

# Social Determinants and its Influence on the Prevalence of Morbidity among Adolescent Girls

Beena Sachan, MZ Idris<sup>1</sup>, Savita Jain<sup>1</sup>, Reema Kumari<sup>1</sup>, Ashutosh Singh<sup>2</sup>

Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow, <sup>1</sup>Department of Community Medicine, CSM Medical University UP, Lucknow, <sup>2</sup>Department of Pathology, LLRM Medical College, Meerut, UP, India

## Abstract

**Background:** The adolescent girls are more vulnerable, particularly in developing countries including India, due to various adverse socio-cultural and economic reasons. Majority of the health problems affecting adolescent girls are preventable by promotion of hygienic practices through proper health education by the teachers. **Aim:** This study was designed to examine the various factors influencing the prevalence of morbidity among school-going adolescent girls of Lucknow district in north India. **Materials and Methods:** A cross-sectional study was carried out in urban and rural schools of Lucknow district from 2008 to 2009. Multistage random sampling was used to select the requisite number of girls. A total of 847 adolescent girls between 10 and 19 years of age were interviewed, and information regarding their socio-demographic characteristics was collected and clinical examination was carried out. Statistical analyses were done using percentage and Chi-square test. **Results:** Of 847 adolescent girls, around 64.8% were found to be sick at the time of the study. Significant association of morbidity was observed with caste, birth order, type of family, socioeconomic status (SES), living status with parents/guardian, and general personal hygiene ( $P < 0.05$ ). **Conclusion:** This study reveals a high prevalence of morbidity. A strong need exists for planning and programming intervention activities for health needs in the area.

**Keywords:** Adolescent girls, Lucknow district, Morbidity, Socioeconomic status

**Address for correspondence:** Dr. Beena Sachan, In front of Dr. Uma Singh, Ashok Nagar, Ghatampur, Kanpur Nagar, U.P. - 209 206, India.  
E-mail: [beenasachankgmu@gmail.com](mailto:beenasachankgmu@gmail.com)

## Introduction

Adolescence has been defined by the World Health Organization as the period of life spanning the ages between 10 and 19 years.<sup>[1]</sup> Since decades, a female from birth till death has been a neglected segment of population. Health of the girls of today will affect the health and survival of the future generation. Adolescent girls are the mothers of tomorrow, and no edifice can be built on a foundation that is weak, and if we could not give a safe and secure today to the mother of tomorrow, it will be futile to expect the future generation to be mentally and physically healthy.

Although there are many programs<sup>[2]</sup> that focus on the needs of adolescent girls, but as the health needs of them are tremendous and these have seldom been met, as a consequence of this, their health status is low. There is no comprehensive study to assess factors influencing the prevalence of morbidity of adolescent girls in Lucknow district, the capital of most populated state, which has prompted to undertake the present study. This study brings out the present morbidity pattern by age and related underlying factors influencing the prevalence of morbidity among school-going adolescent girls in Lucknow district. It will also provide baseline information for carrying out future interventional studies to deal with the problems of adolescent girls.

This study was undertaken among school-going adolescent girls with the following objectives:

1. To find out the morbidity status of school-going adolescent girls.
2. To find out the status of general personal hygiene.
3. To analyze factors influencing the prevalence of morbidity among school-going adolescent girls.

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## Materials and Methods

The study protocol was submitted to the Institutional Ethical Committee and clearance was obtained. Informed consent of the principals of schools was taken before the study and assent from the selected adolescents was also obtained, before initiation of the study.

The present cross-sectional study was carried out among school-going adolescent girls in Lucknow district from October 2008 to September 2009. An optimum sample size of 847 (593 urban and 254 rural) school-going adolescent girls of Lucknow district, aged 10–19 years, were interviewed and examined.

The sample size was calculated using the formula,  $n = Z^2 \frac{pq}{d^2}$  (where  $Z_{(1-\alpha/2)} = 1.96$  at 95% confidence level;  $p$  = prevalence of morbidity,  $q = 1 - p$ ;  $d$  = allowable error). For this study, we assumed 50% prevalence of morbidity, hence  $P = 0.5$ ;  $q = 0.5$ ;  $d = 5\%$ . Thus, the sample size yielded was 385. As the subjects are chosen by multistage random sampling, a design effect due to complex sample design comes into picture. Taking into account the design effect of 2 and 10% as nonrespondents, the total number came out to be 847.

Multistage random sampling technique was used to select the requisite number of eligible girls.

### First stage

Lucknow district is divided into urban and rural areas. The urban area is spread equally on both sides of Gomti River known as Cis Gomti and Trans Gomti. According to Nagar Nigam Lucknow, urban area is divided into six zones. From Cis Gomti, two zones were randomly selected and similarly from Trans Gomti two zones were randomly selected.

### Second stage

At the second stage, from each zone one senior secondary school was selected randomly from the listed senior secondary schools. Similarly two blocks were selected randomly from eight blocks of the rural Lucknow. From each block, one senior secondary school was selected randomly from listed senior secondary schools.

### Third stage

At the third stage, students from classes VI to XII of age group 10–19 years were selected. Students within the class were selected through systematic random sampling. In some schools of rural area, the numbers of students in the classes were not enough; therefore, all the students of the class were invited to participate in the study as systematic random sampling was not possible.

A total of six senior secondary schools, four schools from urban area and two schools from rural area were randomly selected from listed senior secondary schools. From these schools, 593 adolescent girls from urban schools and 254 adolescent girls from rural schools were selected for the study.

Socio-demographic data were collected on all girls at baseline. A structured interview schedule was developed and pre-tested on adolescent girls of a school other than the ones selected for the study. The pre-tested schedule was modified after pre-testing and finalized. The demographic status, which consisted of information on religion, caste, type of family, birth order, and SES, was also recorded in order. Data regarding morbidity status were collected using pre-tested and finalized interview schedule. A separate room in each school was used for examination purpose. Every girl was examined physically from head to toe and any signs and symptoms of illness were recorded. Inquiry was made about practices regarding general personal hygiene. Social class was calculated using modified Kuppuswamy scale<sup>[3]</sup> in urban area and Pareek scale<sup>[3]</sup> in rural area.

### Variable studied

Socio-demographic profile (religion, caste, type of family, birth order, and SES), living status of girls with parents, general personal hygiene, and morbidity status were studied.

### Statistical analysis

Data were entered in Microsoft Office Excel and analyzed with Statistical Package for the Social Sciences (SPSS) version 16.0. Data were analyzed using percentages and Pearson's Chi-square test for normal distribution.  $P$  values less than 0.05 were considered significant.

## Results

Of 847 adolescent girls, around 64.8% were found to be sick at the time of the study. A maximum of 16.4% girls were suffering with hair problems followed by teeth and gum problems, which was 14.2% [Table 1].

In urban Hindu school girls, the total morbidity was 61.4%, and in Muslim school girls, it was 69.2%. In rural Hindu school girls, the total morbidity was 70.2%, and in Muslim school girls, it was 62.5%. The religion was insignificant with regard to total morbidity [Table 2].

In urban schools, the other backward class (OBC) girls had a maximum of 74.0% total morbidity followed by schedule caste/schedule tribe (SC/ST) girls. The caste in urban school girls had significant role in total morbidity, but it was insignificant in rural school girls [Table 2].

**Table 1: Distribution of morbidity pattern by age**

Morbidity pattern	10-13 years (n=331)				14-16 years (n=385)				17-19 years (n=131)				Total (n=847)	
	Urban (n=253)		Rural (n=78)		Urban (n=268)		Rural (n=117)		Urban (n=72)		Rural (n=59)		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Skin	4	1.6	4	5.1	11	4.1	2	1.7	4	5.6	2	3.4	27	3.2
Jaundice	0	0	0	0	2	0.7	0	0	0	0	0	0	2	0.2
Lymphadenopathy	1	0.4	0	0	0	0	1	0.9	0	0	0	0	2	0.2
Edema	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hair	23	9.1	17	21.8	49	18.3	21	18.0	12	16.7	17	28.8	139	16.4
Eyes	15	5.9	7	9.0	43	16	9	7.7	16	22.2	9	15.3	99	11.7
Ear	6	2.4	4	5.1	19	7.1	7	6.0	5	6.9	3	5.1	44	5.2
Throat	21	8.3	6	7.7	20	7.5	5	4.3	3	4.2	3	5.1	58	6.8
Lips	3	1.2	2	2.6	0	0	1	0.9	1	1.4	4	6.8	11	1.3
Tongue	2	0.8	0	0	0	0	0	0	0	0	0	0	2	0.2
Teeth and gums	30	11.9	13	16.7	36	13.4	13	11.1	13	18.1	15	25.4	120	14.2
Musculoskeletal	0	0	0	0	1	0.4	0	0	0	0	0	0	1	0.1
GIT	2	0.8	0	0	0	0	0	0	0	0	0	0	2	0.2
CNS	1	0.4	0	0	0	0	0	0	0	0	0	0	1	0.1
Respiratory	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cardiovascular	1	0.4	0	0	0	0	0	0	0	0	0	0	1	0.1
Reproductive system	5	2.0	1	1.3	17	6.3	8	6.8	6	8.3	3	5.1	40	4.7
Total	114	45.1	54	69.2	198	73.9	67	57.3	60	83.3	56	94.9	549	64.8

In urban schools, a maximum of 74.1% total morbidity was in girls with birth order five or more. Similarly, in rural schools, a maximum of 85.2% total morbidity was in girls with birth order five or more [Table 2].

In urban schools, the girls belonging to nuclear families had more, that is, 63.9% total morbidity, whereas in rural schools, the girls belonging to joint families had more, that is, 88.9% total morbidity. The type of family had significant role in total morbidity in rural school girls [Table 2].

In urban schools, a maximum of 78.7% total morbidity was in girls belonging to SES-IV and a minimum of 45.8% total morbidity in SES-I. In rural schools, a maximum of 73.0% total morbidity was in girls belonging to SES-III and a minimum of 50.0% total morbidity in SES-II girls. In both urban and rural school girls, SES was significantly associated with total morbidity [Table 2].

In urban schools, a maximum of 77.8% total morbidity was in girls living with only mothers/father, and in rural schools, a maximum of 75.0% total morbidity was in girls living with single parent. In urban schools, the living status of girls with parents was significantly associated with total morbidity. In rural schools, no significant association was observed between total morbidity and living status with parents/guardian [Table 3].

Overall, the girls with poor general personal hygiene had a maximum of 80.6% total morbidity and general personal hygiene was significantly associated with total

morbidity. In urban schools, the girls with satisfactory general personal hygiene had a maximum of 72.8% total morbidity, whereas in rural schools, the girls with poor general personal hygiene had a maximum of 89.5% total morbidity [Table 4].

## Discussion

The Government of India has made the adolescent health as a part of Reproductive and Child Health package since 1997. The health problems of adolescent girls vary from place to place, and several studies conducted in India and abroad revealed that the main morbidity conditions include malnutrition, dental caries, diseases of skin, problem of eye and ear, and reproductive problems.<sup>[4]</sup>

In the present study, the leading causes of morbidity were hair problems (16.4%), teeth and gums problems (14.2%), and eyes problems (11.7%) in all age group girls due to poor personal hygiene. In a study conducted by Srinivasan (2000),<sup>[5]</sup> in Tirupati in 598 children aged 6–17 years, the common morbid conditions found were skin disorders 25.7% and dental caries 21.5%. Singh *et al.*<sup>[6]</sup> reported inadequate oral hygiene of 55.4%. In the present study, morbidity due to skin disease is 3.2%. These differences may be due to differences in the study area and other associated factors. The study revealed that the overall prevalence of morbidity was more among Muslim girls, but this difference is insignificant. Adolescent girls belonging to general caste have less morbidity than other backward classes

**Table 2: Distribution of total morbidity according to religion and caste among adolescent school girls**

Religion	Urban (n=593)			Rural (n=254)			Total			
	n	Total morbidity	%	n	Total morbidity	%	N	Total morbidity	%	
Hindu	489	300	61.4	238	167	70.2	727	467	64.2	
Muslim	104	72	69.2	16	10	62.5	120	82	68.3	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=2.28, P=0.13$			$\chi^2=0.42, P=0.13$			$\chi^2=0.76, P=0.384$		
Caste										
General	222	114	51.4	54	42	77.8	276	156	56.5	
OBC	231	171	74.0	114	73	64.0	345	244	70.7	
SC/ST	140	87	62.1	86	62	72.1	226	149	65.9	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=24.92, P=0.000$			$\chi^2=3.63, P=0.163$			$\chi^2=13.73, P=0.001$		
Birth order										
1-2	359	212	59.1	154	102	66.2	513	314	61.2	
3-4	180	120	66.7	73	52	71.2	253	172	68.0	
≥5	54	40	74.1	27	23	85.2	81	63	77.8	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=6.24, P=0.044$			$\chi^2=4.02, P=0.134$			$\chi^2=10.01, P=0.007$		
Family type										
Nuclear	501	320	63.9	200	129	64.5	701	449	64.1	
Joint	92	52	56.5	54	48	88.9	146	100	68.5	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=1.79, P=0.180$			$\chi^2=11.97, P=0.001$			$\chi^2=1.04, P=0.307$		
Socioeconomic status										
I	24	11	45.8	-	-	-	24	11	45.8	
II	229	122	53.3	10	5	50.0	239	127	53.1	
III	190	121	63.7	152	111	73.0	342	232	67.8	
IV	150	118	78.7	92	61	66.3	242	179	74.0	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=28.06, P=0.000$			$\chi^2=3.14, P=0.000$			$\chi^2=28.34, P=0.000$		

**Table 3: Distribution of total morbidity among adolescent school girls according to living status with parents/guardian**

Living status	Urban (n=593)			Rural (n=254)			Total (N=847)			
	n	Total morbidity	%	n	Total morbidity	%	N	Total morbidity	%	
Both parents	548	337	61.5	246	171	69.7	794	508	64.0	
Only mother/father	45	35	77.8	8	6	75.0	53	41	77.4	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=4.715, P=0.030$			$\chi^2=0.110, P=0.740$			$\chi^2=3.900, P=0.048$		

**Table 4: Distribution of total morbidity among adolescent school girls according to general personal hygiene**

General personal hygiene	Urban (n=593)			Rural (n=254)			Total (N=847)			
	n	Total morbidity	%	n	Total morbidity	%	N	Total morbidity	%	
Good	495	301	60.8	164	114	69.5	659	415	63.0	
Satisfactory	81	59	72.8	71	46	64.8	152	105	69.1	
Poor	17	12	70.6	19	17	89.5	36	29	80.6	
Total	593	372	62.7	254	177	69.7	847	549	64.8	
		$\chi^2=4.722, P=0.092$			$\chi^2=4.330, P=0.115$			$\chi^2=6.102, P=0.047$		

and scheduled caste, and this difference is statistically significant. The reason for high morbidity in lower caste could be due to lack of money, either due to poverty or due to more number of children in the

family, lack of knowledge about child care practices, and poor personal hygiene.

In the present study, it was found that morbidity is increasing gradually with increase in birth order and this is statistically significant. This difference may be due to dilution of household resources and mother's attention, as the birth order in the family increases. Girls belonging to joint family have more morbidity than the girls living in nuclear families. This difference is statistically significant in rural area. A significant association between SES and morbidity was also observed ( $P=0.000$ ), which may be because of better living standards with better SES and better awareness among parents. In this study, it was seen that living status of girls with parents was significantly associated with total morbidity. Adolescent girls living with single parent are more associated with morbidity. This result suggests that family background has some effect on physical illness. The two-parent family has traditionally been assumed to offer a better environment for the children's development than a single-parent family.<sup>[7]</sup>

Morbidity was significantly higher in the group with poor personal hygiene score. In a study conducted by Agrawal *et al.*<sup>[8]</sup> in Mumbai among 1,144 girls, common health problems were hygiene related (62.2%). Hence, care should be taken to improve the status of personal hygiene of school girls through coordinated primordial and primary preventive measures like health education.

## Conclusions

Health education programs on hygiene and common diseases have to be carried out regularly in schools in consultation with concern health authorities. A significant association of morbidity with caste, birth order, family type, SES, living status with parents, and personal hygiene suggests a need to develop strategies for intensive adult education and to improve the living standards of the population. Health education may be useful for improving the health status of adolescent girls, and this could be imparted in all the schools with the help of health personnel, and Non-Governmental Organizations and teachers of the school may be trained regarding health education. Parents and school teachers need to be trained adequately. There should be monthly parent-teacher meetings. Simple measures

like improvement of personal hygiene and following safe, hygienic practices by adolescent girls can go a long way in reducing morbidities. In addition to awareness, there is an urgent need for accessible health services for adolescent girls in rural areas.

Adolescent should be considered high-risk group of society (next only to infants and children), so, although they have been neglected till date, still there is time, to provide them helping hands and loving heart, else we will lose millions of perfect women of future.

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