of the COVID-19 pandemic.

Abbreviations:

ADHD: attention deficit hyperactivity disorder; I: inattentive; HI: hyperactive–impulsive; C: combined; ODD: oppositional defiant disorder; CD: conduct disorder; GAD: generalized anxiety disorder; SAD: separation anxiety disorder; MDD: major depressive disorder.

Declarations:

Ethics approval and consent to participate

This study was conducted after the approval and permission of Mashhad University of Medical Sciences Research Committee and was conducted with consideration of Helsinki Declaration in all phases of the study. Confidential data treatment was guaranteed. Written informed consent was obtained from the participants. Availability of data and materials Data from this study will not be openly available until planned publication outputs have been completed.

Consent for publication

Not applicable.

Availability of data and materials

Datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This study was supported by grants from the Mashhad University of Medical Science, Iran.

Authors' contributions

NP and MAK made substantial contributions to the conception or design of the work, analysis or interpretation of data. MGH, MT, ART conducted data collection. SBTS and MT drafted the work and approved the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Acknowledgements

The author wishes to express her gratitude towards the vice president of research in Mashhad University of Medical Sciences.

Ethical Approval

This study was conducted after the approval and permission of Mashhad University of Medical Sciences Research Committee and was conducted with consideration of Helsinki Declaration in all phases of the study. Confidential data treatment was guaranteed. Written informed consent was obtained from the participants.

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Figures

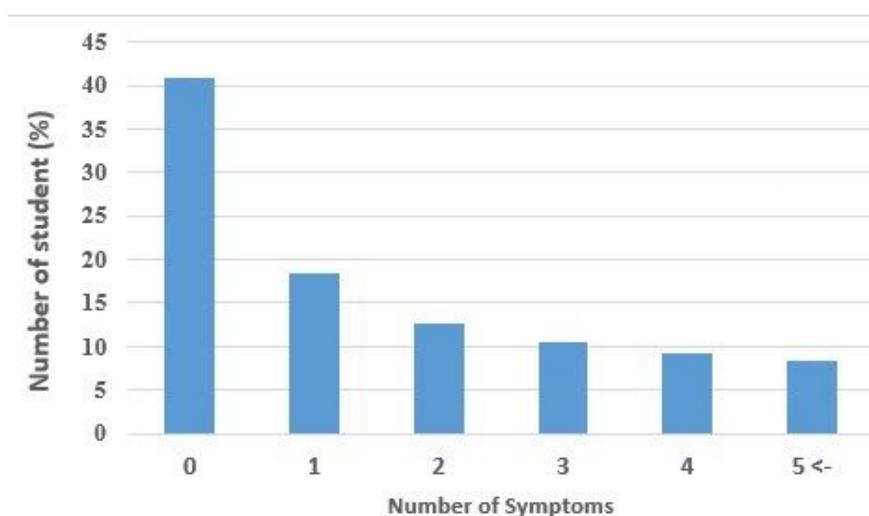


Figure 1

The frequency of co-morbid psychiatric symptoms in Iranian students