Section: Community Medicine

Original Research Article

A COMPARATIVE STUDY OF MORBIDITIES AMONG ADOLESCENTS ATTENDING PUBLIC AND PRIVATE SCHOOLS OF AGRA CITY

Rinu Kumar[1], Shailendra Singh Chaudhary[2], Manisha Madhukar Nagargoje[3], Sunil Kumar Misra[4], Pooja Chaudhary[5]

[1]Senior Resident, Community Medicine, Uma Nath Singh Autonomous State Medical College, Jaunpur, Uttar Pradesh, India
[2]Professor and Head, Community Medicine, Rani Durgawati Medical College, Banda, Uttar Pradesh, India
[3]Associate Professor, Community Medicine, SNMC, Agra, Uttar Pradesh, India
[4]Professor and Head, Community Medicine, FHMC, Agra, Uttar Pradesh, India
[5]Associate Professor, Community Medicine, Rani Durgawati Medical College, Banda, Uttar Pradesh, India

Received : 10/08/2024
Received in revised form : 08/10/2024
Accepted : 22/10/2024

Keywords:
Adolescent health, public or government school, private school, morbidity.

Corresponding Author:
Dr. Pooja Chaudhary,
Emaildr.poojachaudhary@gmail.com

DOI: 10.47009/jamp.2024.6.5.114

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (5); 605-609

Abstract

Background: India has the largest number of children in the world. Several studies have identified the pattern of morbidities among school-going adolescents in India. Morbidities pattern may differ significantly among government and private school. The objective is to identify and compare pattern of morbidities among adolescents attending public and private schools in Agra city of Uttar Pradesh. **Materials and Methods:** A cross-sectional survey was conducted among adolescents in the age group of 10-19 years who were studying in various government and private schools in urban Agra. To draw the required sample size of 480, a multi-stage random sampling technique was applied. Appropriate statistical tests were applied for the analysis. **Result:** Students of government/public schools has higher proportion of anaemia (49.1%), dental caries (22.5%), URTI (8.75%), gingivitis (9.16%), CSOM (7.91%), fungal infection (6.25), worm infestation (5%) and dental fluorosis & mottling (4.16%) while private schools has higher proportion of refractive error (16.2%), acne (12.5%), allergic rhinitis (5.83%) and LRTI (5%). Overall; morbidities related to hematological system (49.6%), oral cavity (34.1%), respiratory system (17.9%) and ENT (10.8%) were comparatively more prevalent among students of government schools while morbidities of skin (15.4%) and ocular system (17.5%) were more prevalent in private schools. **Conclusion:** The study concludes that incorporation of specialization services should be done in the school health services, to deal with specific morbidities found prevalent among government and private schools, as per the need, during regular health check-up of school-going adolescents.

INTRODUCTION

Adolescence is the period of transition from childhood to adulthood and is defined as the period of life between 10 to 19 years of age by the WHO.[1] India has the largest number of children in the world and the school-going adolescent group provides a unique opportunity for early identification and management of childhood and adolescent health problems which often remain neglected by their families and or society.

Common morbid conditions identified among school-going adolescents in India are anemia (23%-78%), dental problems (10%-80%), refractive errors (7%-23%), skin disease (5%-19%), respiratory tract infection (5%-17%) including others.2-25 One of the reason for such a vast difference in the prevalence of various morbidities is the setting of study i.e. government or private school. Though different studies showing morbidity pattern among adolescents are available for students of public or private schools; but very few have studied them together and even fewer has compared the morbidity patterns found among those two types of schools. None of such comparative studies has ever occurred in the Indian state of Uttar Pradesh, at least not in the recent past. One such comparative in Gurugram, Haryana found that 38.73% children of government schools and 13.74% children of private school had one or more morbid condition.[2] With this background; a comparative study was planned to

ISSN (O): 2687-5365; ISSN (P): 2753-6556

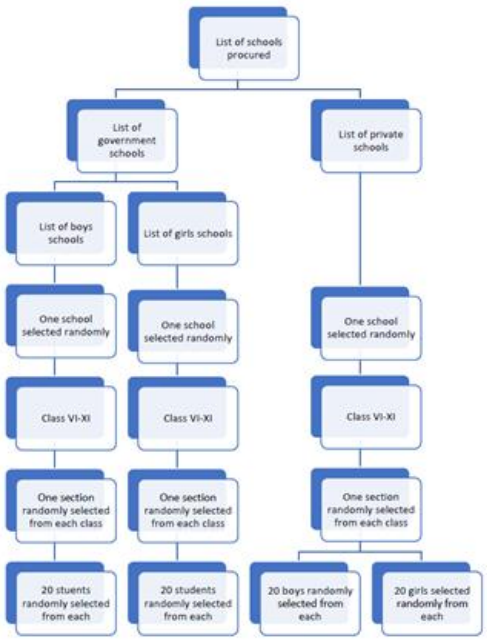
identify and compare pattern of morbidities among adolescents attending public and private schools in Agra city of Uttar Pradesh.

MATERIALS AND METHODS

A school-based cross-sectional, observational, descriptive study was carried out in randomly selected public and private schools of Agra city in the state of Uttar Pradesh, India. The study population comprised of all adolescents, in the age group of 10-19 years, attending all public and private schools of Agra city. The study was conducted between October 2020 and September 2022. A multistage random sampling (discussed later) was used for selection of schools, section of class, and students to reach the final sample. The selected schools were visited more than once, as per the need, for collection of data. Actual data collection was done from January to June, 2022.

The formula, $N=Z2\times(pq)/d2$ was used for the calculation of sample size; where Z is standard normal deviate, p is prevalence of disease, q is 100 minus p, and d is allowable error. The reference study by Bhattacharya A et al (2015) observed that 88.2% school-going adolescents of a government schools in Burdwan district of West Bengal were suffering from one or more illnesses at the time of examination3 and so; for Z=1.96, p=88.2, q=100-88.2=11.8, and d=5% of p=4.41, a sample size $n=3.84\times88.2\times11.8/19.45=205$ was calculated. For an effect size of 2; sample size doubled to 410. To compensate non-responders and for ensuring equal representation from public and private schools, boys and girls, and students from class 6th to 11th standard, a final tally of 480 was decided as the sample size of present study.

Flow chart depicting Sample selection process



Sampling Technique: At first, separate lists of public and private schools of Agra was obtained from the district education department. Next; two public schools – one boy's and one girl's school and one co-educational private school were selected randomly from those lists. In second stage; one section was selected from each class, 6th to 11th randomly. In third stage; desired number of girl and or boy students was selected from selected section of class by a simple random sampling. Students of class 12th were excluded due to their board examination and age group restriction among many of the pupils.

Inclusion Criteria

All adolescents (aged 10-19 years) of selected public and private schools, who were studying in 6th to 11th class, were included in the study.

Exclusion Criteria

Students who were absent due to any reason on the day of data collection or who were not willing to participate in the study were excluded from the study.

Methodology: At first a preliminary visit was paid to the selected school and the principal was informed about the objective and methodology of the study. Informed written consent was taken from the principal of the selected school. Once a section of class was selected for the study; its class teacher was contacted, informed about the study and suitable date and timing for collection of data was find out. At the time of data collection, verbal consent/accent was also taken from the study participants. General and systemic examination was done in a separate room, in presence of an attendant/teacher of same sex. Confidentiality of subjects was maintained throughout the study. Ethical approval was taken from institutional ethical committee of S. N. Medical College, Agra before commencing the study. A pre-designed and pre-tested, semi-structured, self-administered anonymous questionnaire was administered. Data thus collected was entered into Microsoft excel and transferred to SPSS software for analysis. Appropriate statistical tests were used in the study.

RESULTS

The present study was undertaken to find the morbidity profile among adolescents attending public and privates schools of Agra. A total sample of 480 students was taken. An equal proportion of cases were selected from public and private schools (240 each).

[Table 1] shows the gender and class-wise distribution of study participants from both private and public schools. 20 male as well as 20 female students were included from each class of both public as well as private school. 30.8% study subjects had no morbidity; while 30% had 1 morbidity, 23.1% had two morbidities, 11.7% had 3 morbidities and rest 4.3% had four or more

ISSN (O): 2687-5365; ISSN (P): 2753-6556

morbidities at the time of study. Mean number of morbidities was 1.30±1.18 with a range of 0-6. Higher proportion of adolescents attending government school has morbidities in compared to those attending private schools (76.7 vs. 61.7%; p=0.000).

When a system-wise analysis of morbidities was done, morbidities were found commonly in hematological system (45%), mouth & oral cavity (24.8%), skin (13.1%), respiratory tract (12.3%), Eye (11.7%) and ENT (10.6%). The [Figure 1] shows that morbidities related to hematological system (49.6%), oral cavity (34.1%), respiratory system (17.9%) and ENT (10.8%) were comparatively more prevalent among pupils of government schools while morbidities of skin (15.4%) and ocular system (17.5%) were more prevalent among students of private schools.

The [Table 2] shows that common morbidities observed among school-going adolescents in Agra were: anemia 43.33%, dental caries 18.54%, refractive errors 11.04%, acne 9.37%, upper respiratory tract infection (URTI) 6.87%, gingivitis 6.04%, allergic rhinitis 5.83%, chronic supportive otitis media (CSOM) 5.62%, lower respiratory tract infection (LRTI) 4.58%, fungal infection of skin (4.58%), worm infestation or history of passing worms 3.75%, urinary tract infection (UTI) 2.70%, and dental fluorosis with dental mottling 2.50%. Figure 2 shows that among adolescents studying in public/government schools; anaemia (49.1%), dental caries (22.5%), URTI (8.75%), gingivitis (9.16%), CSOM (7.91%), fungal infection of skin (6.25%), intestinal worm infestation (5%) and dental fluorosis with dental mottling (4.16%) were comparatively more prevalent; while, refractive errors (16.2%), acne (12.5%), allergic rhinitis (5.83%) and LRTI (5%) were more prevalent among pupils of private schools.

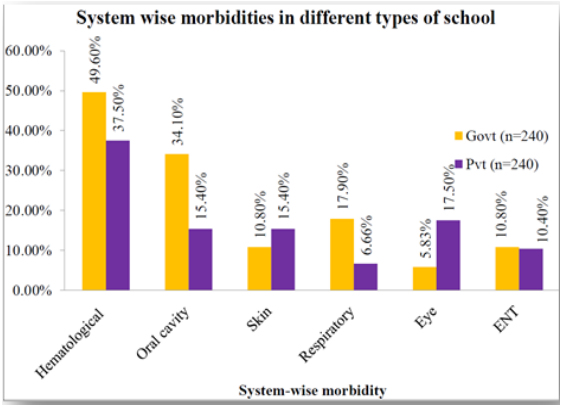


Figure 1: System-wise morbidities in different types of schools (N=480)

Table 1: Distribution of study participants (N=480)

Type of school	Government		Private		Total Number (%)
Standard/class	Male	Female	Male	Female	
6th	20	20	20	20	80 (16.67%)
7th	20	20	20	20	80 (16.67%)
8th	20	20	20	20	80 (16.67%)
9th	20	20	20	20	80 (16.67%)
10th	20	20	20	20	80 (16.67%)
11th	20	20	20	20	80 (16.67%)
Total	120 (25%)	120 (25%)	120 (25%)	120 (25%)	480 (100%)

Table 2: Morbidity at present among study participants (N=480)

Morbidity (in chronological order)	Number	Percentage
Anemia	208	43.33
Dental caries	89	18.54
Refractive error	53	11.04
Acne	43	9.37
Upper respiratory tract infection (URTI)	33	6.87
Gingivitis	29	6.04
Allergic rhinitis	28	5.83
Chronic Supportive Otitis Media (CSOM)	27	5.62
Lower Respiratory tract infection (LRTI)	22	4.58
Fungal infection of skin	22	4.58
Worm infestation or h/o passing worm	18	3.75
Urinary tract infection (UTI)	13	2.70
Dental fluorosis with dental mottling	12	2.50
Conjunctivitis	6	1.25
Deviated nasal septum (DNS)	6	1.25
Hypertension	6	1.25
Asthma	5	1.02
Seizure	3	0.62
Jaundice	3	0.62
Vitiligo	2	0.41

ISSN (O): 2687-5365; ISSN (P): 2753-6556

DISCUSSION

The present study has found that higher proportion of adolescents attending government school has morbidities in compared to those attending private schools (76.7 vs. 61.7%) and the observed difference was statistically significant with a p value of 0.000. Similar pattern but with lower proportions was observed by Deswal BS et al,[2] (2017) who found that 38.73% children of government schools and 13.74% children of private school in Gurugram, Haryana found had one or more morbid condition.

The present cross-sectional study showed that prevalence of morbidities related to hematological system (45%), oral cavity (24.8%), skin (13.1%), respiratory tract (12.3%), Eye (11.7%) and ENT (10.6%) were quite common among school-going adolescents in Agra city.[3] Errayya Dowrula et al,[4] (2021) reported a similar prevalence of oral cavity morbidities (30.62%) as our study (24.8%). The prevalence of skin infections found by our study (13.1%) was lower than the prevalence reported by Errayya Dowrula et al,[4] (2021) in Visakhapatnam (24.87%), and by Naik KR et al,[5] (2020) in Tirupati (46.4%). Similarly; prevalence of ocular morbidities was reported to be 30.75% by Errayya Dowrula et al,[4] (2021) and 29% by Naik KR et al,[5] (2020) which is more than three times of the present study (11.7%).

The present study also found that adolescent students of government schools has higher proportion of morbidities related to hematological system (49.60%), oral cavity (34.10%), respiratory system (17.90%) and ENT (10.80%); while skin (15.4%) and ocular (17.50%) problems were more prevalent among students of private schools. Higher prevalence of skin and ocular problems in south India and among students of private schools might be due to differences in their socio-economic or nutritional status, personal habits (cleaning of eyes and skin) and level of awareness in compared to their counterparts.

Anemia (43.33%), dental caries (18.54%), refractive errors (11.04%), and acne (9.37%) were four most common found morbidities. The prevalence of anemia, found in the present study, was almost similar to the study by Errayya Dowrula et al,[4] (2021), NFHS-5 (2019-2021),[6] and Kakkar et al (2012).[7] On the contrary; Mahajan N et al,[8] (2019) found a higher prevalence of anemia among adolescents in Gujarat, India (61.5%), while; Varma A et al,[9] (2022), Scott S et al,[10] (2022) and Yerpude PN et al,[11] (2018) found a lower prevalence of anaemia (28-37%) in their studies. In the present study, the prevalence of dental caries was found to be 18.4%. Though somewhat similar prevalence of 17.5% was reported by Malvania EA et al,[12] (2014); others like Vishnoi SK et al (2018),[13] Doley S et al (2022),[14] Singh S et al (2020)[15] and Prabakar J et al (2016),[16] reported much higher prevalence (24-47%) in their studies.

The present study found an 11.04% prevalence of refractive error. Almost similar prevalence was observed by Matta S et al (2017),[17] Sandip S et al (2019) and Batra et al (2015).[18,19] On the other hand; Nelson V et al (2018),[20] found a higher prevalence of refractive errors in southern Kerala (21.7%); but Vishnoi SK et al (2018),[13] Sarawade S et al (2020),[21] Bhutia KL et al (2021),[22] and Sethi S et al (2017),[23] found a lower prevalence of refractive error (6-9%) in their studies. 9.37% prevalence of acne found in the present study, was very low in compared to found by Meghwal N et al (2017),[24] and Sharma RK et al (2017),[25] in their studies (38-72%).

The present study found that government schools has higher proportion of anaemia (49.1%), dental caries (22.5%), URTI (8.75%), Gingivitis (9.16%), CSOM (7.91%), fungal infection (6.25), worm infestation (5%) and dental fluorosis & mottling (4.16%) while private schools has higher proportion of refractive error (16.2%), acne (12.5%), allergic rhinitis (5.83%) and LRTI (5%). Higher prevalence of certain conditions among students of private schools was probably related to their personal habits (watching mobile/TV), allergies, or dietary practice (oil and fat). Very few studies were found which have compared prevalence of different morbidities in public and private schools in India. In one such study by Deswal BS et al (2017),[2] higher proportion of adolescents attending government school in Gurugram, Haryana were found having refractive errors in compared to those attending private schools (36.19 vs. 12.79%). The finding is in contrast with the present study; where lower proportion of adolescents attending government school was found suffering from refractive errors in compared to those attending private schools (5.83 vs. 16.25%).

CONCLUSION

Students of government/public schools has higher proportion of anaemia (49.1%), dental caries (22.5%), URTI (8.75%), gingivitis (9.16%), CSOM (7.91%), fungal infection (6.25), worm infestation (5%) and dental fluorosis & mottling (4.16%) while private schools has higher proportion of refractive error (16.2%), acne (12.5%), allergic rhinitis (5.83%) and LRTI (5%). On the basis of the above findings we recommend that regular health check-up of school-going adolescent is the need of the hour and specialization services should also be incorporated to deal with specific morbidities found prevalent among students of government schools and private schools, as per their need.

REFERENCES

1. World Health Reports 1996-2007. World Health Organization; 2008.
2. Deswal BS, Gupta VP, Girdhar S, Singh M, Yadav VP, Verma T et al. (2017). Comparative Morbidity and Health

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Seeking Behavior among School Children of Government and Public Rural Schools. Indian Journal of Health Sciences and Care; Vol. 4, No. 1, April, 2017, pp- 1-4 (DOI: 10.5958/2394-2800.2017.00001.3)
3. Bhattacharya A, Basu M, Chatterjee S, Misra RN, Chowdhury G. Nutritional status and morbidity profi le of school-going adolescents in a district of West Bengal. Muller J Med Sci Res 2015;6:10-5.
4. Dowrula E, Vithanala VDP, Sreegiri S, et al. Morbidity profile of school children in rural and urban areas of Visakhapatnam – a comparative study. J Evid Based Med Healthc 2021;8(22):1835-1840. DOI: 10.18410/jebmh/2021/346
5. Naik KR, Srinivasan K, Prameela B, et al. A cross sectional, analytical study of the morbidity pattern among boys residing in social welfare hostels in Tirupati town, A. P. J. Evolution Med. Dent. Sci. 2020;9(08): 544-548, DOI: 10.14260/jemds/2020/122
6. International Institute for Population Sciences (IIPS) and ICF. National family health survey (NFHS-5) 2019- 2021.
7. Kakkar R, Kandpal SD, Aggarwal P. Health Status of Children under School Health Services in Doiwala Block, Dehradun. Indian J Community Health 2012;24:45-8.
8. Mahajan N, Kshatriya GK. Trends of nutritional anaemia among adolescents of Kukna Tribal Community of Gujarat, India. Online J Health Allied Scs. 2019;18:1.
9. Varma A, Vagha J, Agrawal A, Meshram R, Damke S, Thakur S. Sociodemographic determinants in prevalence of anemia in adolescents of rural area of Maharashtra. J Datta Meghe Inst Med Sci Univ 2020;15:209-14
10. Scott, S., Lahiri, A., Sethi, V., Wagt, A.,Menon, P., Yadav, K., Varghese, M., Joe, W., Vir, S. C., &Nguyen, P. H. (2022). Anaemia in Indians aged 10–19 years:Prevalence, burden and associated factors at national andregional levels. Maternal & Child Nutrition, 18, e13391.https://doi.org/10.1111/mcn.133911
11. Yerpude PN, Jogdand KS, Jogdand M. A study of health status among school going adolescents in South India. Int J Health Sci Res. 2018;3(11):8-12.
12. Malvania EA, Ajithkrishnan CG, Thanveer K, Hongal S. Prevalence of dental caries and treatment needs among 12-year-old school going children in Vadodara City, Gujarat, India: A cross-sectional study. Indian J Oral Sci 2014;5:3-9.
13. Vishnoi S.K., Jora R, Choudhary S, Chopra P. Comprehensive study of morbidity in school going children in rural areas of western Rajasthan 10.18231/2581-4702.2018.0016
14. Doley S, Srivastava M, Gupta R, Piplani A. Association between oral hygiene status and dental caries among 13–14 years old children of Kamrup District, Assam. J Indian Assoc Public Health Dent 2022;20:137-41.
15. Singh S, Vijayakumar N. Height and dental caries among 13-year-old adolescents in India: A sociobehavioral life course approach. Dent Res J 2020;17:373-9.
16. Prabakar J, John J, Srisakthi D. Prevalence of dental caries and treatment needs among school going children of Chandigarh. Indian J Dent Res 2016;27:547-52(47.3%)
17. Matta S, Matta P, Gupta V, Dev A. refractive error among adolescents attending Ophthalmic OPD Jhansi India. Ind. Journal Comm Medicine. 2017-04-2018-06; 31(2).
18. Sandip S., Bhavya M., Meena C., Archana N., Diwakar R. Prevalence of refractive errors in 10 – 16 years of students in eastern Bangalore, India,
19. Batra N, Kaushal D, Gill AS. Refractive errors in School children – Data from a school. Tropical ophthalmology 2007; 7(3): 43 – 7.
20. Nelson V, Viswanathan G, Simon S. Prevalence and Determinants of Refractive Errors among School Children, A Study from South Kerala. Natl J Community Med 2018;9(11):813-818
21. S S Sarawade. Study on the refractive status of school going children between age group of 10 to 15 years Volume 13 Issue 3 - March 2020
22. Bhutia KL, Bhutia SC, Gupta N, Shenga DO. Prevalence of refractive errors among the school-going children in East Sikkim. Indian J Ophthalmol 2021;69:2018-20.
23. Sethi S, Bhati D. Refractive error among adolescents attending Ophthalmic OPD Jhansi India. Ind. Journal Comm Medicine. 2017- 04-2018-06; 31(2).
24. Meghwal N et al. Prevalence and Determinants of acne among School Children, A Study from South Kerala. Natl J Community Med 2018;9(11):813-818.
25. Sharma, Reena Kumari; Dogra, Sunil; Singh, Amarjeet1; Kanwar, Amrinder J. Epidemiological patterns of acne vulgaris among adolescents in North India: A cross-sectional study and brief review of literature. Indian Journal of Paediatric Dermatology 18(3):p 196-201, Jul–Sep 2017. | DOI: 10.4103/ijpd.IJPD_82_16

ISSN (O): 2687-5365; ISSN (P): 2753-6556