BMJ Paediatrics Open

Epidemiological survey of mental health in adolescent school children of Gujarat, India

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To cite: Nair S, Ganjiwale J, Kharod N, *et al*. Epidemiological survey of mental health in adolescent school children of Gujarat, India. *BMJ Paediatrics Open* 2017;**1**:e000139. doi:10.1136/bmjpo-2017-000139

Received 31 May 2017
Revised 27 September 2017
Accepted 28 September 2017

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ABSTRACT

Introduction Mental health problems in adolescents are inadequately researched in low-resource settings. We aimed in this study to assess the prevalence of mental health problems and correlates in school children aged 13–17 years and compare differences between urban and rural schools in Anand District, Gujarat.

Methods and analysis A cross-sectional study was conducted in five Gujarati medium higher secondary schools in Anand, Gujarat. Six hundred and ninety-three students with equal distribution of boys and girls belonging to 9th to 12th grades were included in the study. Strengths and Difficulties Questionnaire (SDQ) was used to assess the mental health status of the students, and total difficulties scoring was used to categorise participants into normal (0–15) and high (borderline (16–19) and abnormal (20–40)). Socio-demographic data and Teenage Screening Questionnaire-Trivandrum (TSQ) were used to assess associated medical and psychosocial factors. Clearance was obtained from the institutional ethics committee before conducting the study.

Results 15% participants had a high SDQ score. Girls had more emotional problems, while the rest of the mental health problems were more prevalent in boys. Rural children were found to have more mental health issues. Having an eye problem, scoring <50% in last annual examinations, failure in examinations, difficulties in studying at home and difficulties in relationships were associated with high SDQ score. Keeping physically fit and having friends were associated with normal SDQ score. Logistic regression model revealed that age, receiving punishment in form of more homework and difficulty discussing friends with parents increased odds of high SDQ score, while having friends and after-school entertainment like watching movies decreased odds of high SDQ score.

Conclusions At least one in eight adolescents in this study was at risk of mental health problems. SDQ self-report questionnaire and TSQ survey may be used as a screening modality to identify at-risk students.

What is already known on this topic?

- Psychological morbidities in a developing child are known to hamper the child's development as well as the future social capital.
- Mental health of children is not adequately explored in India, especially in Gujarat.

What this study hopes to add?

- This study reports that at least one in eight adolescents is at risk of mental health problems.
- Screening tools such as Strengths and Difficulties Questionnaire and Teenage Screening Questionnaire-Trivandrum appear to be useful to identify children at risk of mental health problems.
- We found factors that increased and decreased the odd of a having a mental health problems.

INTRODUCTION

Mental health problems affect a significant number of children and adolescents and continue to be on the rise worldwide. Recently, a meta-analysis of 41 studies conducted between 1985 and 2012 in 27 countries estimated a global prevalence of mental disorders in children and adolescents of 13%.[1] The prevalence of child psychiatric disorders in India has been found to be 7% in the community and 23% in schools.[2 3] India has the largest population of adolescents in the world, home to 243 million individuals, which is a significant number accounting for one-fifth of the world's adolescents. Hence, assessment of mental health in India will in turn affect global health.

Adolescents spend majority of their time in school when away from home. School teachers are often helpful in identifying the mental healthcare needs of adolescents. However, in the current context, they are not well trained or oriented to pick up the early warning signs. Primary healthcare providers, on the other hand, may lack the time and patience required to identify and manage these disorders in their routine already-busy practices. This is where the use of screening tools or procedures would benefit the situation.

Table 1 Distribution of mental health problems in school going adolescents

Domain	Normal, n (%)	Borderline, n (%)	Abnormal, n (%)
Emotional problems (n=693)	600 (87)	47 (7)	46 (6)
Conduct problems (n=692)	576 (83)	58 (8)	58 (9)
Hyperactivity (n=692)	651 (94)	23 (3)	18 (3)
Peer problems (n=693)	500 (72)	140 (20)	53 (8)
Pro-social behaviour (n=692)	642 (93)	21 (3.0)	29 (4)
Total difficulties score (n=691)	588 (85)	64 (9)	39 (6)

Strengths and Difficulties Questionnaire (SDQ) is one such easy to use behavioural screening tool.[4]

Mental health of children is not adequately explored in India, especially in Gujarat. If untreated, these conditions severely influence children's development and their potential to live fulfilling and productive lives. In this study, we aimed to assess the prevalence of the mental health problems and co-relates in adolescent school children and to compare the differences between urban and rural schools in Anand District of Gujarat.

MATERIALS AND METHODOLOGY

Study type and setting

A cross-sectional questionnaire-based study was conducted among schools of both rural and urban areas of Anand District, between June 2015 and November 2015. Five schools were included in the study out of which three schools were coeducational; the remainder were single gender (one girls' school and one boys' school). The schools were chosen within a 15 km radius as per feasibility. Permission was sought from the head of the institutions and the respective class teachers of the selected schools. Students belonging to grades 9–12 (13–17 years) who were present on the day of the study were all included. It was noted that the total number of absentees were less than 5%. A total of 693 students were recruited in the study.

Procedure

The study questionnaire consisted of socio-demographic data, Gujarati version of Teenage Screening Questionnaire-Trivandrum (TSQ) and SDQ. SDQ was used to assess the mental health status of the students, whereas TSQ was used to assess the associated medical and psychosocial factors.

The SDQ is a screening instrument for the children aged 3–17 years, which surveys their mental health symptoms and positive attitudes. It can be completed by parents, teachers or the adolescents of age 11 years or older.[4] Although SDQ is a relatively new instrument, it has already seen widespread use as a brief psychiatric screening of children and adolescents and has been translated into more than 80 languages. SDQ measures positive or negative behavioural attributes using 25 items focused on the following dimensions: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour. SDQ scale items are rated on a 3-point scale: 'not true', 'somewhat true' or 'certainly true'. The sum of the first four problem areas (excluding pro-social behaviour as per scoring manual available at http://www.sdqinfo.com) generate a total difficulties score ranging from 0 to 40, which is further categorised as normal (score≤15) and high (borderline (16–19) and abnormal (20–40)). Children with high SDQ scores (16–40) are likely to have greater rates of existing mental disorders compared with their cohorts with 'low' SDQ scores.[4]

TSQ is a self-administered questionnaire assessing the psychological and medical problems an adolescent might

Table 2 Distribution of mental health problems in rural and urban schools

Domain	Rural, n (%)	Urban, n (%)	p Value*
Emotional problems			0.7
Normal	227 (86)	373 (87)	
Borderline	15 (6)	32 (7)	
Abnormal	22 (8)	24 (6)	
Conduct problems			0.8
Normal	220 (84)	356 (83)	
Borderline	17 (6)	41 (10)	
Abnormal	26 (10)	32 (7)	
Hyperactivity			0.3
Normal	245 (93)	406 (95)	
Borderline	10 (4)	13 (3)	
Abnormal	9 (3)	9 (2)	
Peer problems			0.3
Normal	197 (75)	303 (71)	
Borderline	51 (19)	89 (21)	
Abnormal	16 (6)	37 (8)	
Pro-social behaviour			0.048
Normal	237 (90)	405 (94)	
Borderline	9 (3)	12 (3)	
Abnormal	17 (7)	12 (3)	
Total difficulties score			0.4
Normal	220 (84)	368 (86)	
Borderline	26 (10)	38 (9)	
Abnormal	17 (6)	22 (5)	

*p Value has been calculated comparing the normal with high (borderline and abnormal clubbed together) scores.

be experiencing. It contains questions regarding the physical ailments the teenager might be facing like eye, skin, hair, dental and body image problems, among others. The psychological domain is assessed by questions that reflect the children's academic performance, after-school activities, social life and their ability to communicate with their parents, among others. For example, the lack of time to study, inability to understand or remember lessons, personal distractions and family problems affecting their studies are the reasons enquired to identify the scholastic problems. Similarly, there are multiple-choice questions to assess family-related problems, personal problems and adjustment problems.[5]

The self-report version of SDQ was translated to Gujarati and subsequently validated prior to this study using the translation-back translation process by authors. Fifteen students from Gujarati and English medium schools each belonging to eighth and ninth grades were selected at random with equal number of boys and girls and were administered the Gujarati version and English version of the SDQ 1 week apart. Linguistic equivalence, conceptual equivalence, scale equivalence and reliability of both versions of the SDQ were compared. The translated version was found to have good linguistic and conceptual equivalence, and the concordance rate was found to be 93%. The students who participated in validation part were excluded from the main study.

Table 3 Distribution of mental health problems according to gender

Domain	Boys, n (%)	Girls, n (%)	p Value*
Emotional problems			<0.001
Normal	327 (92)	273 (81)	
Borderline	16 (5)	31 (9)	
Abnormal	13 (3)	33 (10)	
Conduct problems			0.025
Normal	284 (80)	292 (87)	
Borderline	30 (8)	28 (8)	
Abnormal	41 (12)	17 (5)	
Hyperactivity			0.015
Normal	326 (92)	325 (96)	
Borderline	17 (5)	6 (3)	
Abnormal	12 (3)	6 (3)	
Peer problems			0.003
Normal	239 (67)	261 (77)	
Borderline	83 (23)	57 (17)	
Abnormal	34 (10)	19 (6)	
Pro-social behaviour			0.001
Normal	319 (90)	323 (96)	
Borderline	15 (4)	6 (2)	
Abnormal	22 (6)	7 (2)	
Total difficulties score			0.2
Normal	295 (83)	293 (87)	
Borderline	32 (9)	32 (9)	
Abnormal	27 (8)	12 (4)	

*p Value has been calculated comparing the normal with high (borderline and abnormal clubbed together) scores.

Statistical analysis

Primary outcome variable (SDQ score) was categorised as normal or high as per the previously stated cut-off. Univariate analysis was used to study the frequency of various factors and determine the associations with the SDQ. Multivariable logistic regression (LR) analysis was performed to determine the significant contributors of the total SDQ score. Analysis was done using SPSS V.14. The following input variables of TSQ were included to determine any variance with SDQ: age; gender; grade; locality; eye problems; ear, nose and throat problems; dental problems; hair/face problems; nail/skin problems; any other problems; physical fitness activities; performance in last annual exam; failure in any subject in last annual exam; get help at home for studies; face difficulties in studying at home; receive punishment from teacher for not completing homework; have friends; face difficulties discussing friends with parents; going out with friends; after-school entertainment; and difficulties in relationship with others. All percentages in tables have been rounded to the nearest whole number.

RESULTS

Six hundred and ninety-three students from the urban and rural schools were included in the survey. The male:female ratio was comparable in rural and urban areas (50% males in rural against 52% in urban) with the median age of the participants being 15 years and majority belonging to the 10th grade (48%).

High SDQ score was observed in 15% of the participants (9% borderline and 6% abnormal, 9% boys and 6% girls). Peer problem was the most common mental health problem affecting more than one in four children (table 1). On comparison of rural and urban study populations, pro-social behaviour was observed to be significantly higher in rural, whereas all the other domains of SDQ and the total SDQ score were equivocal (table 2). Gender-wise comparison revealed that males and females had a comparable mean total SDQ score and gender was not a significant contributor to variance in total SDQ score. Emotional problems were more common in girls, and conduct disorders, peer problems and hyperactivity were more predominant in boys (table 3). Gender, by region comparison, revealed that hyperactivity was more common in rural boys, whereas peer problems are common in urban girls (table 4).

Univariate analysis (table 5) showed that reported difficulties in studying at home, having eye problems, scoring <50% in last annual examination or failure in a previous examination, difficulties in relationships with

Table 4 Distribution of mental health problems according to gender in rural and urban schools

	Boys			Girls		
Domain	Rural	Urban	p Value*	Rural	Urban	p Value*
Emotional			0.5			0.5
Normal	120	207		107	166	
Borderline	8	8		7	24	
Abnormal	3	10		19	14	
Conduct			0.4			0.5
Normal	105	179		115	177	
Borderline	8	22		9	19	
Abnormal	17	24		9	8	
Hyperactivity			0.029			0.4
Normal	115	211		130	195	
Borderline	9	8		1	5	
Abnormal	7	5		2	4	
Peer problem			0.3			0.017
Normal	85	154		112	149	
Borderline	35	48		16	41	
Abnormal	11	23		5	14	
Pro-social			0.2			0.039
Normal	114	205		123	200	
Borderline	6	9		3	3	
Abnormal	11	11		6	1	
Total score			0.5			0.1
Normal	109	186		111	182	
Borderline	9	23		17	15	
Abnormal	12	15		5	7	

*p Value has been calculated comparing the normal with high (borderline and abnormal clubbed together) scores.

others and difficulties discussing friends with parents were associated with high SDQ score (at risk of mental health problems). Physical fitness, spending time with friends and making friends could be protective as they were found to be associated with a low SDQ score. LR analysis (table 5) revealed that higher age, punishment in the form of more homework and difficulty discussing friends with parents increased the odds of a high SDQ score, while having friends and after-school entertainment in the form of watching movies decreased the odds of a high SDQ score.

DISCUSSION

Fifteen per cent students in our study were found to have high SDQ score. Percentages reported in previous Indian studies range from 24% to 37%,[6–8] whereas other studies have reported lower levels ranging from 10% to 17%.[9 10] Peer problem (28%), emotional problem (13%) and conduct problems (8%) were the most common mental health problems in our study. This was consistent with a previous study except that emotional problems were less common compared with conduct problems in that study.[10] The prevalence of peer problems in our population may correlate with 40%–70% prevalence of bullying-related involvement in urban and rural schools around Anand. [11] Rural children were found to be more social. This can be explained based on the effect of urbanisation and preservation of social interactions in rural areas.

Higher levels of emotional symptoms among rural as well as urban girls were consistent with other studies.[9 12–14] Girls are more predisposed to emotional problems like depression.[15] Conduct disorders, peer problems and hyperactivity were all more prevalent in boys. Boys tend to externalise, and hence, behavioural issues such as aggression are more common in them.[12 16]

Factors such as increasing age, reported difficulties in studying at home, scoring <50% in last annual examinations or failure in a previous examination, eye problems, difficulties in relationships with others, difficulties discussing friends with parents and punishment in the form of more homework were significant factors

Table 5 Univariate analysis and multivariable logistic regression findings

Variable	Characteristic	SDQ total: Normal (0–15)	SDQ total: High (16–40)	p Value*	Adjusted odds	95% CI	p Value†
Age	Mean (SD)	14.71 (1)	14.90 (1)	0.06	1.731	1.180 to 2.539	0.005
Eye problems	Yes	93	28	0.005	2.249	1.307 to 3.867	0.003
	No (reference)	495	75				
Punishment for not doing homework	Physical (reference)	136	28	0.381	1.955	1.038 to 3.680	0.038
	More homework	451	75				
Physical fitness activities	Yes	362	49	0.007			
	No	224	54				
Performance in last annual examination	<35%	53	16	0.006			
	40%–50%	59	16				
	50%–60%	146	34				
	60%–70%	179	18				
	70%–80%	69	11				
	>80%	82	8				
Failed in any subject in last annual exam	Yes	51	19	0.002			
	No	537	84				
Face difficulties in studying at home	Yes	62	26	<0.001			
	No	525	76				
Having friends	Yes	559	88	<0.001	0.385	0.182 to 0.812	0.012
	No (reference)	28	15				
Difficulties discussing friends with parents	Yes	53	30	<0.001	3.552	1.935 to 6.520	0.001
	No (reference)	535	73				
After-school entertainment	Sports and games (reference)	213	27				
	Watching movies	29	13		3.042	1.309 to 7.092	0.01
	Going out with friends	87	15	0.002			
	Watching TV	151	19				
	Others	108	29				
Difficulties in relationship with others	Yes	34	16	<0.001			
	No	554	87				

*p Value for univariate analysis.
†p Value for logistic regression.

associated with predisposition to mental health problems. Failure or below-average performance in examination can lead to or stem from low self-esteem as well as emotional and behavioural problems. Presence of poor academic performance in some cases may be the harbinger of underlying specific learning disability. It is an invisible handicap that is often unrecognised by the teachers who may resort to punishment as a mode to achieve better results, as in our study where punishment in the form of more homework was observed to be associated with increased mental health problems.

Earlier studies have revealed that children with low visual acuity had poor scholastic performance and more chances of school drop outs.[17 18] Effect of visual difficulties is probably mediated through poor scholastic performance and highlights a significant area for intervention. Similarly, previous studies have shown that academic achievement is significantly influenced by the socioeconomic and cultural milieu of the family.[18] Difficulties in studying at home could be due to an unhappy family environment such as parental or sibling fights, broken homes, parental marital discords, lack of parental support and beating at home and can lead to poor scholastic performance and depression.[18–22]

Students who had difficulties discussing about their friends with parents had a higher SDQ score. In a previous study,[23] restrictions from the parents were reported to limit discussions about friends at home. Inability to give

time for or encouraging discussions regarding their friends made it difficult for the children to communicate with their parents regarding the same. An earlier study[22] found that bullying in school, though not a significant contributor, was also responsible for the emotional stress faced by children in school.

The factors that were found to have a favourable effect on the mental health were physical fitness, after-school entertainment like watching movies and spending time with friends. A previous study found that extracurricular activities led to decrease in depression rates.[24] Physical activity can lead to improvements in self-esteem and has potentially beneficial effects for reducing depression and anxiety.[25 26] Physical activity in the form of sports and games helps improve problem-solving skills and helps the adolescents cope better with mental health problems and even prevents the onset of psychological symptoms.[27] Extracurricular activities overall appear to be protective as they may promote better social skill development. Children who made time to go out with friends and made efforts to make new friends had a lower SDQ score as compared with those who preferred to be alone. Adolescence is the period when children rely on their friends maximally for support.

Though adolescent mental health is an upcoming global issue, it is of more serious concern in the low-income and middle-income countries like India (where majority of the adolescent population harbour) owing to resources crunch and limited healthcare infrastructure. This is further complicated by stigma related to mental illness in this culture. Identification of significant load builds up cause for having the 'Life skills' education as part of the curriculum and training of school teachers. This study also highlights the advantages of SDQ as a screening tool. It is significantly shorter and easier to use than other similar questionnaires. It is downloadable free of charge and can be used by workers at the community level and even school teachers who are not highly trained in mental health.[28] However, a larger study would help identify the psychometric properties of SDQ better.

CONCLUSION

Mental health problems are highly prevalent among adolescent population in India. A significant proportion of school-going adolescents harbour mental health problems, which accounted for 15% of the students who participated in our study. All mental health issues were found to be more prevalent among the rural students except for peer problems. Emotional problems were more common in girls, while the remaining domains were more common in boys. Physical ailment like refractive errors, difficulties in studying at home, failing in a previous examination, inability to communicate with parents and punishment at school adversely affect the mental health of students, while making more friends and spending time with them as well as involvement in extracurricular activities were the protective factors. The Gujarati versions of the self-report SDQ and TSQ survey are simple, useful strategies to identify at-risk population and associated factors. This study can bring awareness about the mental health of children among their teachers and parents and can guide them to take necessary intervention.

Acknowledgements We thank Dr Maunil Bhatt for English language check.

Contributors SN contributed to the design and plan of analysis of the study, data acquisition, data analysis, writing the manuscript and final approval of this manuscript. JG contributed to plan of analysis, data analysis, writing the manuscript and final approval of the same. NK contributed to the conception, study design, inputs to the manuscript, data analysis and final approval. JV contributed to the design of the study, data analysis, writing the manuscript, intellectual contribution and final approval of the manuscript. SMN contributed to the design and planning of the study, revision of the manuscript for important intellectual content and final approval of this manuscript.

Competing interests None declared.

Patient consent Obtained.

Ethics approval Institutional Ethics Committee of HM Patel Center for Medical Care and Education.

Provenance and peer review Not commissioned; externally peer reviewed.

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