Original Research Article

A cross-sectional study on morbidity status among school going adolescents in Thiruvallur district, Tamil Nadu

Sathish Dev D.[1], Sugantha Valli M.[2]*, Gnana Sezhian M.[3], Suganya E.[4]

[1]Department of Community Medicine, A.C.S. Medical College and Hospital, Chennai, Tamil Nadu, India
[2]Department of Microbiology, Clinical Consultant at HITECH Diagnostic centre, Chennai, Tamil Nadu, India
[3]Department of Plastic Surgery, Madras Medical College, Chennai, Tamil Nadu, India
[4]Department of Pediatrics, Madras Medical College, Chennai, Tamil Nadu, India

*Correspondence:
Dr. Sugantha Valli M.,
E-mail: dr.msv86@gmail.com

ABSTRACT

Background: Adolescents represent about 21.8 percent of India's population. Various health risks with potentially life-threatening consequences become prominent in this age group. This study was undertaken with the objective to determine the morbidity profile of school going adolescents in Tamil Nadu.
Methods: This descriptive, cross sectional study was planned and conducted from January 2016 to August 2017. The study population included 987 adolescent boys and girls aged between 10 to 19 years studying in high and higher secondary Government schools of Thiruvallur district of Tamil Nadu. Semi-structured questionnaire was used as data collection tool.
Results: The mean age groups of this school going adolescent are 14.2 yrs. In the present study 583 (59%) of the study participants were affected by one or more morbidity condition. Among them, 395 (67.7%) were in the age group 10-14 years and 188 (32.2%) in the age group 15-19 years. 122 (21%) and 461 (79.1%) of male and female were affected respectively. In the present study, fever (21%) was the commonest reported morbidity followed by acute respiratory infection (15.7%) and acute gastrointestinal disease (13. 4%).
Conclusions: This study shows that adolescents are prone to a wide range of morbidity conditions. Apart from respiratory and gastro intestinal diseases, reproductive tract infections and sexual health problems are important morbidities affecting this age group. There is strong need to sensitize health care practitioners at all levels, in both government and private sectors towards health problems in adolescent age groups.

Keywords: Morbidity profile, Adolescents, Rural Tamil Nadu

INTRODUCTION

Adolescence is a transitional period between childhood and adulthood and also changes at biological, psychological and social level. But the adolescence within itself is considered as quite heterogeneous and many suggest further subdivision into smaller age groups, of early adolescent (10-13 years), middle adolescent (14-17 years) and late adolescent (18-20 years).[1] Globally the number of adolescents is expected to reach 1.13 billion by 2025 i.e., an increase of 219 million or 24% rise of current. In the developing world, as a whole, the adolescent population is estimated at 914 million, about one fifth of all ages as per the study.[2] Adolescents represent about 21.8 percent of India's population. There are about 250 million adolescents in our country, out of the total adolescents more than 2/3rds i.e., 71.36% lives in rural areas.[2] In Tamil Nadu 17.23% (12.4 million) of the state population is aged between 10-19 years (census 2011).

Adolescence is commonly regarded as a healthy time of life, with peaks in strength, speed, fitness, and many cognitive abilities. But this has been proven to be a serious misconception, as major shifts in health take place around puberty as new health risks with potentially life-threatening consequences become prominent.[3] Also adolescent age group is prone for several acute illnesses and chronic illnesses like visual impairment, dental problem, etc. Various high risk behaviours like smoking and consuming alcohol, adopted during adolescence and failure to cope up with transition and demands of life put them at risk of injuries, non-communicable diseases, mental health disorders and suicides.[4,5] Also, in addition to that substance abuse, internet and mobile phone addiction are emerging as major public health challenges in adolescent age group in recent times.[6]

The overall morbidity and mortality among adolescents is increasing day by day due to varied reasons. World Health Organization report says that about 1.3 million adolescents die from preventable or treatable causes. Sexual and reproductive health problems, nutritional problems and mental health problems are the major health problems of adolescents.[7] As per NFHS (National Family Health Survey)-3 data, about 56% of girls and 30% of boys in this group are anaemic. Overall prevalence of obesity was 5.74% with rates of 4.4% among boys and 8.8% in girls, the prevalence of underweight is 42% with rates of 52% among girls and 25.6% in boys.8 About 29% boys and 4% girls use some kind of tobacco and 12% of the boys smoke cigarettes or bidis. The average age at tobacco use initiation was earliest (12 .3 years).[8]

Considering the fact that adolescents constitute more than one fifth of the population and are at high risk multitude of physical illnesses, which can impact their learning, quality of life and future productivity of the nation as a whole, it is high time to initiate a comprehensive adolescent health services in India. Large scale community based studies are the need of the hour to fulfil this knowledge gap to identify the present morbidity condition of the adolescent age group. So that it provides quality data to the health policy makers, health care practitioners at various levels and other stake holders for developing evidence based interventions, for adolescent health. Hence it is planned to conduct a study in Thirvallur district, Tamil Nadu to identify the present morbidity status among rural adolescents.

METHODS

This descriptive, cross sectional study was planned and conducted from January 2016 to August 2017. The study population included all adolescent boys and girls aged between 10 to 19 years studying in high and higher secondary Government schools of Thiruvallur district of Tamil Nadu. Sample size was calculated considering prevalence of 30% anemia in adolescent boys (NFHS 3), with 3% absolute precision and 95% confidence level.

Adding 10% non-response error (896), the final sample size was arrived as 987.

The individual students were selected into the study by multistage random sampling. The Thiruvallur district has 12 taluks. Out of the 12 taluks, three taluks were selected by simple random sampling (Poonamalle taluk, Madhavaram taluk and Ambattur taluk). All schools in the selected 3 taluk were serially numbered and 4 schools were selected in each taluk (totally 12 schools) by simple random sampling method. The total sample size was distributed among all these 12 schools selected by Probability proportion to size (PPS) method. The study population in each school was selected by simple random sampling method keeping the school attendance register as sampling frame

The details regarding the morbidity and health seeking behaviour were collected using a pre-designed and pre-tested, semi structured questionnaire. The interview schedule was piloted in a higher secondary school in Kanchipuram district. The study was approved by institutional human ethics committee. Informed written consent was obtained from the parent/ guardian of the child. The purpose of the study was explained to the class teacher and students. Study sample adolescent were selected randomly by using the attendance register as sampling frame. All the study participants were interviewed personally through, pre-tested and semi-structured questionnaire after building a good rapport with them. Current heath problem was defined as any physical health problem which occurred in past one month. Chronic problems were defined as any physical and mental health problem which was persisting for more than 3 months.

Statistical analysis

Descriptive analysis was done for background variables. The association between explanatory variables and categorical outcomes was assessed by cross tabulation and comparison of percentages. Chi square test was used to test statistical significance. P value <0 .05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.

RESULTS

A total of 987 adolescent school going students were interviewed from 12 government schools identified in Thrivallur district of Tamil Nadu. The majority of the study participants n=798 (80.85%) were females and n=189 (19.2%) were male population. The mean age groups of this school going adolescent are 14.2 yrs±3.8SD (Table 1).

Majority of the adolescent students belonged to Lower middle class 855 (86.6%) followed by upper lower class 121 (12. 2%) and none of them in lower class. The fathers were more literate (80.6%) than the mothers (67.8%) of

the adolescent students. 723 (73.2%) adolescent were Nuclear Family and 146 (14.8%) were in joint family and 118 (11.95%) were in extended family. 505 (51.17%) and 482 (48.83%) were living in own house and rented house respectively (Table 2).

Table 1: Socio demographic profile of study population (n=987).

Parameter	Frequency	%
Gender		
Female	798	80.85
Male	189	19.15
Socio economic status		
Upper middle class	11	1.11
Lower middle class	855	86.63
Upper lower class	121	12.26
Family type		
Nuclear family	723	73.2
Joint family	146	14.8
Extended family	118	11.95
Housing		
Own house	505	51.17
Rented house	482	48.83

Table 2: Morbidity among the adolescent by age and sex.

Age group (yrs)	Morbidity present		
	Male	**Female**	**Total (%)**
10-14	79	316	395 (67.7)
15-19	43	145	188 (32.2)
Total (%)	122 (21)	461 (79 .1)	583 (59)

In the present study 583 (59%) of the study participants were affected by one or more morbidity condition.

Among them, 395 (67.7 %) were in the age group 10-14 years and 188 (32.2%) in the age group 15-19 years old. 122 (21%) and 461 (79.1%) of male and female were affected respectively (Table 3).

In the present study, fever (21%) was the commonest reported morbidity followed by acute respiratory infection (15.7%), acute gastrointestinal disease (13.4%), ear infection (13%), muscular pain, dental problem (11.6%), refractory errors (10.6%), asthma (4.1%), injuries and accidents (3.4%) and thyroid disorder (1.7%). Similarly among the girls, fever (20.8%) was predominate problem followed by acute respiratory infection (15.4%), acute gastrointestinal disease (13.4%), ear infection (13.4%) and muscular pain (13%) and dental problem (11.7%). Among the boys fever (20.4%), acute respiratory infection (16.3%) was reported major problem followed by acute gastrointestinal disease (13.1%), ear infection (13.1%), muscular pain (4.1%), dental problem (11.4%) and refractory errors (10.6%) were the major problem. There is no much gender variation in the current study (Table 4).

Substance abuse problem

Alcohol abuse

Majority of the participants 92.30% reported that consumption of alcohol is bad for health. 5 boys (2.5%) had habit of consuming alcohol occasionally. For majority of them friends were first drinking partner. No girl participants in the present study were consuming alcohol (Table 5).

Majority of the participants 96.15% reported that use of tobacco is bad for health. Boys 7 (3.7%) have the habit of using tobacco, out of which 2 reported using tobacco chewing.

Table3: Morbidity pattern among adolescent by age and sex.

Condition	Male			Female			Total (%)
	10-14 yrs	**15-19 yrs**	**Total (%)**	**10-14 yrs**	**15-19 yrs**	**Total (%)**	
Fever	17	8	25 (20.4)	66	30	96 (20.8)	121 (21)
Cold/ARI	13	7	20 (16.3)	49	22	71 (15.4)	91 (15.6)
Acute gastrointestinal diseases	10	6	16 (13.1)	43	19	62 (13.4)	78 (13.4)
Ear infection	10	6	16 (13.1)	42	18	60 (13)	76 (13)
Muscular pain	3	2	5 (4.1)	12	5	17 (3.6)	22 (3.7)
Dental problem	9	5	14 (11.4)	37	17	54 (11.7)	68 (11.6)
Refractory errors	8	5	13 (10.6)	33	16	49 (10.6)	62 (10.6)
Asthma	3	1	4 (3.2)	13	7	20 (4.3)	24 (4.1)
Injuries and accidents	3	2	5 (4)	9	6	15 (3.25)	20 (3.4)
Thyroid	1	1	2 (1.6)	6	2	8 (1.7)	10 (1.7)
Epilepsy	1	0	1 (0.8)	2	1	3 (1.7)	4 (0.7)
RHD	1	0	1 (0.8)	3	1	4 (0.8)	5 (0.8)
Tuberculosis	0	0	0	1	1	2 (0.4)	2 (0.34)
Total	79	43	122	316	145	461	583

Table 4: Alcohol addiction profile of the participants.

Variable	Number
Habit of alcohol consumption	5
First drinking partner	
Friends	4
Relatives	1
Frequency of alcohol consumption	
Weekly	2
Occasionally	3

Table 5: Addiction profile of the participants (tobacco).

Habit	Number
Habit of tobacco use	
Smoking	7
Tobacco chewing	2
Duration of tobacco use (years)	
<1	5
>1	4
First smoking partner	
Friends	6
Self	3

DISCUSSION

In this study a total of 987 adolescent government schools going students were interviewed and their morbidity pattern was presented. This study showed that 583 (59%) of the study participants were affected by one or more morbidity condition at the time conducting survey. According to a study 404 (58.72%) of adolescents reported current morbidity, which is similar to the present study.[9] Study by Shinde et al showed majority 84.3% of children were found to have one or more morbid conditions, which is higher percent of morbidity than the present study.[10] A study published, showed a higher proportion of adolescent 88.2% were noted to have one or more morbidity condition.[11] 40% male and 60% female had morbidity, which is similar to present study that the morbidity condition found higher in female participant than in male study participants.

Bhattacharya et al have assessed nutritional status and morbidity profile of 424 adolescents in three randomly selected co-educational schools of Burdwan District of West Bengal.[7] The prevalence of underweight and stunting were 53.31% and 47.41%, respectively, which was significantly higher in early adolescence than in late adolescence and more in boys than in girls. About 55.18% had pallor, 40.33% had dental caries, 33.49% were suffering from refractive errors, 23.11% had history of worm infestation, 38.90% had skin problems, and 68.61% adolescents had ENT problems.

According to study, done in Kancheepuram district of Tamil Nadu, India showed among adolescent, acute respiratory infection (16.2%), acute gastrointestinal disease (5.3%), ear infection (5.6%) and muscular pain (6.3%) and among male, acute respiratory infection (27%), acute gastrointestinal disease (10%), ear infection (8.4%) and muscular pain (9.2%) were observed in both boys and girls.[12] In another study showed prevalent morbid condition varies for boys and girls.[13] Among boys were skin disorders (57.7%), E.N.T. conditions (52.0%), vitamin–A deficiency (47.3%), vitamin-B deficiency (24.7%) and dental caries (24.0%). The major prevalent morbid conditions among girls were skin disorders 67.7%; E.N.T conditions 45.3%, vitamin-A deficiency 38%; pediculosis/scabies 25%.

Substance abuse is one of the major public health concerns in adolescent population, which are reported to ubiquitous among both urban and rural adolescents. These mainly include tobacco and alcohol consumption. The habit of substance abuse and smoking that develops during adolescence is most likely to continue during adulthood and significantly enhance the risk of various non-communicable disease including cardio vascular disorders, malignancies etc. Narain et al (2011) in Noida city studied 4786 students aged 11-19 yrs and reported prevalence of any kind of tobacco use among 11 to 19 yr old students was 11.2 percent, 8.8 percent were ever smokers (including current smokers), 4. 6 percent were ever tobacco chewers (including current chewers), 3.7 percent were, exclusive smokers and 2. 5 percent were exclusive tobacco chewers.[14]

Reddy et al in their school based cross sectional study in urban areas of Delhi and Chennai revealed 24.8 and 6.7 percent of sixth-grade students and 9.3 and 2.9 percent of eighth-grade students had ever used tobacco and were current tobacco users, respectively.[15] Tsering et al conducted school based cross-sectional study in urban and rural areas in West Bengal among 416 high school students studying in 8th, 9th and 10th standard.[16] They reported 5.2 percent urban students and 7.3 per cent rural students were consuming alcohol. Ningombam et al (2011), in his school based cross-sectional survey in urban areas of Manipur, reported 15.6 percent of adolescents aged 15-19 yrs had ever used alcohol and 12.6 percent male street children aged 12 to 16 yrs consumed alcohol.[17]

CONCLUSION

Overall from the discussion, it can be summarized that it is a misconception to assume that adolescent age group is relatively healthy population. As documented by the current study, they are prone to a wide range of morbidity conditions. Apart from respiratory and gastro intestinal diseases, reproductive tract infections and sexual health problems are important morbidities affecting this age group. Other common morbidities include conditions affecting skin, dentition etc. Psychological illness is another important and often neglected aspect of adolescent health. Hence it can be concluded that there is

strong need to sensitize health care practitioners at all levels, in both government and private sectors towards health problems in adolescent age groups and impart necessary skills to manage them effectively.

REFERENCES

1. Anthony D. The state of the world's children 2011-adolescence: an age of opportunity: United Nations Children's Fund (UNICEF); 2011.
2. Available at: http://www.censusindia.gov.in/2011 census/C-series/C-13.html. Accessed on 24th September 2019.
3. Kleinert S. Adolescent health: an opportunity not to be missed. Lancet. 2007;369(9567):1057-8.
4. Ronsmans C, Graham WJ. Maternal mortality: who, when, where, and why. Lancet. 2006;368(9542):1189-200.
5. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. Lancet. 2007;369(9569):1302-13.
6. Samal J, Dehury RK. Salient Features of a Proposed Adolescent Health Policy Draft for India. J Clin Diagn Res. 2017;11(5):Li01-Li05.
7. Bhattacharya ABM, Chatterjee S, Misra RN, Chowdhury G. Nutritional status and morbidity profile of school-going adolescents in a district of West Bengal Muller. J Med Sci Res. 2015;6:10-5.
8. Available at: https://www.nhp.gov.in/adolescent-health-10-19-years_. Accessed on 24th September 2019.
9. Altaf R, Hussain PSK. Comparative study of the nutritional and health status among adolescent students (boys and girls) in rural area, Chandragiri, Chittoor district. A.P. IOSR J Dent Med Sci. 2015;14(9):30-7.
10. Shinde M, Joshi A, Trivedi A. Morbidity pattern among school children of rural area of Obaidullaganj block of Raisen District of Madhya Pradesh. Int J Adv Med. 2017;2(2):144-6.
11. Srinivasan K, Prabhu G. A study of the morbidity status of children in social welfare hostels in Tirupati town. Indian J Community Med. 2006;31(3):170-2.
12. Sivagurunathan. Morbidity profile of adolescents reported to an urban health center in Kancheepuram district of Tamil Nadu, India. Int J Community Med Health. 2015;2:4.
13. Deshmukh P, Gupta S, Bharambe M, Dongre A, Maliye C, Kaur S, et al. Nutritional status of adolescents in rural Wardha. Indian J Pediatr. 2006;73(2):139-41.
14. 14. Narain R, Sardana S, Gupta S, Sehgal A. Age at initiation & prevalence of tobacco use among school children in Noida, India: A cross-sectional questionnaire based survey. Indian J Med Res. 2011;133(3):300.
15. Reddy KS, Perry CL, Stigler MH, Arora M. Differences in tobacco use among young people in urban India by sex, socioeconomic status, age, and school grade: assessment of baseline survey data. The Lancet. 2006;367(9510):589-94.
16. Tsering D, Pal R, Dasgupta A. Licit and illicit substance use by adolescent students in eastern India: Prevalence and associated risk factors. J Neurosci Rural Prac. 2010;1(2):76.
17. Ningombam S, Hutin Y, Murhekar MV. Prevalence and pattern of substance use among the higher secondary school students of Imphal, Manipur, India. Natl Med J India. 2011;24(1):11-5.