pISSN 2394-6032 | eISSN 2394-6040

Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20184590

Morbidity pattern and its correlates among adolescent girls residing in rural and urban areas of Haldwani, India

Neha Goyal*

Department of Community Medicine, Teerthanker Mahaveer Medical College and Research Centre, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

Received: 01 September 2018 Revised: 04 October 2018 Accepted: 06 October 2018

*Correspondence: Dr. Neha Goyal,

E-mail: drgoyalneha@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Adolescent girls are vulnerable to different morbidities as their health is a confluence of diverse factors, with the profile of disease burden varying from early adolescent girls of 10-14 years age, to late adolescent girls of 15-19 years age.

Methods: This cross-sectional study was done in rural and urban schools of Haldwani block of district Nainital. Multistage random sampling was used to select adolescent girls of 10 to 19 years of age, who were clinically examined and interviewed. Data was analysed using SPSS v21. Statistically significant association was established by Chi-square test.

Results: Common morbidities found among adolescent girls were menstrual problems (54.81%), malnutrition including nutritional deficiencies (54.03%), refractive errors (31.17%), hair problems (28.31%) and dental problems (28.18%). General morbidity was present among 51.69% and 61.47% of rural and urban girls respectively. 123 (15.97%) and 97 (12.60%) were found to suffer from skin diseases and respiratory diseases respectively.

Conclusions: This study revealed a high prevalence of various morbid conditions among adolescent girls despite of various ongoing measures addressing them.

Keywords: Morbidity, Adolescent girls, Rural, Urban

INTRODUCTION

Adolescents, between the ages of 10 and 19 years, constitute one sixth of the world's population and account for substantial proportion of global burden of disease and injury, and are now being identified as central to achieving the Sustainable Development Goals (SDGs). India has largest adolescent population of 243 million representing 21.2% of its population in this age group. Of the total female population in India 10.7% and 9.7% are adolescent girls in age groups 10-14 years and 15-19 years respectively. Since adolescence is phase of physical, cognitive, social, emotional and sexual development, the health of girls during this phase depends on confluence of a various factors at individual,

family, community and national levels.⁴ And many of the health problems during this opportunistic phase are either preventable or treatable and are associated with behaviours like poor eating habits, lack of physical activity, exposure to violence, tobacco and alcohol use and risky sexual behaviour which begin during adolescence, and therefore it is possible to avert more than 33% of the disease burden and 60% of premature deaths among adults by eliminating them.²

The priority needs of adolescents in India today include array of health issues like malnutrition and anaemia, lack of knowledge on sexual and reproductive health (that may result in risky sexual behaviour, early and unwanted pregnancies, sexually transmitted infections including

HIV/AIDS), substance abuse, communicable and non-communicable diseases, mental health concerns, and injuries and violence (including gender based violence), which contribute to increased morbidity and mortality not only during adolescence but also later in their lives.² In this context, this study was done to study the morbidity pattern and its socio-demographic correlates among adolescent girls residing in rural and urban areas of Haldwani.

METHODS

The present cross-sectional study was carried out to study the morbidity pattern among adolescent girls residing in rural and urban areas of Haldwani block of Nainital district in Uttarakhand, from October 2013 to September 2014. For calculating the sample size, the overall prevalence of morbidities among adolescent girls was taken as 65%. With permissible level of error in estimate taken as 5%, taking the design effect of two and assuming 10% refusals, the sample size of present study had come out to be 770. Multistage random sampling was used to select girls. First of all, list of schools with grades from class 6th to 12th from rural and urban areas of Haldwani was prepared. Second stage consisted of selecting one government and one non-government school randomly from rural and urban areas. Lastly simple random sampling was used to select 770 adolescent girl students out of total girls in required age range of 10 to 19 years in selected schools. Informed verbal consent was taken after explaining the purpose of the study and confidentiality was assured. Girls were examined and interviewed using predesigned, semistructured questionnaire containing socio-demographic information including particulars, age, birth order, total number of family members, type of family, religion, food habits, other habits including use of tobacco, education and occupation status of parents, total family income and history of any prior illness. Study tools for examination included stethoscope, torch, Snellen's chart, measuring tape and weighing machine. General morbidity in present study was defined as any subjective departure from the state of physiological wellbeing. Acute illness has been ascertained by considering it as any illness fifteen days prior to the interview. Manifestations related to a particular illness persisting for more than a month during prior one year were referred as chronic. Data with respect to number of girls with morbidities has been finally presented based on the subjective manifestations, findings of clinical examination and established disease explored by history in few cases and few exclusions. Regarding few definitions used to record sociodemographic information like family type and occupation of parents, the nuclear family considered to be consisted of married couple and their dependent children occupying same dwelling space, agriculture workers were practising farming, business included those people who earn from their own shop establishment, service was considered as working in any government department or private establishment irrespective of type of job and labourers

were people working on wages in factory or farms and skilled labourers include worker with some special skill and homemakers were women engaged in household duties but doing no other work to augment family income. Finally the data collected was analysed using SPSS v21. Chi-square test was used for assessing statistically significant association and the two-tailed p value less than 0.05 was considered significant.

RESULTS

Mean age of adolescent girls in present study was 14.29±1.81 years. Out of 443 girls from rural area, 292 (65.90%) and 151 (34.10%) belonged to 10 to 14 and 15 to 19 years age categories respectively, and out of 327 urban girls 137 (41.90%) and 190 (58.10%) were in the 10 to 14 and 15 to 19 years age categories respectively. Overall 430 girls were found to suffer from one or more morbidities in present study and the prevalence of general morbidity was 51.69% and 61.47% among rural and urban girls respectively. Most common morbidities among adolescent girls were menstrual problems (54.81%), malnutrition including nutritional deficiencies (54.03%), refractive errors (31.17%), hair problems (28.31%) and dental problems (28.18%). Skin diseases, history of passage of worms and respiratory diseases were respectively present in 123 (15.97%), 127 (16.49%) and 97 (12.60%). About 63 (8.18%) and 29 (3.77%) were found to suffer from diseases of digestive system and musculoskeletal problems respectively. Genitourinary complaints including vaginal discharge, itching in genital areas and burning during micturition were present in 23 (2.99%) of girls. Eye diseases (excluding refractive errors) were found in 0.78% of girls and disability was present in 0.52% of girls. 1.69% of girls have suffered from infectious diseases including tuberculosis and malaria, 0.78% of girls were suffering from diseases of central nervous system. Miscellaneous conditions including endocrine and blood disorders were present in 0.91% of girls (Figure 2).

Among rural school girls most common morbidity found was malnutrition present in 229 (51.69%) including the findings of anthropometric assessment and clinical manifestations of nutritional deficiencies. Clinical signs of Vitamin A deficiency including Bitot's spots were found in 3 (0.67%) rural girls. However among urban girls most common morbidity was menstrual problems including dysmenorrhea, found in 210 (64.22%). History of passage of worms, genitourinary problems, skin diseases diseases and musculoskeletal were comparatively more common among urban girls, respectively present in 63.78%, 60.87%, 58.54% and 51.72%, as compared to rural girls. Other morbidities including diseases of digestive system, hair problems, refractive errors, dental problems and respiratory diseases were comparatively more common among rural girls, respectively present in 74.60%, 72.94%, 60%, 58.06% and 56.70% (Table 1).

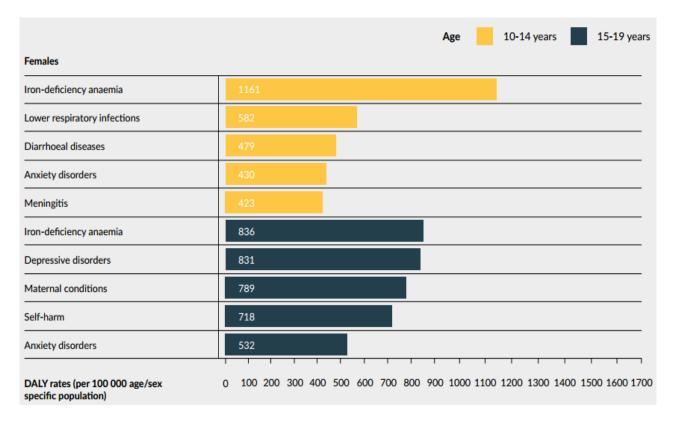


Figure 1: Estimated top five causes of disability-adjusted life years (DALYs) lost globally among adolescent females, 2015.

Source: Global Accelerated Action for the Health of Adolescents (AA-HA!): guidance to support country implementation. Geneva: World Health Organization; 2017: p.19.¹

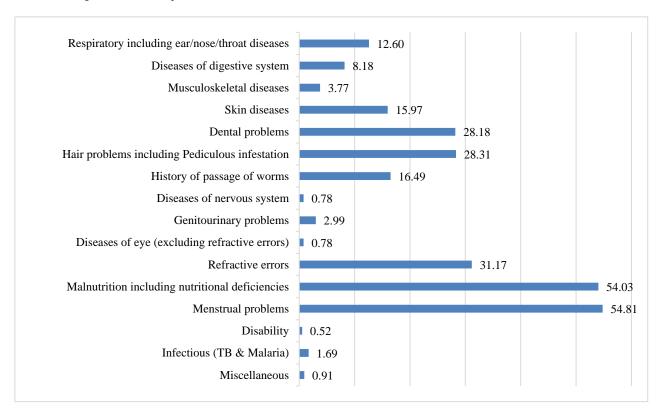


Figure 2: Morbidity pattern among adolescent girls in present study.

Table 1: Morbidity pattern among rural and urban adolescent girls.*

Morbidities	Rural N (%)	Urban N (%)	Total
Respiratory including ear/nose/throat diseases	55 (56.70)	42 (43.30)	97
Diseases of digestive system	47 (74.60)	16 (25.40)	63
Musculoskeletal diseases	14 (48.28)	15 (51.72)	29
Skin diseases	51 (41.46)	72 (58.54)	123
Dental problems	126 (58.06)	91 (41.94)	217
Hair problems including Pediculous infestation	159 (72.94)	59 (27.06)	218
Malnutrition including nutritional deficiencies (anthropometry and clinical assessment)	229 (55.05)	187 (44.95)	416
Refractive errors	144 (60.0)	96 (40.0)	240
Diseases of eye (excluding refractive errors)	3 (50.0)	3 (50.0)	6
Menstrual problems	212 (50.24)	210 (49.76)	422
History of passage of worms	46 (36.22)	81 (63.78)	127
Genitourinary problems	9 (39.13)	14 (60.87)	23
Diseases of nervous system	3 (50.0)	3 (50.0)	6
Disability	3 (75.0)	1 (25.0)	4
Infectious (TB & Malaria)	6 (46.15)	7 (53.85)	13
Miscellaneous	2 (28.57)	5 (71.43)	7

^{*}Multiple response.

Table 2: Distribution of general morbidity according to different socio-demographic factors.

Socio-demographic characteristics	General morbidity present (N=430)	General morbidity absent (N=340)	χ² P value*	
Place of residence				
Rural	229 (51.69)	214 (48.31)	$\chi^2 = 7.29$	
Urban	201 (61.47)	126 (38.53)	p=0.007	
Age category				
10 to14 years	218 (50.82)	211 (49.18)	$\chi^2 = 9.93$	
15 to 19 years	212 (62.17)	129 (37.83)	p=0.002	
Type of school				
Government	305 (59.34)	209 (40.66)	$\chi^2 = 7.65$	
Private	125 (48.83)	131 (51.17)	p=0.006	
Religion				
Hindu	262 (53.47)	228 (46.53)	$\chi^2 = 3.08$	
Muslim/Others	168 (60.00)	112 (40.00)	p=0.079	
Type of family				
Nuclear	290 (59.55)	197 (40.45)	$\chi^2 = 7.37$	
Joint	140 (49.47)	143 (50.53)	p=0.007	
Birth order				
First	171 (64.77)	93 (35.23)	$\chi^2 = 19.39$ p<0.001	
Second	112 (58.33)	80 (41.67)		
Third or more	147 (46.82)	167 (53.18)		
Education of mother				
No formal education	172 (61.87)	106 (38.13)		
Primary/ Middle	127 (59.35)	87 (40.65)	$\chi^2 = 16.02$	
High school/ Intermediate	107 (49.54)	109 (50.46)	p=0.001	
Graduate/ Above	24 (38.71)	38 (61.29)		
Education of father				
No formal education	84 (60.43)	55 (39.57)	$\chi^2 = 1.99$	
Primary/Middle	126 (56.76)	96 (43.24)	p=0.573	
High school/Intermediate	167 (54.05)	142 (45.95)		
Graduate/Above	53 (53.00)	47 (47.00)		

Continued

Socio-demographic characteristics	General morbidity present (N=430)	General morbidity absent (N=340)	χ² P value*	
Mother occupation				
Homemaker	300 (57.47)	222 (42.53)	2 26 07	
Service	70 (40.23)	104 (59.77)		
Labourers	60 (81.08)	14 (18.92)		
Father occupation				
Agriculture	31 (34.83)	58 (65.17)		
Business	153 (66.81)	76 (33.19)	$\chi^2 = 51.38$	
Service	179 (63.25)	104 (36.75)	p<0.001	
Labourers	67 (39.64)	102 (60.36)		
Food habits				
Vegetarian	135 (68.88)	61 (31.12)	$\chi^2 = 18.11$	
Mixed	295 (51.39)	279 (48.61)	p<0.001	

^{*2} tailed p value <0.05 is considered significant.

In present study general morbidity was present in 430 girls and prevalence of general morbidity was 51.69% and 61.47% among rural and urban girls. It was found that place of residence, age and type of school were significantly associated with general morbidity among girls. General morbidity was significantly higher among girls residing in urban areas as compared to rural and among late adolescent girls (15-19 years) as compared to early adolescent girls (10-14 years). 59.34% girls studying in government schools have general morbidity as compared to 48.83% in private schools with significant difference (χ^2 =7.65, p=0.006). General morbidity was significantly higher in girls belonging to nuclear families (59.55%) as compared to girls from joint families (49.47%) and according to religion 53.47% of Hindu girls had general morbidity as compared to 60% girls in Muslim/others group with statistically significant difference (χ^2 =3.08, p=0.079). Stratification according to birth order showed that 64.77% girls with first birth order have general morbidity as compared to 58.33% and 46.82% girls with second birth order and birth order third or more respectively and the difference being significant statistically (χ^2 =19.39, p<0.001). General morbidity was significantly associated with education status of mothers and 61.87% of girls were found to have morbidity when mother has received no formal education as compared to 59.35%, 49.54% and 38.71% with mothers' education till primary/middle, high school/intermediate and graduate/ above respectively ($\chi^2=16.02$, p=0.001). Fathers' education status has been found to have no significant effect in this study. According to working status of mothers it was found that 81.08% of girls have general morbidity of some or other kind when mothers were labourers were which was significantly higher than 57.47% and 40.23%, when mothers were homemakers and doing service respectively. Fathers' occupation status also has significant effect on general morbidity among girls and it was maximum among girls when fathers' occupation was business (66.81%). Morbidities were significantly more common in girls taking the vegetarian diet as compared to girls taking the mixed diet (Table 2).

DISCUSSION

Sustainable development goals (SDGs) are seeking to achieve global sustainable development by 2030, which seems challenging without investment in adolescent health as this period of adolescence, offer opportunities for health gains both through prevention and early intervention in sizeable proportion of population. In India, RKSK has been developed to strengthen the adolescent component of the RMNCH+A strategy with focus on health promotion in six main areas nutrition, sexual & reproductive health, injuries and violence (including gender based violence), non-communicable diseases, mental health and substance misuse.² Existing data related to burden of morbidity among adolescent girls reveals that iron deficiency anaemia has been the leading cause of disability-adjusted life years (DALYs) lost globally for 10 to 14 years as well as for 15 to 19 years old girls. Figure 1 shows that among younger adolescent females, the leading five causes of DALYs lost globally were iron deficiency anaemia, lower respiratory infections, diarrhoeal diseases, anxiety disorders and meningitis, & among older ones depressive disorders, maternal conditions and self-harm were notable besides iron deficiency anaemia.1

In present study predominant morbidities found among adolescent girls were malnutrition, menstrual problems, refractive errors, hair problems and dental problems. Prevalence of general morbidity was 51.69% and 61.47% among rural and urban girls respectively with significant difference, however in a study conducted by Sachan et al in Lucknow, overall 64.8% girls have one or more morbidities and prevalence of total morbidities was 69.7% and 62.7% among rural and urban girls.⁵ Leading causes of morbidity among adolescent girls found by Sachan et al in Lucknow, were hair problems (16.4%), teeth and gums problems (14.2%), and eyes problems (11.7%) in all age groups however in present study hair problems, dental problems and eye morbidities including refractive errors were present in 28.31%, 28.18% and 31.9% girls. These differences may be due to different composition of study sample with respect to place of residence and age groups. Arya et al in Jhansi found that eye problems were commonest and present in 85.8% of adolescent girls which is quite high when compared with present study findings.⁶ Eram et al in Aligarh found most common morbidity among adolescent girls was menstrual problems including dysmenorrhoea or irregular cycles/pattern of bleeding, and this is consistent with present study.⁷

In the study by Jain et al in Dehradun, 63.7% girls were found to have one or other morbid conditions and 77.3% of them have morbidity related to blood and blood forming organs (including nutritional anaemia) and similar findings revealed in present study. 8 Bhattacharyya et al in West Bengal, found about 46.29% school going adolescent girls were undernourished and nutritional deficiencies signs present were pallor (75.92%), vitamin A deficiency (6.78%), vitamin B deficiency (32.9%) and iodine deficiency disorders in (4.32%), which are similar to manifestations observed in present study.9 Vitamin A deficiency including Bitot's spots was found in 0.67% of rural girls belonging to 10-14 years age category in present study. Comparatively higher percentage is observed by Bashar et al in Panchkula, Haryana and Hari Krishna BN et al in Hyderabad during a school health survey, where conjunctival xerosis and Bitot's spots were found in 5% of rural girls of 10 to 15 years age and 2.6% respectively. 10,11

Skin diseases in present study were found in 15.97% girls which were comparatively more among urban girls, which is similar to findings of Eram et al in Aligarh. Sachan et al found skin problems in 3.2% of girls which were comparatively more among rural girls.⁵ However, skin diseases in study by Yerpude et al in Guntur, Andhra Pradesh was 22.2% among urban school adolescent girls, 10.5% in Hari Krishna et al's study, and 3.1% in Sinha et al's study. 11-13 Refractive errors in present study were present in 31.17% girls with significantly more of rural girls affected as compared to urban, with the visual acuity varying from 6/9 to 6/36 in better eye. Inadequate correction was detected in 26 girls of which 17 were rural and 9 urban. Also the refractive errors were more common among girls in 15-19 years age group (38.12%) as compared to 10-14 years (25.64%). These results were inconsistent with findings of Basu et al in Gujarat revealing the overall prevalence of refractive error among girl students of 7 to 15 years of age to be only 15.22%. Mohanta et al in West Bengal found refractive errors in 52.2% females of 12-15 years of age. 15 Joice et al in Puducherry among rural girls of 6-17 years, found refractive errors in 22.3%.¹⁶

Cross sectional studies conducted in Andhra Pradesh, among adolescent girls residing in social welfare hostels representing weaker sections of society by Susmitha et al and Wasnik et al, the leading causes of morbidity found were pediculosis, pallor, dysmenorrhoea, dental caries, skin diseases, vitamin deficiency and passing worms in

stools and defective vision. ^{17,18} Similar to present study findings, Charitha et al in Andhra Pradesh found leading causes of morbidity among adolescent girls were pallor (48%), pediculosis (27.9%), dysmenorrhea (19.9%), vitamin deficiencies (19%), dental caries (18.3%), skin infections (16.6%), passing worms in stool (10.6%), acute respiratory infections (6.4%). ¹⁹ However, Yerpude et al in Guntur, Andhra Pradesh found among school adolescent girls that anaemia, dental caries, ENT problems, skin disorders, history of worm infestation and ophthalmic problems were respectively present in 66.67%, 36.11%, 29.17%, 22.22%, 15.28% and 12.5%. ¹²

In present study respiratory diseases were present in 12.6% girls, which is similar to findings of Arya et al, while Sachan et al found morbidities involving throat including pharyngitis were present in 6.9%.^{5, 6} Eram et al found upper respiratory infections in 20% and ENT problems including tonsillitis, ear discharge/earache and hearing defects in 12%, which is comparatively more than in present study. Jain et al found respiratory morbidities in 5.1% girls. In present study genitourinary problems including vaginal discharge and burning during micturition was reported by 2.99% of girls. Much higher is observed by Arya et al in Jhansi where 10.4% girls had vaginal discharge in which urban was 7.9% and rural was 16.21%, however in our study more of urban girls affected.6 Sinha et al in Lucknow, found vaginal discharge in 8.1%, which is higher than in present study. 13 Nirmala et al in Kerala found endocrinal problems including thyroid enlargement in 7.5% among unmarried girls between 16-18 years of age from urban area, this is much higher than 0.91% in present study, which may be due to majority of girls during their early adolescence in our study. 20 Sachan et al in Lucknow found religion and type of family were insignificantly related to total morbidity among girls, however in present study general morbidity was significantly more among girls belonging to nuclear families and Muslim/others group when respectively compared with girls from joint families and Hindu girls.⁵ Sachan et al in Lucknow also found that total morbidity was significantly higher among girls of higher birth order, and this is again inconsistent with findings of present study where general morbidity was significantly more among girls with first birth order.5 The reason could be lack of care received by first child which is gained subsequently with experience. Jain et al in Dehradun showed significant relationship of morbidity in girls who were non-vegetarian as compared to those who were vegetarian. Morbidities were significantly more common in girls taking the vegetarian diet as compared to girls taking the mixed diet in present study.⁸ The fact that mental health disorders in adulthood start by age of fourteen years, but most cases remain undetected and untreated, compels for the need of assessment of morbidities related to mental health, which is not done in present study. Another limitation was inclusion of school going adolescent girls only.

CONCLUSION

Present study concluded that various morbidities were prevalent among adolescent girls and majority are either preventable or treatable. Place of residence, age, birth order, type of family and school were significantly associated with morbidities among girls, signifying the importance of strengthening the role of family and schools for promoting the health of adolescent girls, giving emphasis to health communication and periodic screening.

ACKNOWLEDGEMENTS

Author would like to acknowledge the valuable support and help provided by study subjects, school principals and teachers.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- Global Accelerated Action for the Health of Adolescents (AA-HA!): guidance to support country implementation. Geneva: World Health Organization; 2017:19. Available at: http://www.who.int/maternal_child_adolescent/topic s/adolescence/framework-accelerated-action/en/. Accessed 19 August 2018.
- Government of India. Ministry of Health and Family Welfare, New Delhi. RKSK Strategy Handbook; 2014: 32-33. Available at: http://nhm.gov.in/images/ pdf/programmes/RKSK/RKSK_Strategy_Handbook .pdf. Accessed 19 August 2018.
- 3. Park K. Demography and Family Planning. Text Book of Preventive and Social Medicine. 24th ed. Jabalpur: Banarasi Das Bhanot; 2017: 516.
- 4. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A, et al. Adolescence and the social determinants of health. Lancet. 2012;379(9826):1641-52.
- 5. Sachan B, Idris MZ, Jain S, Kumari R, Singh A. Social determinants and its influence on the prevalence of morbidity among adolescent girls. North Am J Med Sci. 2012;4:474-8.
- 6. Arya V, Chaturvedi S. Comparative study on morbidity pattern among adolescent schoolgirls in rural and urban school of Jhansi. Int J Med Sci Public Health. 2018;7(5):345-8.
- 7. Eram U, Tamanna Z, Khalique N. Study of morbidity pattern among adolescent girls in rural areas of Aligarh. Int J of Current Advanced Res. 2016;5(11):1455-7.
- 8. Jain K, Agrawal D, Gupta SK. High Morbidity among Urban Adolescent Females: A Cause for

- Concern. Int J of Contemporary Medical Res. 2016;3(4):961-4.
- Bhattacharya A, Basu M, 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
- Bashar A, Aggarwal AK, Pilania M. A Study to Assess Pattern of Morbidities among Adolescents under School Health Program from A rural Block of North India. National J Community Med. 2017;8(12):721-5.
- 11. Hari Krishna BN, Sreedhar M, Madhukeerthi. Cross sectional Study on Nutritional Status and Morbidity pattern among School going Adolescents in Rural Health Training Centre, Patancheru, Hyderabad District-Telangana. Indian J of Basic and Applied Medical Res. 2017;6(3):5-9.
- 12. Yerpude PN, Jogdand KS, Jogdand M. A study of health status among school going adolescent girls in South India. Int J Health Sc Res. 2013;3(11):8-12.
- 13. Sinha S, Gupta P, Sachan B, Kumar S, Kumari S. A study on the morbidity pattern in adolescent school girls. Int J Community Med Public Health. 2017;4:1901-5.
- 14. Basu M, Das P, Srivastava RK. Growth and morbidity pattern of students of urban girls' school in Gujarat. Indian J Prev Soc Med. 2012;43(1):62-7.
- 15. Mohanta M, Dasgupta A, Pan T, Paul B, Bandyopadhyay L, Mandal S. An epidemiological study on ocular morbidities among school students in an urban area of South 24 Parganas, West Bengal. Int J Community Med Public Health. 2018;5:3454-8.
- Joice S, Velavan A, Natesan M, Singh Z, Purty AJ, Hector H. Assessment of Nutritional Status and Morbidity Pattern among School Children of Rural Puducherry. Acad Med J India. 2013;15:1(1).
- 17. Susmitha KM, Jyothi C, Prabakaran J. Morbidity Pattern among the Adolescent girls: A study in the social welfare hostels for scheduled caste, Nellore city, A.P., India. Nat J Res Com Med. 2012;1:35-40.
- 18. Wasnik V, Rao BS, Rao D. A Study of the Health Status of Early adolescent Girls residing in Social Welfare Hostels in Vizianagaram district of Andhra Pradesh State, India. Int J Collaborative Res Internal Med Public Health. 2012;4(1):72-83.
- Charitha T, Kumar DK, Susmitha KM, Prabakaran J. Morbidity Pattern among Adolescent girls in urban slums of Kurnool town, Andhra Pradesh, India. National J Res in Community Med. 2017;6(1):18-22.
- 20. Nirmala.C, Jayakumari.C, Mayadevi.B, Nandini V.R. Reproductive Morbidity and Endocrinological Profile of Unmarried Adolescent Girls (16-18 years) in Urban Setting. JMSCR. 2017;5(3):19209-13.

Cite this article as: Goyal N. Morbidity pattern and its correlates among adolescent girls residing in rural and urban areas of Haldwani, India. Int J Community Med Public Health 2018;5:4889-95.