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Original article

A cross-sectional study: the prevalence of mental disorders and associated factors in middle school students in Tuy Hoa City, Vietnam in 2021

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Abstract: ***Background:*** A mental disorder is a state of mental health deviance in a period and leads to the disruption of a body's self-balance. Adolescence is a period of many psychophysiological changes, and several factors which are related to personal characteristic, family and school could adversely affect a child's mental well-being. The objectives of the study were to determine the prevalence of mental disorders and ascertain some associated factors in middle school students (ages 12-15) in Tuy Hoa city, Phu Yen province, Viet Nam 2021. ***Materials and methods:*** A cross-sectional study was conducted from March to April on 539 students and parents at middle schools in Tuy Hoa city, Viet Nam in 2021. Parents were requested to complete the Strengths and Difficulties Questionnaire (SDQ). ***Results:*** The prevalence of having mental disorders in middle school students was 22.7%. The difference between the prevalences of having mental disorders in male and female students was statistically significant (p=0.014), grade lever (p=0.020), conduct (p=0.040), concern from parents (p=0.046), family conflicts (p=0.029), being scolded for making mistakes by parents (p=0.004) and being bullied by classmates (p=0.045). ***Conclusion:*** Experiencing mental disorders was relatively prevalent among middle school students. Some factors which were related to family and school environments were found associated with psychiatric disorders. Therefore, interventions and cooperation from parents and school officers are essential to mitigate students' sufferings caused by mental health problems, promote psychological well-being, or preclude psychoses from occurring.

Keywords: mental health; mental disorder; SDQ; cross-sectional study.

1. INTRODUCTION

A mental disorder is a state of long-term deviance of one's mental health and leads to the disruption of the body's balance, thereby adversely affecting the child's development, education level and quality of life. Studies which were conducted around the world on adolescents about mental disorders recorded a range of rates of 10-20% [1]. In Vietnam, the prevalence ranged from 9.1% to 28.2% [2-5]. The above data demonstrated that mental disorders in Vietnamese adolescents have been one of the major public health problems and there has been an increasing tendency. However, most of these studies employed the Strengths and Difficulties Questionnaire – SDQ with the method of self-completion by adolescents. The utilization was a limitation since it did not reflect comprehensively the sensitivity as well as the usefulness of the results. In addition, the version of youth-self report is not appreciated in comparison with the parent-report counterpart [6]. Therefore, this study was conducted to determine the prevalence of mental disorders in school

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children by employing the expanded version of the SDQ25 for parents and ascertain the factors associated with mental disorders. From the findings of this study, appropriate interventions could be proposed to restrict the risk as well as improve mental health of students.

2. MATERIALS AND METHOD

2.1. Study design and participants

A cross-sectional study was conducted on students at middle schools in Tuy Hoa city, Phu Yen province, Viet Nam.

2.2. Measurement

The Strengths and Difficulties Questionnaire (SDQ) provides the initial assessment in clinical screening of mental disorders for subjects who are in the 4 - 16 age range [7], with 94.6% specificity (CI: 94.1 - 95.1%) and 63.3% sensitivity (CI: 59.7 - 66.9%), has been standardized in Vietnam [8, 9]. There are 5 scales in the questionnaire, including emotional symptoms (items 3, 8, 13, 16, 24), conduct problems (items 5, 7, 12, 18, 22), hyperactivity/ inattention (items 2, 10, 15, 21, 25), peer problems (items 6, 11, 14, 19, 23) and prosocial behavior (items 1, 4, 9, 17, 20). For each item, respondents are instructed to mark in only one of three boxes, which represents their responses about the item (not true, somewhat true, or certainly true), and it will be scored 0, 1 or 2 [10]. The total difficulties score is calculated by adding scores of 4 scales: emotional symptoms, conduct problems, hyperactivity/ inattention, and peer problems. The score of $\geq$ 14 reflects clinically significant mental health problems. The impact supplement (items 28, 29, 30, 31, 32) assesses the impact of perceived difficulties on a child's life, including 4 aspects: home life, classroom learning, friendship, and leisure activities [7].

Data was collected on two target groups: students and parents/ guardians of students. Self-administered questionnaires were applied for both groups. As for the group of students, information about 3 aspects of students' life was collected, including personal characteristics: gender, age, grade level (6th grade, 7th grade, 8th grade, 9th grade), academic performance (very good, good, average – below average), conduct (very good, good, average); family-related factors: living with someone (parents, a parent, other), concern from parents (yes, no), family conflicts (yes, no), being scolded for making mistakes by parents (yes, no); school-related factors: academic pressure (yes, no), concern from teachers (yes, no), receiving reprimands for making mistakes from teachers (yes, no), having intimate friends (yes, no), being bullied by classmates (yes, no).

As for parents or guardians, required information about personal characteristics of a parent included highest educational level (elementary, middle school, high school, vocational school /college, university/ postgraduate), marital status (married, separated/ divorced/ widowed/ other) and family financial status (poor, near-poor, moderate, better off, affluent). Then the parents/ guardians were requested to complete the SDQ25.

2.3. Sample size

The sample size is estimated by the following formula, with estimated prevalence of mental disorders among junior high school students was 0.21[11]. Since a multistage cluster sampling with probability proportional to size (PPS) of the commune using as the primary sampling unit was used, therefore the estimated sample size was required to multiply by design effect to account for the effects of clustering. The design effect was 2. Thus, the sample size was estimated to be 526. The non-response rate and incomplete of the answer to all questions included in this study was estimated to be about 10%, the final sample size was 579 subjects. The study was conducted from March to April on 582 middle school students in Tuy Hoa city, Phu Yen province, Viet Nam.

2.4. Method of data collection

Initially, four schools in the inner city and the suburbs were randomly selected. Then, five classes from each grade level of each school were randomly selected. In each class, students who met the inclusion criteria were included in the study. Inclusion criteria are that students in grades 6, 7, 8 and 9 from middle schools are present at the time of the study and agree to participate in the study. Exclusion criteria are that the student's parents or supervisors did not agree to participate in the study or did not complete the Strengths and Difficulties questionnaire (SDQ25) or students with health problems were unable to participate in completing the questionnaire or students were absent from both two contacts. Documents for legal guardians including self-administered questionnaires for parents, information sheets, and consent forms for participating in the study were dispatched to students. The students were asked to hand these documents to their parents/guardians for them to sign the consent form for participating in the study (if agreed) and to complete the questionnaire. After including a total of 582 students and parents in the study, eighteen parents who did not give their permission for their children to participate in the study and 25 parents who did not complete the questionnaire were excluded. Thus, the actual sample size was 539 students and their parents, an overall response rate of 93%.

2.5. Data quality control

After the survey questionnaire is collected, it will be checked for completeness of the questions to ensure that the data is fully collected.

Using data entry software Epidata version 3.2.

2.6. Statistical analysis

Sampling weight, namely grade level according to the sampling scheme used was adopted as the key characteristic to estimate the prevalence of mental disorder. In this research, weights were calculated based on the population distribution of students at Junior high school in Tuy Hoa City. STATA/SE version 14.2 (serial number 401406252951, Licensed to Truc Dang) with the svyset commands was used to adjust the standard errors for the cluster sampling design. Percentages

(%) and 95% confidence interval were utilized to measure qualitative variables as mental disorder. Chi-square tests were deployed to ascertain associations between mental disorder status and factors related to personal characteristics, family, and school. Prevalence ratios (PR) and 95% confidence intervals were employed to estimate the associations in univariate analysis. Multivariable Poisson regression model was used to control potential confounding factors which could affect the associations between mental disorder status and related factors.

2.7. Ethical considerations

The study protocol was approved in terms of research ethics from the Ethics committee for Biomedical Research, of University of Medicine and Pharmacy in Ho Chi Minh City, No. 101/HĐĐ-ĐHYD, signed on February 17, 2021. The study was granted a recommendation letter from the Department of education and training of Tuy Hoa city, Phu Yen province, Viet Nam, No. 03/GT.

3. RESULTS

There was no notable difference between the percentages of male and female. More than ½ of the participating students possessed good academic performance and approximately 90% of the students achieved good conduct (Table 1). Students with mental disorders accounted for 22.7% of the total participants. The percentage of peer problems subscale was the highest (65.1%), and the proportion of hyperactivity/ inattention was 10.0%, which was the lowest compared to other subscales (Table 2).

Table 1. Personal characteristics of the participants

Characteristics		Percentage	95% CI
Gender	Male	45.5	40.0 - 51.2
	Female	54.5	48.8 - 60.0
Age	12	24.2	23.5 - 24.9
	13	27.4	26.7 - 28.2
	14	24.1	23.7 - 24.6
	15	24.2	23.8 - 24.6
Academic performance	Very good	52.0	10.9 - 90.5
	Good	33.6	10.0 - 697
	Average - Below average	14.4	2.7 - 50.7
Conduct	Very good	89.7	67.7 - 97.3
	Good	8.6	2.4 - 26.6
	Average	1.7	0.0 - 8.9

Table 2. Mental disorder status and subscale

	Percentage	95% CI
Having mental disorders	22.7	18.1 - 28.0
Emotional symptoms	21.1	18.8 - 23.6
Conduct problems	24.7	22.4 - 27.0
Hyperactivity/ inattention	10.0	6.6 - 15.0
Peer problems	65.1	61.5 - 68.5
Prosocial behavior	18.1	14.4 - 22.5
Impact	5.1	3.4 - 7.7

Table 3. Association between mental disorder status and personal characteristics

Characteristics		Having mental disorders (%)		p value	PR (95% CI)
		Yes	No		
Gender	Male	19.1	80.9	0.013	0.74 (0.62 – 0.89)
	Female	25.7	74.3		1
Age	12	15.2	84.8		1
	13	21.4	78.6	0.206	1.41 (0.72 – 2.76)
	14	29.0	71.0	0.052	1.91 (0.99 – 3.67)
	15	25.4	74.6	0.090	1.67 (0.86 – 3.22)
Academic performance	Very good	20.1	79.9		1
	Good	22.5	77.5	0.668	1.12 (0.52 – 2.41)
	Average - Below average	32.2	67.8	0.103	1.60 (0.84 – 3.06)
Conduct	Very good	21.2	78.8		1
	Good	36.1	63.9	0.012	1.70 (1.25 – 2.33)
	Average	33.8	66.2	0.181	1.60 (0.68 – 3.77)

There were several statistically significant associations between mental disorder status and factors which were related to individual, family, and school (Table 3-5). The variables with p value <0.2 in univariate analysis were included in multivariate model. After analyzing by multivariable Poisson model, factors associated with having mental disorders included gender, grade level, conduct, concern from parents, family conflicts, being scolded for making mistakes by parents, and being bullied by classmates (Table 6).

Table 4. Association between mental disorder status and family-related factors

Characteristics		Having mental disorders (%)		p value	PR (95% CI)
		Yes	No		
Living with someone	Parents	20.1	79.9		1
	A parent	22.5	77.5	0.668	1.12 (0.52 – 2.41)
	Other	32.2	67.8	0.103	1.60 (0.84 – 3.06)
Concern from parents	Yes	21.2	78.8	0.012	0.50 (0.34 – 0.75)
	No	42.1	57.9		1
Family conflicts	Yes	33.7	66.3	0.036	1.76 (1.07 – 2.90)
	No	19.1	80.9		1
Being scolded for making mistakes by parents	Yes	24.4	75.6	0.010	1.53 (1.21 – 1.93)
	No	16.0	84.0		1

Table 5. Association between mental disorder status and school-related factors

Characteristics		Having mental disorders (%)		p value	PR (95% CI)
		Yes	No		
Academic pressure	Yes	28.8	71.2	0.007	1.57 (1.26 – 1.95)
	No	18.4	81.6		1
Concern from teachers	Yes	20.9	79.1	0.074	0.75 (0.54 – 1.06)
	No	27.7	72.3		1
Receiving reprimands for making mistakes from teachers	Yes	22.2	77.8	0.725	0.94 (0.57 – 1.56)
	No	23.6	76.4		1
Having intimate friends	Yes	20.2	79.8	0.012	0.51 (0.35 – 0.77)
	No	39.4	60.6		1
Being bullied by classmates	Yes	40.0	60.0	0.010	1.92 (1.35 – 2.73)
	No	20.7	79.3		1

Table 6. Association between mental disorder status and related factors by multivariable Poisson regression model

Characteristics		Having mental disorders			
		Crude PR (Crude 95% CI)	p value	Adjusted PR (Adjusted 95% CI)	p value
Gender	Male	0.74 (0.62 – 0.89)	0.013	0.72 (0.58 – 0.88)	0.014
Grade level	6^{th} grade	1	0.206	1	
	7^{th} grade	1.41 (0.72 – 2.76)	0.052	1.27 (0.76 – 2.11)	0.239
	8^{th} grade	1.91 (0.99 – 3.67)	0.090	1.74 (1.18 – 2.56)	0.020
	9^{th} grade	1.67 (0.86 – 3.22)	0.206	1.39 (0.84 – 2.30)	0.130
Conduct	Very good	1		1	
	Good	1.70 (1.25 – 2.33)	0.012	1.86 (1.06 – 3.29)	0.040
	Average	1.60 (0.68 – 3.77)	0.181	2.01 (0.94 – 4.28)	0.061
Concern from parents		0.50 (0.34 – 0.75)	0.012	0.63 (0.40 – 0.99)	0.046
Family conflicts		1.76 (1.07 – 2.90)	0.036	1.61 (1.10 – 2.35)	0.029
Being scolded for making mistakes by parents		1.53 (1.21 – 1.93)	0.010	1.40 (1.22 – 1.60)	0.004
Being bullied by classmates		1.92 (1.35 – 2.73)	0.010	1.76 (1.02 – 3.04)	0.045

4. DISCUSSION

The prevalence of having mental disorders among middle school students in Tuy Hoa city at the time of the study was 22.7%, 95% CI: 18.1-28.0. There was a similarity between our study result and other studies. Study of Dam Thi Bao Hoa reported that the proportion of students with mental disorders was 22.9% [9]. Another study conducted by Tran Tuan found that 20% of students sustaining psychiatric disorders were found. The similarities of these results can be elucidated by the fact that they were conducted on middle school students and the parent-report version of the SDQ25 was employed with the cut-off score of the scale being ≥ 14. Among five areas of the questionnaire, peer problems were the most common in students (65.1%), while the proportion of children with hyperactivity/ inattention was the lowest (10.0%). The percentages of students with emotional symptoms, conduct problems, and prosocial behavior were 21.1%, 24.7% and 18.1% respectively. These figures are comparable to the results of other studies which utilized the SDQ as a screening questionnaire on middle school students in Vietnam [10-12]. In this study, the impact of perceived difficulties on a child's life was estimated at the rate of 5.1%. In Vietnam thus far, there have been no studies utilizing the SDQ25 version with the impact supplement to determine the percentage of impacted students. However, there have been a few foreign studies which applied the version and reported analogous results to ours. One of them it was a study conducted in Egypt by Asmaa Abd Elhamid. The outcome demonstrated that the proportion of students with the impact of difficulties was 7.8% [13].

As regards associated factors, the results indicated that the proportion of students with mental disorders was higher in female group than in male group, p = 0.014 and 95% CI: 0.58 - 0.88. Results of a study by Nguyen Thi Truc Mai also showed that female individuals had 1.38 times the prevalence of psychiatric disorders compared to male, the difference was statistically significant with p<0,05 [2]. Eighth graders had a 1.74 times greater proportion of mental disorders than students in 6th grade did, p = 0.020 and 95% CI: 1.18 – 2.56. The results of other studies also demonstrated that having mental health problems in students had an association with grade level and the prevalence of psychiatric disorders increased with the grade of the students [14, 15]. Students with good conduct had 1.86 times the rate of mental disorders compared to students with very good conduct, p=0.040 and 95% CI: 1.06 – 3.29. In fact, students with poorer conduct often exhibit inappropriate behaviors. They violate rules and regulations in the school regularly and have difficulties in manifesting their feelings explicitly. This manifestation can be one of indications of mental disturbances, especially prosocial behavior. The prevalence of mental disorders in students with the care and concern of parents was considerately lower than in students with indifferent parents. The difference was statistically significant with p= 0.046 and 95% CI: 0.40 – 0.99. The figures are psychologically appropriate and consistent with domestic studies. In the study of Nguyen Thi Truc Mai, the prevalence rate of mental health problems in the group that received parental attention was equal to 0.39 times the rate in the group with indifferent parents (p<0.001) [1]. Students who were living in families with regular conflicts had a 1.61 times higher proportion of mental disorders compared to students without that kind of situation. This difference was statistically significant with p = 0.029 and 95% CI: 1.10 – 2.35. Results of a study by Mai Hong Nhung were similar to ours: students who lived in a tense environment with contention among family members had 1.47 times the rate of mental disorders than the other students. The difference was statistically significant [10]. Students whose parents were scolded for making mistakes displayed a 1.40 times greater rate of psychiatric disorders in comparison with students who were not rebuked by their parents, p=0.004 and 95% CI: 1.22 – 1.60. Results from a study of Dam Thi Bao Hoa showed an analogous trend: there was a significant association between mental and behavioral disorders and psychological stressors (being scolded by parents for poor schoolwork, being reprimanded by teachers, getting inferior grades, etc) with p<0.001 [9]. The proportion of mental disorders in students who were derided and bullied by their peers was 1.76 times higher than in the group of other students, the difference was statistically significant with p=0.045 and 95% CI: 1.02 – 3.04. A similar trend was found in the outcome of a study by Mai Hong Nhung: the prevalence of having psychiatric disorders in students bullied by their peers was 1.52 times higher than in the group of students who were not bullied.

Since the study was designed to have a sufficient sample size, the results could be representative of the target population. In the process of data analysis, weight adjustments by grade level were applied to increase the justification of representation of middle school students in Tuy Hoa city. The results of this study are convincing empirical evidence which could provide schools' administrators and parents with better recognition of mental disorders and associated factors.

The study contained a large enough sample that the study results were representative of the target population. In the process of data analysis, the study uses weighting by grade level to balance the representation ratio of middle school students in Tuy Hoa city. Research results were scientific evidence to help schools and parents better understand the factors related to autism.

One limitation of the study was that only the parent-reported version was used. More teachers' narratives needed to be exploited in data collection to increase the reliability of the estimate to detect the child's mental health status more accurately.

Conclusion

According to the results from utilizing the SDQ25, the prevalence of having mental disorders in middle school students was 22.7%. After applying multivariable Poisson model, factors associated with mental disorders in students included gender, grade level, conduct, concern from parents, family conflicts, being scolded for making mistakes by parents, and being bullied

by classmates. A limitation of the study was the sole utilization of the parent-report version. Additional data from teachers should be collected to increase the reliability of estimates, thereby detecting more accurately the mental health conditions of a child.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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