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Editorial

INFANT AND YOUNG CHILD FEEDING (IYCF) PRACTICES NEED A FILLIP

Deoki Nandan* and Shariqua Yunus**

About 35 per cent of the children under five years of age die each year due to under-nutrition, and many more are permanently disabled by the physical and mental affects of a poor dietary intake in the early years of their lives. By the time children reach their second birthday, if under-nourished; they could suffer from irreversible physical and cognitive damage, affecting their future health, economic well-being and welfare. The consequences of insufficient nourishment continue into adulthood and are passed on to the next generation. As per the National Family Health Survey-III (2005-'06), 48 per cent of the children under-five years of age are stunted and 43 per cent are underweight in India. The survey also establishes the fact that the proportion of children who are stunted or underweight increases rapidly with the child's age during 6-23 months. It may also be noted from the survey data that even during the first six months of life, when most babies are breast-fed, 20-30 per cent of the children are under-nourished as per the three nutritional indices namely, stunting, wasting and underweight. The major reason for such poor nutritional status amongst children is inappropriate, inadequate and faulty infant and young child feeding practices.

Optimal infant and young child feeding (IYCF) practices form the cornerstone of child care and development. According to the Lancet Series on Child Survival, infant and young child feeding ranks among the most effective interventions to improve child nutrition/health and reduce child mortality. The achievement of universal coverage of optimal breast-feeding could prevent 13 per cent of the deaths occurring in children less than 5 years of age globally while appropriate complementary feeding practices would result in an additional 6 per cent reduction in under-five mortality. Optimal infant and young child feeding practices as recommended by the World Health Organization includes early initiation of breast feeding i.e., within an hour of birth; exclusive breast-feeding till 6 months of age; and introduction of complementary feeding at 6 months while continuing breast-feeding up to 2 years or beyond.

In India, as per figures available from the district Level Health Survey (DLHS, 2007-'08), only 40.2 per cent of the children under three years are breast-fed within one hour of birth, 46.4 per cent of the children aged 0-5 months are exclusively breast-fed, 24.9 per cent of the children aged 6 to 35 months are breast-fed for at least 6 months and a miniscule 23.9 per cent of the children aged 6 to 9 months receive solid, semi-solid foods and breast milk. According to the recently concluded WHO-INCLIN study, the reasons for such abysmally low levels of good IYCF practices points to myths/misconceptions amongst the mothers and key decision makers in the family about feeding, limited availability of time with the mothers for preparation of modified

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home food and active feeding for under-two children, consequent dependence on commercially available ready to eat food in the market and inadequate responsiveness of the government health system and schemes to address the issue of under-nutrition. According to the study, mothers in most of the households in India have little time for preparing special foods for infants and small children or modifying the food cooked for the adults. Further, while breast-feeding and child feeding are natural acts, they are also learned behaviours. An extensive body of research has demonstrated that mothers and other caregivers require active support for establishing and sustaining appropriate IYCF practices. However, this aspect of child health is often not well addressed in the basic training of doctors and nurses and other allied health and nutrition personnel. Because of lack of adequate knowledge and skills, health professionals in fact are often barriers in improving IYCF practices.

The Government of India is cognizant of the importance of IYCF and the need to improve infant and young child feeding practices in the country. The Government has launched a series of schemes and programmes to this effect. While recognizing the value of the range of programmes under various Government ministries and departments, gaps in the IYCF interventions have been noted both at the level of policy and individual capacities. These gaps can be addressed through the introduction of policy protocols, inter-sectoral convergence and coordination, advocacy and communication, capacity building and empowerment, and community involvement.

National guidelines on IYCF and existing strategies like IMNCI (Integrated Management of Neonatal and Childhood Illness) need to be widely disseminated and implemented. A cadre of nutrition counsellor needs to be created in all institutions where deliveries are conducted. Further, there is an imperative need to revitalize the “Baby-friendly Hospital Initiative” and strengthen the implementation of the IMS Act. A joint operational framework for optimal IYCF must be developed between the ministries of Health and Family Welfare and Women and Child Development to achieve the convergence of purpose, synergy in implementation and joint monitoring. Opportunities for behavioural change are diverse and need to be coordinated at the local, district, state and national levels with programmes reaching caregivers of children under two (NRHM & ICDS). All hospitals, maternity establishments, health and ICDS staff need to be directed to counsel pregnant/lactating mothers at every possible opportunity on the benefits of appropriate IYCF. An extensive and focused communication campaign on IYCF needs to be launched to address all target groups including counseling to mothers through health and Anganwadi centres. There is a need to harmonize behavioural change communication goals across all levels and sectors including media. Media and other stakeholders need to be engaged to ensure continued attention to nutrition and a focus on children under-two. It is imperative to build knowledge, capacity for behaviour change communication, counselling and develop problem solving skills among Anganwadi Workers (AWWs), Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs) for improving the IYCF practices. It is not only important to build the capacities of the field level functionaries but the medical and paramedical personnel at the hospitals and health centres as well need to be capacitated in the area of IYCF as they are the first point of contact in cases of institutional deliveries. Often, it is observed that the mothers in the community are committed to feed their children as per the desired IYCF practices but the requisite community support is missing. Hence, there is a need to sensitize the entire communities to the needs of children under-two, including family members, panchayat members, women's groups,

mothers' committees and other local resource groups. The participation of fathers and elders in the family in child care and sharing household responsibilities are important for improving IYCF practices. The community support groups have a vital role in providing information on correct IYCF practices and supporting mothers in problem solving and care seeking.

Optimal IYCF practices have the potential in preventing under-five child deaths. The policy and strategies of the Government of India provide a favourable environment for the implementation of this low-cost intervention. The practice of breast-feeding children is culturally acceptable; however, the community practices related to early initiation and exclusive breast-feeding for six months and optimal complementary feeding from six months of age needs to be strengthened. This can be achieved through catalytic inputs and inter-sectoral convergence and coordination to overcome the barriers in the efficient implementation of the robust Government programmes in place.

IMPACT OF HEALTH EDUCATION ON KNOWLEDGE AND PRACTICES ABOUT MENSTRUATION AMONG ADOLESCENT SCHOOL GIRLS OF KALAMBOLI, NAVI-MUMBAI

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ABSTRACT

This study was undertaken to assess the impact of health education on knowledge regarding menstruation and sources of information, misconceptions, restrictions, status of menstrual hygiene and practices amongst adolescent school girls. A community-based interventional study was conducted among 217 adolescents of Kalamboli, Navi-Mumbai, Maharashtra, India. A pre-tested questionnaire was administered and later health education regarding menstruation and healthy menstrual practices was imparted to the girls. Post-test was done after 3 months to assess the impact of health education. In the pre-test, menstrual perceptions amongst them were found to be poor and practices incorrect while in the post-test, there was a significant difference in the level of knowledge ($P < 0.01$). There was no significant difference in pre and post-test with regard to restrictions followed during menses ($P > 0.05$). In the pre-test, it was observed that 51.28 per cent of the girls washed their cloths only with water, 4.27 per cent of them sundried their cloths and 51.28 per cent of them burnt these for final disposal while in the post-test preceding health education, significant improvements were observed in their practices.

Key Words: Health education, Menstruation, Knowledge and practices, Adolescent girls.

Adolescence is the period of transition from childhood to adulthood. WHO has defined adolescence as the age group of 10-19 years¹. The onset of menstruation is one of the most important changes occurring among girls during the adolescent years. Menstruation is still regarded as something unclean or dirty in the Indian society. Because of various myths, misconceptions and restrictions practiced during menstruation, the adolescent girls often develop negative attitudes towards this natural physiological phenomenon. Majority of the girls lack scientific knowledge about menstruation and puberty. Adolescent girls often are reluctant to discuss this topic with their parents and often hesitate to seek help regarding their menstrual problems. Unhygienic menstrual practices may affect their health such as increased vulnerability to RTIs (Reproductive Tract Infections) and PID's (Pelvic Inflammatory Diseases) and other complications. Use of sanitary pads may be increasing but not among girls from rural and poor families. Girls should be educated about "menstruation and healthy menstrual practices" through expanded programme of health education in schools. Data on their level of knowledge and practices are beneficial for planning programmes for improving their awareness level.

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OBJECTIVES

- i. To study the existing level of knowledge and practices regarding menstruation among adolescent school girls and to assess the change in their knowledge level and practices after health education on “menstruation and healthy menstrual practices”;
- ii. To assess the source of information, beliefs, misconceptions and restrictions related to menstruation; and
- iii. To find out the status of menstrual hygiene among adolescent school girls.

MATERIALS AND METHOD

A community-based interventional study was conducted among all 217 adolescent girls of classes IXth and Xth of two secondary schools in Kalamboli. Kalamboli is the field practice area of MGM Medical College, Navi-Mumbai, Maharashtra, India. The study was conducted during the period July-December 2009. After taking permission from the school authority, a pre-designed, pre-tested, structured questionnaire in Marathi was administered to the school girls to study their existing level of knowledge and practices regarding menstruation. The questionnaire included topics concerning menstruation, source of information, menstrual hygiene, beliefs and restrictions related to menstruation.

After collection of the questionnaire, health education regarding “menstruation and healthy menstrual practices” was imparted to the girls through lectures with the help of audio-visual aids. This was followed by question-answer session to clarify their doubts. After three months, the same questionnaire was again administered to the students (post-test) to assess the impact of health education. Data obtained were compiled and analyzed statistically using chi-square test and percentages.

FINDINGS

In the study, it was observed that out of 217 girls, 197 (90.78%) had attained menarche while 20 (9.22%) had yet to attain menarche. The mean age of menarche of the respondents was 13.32 years. All the 217 (100%) girls were aware of menstruation. 94 (43.3%) girls reported that their mother was the main source of information about menstruation. Other sources of information were friends 57 (26.3%), sisters 32 (14.7%), relatives 18 (8.3%), literature e.g. magazines, newspapers, etc. 14 (6.5%) and T.V. 2 (0.9%). Out of the 197 girls who had attained menarche, the reaction to first menstruation was noted. 46 (23.35%) of them felt dirty and 41 (20.81%) of them became angry thinking that why only girls should have it while boys don't. 40 (20.30%) girls felt weird, 38 (19.30%) got irritated while 17 (8.63%) felt good that they grew up and 15 (7.61 %) girls did not react in any manner.

The inter-menstrual interval was reported to be 28-30 days in 83 (42.13%) girls, 15-27 days in 27 (13.70%) girls, 31-45 days in 41 (20.81%) girls and 46-60 days in 46 (23.36%) girls. The duration of menstrual flow was <2 days in 18 (9.13%) girls, 3-6 days in 169 (85.80%) girls and 7-12 days in 10 (5.07%) girls. Dysmenorrhoea was reported in 158 (80.20%) girls. In the pre-test, only 73 (33.64%) girls correctly reported uterus as the organ from where blood comes whereas 113 (52.07%) girls reported urethra while 16

(7.38%) and 15 (6.91%) girls reported ovary and stomach respectively from where the blood comes. Following health education, 216 (99.54%) girls correctly reported uterus as the organ from where menstrual blood comes. In the post-test, 137 (63.13%) girls felt that it is one of the reasons for sickness and absenteeism in schools.

TABLE 1
KNOWLEDGE AND BELIEFS REGARDING MENSTRUATION (n=217)

Knowledge and or Beliefs	Yes		No		Can't say		X2 and P value
	No.	%	No.	%	No.	%	
1. Do you think menstrual blood is impure?							
Pre-Test	157	72.35	9	4.14	51	23.51	X ² =399.434, df= 2, P= 0.000, P<0.01
Post-Test	0	0	217	100	0	0	
2. Influence of hot and cold food on menses?							
Pre-Test	173	79.72	24	11.05	20	9.23	X ² =298.381, df= 2, P= 0.000, p<0.01
Post-Test	12	5.52	200	92.16	5	2.32	
3. Does excessive bleeding lead to anaemia?							
Pre-Test	28	12.91	97	44.70	92	42.39	X ² =330.897, df= 2, p= 0.000, p<0.01
Post-Test	216	99.54	0	0	1	0.46	
4. Does a woman have menses during pregnancy?							
Pre-Test	88	40.56	124	57.14	5	2.30	X ² =118.364, df= 2, P= 0.000, P<0.01
Post-Test	0	0	217	100	0	0	
5. Is it okay to have sex during menses?							
Pre-Test	112	51.63	83	38.24	22	10.13	X ² =3.016, df= 2, P= 0.221, P>0.05
Post-Test	110	50.70	94	43.31	13	5.99	

Table 1 shows the knowledge and beliefs regarding menstruation among adolescent school girls. In the pre-test stage, 157 (72.35%) girls felt that menstrual blood is impure, 173 (79.72%) girls felt that there was an influence of hot and cold foods on menstrual flow while in the post-test, there was significant difference in their level of knowledge on menstruation (p<0.01).

TABLE 2
RESTRICTIONS AND PRACTICES DURING MENSTRUATION (n=197)

Restrictions and Practices during Menstruation	Yes		No		X2 and P value
	No.	%	No.	%	
1. Do you visit holy places during menstruation?					
Pre-Test	0	0	197	100	—
Post-Test	0	0	197	100	
2. Do you visit relatives, friends, and neighbours during menses?					
Pre-Test	87	44.16	110	55.84	X2=1.466,df=1, p= 0.226, p>0.05
Post-Test	100	50.76	97	49.24	
3. Do you do household activities during menses?					
Pre-Test	92	46.71	105	53.29	X2=0.092,df=1, p= 0.762,P>0.05
Post-Test	96	48.74	101	51.26	
4. Do you practice isolation during menses?					
Pre-Test	102	51.77	95	48.23	X2=0.497,df=1, p= 0.481,P>0.05
Post-Test	94	47.72	103	52.28	
5. Do you bathe daily during menses?					
Pre-Test	192	97.46	5	2.54	X2=3.241,df= 1, p= 0.072,P>0.05
Post-Test	197	100	0	0	
6. Do you wash your genitalia often with soap and water whenever you change cloth/ sanitary pad?					
Pre-Test	59	29.95	138	70.05	X2=174.545,df=1, p= 0.00,P<0.01
Post-Test	187	94.93	10	5.07	

Findings in Table 2 show the menstrual practices and various restrictions followed by the girls during menstruation. In the pre-test phase, 197 (100%) reported that they do not visit holy places during menstruation and 102 (51.77%) girls reported that they are kept in isolation at home during menses. In the post-test phase, no significant difference was seen with regard to the restrictions followed by them ($p>0.05$). In the pre-test period, only 59 (29.95%) girls reported that they wash their genitalia with soap and water whenever they change their cloths/sanitary pads whereas in the post-test period, significant improvement was observed in their menstrual practice ($p<0.01$). Out of the 197 girls, 31 (15.74%) girls used only cloths during menstruation, 80 (40.61%) used only sanitary pads while 86 (43.65%) girls used both sanitary pads and cloths during menses.

TABLE 3
PRACTICE OF MENSTRUAL HYGIENE IN ADOLESCENT GIRLS USING CLOTH (n= 117)

Practice of Menstrual Hygiene Using Cloth	Pre-test		Post-test	
	No.	%	No.	%
1. Type of clothes used				
Terricott	26	22.23	5	4.27
Nylon	9	7.69	2	1.71
Cotton	82	70.08	110	94.02
2. How often do you change clothes in a day?				
Two times a day	29	24.78	2	1.71
Three times a day	44	37.61	40	34.19
Four times a day	25	21.37	55	47.00
Five times a day	19	16.24	20	17.10
3. How do you wash your clothes?				
Soap and water	57	48.72	102	87.18
Only water	60	51.28	15	12.82
4. Where do you dry the cloth?				
House-corner	112	95.73	80	68.38
Sundry	5	4.27	37	31.62
5. When do you finally dispose of the used clothes?				
After 3 months	16	13.67	56	47.86
After 4 months	15	12.82	48	41.03
After 1 year	80	68.37	13	11.11
After 2 years	6	5.14	0	0
6. How do you dispose of the used clothes?				
Burn the cloth	60	51.28	29	24.79
Throw in dustbin	38	32.47	84	71.80
Bury the cloth	4	3.42	1	0.85
Throw on roads	15	12.83	3	2.56

Data given in Table 3 show the practices during menstruation among girls using cloths (n=117). In the pre-test period, the type of cloths used was reported as cotton 82 (70.08%), terricott 26 (22.23%) and nylon 9 (7.69%) which increased to 110 (94.02%) girls using cotton in post-test period. During the pre-test phase, 60 (51.28%) girls washed their cloths only with water and 57 (48.72%) washed with soap and water. In the post-test period, the figures rose with 102 (87.18%) girls washing their cloths with soap and water. For drying the cloths, in the pre-test period, only 5 (4.27%) girls sun-dried their cloths which increased to 37 (31.62%) in the post-test phase.

TABLE 4
PRACTICE OF MENSTRUAL HYGIENE BY GIRLS USING SANITARY PAD (n=166)

Practice of menstrual hygiene in girls using sanitary pad	Pre-Test		Post-Test	
	No.	%	No.	%
1. How often do you change pads a day?				
Two times a day	68	40.96	11	6.62
Three times a day	65	39.15	90	54.21
Four times a day	24	14.45	56	33.73
Five times a day	9	5.44	9	5.44
2. In what do you wrap the pads while disposing of?				
Paper	87	52.41	96	57.83
Plastic	79	47.59	70	42.17
3. Where do you dispose of the sanitary pads?				
House-dustbin	160	96.38	165	99.40
Road-side	5	3.01	1	0.60
Latrine	1	0.61	0	0

Out of the 166 girls using sanitary pads during menstruation, 68 (40.96%) girls reported that they changed the pads only twice a day during the pre-test period while the figure reduced to 11 (6.62%) in the post-test phase. 160 (96.38%) girls disposed off the sanitary pads in the house-dustbin while 5 (3.01%) and 1(0.61%) girls disposed it off by the roadside and latrine respectively (Table 4).

TABLE 5
REACTIONS OF GIRLS ON SEEING SANITARY PAD ADVERTISEMENTS ON T.V.
(n=217)

Reactions by girls on seeing sanitary pad advertisements shown on T.V.	No.	%
1. Feel shy in front of male members and feel like changing the channel	61	28.12
2. No reaction	58	26.73
3. Informative	47	21.65
4. Feel embarrassed	31	14.28
5. Such advertisements should be banned	20	9.22

Table 5 shows the reactions given by the respondents on seeing the advertisement of sanitary pads on television. 61 (28.12%) girls said that they felt shy to see the advertisements in front of male members of the family while 47 (21.65%) girls felt these were very informative, 31 (14.28%) girls felt embarrassed and 20 (9.22%) girls reported that such advertisement should be banned.

DISCUSSION

In the present study, the mean age of menarche of the adolescent school girls was 13.32 years whereas the study conducted in Singur, West Bengal, the mean age at

menarche was found to be 12.8 years². In the present study, cent per cent of the girls were aware of menstruation. Ideally, all mothers should make their daughters aware of menstruation even before they could attain menarche. In the present study, mother was found to be the main source of information for only 94 (43.3%) girls. This could be due to lack of proper communication between mother and daughter owing to traditional taboos, they feel awkward and embarrassed to discuss on this subject. The other sources of information were friends 57 (26.3%), sisters 32 (14.7%), relatives 18 (8.3%), literature 14 (6.5%) and T.V. 2 (0.9%). In a study conducted by Parvathy Nair et al³, 41 per cent of the girls received information about menstruation from their mothers, 22.4 per cent got information from their elder sisters, 21 per cent from their friends, 4.4 per cent from television and 3.3 per cent of the girls got information from books. Another study conducted by Deo et al⁴ among urban girls, mother was reported as the main source of information on menstruation for 27.5 per cent of the girls whereas it was a teacher for their rural counterparts (27.01%). In the present study, the inter-menstrual interval was reported to be 28-30 days by 83 (42.13%) girls whereas it was 31-45 days for 41 (20.81%) girls and 46-60 days for 46 (23.36%) girls. This could be because of changing trends in lifestyle, dietary habit, stress, hormonal imbalance or some medical reasons which requires gynaecological assessment at the earliest. In a study conducted by Rajni Dhingra et al⁵ among tribal Gujjar adolescent girls, only 9.9 per cent of the subjects had their menstrual cycle between 45-60 days which is much lower than the figure in the present study.

The knowledge regarding the organ from where menstrual blood comes was correctly reported as uterus by 73 (33.64%) girls whereas 113 (52.07%), 16 (7.38%), and 15 (6.91%) reported urethra, ovary and stomach respectively. The girls were not able to differentiate between urethral and vaginal opening. This shows the low level of knowledge among girls about female anatomy. Also the topic is least talked by girls as they feel uncomfortable and shy. In a study conducted by SP Singh et al⁶ among adolescent girls of Varanasi district (UP), 43.5 per cent of the girls correctly responded uterus as the organ from where the menstrual blood comes. In the study conducted by Adhikari P et al⁷ among the rural adolescent girls of Nepal, 25.3 per cent of the girls reported uterus as the organ from where the bleeding comes whereas 32 per cent, 26.7 per cent and 16 per cent said the fallopian tube, vagina and urinary bladder respectively from where the menstruation blood comes.

In the present study, the pre-test menstrual perceptions among girls were found to be poor and practices were often incorrect. 157 (72.35%) girls felt that "menstrual blood is impure." This is almost similar to (73.1%) girls reporting menstruation as "release of bad blood" in a study conducted by Echendu Dolly Adinma⁸ among Nigerian secondary school girls. In the present study, 173 (79.72%) girls felt that there was an influence of hot and cold food on menstrual flow while in the post-test, there was a significant difference in the level of knowledge ($P < 0.01$).

Similarly, in the pre-test phase, 197 (100%) girls reported that they do not visit holy places during menstruation and 102 (51.77%) girls reported they are kept isolation at home during menses. In the post-test phase, there was no significant difference in the restrictions followed by them ($P > 0.05$). This shows the influence of socio-cultural beliefs and taboos regarding menstruation among these adolescent girls. Even literate females find it difficult to go against the restrictions, owing to such strong socio-cultural beliefs and practices. Such different types of restrictions practiced during menstruation

were also reported by Das Gupta A² in their study where 70.59 per cent of the girls did not attend any religious occasion, 42.65 per cent did not play, 33.82 per cent of them did not perform any household work and 10.29 per cent of the girls did not attend any marriage ceremony during the menstrual period. In the present study, during the pre-test period, only 59 (29.95%) girls reported that they wash their genitalia often with soap and water whenever they change their cloths or sanitary pads whereas following health education in the post-test period, there was significant improvement in the menstrual practice ($P<0.01$). In the present study, 31 (15.74%) girls used only cloths while 80 (40.61%) girls used only sanitary pads during menses. Due to non-affordability of sanitary pads, 86 (43.65%) girls used sanitary pads only during the first two days of cycle as the flow is heavy in these days while in the next 2-3 days, they preferred cloths for menses. In a study conducted by Echendu Dolly Adinma⁸ among Nigerian school girls, amongst materials used as menstrual absorbent, toilet tissue paper was most commonly used (41.31%) followed by sanitary pads (32.7%), cloths (14.4%) and multiple materials (10.7%) was used by the girls.

It is seen that in the pre-test phase, 60 (51.28%) girls washed their cloths only with water and 57 (48.72%) washed their cloths with soap and water which in the post-test phase, increased to 102 (87.18%) girls washing their cloths with soap and water. With regard to drying the cloths, in the pre-test period, only 5 (4.27%) girls sun-dried their cloths which increased to 37 (31.62%) in the post-test period. With regard to the final disposal of the used cloths, in the pre-test period, 60 (51.28%) girls burnt it, 38 (32.47%) girls threw it in the dustbin, 4 (3.42%) girls buried it and 15 (12.83%) girls threw it by the roads. In the post-test period, 84 (71.80%) girls reported that they threw the used cloths in the dustbin. Such menstrual practices were also reported in another study⁹ among adolescent school girls in Nepal where 59 per cent of the girls dried their washed reusable absorbent materials (cloths) outside the house and under sunlight. For final disposal of the menstrual materials, 43 per cent of the girls buried their absorbent materials followed by 35 per cent threw with other wastes and 19 per cent burnt the materials.

In the pre-test phase, 68 (40.96%) girls reported that they changed the pad only twice a day while in the post-test it decreased to 11 (6.62%) thereby showing improved menstrual hygiene and practice following health education. 61 (28.12%) girls said that they felt shy to see the advertisements of sanitary pads on television in front of male members of the family while 47 (21.65%) girls felt that these advertisements were very informative, 31 (14.28%) girls felt embarrassed and 20 (9.22%) girls reported that such advertisements should be banned. Thus, we can say that such advertisements should be made more informative and student-friendly so that they can be perceived well by adolescent school girls. Moreover, the findings emphasise on the inclusion of safe hygiene and sanitary practices should be included in the school curricula as well as greater communication between student and lady teachers and between daughters and mothers.

CONCLUSION

The present study has revealed unhealthy menstrual practices, low level of knowledge and various misconceptions among adolescent school girls regarding menstruation. The study also clearly brings out the impact of health education in improving their knowledge and practices. Taking into account the health implications and prevailing

socio-cultural and economic factors, there is an urgent need for intensifying effective strategies to persuade the adolescent school girls to adopt healthy menstrual practices. A well-informed continuous, school education programme should be imparted to the students. Further, emphasis also needs to be given through workshops and seminars on "Adolescent Reproductive Health".

REFERENCES

1. GANGULI S.K. (2003): Adolescent Health; Indian Journal of Public Health, 47 (3): 5-15.
2. DASGUPTA A. & SARKAR M. (2008): Menstrual Hygiene: How Hygienic is the Adolescent Girl? Indian Journal of Community Medicine, April, 33 (2): 77-80.
3. NAIR PARVATHY, GROVER L VIJAY et al (2007): Awareness and Practices of Menstruation and Pubertal Changes amongst Unmarried Female Adolescent in a Rural Area of East Delhi; Indian Journal of Community Medicine, 32 (2): 156-157.
4. DEO D. S. & GHATTERGI CH (2005): Perception and Practices regarding Menstruation: A Comparative Study among Urban and Rural Adolescent Girls; Indian Journal of Community Medicine, 30 (1): 33-34.
5. DHINGRA RAJNI, ANIL KUMAR et al (2009): Knowledge and Practices Related to Menstruation among Tribal (Gujjar) Adolescent Girls; Ethno-med, 3 (1): 43-48.
6. SINGH SP, SINGH MAYA et al (2006): Knowledge Assessment regarding Puberty and Menstruation among School Adolescent Girls of District Varanasi (U.P.); Indian Journal of Preventive and Social Medicine, 37 (1&2): 9-14.
7. ADHIKARI P, KADEL B et al (2007): Knowledge and Practices regarding Menstrual Hygiene among Rural Adolescent Girls of Nepal; Kathmandu University Medical Journal, 5 (3): 382-386.
8. ADINMA E. & ADINMA J. (2008): Perception and Practices on Menstruation amongst Nigerian Secondary School Girls; African Journal of Reproductive Health, 12 (1): 74-83.
9. http://www.wateraid.org/documents/plugin_documents/wa_nep_mhm_rep_march2009.pdf.

PROFILE OF POISONING CASES AT A NORTH INDIAN TERTIARY CARE HOSPITAL

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ABSTRACT

Poisoning is a major problem in developing countries. Recently, it is increased due to the frequent use of pesticides in agriculture and exposure to hazardous chemical compounds as a result of rapid industrialization. Profile of poisoning in an area depends upon the access and availability of poison, socio-economic status, cultural and religious influences. This study has been aimed to determine the various parameters of poisoning such as mode and type of poisoning, relation to sex, occupation, marital status, vulnerable age group, outcome of patients with poisoning, and to find out the most common type of poison used in the North Indian states. Data were collected from the cases admitted with acute poisoning in medical wards of Jawaharlal Nehru Medical College and Hospital, Aligarh, over a period of one year. 104 cases were taken and the type of poison consumed, age and sex, marital status, religion, social class, mode of poisoning, occupation and outcomes of the victims with poisoning were assessed. Maximum number of cases (n=59) were recorded in the 20-29 years age group. The frequency declined as the age advanced ($P<0.01$). Irrespective of sex, suicide was the most common mode of poisoning. Aluminium phosphide was the most common poison and with maximum mortality ($P=0.002$). Majority of the cases belonged to the middle socio-economic strata (Class III and IV). Organophosphates and aluminium phosphide constituted the majority of cases in rural areas (63%), while zinc phosphide, aluminium phosphide, sedatives and delirients accounted for majority of the urban cases (80%). The distribution pattern was statistically significant ($P<0.001$). Marital discord and family problems were important causes of poisoning. There is an alarming increase in the cases of poisoning mainly for suicidal purposes. Cases of aluminium phosphide poisoning are increasing in recent years in North India which causes mortality due to its high case fatality rate. Due to non-availability of specific antidote and ease of procurement, it will assume epidemic proportions in future. Strict legislative measures over the sale of poison and increase in public awareness about the seriousness of the problem through health education should be undertaken.

Key Words: Poisoning, Socio-demographic profile, Pesticides, Drugs, North India.

Massive use of pesticides in agriculture, introduction of a variety of newer drugs for treatment, exposure to hazardous chemical products due to rapid industrialization, unhealthy dietary habits and increase in alcohol consumption have led to a wide

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spectrum of toxic products to which people are exposed now as compared to the earlier days¹⁻⁵. Profile of poisoning in an area depends upon a variety of factors, ranging from access to and availability of poison, socio-economic status of the individual, cultural and religious influences, etc. Poisoning forms a major problem in developing countries, though the type of poison and the associated morbidity and mortality varies from one place to another and it may change over a period of time⁶. Easy availability and low cost of hazardous chemicals play a major role in suicidal, homicidal and accidental poisoning in developing countries^{7,8}. In developed countries, the rate of mortality from poisoning varies only from 1 to 2 per cent but in developing countries like India, it varies between 15 to 30 per cent and is the fourth most common cause of mortality specially in rural India^{9,10}. In North India, aluminium phosphide (ALP) and organophosphate poisonings (OPP) are common. These substances are widely used to control pests and insects and have become major contributors of deaths due to poisoning¹¹.

According to the World Health Organization (WHO), 99 per cent of the fatal poisoning cases occur in developing countries, predominantly among the farmers due to various kinds of poisoning, including poisonous toxins from natural products during handling^{8,11,12}. Therefore, early diagnosis, treatment and prevention are crucial in reducing the burden of poisoning related injury in any country. Very few studies have been done in North India regarding the epidemiology of poisoning as compared to South India. So, this study has been aimed to determine the various parameters of poisoning such as mode of poisoning, type of poison, relation to occupation, marital status, outcome of patients with poisoning, vulnerable age group and to find out the most common type of poison used in North India as compared to South India.

MATERIALS AND METHOD

This study was conducted during January-December 2009. Data were collected from all the poisoning cases admitted during this period to the emergency ward and medical wards in Jawaharlal Nehru Medical College and Hospital, Aligarh, Uttar Pradesh which is a large tertiary care teaching hospital in North India. A total of 104 poisoning cases were admitted during this period. Information was collected about the type of poison consumed, age and sex, marital status, religion, duration of hospitalization, whether they belonged to rural or urban areas, mode of poisoning, occupation of the patient and the outcomes of the victims of poisoning. Data were documented and statistically analyzed. Chi-square test was done and $P < 0.05$ was considered significant.

FINDINGS

A total of 104 patients [62 males (59.6%) and 42 females (40.4%)] were enrolled in the study. Most of the patients were young with the age and sex distribution as shown in the Table 1 below. Maximum number of cases ($n = 59$) were recorded in the age group of 20-29 years and the frequency declined as the age advanced ($p < 0.01$).

Mode of Poisoning: Table 1 also shows the mode of poisoning in different groups. There were 84 (80.8%) suicidal cases that included 52 males and 32 females, 16 (15.4%) accidental cases which included 9 males and 7 females and 4 (3.8%) homicidal attempts. Irrespective of sex, suicide was the most common mode of poisoning. Moreover, gender had no statistically significant effect on the mode of poisoning

($P=0.11$). Figures in Table 2 indicate that aluminium phosphide was the most common poison for both homicidal and suicidal purposes while accidental poisoning occurred due to zinc phosphide (rat poison, 37.5%), acid ingestion (25%), sedatives (25%) and organophosphates (12.5%).

TABLE 1
DISTRIBUTION OF PATIENTS BY THEIR AGE, SEX AND MODE OF POISONING

Age (years)	Male			Female			Total
	Suicidal	Accidental	Homicidal	Suicidal	Accidental	Homicidal	
< 20	16	-	-	12	-	-	28 (26.9%)
20-29	23	9	1	16	7	3	59 (56.8%)
30-39	8	-	-	2	-	-	10 (9.6%)
> 40	5	-	-	2	-	-	7 (6.7%)
Total	52	9	1	32	7	3	104

TABLE 2
DISTRIBUTION OF PATIENTS BY THE TYPE AND MODE OF POISONING

Poison	Mode of Poisoning			Total
	Accidental	Homicidal	Suicidal	
Acid				
	4(25%)	-	-	4(3.8%)
ALP	-	4(100.0%)	28(33.3%)	32(30.8%)
Delirient	-	-	4(4.8%)	4(3.8%)
OPP	2(12.5%)	-	14(16.8%)	16(15.4%)
Rat poison (zinc phosphide)	6(37.5%)	-	18(21.4%)	24(23.1%)
Sedative	4(25%)	-	8(9.6%)	12(11.5%)
Unknown	-	-	12(14.3%)	12(11.5%)
Total	16	4	84	104

Nature of Poison Consumed and Outcome: Aluminium phosphide was the commonest poison consumed (30.8%) followed by zinc phosphide (rat poison, 23.1%) and organophosphorus compounds (15.4%). Other common poisons included sedatives (11.5%) and unknown poisons (11.8%) (Table 3). Overall mortality was 14.4 per cent ($n=15$) while 89 patients had a favourable outcome. Of those expired, maximum mortality was recorded in the aluminium phosphide group (37.5%) which was significantly different from other groups (Pearson Chi-square value 21.29, $P=0.002$). Late presentation, consumption of fresh and unexposed tablets and high poison dose were important causes associated with mortality.

TABLE 3
DISTRIBUTION OF PATIENTS BY THE TYPE OF POISONING, SEX AND OUTCOME

Type of Poison	Male		Female		Expired	
	Improved	Expired	Improved	Expired	Total	% Mortality
OPP	7	1	7	1	2/16	12.5
Zinc Phosphide	16	-	7	1	1/24	4.2
Acid	-	-	4	-	0/4	-
ALP	12	8	8	4	12/32	37.5
Sedatives	8	-	4	-	0/12	-
Delirient	4	-	-	-	0/4	-
Unknown	4	-	8	-	0/12	-

Socio-economic Pattern of Victims: The cases were classified into different social classes on the basis of Modified Prasad Classification¹³. As shown in Table 4, it was observed that majority of the cases belonged to middle and low socio-economic stratum irrespective of their urban-rural distribution. In fact, 60 victims belonged to middle socio-economic strata (Classes III and IV) and 34 to low socio-economic strata (Classes V and VI) while only 10 patients were in Classes I and II. A definite pattern of poisoning was observed on analysing by their urban versus rural distribution. Organophosphates and aluminium phosphide constituted the majority of cases in rural areas (63%) while zinc phosphide (rat poison), aluminium phosphide, sedatives and delirients accounted for majority of the urban cases of poisoning (80%). The distribution pattern attained statistical significance using Chi-square test ($P < 0.001$).

TABLE 4
POISONING TYPE BY SOCIO-ECONOMIC (SE) CLASS
BASED ON MODIFIED PRASAD CLASSIFICATION

Social Class	Upper High (Class I)	High (Class II)	Upper Middle (Class III)	Lower Middle (Class IV)	Poor (Class V)	Below Poverty Line (Class VI)	Total (%)
OPP	-	-	8	4	2	2	16 (15.4%)
Zinc Phosphide	-	4	8	8	2	2	24 (23.1%)
Acid	-	-	2	-	2	-	4 (3.8%)
ALP	-	-	8	8	9	7	32 (30.8%)
Sedatives	2	-	4	2	4	-	12 (11.5%)
Delirients	2	-	2	-	-	-	4 (3.8%)
Unknown	-	2	4	2	-	4	12 (11.5%)
Total (%)	4 (3.8%)	6 (5.8%)	36 (34.6%)	24 (23.1%)	19 (18.3%)	15 (14.4%)	104

Married versus Unmarried: The study found that the number of married subjects were 67.3% ($n = 70$) while only 32.7% ($n = 34$) patients were unmarried.

TABLE 5
DISTRIBUTION OF PATIENTS ACCORDING TO MARITAL STATUS

	Male	Female	Total
Married	44	26	70 (67.3%)
Unmarried	20	14	34 (32.7%)

Distribution of Cases by Religion: Majority of the patients (63.5%) were Hindus (n = 66) followed by 35.6 per cent Muslim patients (n = 37) and only one Sikh patient.

TABLE 6
DISTRIBUTION OF CASES BY RELIGION

Religion	No. (N = 104)	%
Hindu	66	63.5
Muslim	37	35.6
Sikh	01	0.96

Cause of Poisoning due to Suicide and Homicide: There were 88 cases of poisoning due to suicide (n = 84) and homicide (n = 4). In these 88 cases the reason for poisoning has been shown in Table 6. It was observed that important reasons of poisoning in males were discord with parents, financial difficulties, loss of Job and marital discord. Important causes of poisoning in females were marital discord, failure in examination and problems in the family. Among these causes, marital discord and family problems were related to all the homicides.

TABLE 7
DISTRIBUTION OF PATIENTS BY THEIR SEX AND CAUSE OF POISONING DUE TO SUICIDE AND HOMICIDE

	Marital Discord	Financial Difficulties	Failure in Exam	Family Problems	Discord with Parents	Separation/ Death of Boy Friend/ Girl Friend	Loss of Job	Others	Total
Male	7	9	5	5	17	2	8	-	53
Female	10	3	7	5	5	4	-	1	35
Total	17	12	12	10	22	6	8	1	88

DISCUSSION

Most of the patients in this study were in the young age group and maximum number of patients (56.8%) was in the age group of 20–29 years followed by 26.9 per cent in below 20 years age group. Since most of the cases were suicidal in nature, the distribution pattern shows the mental vulnerability and impulsiveness of our youth. Similar patterns have been reported from other regions of India as well^{2,3,14,15}. The present study indicates that there was more number of male poisoning cases (59.6%) which is similar to the results found in other studies done in Eastern Uttar Pradesh and

Rohtak of Haryana^{16,17}. The high incidence in case of males may be because they are more exposed to stress and strain due to financial difficulties, loss of job, discord at home and work place, etc. There were more Hindus (63.4%) than Muslims (35.7%). Similar results have been observed in another study¹⁴. Aligarh and its adjoining areas have comparatively higher Muslim population as compared to other areas of North India still Muslim victims in this study were lesser than Hindus. One important reason could be that Islam teaches that taking one's life (suicide) is a big sin and therefore, Muslims seem to commit suicide less than people of other religions.

Suicide was the most common mode of poisoning in this study and is comparable to other studies¹⁸ and suggests that suicide by using poisons has increased because of their easy availability in the market and also there is a general belief that poison terminates life with minimal suffering^{19,20}. Aluminium phosphide was the most common type of poison consumed for both homicidal and suicidal purposes. Studies from other parts of India have reported organophosphates² and other pesticides³ as common causes of poisoning. Recently, there has been an increasing trend in the incidence of aluminium phosphide poisoning in North India, may be due to its easy availability, absence of specific antidote and high fatality rate³. In an earlier study, aluminium phosphide was found to be the most common cause of acute poisoning in India⁴. Overall mortality in the present study was 14.4 per cent. This finding is similar to the reported mortality rates in some other Indian studies^{14,17,21,22}. Most of the cases of poisoning belonged to the middle and low socio-economic group signifying the fact that financial and social problems may have an important bearing in the daily lives of these groups. Based on the predominant agricultural background of the study population, a significant use of insecticides and rodenticides as poisons is not unusual in both urban and rural set ups. Poisoning was more common in the married group irrespective of the sex. This is consistent with studies from Orissa² and Chandigarh¹¹, and shows that married persons may become victims of greater stress than single individuals in their day-to-day lives. The different causes of the stress culminating in poisoning ranged widely from marital and family discords to financial and job related problems to educational and other matters.

CONCLUSION

It has been observed that there is an alarming increase in cases of poisoning mainly for suicidal purposes. North India is a predominantly agricultural region and therefore, aluminium phosphide (pesticide) was found to be the most common cause for acute poisoning with high mortality, due to its high fatality rate. It might assume epidemic proportions in future, specially because of the non-availability of specific anti-dote and easy procurement. This calls for urgent research to find a specific anti-dote and strict legislative measures over sale and purchase of the fumigant. The same applies for other poisons and drugs which are common agents used for poisoning whether for suicidal, homicidal or accidental. Above all, increase in public awareness about the seriousness of problem through health education and efforts to distress and develop a healthy outlook towards life should be undertaken.

REFERENCES

1. YANKO I., VALENTIN A. & IVAN D. (2001): Acute Poisoning Mortality Rate in Plovdiv Region, Bulgaria; *Arh Hig Rada Toksikol*, 52: 307-313.
2. SENANAYAKE N. & PETRIS H. (1995): Mortality due to Poisoning in a Developing and Agricultural Country- Trends over 20 years; *Hum Exp Toxicology*, 14: 808-811.
3. SINGH S., WIG N., CHAUDHARY D, SOOD N.K. & SHARMA B.K. (1997): Changing Pattern of Acute Poisoning in Adults: Experience of a Large North-West Indian Hospital (1970- 1989); *J Assoc Physicians India*, 45 (3): 194-197.
4. SIWACH S.B. & GUPTA A. (1995): The Profile of Acute Poisonings in Rohtak, Haryana- A Study; *J Assoc Physicians India*, 43 (11): 756-759.
5. FLEMMING K., WIM VAN DER HOEK, DONALD C. COLE, GERARD H., HUBERT D., SURJIT S. & MICHAEL E. (2003): Reducing Acute Poisoning in Developing Countries- Options for Restricting the Availability of Pesticides, *Toxicology*, 192: 249-261.
6. SHARMA B.R., HARISH D. SHARMA & VIVEK VIJ K. (2002): Poisoning in Northern India: Changing Trends, Causes and Prevention Thereof, *Med Sci Law*, 42 (3): 251-255.
7. EDDLESTON M. (2000): Patterns and Problems of Deliberate Self-Poisoning in the Developing World. *Q J Med*, 93: 715- 731.
8. BATRA A.K., KEOLIYA A.N. & JADHAV G.U. (2003): Poisoning: An Unnatural Cause of Morbidity and Mortality in Rural India; *J Assoc Physicians India*, 51: 955-959.
9. TARUNI N.G., BIJOY T.H. & MOMONCHAND A. (2001): A Profile of Poisoning Cases Admitted to RIMS Hospital, Imphal; *J Forensic Med Toxicol*, 18: 31-33.
10. PILLAY V.V. (2001): In: MKR Krishna's Hand Book of Forensic Medicine and Toxicology, 12th Ed., Paras Publications, Hyderabad, p 276-299.
11. SHARMA B.R., HARISH D., SHARMA V. et al (2001): The Epidemiology of Poisoning: An Indian View point; *J Forensic Med Toxicol*, 18: 31-33.
12. World Health Organisation Bulletin (1999): Guidelines for Poison Control, WHO, Geneva.
13. AGARWAL A.K. (2008): Social Classification: The Need to Update in the Present Scenario; *Indian J of Community Medicine*, January, 33 (1): 50-51.
14. KIRAN N., SHOBA RANI R.H., JAI PRAKASH V. et al (2008): Pattern of Poisoning Reported in a South Indian Tertiary Care Hospital; *Indian J Forensic Med and Toxicology*, July-December, 2 (2): 17-19.
15. JAISWAL S., VERMA R.K., TEWARI N. (2009): Alumunium Phosphide Poisoning: Effect of Correction of Severe Metabolic Acidosis on Patient Outcome; *Ind Jour Critical Care Medicine*, Jan.-Mar., 13 (1): 21-24.
16. AGARWAL R., BARTHWAL S.P., NIGAM D.K. et al (1995): Changing Pattern of Acute Poisoning in an Eastern UP Hospital-based Study; *J Assoc Physicians India*, 43: 907.
17. DHATTARWAL S.K. & SINGH H. (2001): Profile of Deaths due to Poisoning in Rohtak, Haryana; *J Forensic Med Toxicol*, 18: 28-29.
18. SRINIVAS RAO C.H., VENKATESWARLU V., SURENDER T. et al (2005) : Pesticide Poisoning in South India– Opportunities for Prevention and Improved Medical Management; *Tropical Med Int Health*, June, 10 (6): 581-588.
19. UNNIKRISHNAN B., SINGH B. & RAJEEV A. (2005): Trends of Acute Poisoning in South Karnataka; *Kathmandu University Medical Journal*, 3 (2) 10: 149-154.

20. HANSEN A.C. (1991): Deaths due to Poisoning in Denmark in 1983-1987; *Ugeshlarger*, 153: 496-500.
21. NIMAL S. & LAXMAN K. (1988): Pattern of Acute Poisoning in a Medical Unit in Central Sri Lanka; *For Sci Int*, 36: 101-104.
22. GUPTA B.D. & VAGHELA P. (2005): Profile of Fatal Poisoning in and around Jamnagar; *JIAFM*, 27 (3): 145-148.

EFFECT OF SOCIO-CULTURAL FACTORS ON THE PREFERENCE FOR THE SEX OF CHILDREN BY WOMEN IN AHMEDABAD DISTRICT

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ABSTRACT

A number of cultural and socio-economic factors influence the relative benefits and costs of sons and daughters and ultimately effects the parents' gender preferences. The present study was carried out to know the effect of socio-cultural factors on the preference of the sex of the children. A cross-sectional study was conducted among 385 married women in the reproductive age group of 15-49 years during March 2007-April 2008 in randomly selected areas of Ahmedabad district, Gujarat, India. Son-preference was observed amongst 87.53 per cent of the studied women. 93.04 per cent of the illiterate women preferred male child whereas 68.75 per cent of the women who completed graduation had the preference for son. The association between education and son preference was found to be statistically significant ($P<0.01$). The son preference observed more in rural areas (94.30%) than urban areas (80.73%) and the difference was statistically significant ($P<0.0001$). Keeping the family line (42.14%) and the girl not staying with parents after the marriage (50.45%) were the major reasons for son preference. The study found that education, place of residence and cultural factors play a role in son-preference.

Key Words: Gender preference, Reproductive women, Socio-cultural factors, Education.

Preference for sons or more number of sons than daughters has been documented in several countries in the world¹. Particularly in India, son-preference is very strong and pervasive and has been frequently cited as one of the major obstacles for reducing the national fertility level². According to this argument, if couples continue to bear children in order to have a minimum number of desired sons, they would exceed the two-children norm advocated by the national family planning programme. At the same time, desires for controlling fertility and achieving the wanted sex composition of children which includes at least one son, put pressure on couples to intervene the biological process of reproduction through sex selective abortion for the fulfilment of both these desires³. Preference for male child and discrimination against the female child are causing the rapid disappearance of female children in India. 35 million females were found missing according to census 2001 which was 32 million during 1991. The 2001 Indian census found a sex ratio of 927 girls per 1,000 boys in the age group of 0-6 years as compared to 945 in census 1991. Approximately, five years after the census, NFHS-3 finds the national sex ratio of 918 in the population of 0-6 years⁴. Skewed sex ratio is an issue of major concern and has long-term social and demographic consequences. Studies have found that a number of cultural, social and

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economic factors influence the relative benefits and costs of sons and daughters and ultimately effects parents' gender preferences⁵⁻⁷. Studies in India have identified some major factors that favour son-preference. Factors like economic utility of sons, old age security, economic reward, socio-cultural utility, inheriting property, etc. influence the decision for the preference for sons⁶⁻⁹. Studies have also identified some factors like economic liability, discontinuation from the natal family after marriage, marriage related problems of daughter which act as barriers for daughter-preference⁹⁻¹³. Therefore, this study was conducted to determine the effect of socio-cultural factors on the preference for the sex of the children.

MATERIALS AND METHOD

A community-based cross-sectional study was conducted during March 2007-April 2008. The sample size was calculated with the assumption that 50 per cent of the reproductive women will have preference for the male child and 50 per cent for the girl child. Sample size was calculated by using the formula $n = (Z^2 \cdot 1-\alpha/2) / p(1-p)$.

Estimated sample size was 385. Married women in the reproductive age group of 15-49 years were interviewed. The study was conducted both in urban and rural areas of Ahmedabad district. For urban area, one of the field practice area of the Department of Community Medicine, B.J. Medical College, Ahmedabad, India, was randomly selected. The rural area of Ahmedabad has seven blocks. For the study purpose, one of the blocks was randomly selected and the study was carried out in one of the PHCs of the selected block. For random selection, the currency method was used. A pre-designed and pre-tested proforma was used to collect the baseline data by house-to-house visits. Informed oral consent was taken before the initiation of the survey. Analysis was done in Epi info version 3.4. Chi-square test was used to test the statistical significance.

FINDINGS

A total of 385 women in the reproductive age group of 15-49 years were studied in Ahmedabad district. 192 women were from urban and 193 were from rural areas. Maximum number of women were in the age group of 20-34 years (69.36%). The mean age of the women was 30.79 ± 7.57 years. All the respondents belonged to Hindu religion. Majority of the women were from the socio-economic classes II to IV. 63.6 per cent of the women were from nuclear families. 61.3 per cent of them were educated up to primary and secondary school and 68.3 per cent were engaged in household work. Out of the 385 respondents, 337 (87.53%) had preference for a male child. The factor of son-preference was correlated with various socio-economic characteristics. Preference for son was observed in 93.04 per cent and 68.75 per cent of the illiterate and graduated women respectively. The association between education and preference for son was found to be statistically significant ($X^2 = 14.11$, $p < 0.01$). 94.30 per cent of the rural women had a preference for the male child as compared to 80.73 per cent of the women from urban areas and the difference was found to be statistically significant ($X^2 = 15.02$, $p < 0.0001$). 89.63 per cent of the women from the lower classes III, IV and V preferred a male child as compared to 84.03 per cent of the women from the higher classes I and II. Male child preference was observed more in joint type of families (90.71%) than nuclear families (85.71%). Similarly, son-preference was predominant among scheduled tribes (96.15%) than other castes (Table 1).

TABLE 1
ASSOCIATION BETWEEN SOCIO-ECONOMIC CHARACTERISTICS AND SON-PREFERENCE

S. No.	Characteristics	Son-Preference		Chi square value	P value
		Yes (N=337)	No (N=48)		
1.1	Social Class				
	Classes I & II (n=144)	121 (84.03%)	23 (15.97%)	2.10	>0.05
	Classes III, IV & V (n=241)	216 (89.63%)	25 (10.37%)		
1.2	Type of Family				
	Nuclear (n=245)	210 (85.71%)	35 (14.28%)	1.61	>0.05
	Joint (n=140)	127 (90.71%)	13 (9.28%)		
1.3	Education				
	Illiterate (n=115)	107 (93.04%)	8 (6.96%)	14.11	< 0.01
	Primary (n=137)	123 (89.70%)	14 (10.20%)		
	Secondary (n=99)	83 (83.84%)	16 (16.16%)		
	Higher Secondary (n=18)	13 (72.22%)	5 (27.78%)		
	College (n=16)	11 (68.75%)	5 (31.25%)		
1.4	Occupation				
	Housewife (n=263)	227 (86.31%)	36 (13.69%)	2.62	>0.05
	Labourer (n=99)	91 (91.92%)	8 (8.08%)		
	Service (n=23)	19 (82.61%)	4 (17.39%)		
1.5	Caste				
	Open (n=115)	101 (87.8%)	14 (12.1%)	3.46	>0.05
	SC (n=96)	80 (83.33%)	16 (16.6%)		
	ST (n=26)	25 (96.15%)	1 (3.85%)		
	OBC (n=148)	131 (88.5%)	17 (11.4%)		
1.6	Residence				
	Urban (n=192)	1 5 5 (80.73%)	37 (19.27%)	15.02	<0.0001
	Rural (n=193)	1 8 2 (94.30%)	11 (5.70%)		

SC= Scheduled Caste, ST= Scheduled Tribe, OBC= Other Backward Class

Findings in Table 2 show that keeping the family line (42.14%) alive was the major reason cited for son-preference followed by old age security (30.86%) and demand of in-laws (21.36%). Girl not staying with parents after marriage (50.45%) was found to be the major reason for not preferring a girl child.

TABLE 2
DISTRIBUTION OF THE WOMEN BY THE REASONS BEHIND PREFERENCE FOR SON
AND NON-PREFERENCE FOR DAUGHTER

Characteristics	N=337 (100%)*
Reasons for preference for son	
Income purpose	21 (6.23%)
Keeping family line	142 (42.14%)
Old age security	104 (30.86%)
Demand of in-laws	72 (21.36%)
Social status	43 (12.76%)
To perform last rite	4 (1.19%)
Reasons for not preference for daughter	
Dowry problems	46 (13.64%)
Marriage related problems	63 (18.69%)
Difficulty to rear up	58 (17.21%)
Not staying with parents	170 (50.45%)
*Due to multiple responses, total may exceed 100 per cent.	

DISCUSSION

Preference for sons is influenced by economic, religious, cultural, social and emotional desires and norms that favour males and make females less desirable and parents expect sons but not daughters¹⁴. Parents' preference for son exerts substantial impact on the fertility desires and family planning behaviour which effects the fertility reduction¹⁵. To understand why preference for male child is so strong in a society, it is important to recognize the social and cultural factors in that particular society. In this study, higher son preference (87.53%) was observed as compared to other hospital-based studies. Puri et al and BN Vadera et al reported that 56 per cent and 58.3 per cent of the women had preference for a male-child respectively^{16,17}. The present study identified a significant association between education and son-preference as there was substantial decreased son-preference with increased education level among women. Preference for a male child was higher among the rural women than the urban women. This difference was found to be statistically significant since majority of the rural women belonged to joint families. Higher son preference was due to the demand by the in-laws or pressure from the other family members. The study conducted by BN Vadera also observed a similar difference between urban and rural areas^{17,18}.

Keeping the family line alive was the main reason for preference for a son followed by old age security. The foremost reason for non-preference for a girl-child was the fact that girls do not stay with the parents after marriage. As per the report published by UNFPA^{10,17}, the important reasons for son-preference include social responsibilities are taken by the males, propagation of family name, support in the old age, performing cremation of parents and dowry given for girls' marriage. Dyson and Moore also reported similar findings⁸. Cain and his associates argued that in areas where females are economically dependent on the male family members; women will be motivated

to have greater number of children, particularly sons who are valued as an insurance against the risk of divorce, widowhood and old age¹⁹.

CONCLUSION AND RECOMMENDATION

Fertility behaviour appears to be influenced by a strong desire to acquire a male-child. Without understanding why the male-child preference is there in the society, further reduction in the fertility may become increasingly more difficult to achieve unless there is concomitant decline in the preference for the male-child. In the present study, preference for male-child is linked to the prevailing socio-cultural factors in the society, especially education, residential area of women and cultural factors. This highlights the need to improve the education level amongst women. Awareness of women particularly in rural areas is also required to decrease the preference for a male-child. Strong and decisive policies are needed to be implemented by the government to improve the status of women and to change the attitude of the society towards the female-child. Sex-selective abortion is to be strictly banned before the implementation of two-child norm as it tends the parents to abort the child if the foetus is a girl.

REFERENCES

1. CLELAND J.G., VERRALL J. & VAESSAN M. (1983): Preference for the Sex of Children and Their Influence on Reproductive Behaviour; World Fertility Survey: Comparative Studies, No.27, International Statistical Institute, Voorburg, Netherlands.
2. RAJARETNAM T. & DESHPANDE R.V. (1994): The Effect of Sex-Preference on Contraceptive Use and Fertility in Rural South India; International Family Planning Perspectives, 20 (3): 88-95.
3. ACHARYA ARUN K.(2004): Gender Preference and India's Missing Girls: Evidence from Some Selected States of India; Population Association of America, Boston, USA.
4. NFHS III (2005-2006): Survey Report.
5. BRADHAN PRANAB (1982): Little Girls and Death in India; Economic and Political Weekly, 17: 36.
6. SHRINIVASAN & BARDHAN P.K. (1987): Rural Poverty in South India; Oxford University Press, Oxford, 472-482.
7. DHARMALINGAM & ARUNACHALAM (1996): The Social Context of Family Size: Preference and Fertility Behaviour in a South Indian Village; Genus, 52: 83-103.
8. DYSON T. & MOORE M. (1983): On Kinship Structure: Female Autonomy and Demographic Behaviour in India; Population and Development Review, 9 (1): 35-60.
9. BHATIA (2006): Son-Preference and Daughter Neglect in India; Bombay.
10. Office of the Registrar General and Census Commissioner, India, Ministry of Health and Family Welfare, United Nations Population Fund (2003): Missing.....Mapping the Adverse Child Sex Ratio in India;1.
11. National Family Health Survey (MCH and Family Planning): Population Research Centre and IIPS, Bombay, 1992-93 and 1994 .
12. CHOWDHURY M.K. (1994): Mother's Education and Effect of Son-preference on Fertility in Matlab, Bangladesh; Population Research and Policy Review, 13: 257-273.
13. ASADUZZAMAN KHAN M. & PARVEEN A. K. (2000): Influence of Son-Preference

- on Contraceptive Use in Bangladesh; *Asian-Pacific Population Journal*, 15: 43-56.
14. ESPENSHADE THOMAS J. (1977): The Value and Cost of Children; *Population Bulletin*, 32: 3-47.
 15. MAHI PRABHJOT (1999): Preference for the Sex of Children and Its Implication on the Reproductive Behaviour in Urban Himachal Pradesh; *The Journal of Family Welfare*, 45 (1): 23-30.
 16. PURI S. (2007): Gender Preference and Awareness Regarding Sex Determination among Married Women in Slums of Chandigarh; *Indian J Community Medicine*, 32 (1): 60-2
 17. VADERA B.N., JOSHI U.K. et al (2007): Study on Knowledge, Attitude and Practice about Gender Preference and Female Foeticide among Pregnant Women; *Indian Journal of Community Medicine*, 32 (4): 300-301.
 18. DAS N. (1987): Sex-Preference and Fertility Behaviour: A Study of Recent Indian Data; *Demography*, 24 (4): 517-530.
 19. CAIN M. (1984): Women's Status and Fertility in Developing Countries: Son-Preference and Economic Security; Working Paper No.110, Centre for Policy Studies, The Population Council, New York.

NUTRITIONAL STATUS OF ADOLESCENTS IN RURAL AND URBAN ROHTAK, HARYANA

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ABSTRACT

Adolescents form the future generation of a country. Adolescents' nutritional needs are critical for the well being of a society. Investing in nutrition throughout the life cycle will have both short-term and long-term benefits of economic and social significance. Hence, this study was carried out with the aim to determine the nutritional status of adolescents in urban and rural schools of Rohtak district of Haryana, India. Stratified random sampling technique was used for sampling. The study population was divided into two strata- rural and urban and further into two sub-strata based on the type of school i.e. government or private in each stratum. Sample size selected for the study was 2000 with 500 subjects per sub-stratum. Height and weight were taken using the standard procedure. Stunting (height for age) and thinness (BMI for age) were calculated as per the National Centre for Health and Statistics (NCHS) standards. The data were analyzed separately for boys and girls and tests of significance applied wherever applicable. It was found that the mean weight and mean BMI of adolescents in the 13–14 years age group was more in rural areas (38.83 kg and 16.97) than in urban areas (38.59 kg and 16.95). However, mean height was similar for this age group in both urban as well as rural areas. In successive age groups, all three parameters were more in urban adolescents than in their rural counterparts. Mean weight and mean BMI among female subjects in urban areas was more than those from rural areas in all age groups. However, mean height was similar in both the areas except among adolescents of 15–16 years age group, where urban females were taller than rural females approximately by 1 cm. The prevalence of thinness in the rural areas ranged from 24.5 to 31.5 per cent among males as compared to 14.6 to 15.8 per cent among females. Stunting in urban areas ranged from 6.5 to 15.2 per cent among males and 7 to 14 among females. Thinness was more prevalent among males than females in urban areas and it ranged from 21.9 to 34.1 per cent among males and 11.5 to 19.8 per cent among females. The prevalence of stunting and thinness was more in rural than in urban settings for both the sexes but the difference was not statistically significant. The overall nutritional status among the rural subjects was poor than that of the urban subjects for both the sexes. Hence, more stress should be laid on planning and implementing nutritional programmes for adolescents in rural settings.

Key Words: Nutritional status, Adolescents, Anthropometry, Stunting, Thinness, Rural, Urban.

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The term adolescence is derived from the Latin word 'adolescere'; meaning "to grow, to mature." It has been defined by the World Health Organization (WHO) as the period of life from 10 to 19 years and characterized by rapid physical growth, significant emotional, psychological and spiritual changes; and evolving personal relationships. Adolescence is recognized as a phase rather than a fixed time period in an individual's life¹. Approximately, 20 per cent of the population of the South-East-Asia consists of adolescents² and according to 2001 census of India, 22.9 per cent of the Indian population is adolescent, constituting 1/3rd of the total world adolescent population³.

Adolescence is the future generation of any country. Their nutritional needs are critical for the well being of a society² but for many years, their health has been neglected because they are considered to be less vulnerable to diseases compared to relatively young children or the old people⁴. If the adolescents are well-nourished, they can make optimal use of their skills, talents and energies and would be healthy and responsible citizens. Adolescence, a second period of rapid growth may serve as an opportunity for compensating faltered early childhood growth though the potential for significant catch-up is limited².

Poor nutrition starts before birth and goes into adolescence and adult life and can span into generations. Investing in nutrition throughout the life-cycle will have both short-term as well as long-term benefits of economic and social significance². It is imperative to know the baseline nutritional status of adolescents in a community for planning appropriate interventions. Hence, this study was carried out with the aim to determine the nutritional status of adolescents in rural and urban areas of Rohtak district, Haryana, India.

MATERIALS AND METHOD

The study was conducted in urban and rural schools of Rohtak district. In the rural areas, schools were selected from Lakhanmajra block, the field practice area attached to the Department of Community Medicine, Post-Graduate Institute of Medical Sciences, Rohtak. This was a cross-sectional study carried out during September 2008-August 2009. Stratified random sampling technique was used for sampling. The study population was divided into two strata- rural and urban and further into two sub-strata based on the type of school i.e. government or private in each stratum. List of schools having children in the age group of 13–16 years was taken from the District Education Officer (DEO). Four schools were selected from each sub-stratum in both the strata. A total of 500 children in the above mentioned age group were selected from schools of each sub-stratum and this was adequate based on the prevalence of malnutrition in Haryana as per the National Family Health Survey (NFHS-3)⁵ at 95 per cent level of significance and 10 per cent permissible error. Thus, the researchers arrived at a total sample of 2000 adolescents (1000 rural and 1000 urban).

Consent from the Principal of the concerned schools was taken. Schools were visited with prior intimation. The students and the teachers were briefed about the study. All the students in the selected school falling in the above mentioned age group as per the school records were included in the study. To maintain uniformity in the study, the students from the lower standards were enrolled first and the students were called according to their roll numbers. The study was carried out till the desired number of samples was achieved. The students who were physically challenged (differently

abled) were excluded from the study. Height and weight were taken using the standard procedure⁶. Stunting (height for age) and thinness (BMI for age) were calculated as per the National Centre for Health and Statistics (NCHS) standards¹. The collected data were analyzed separately for boys and girls and tests of significance were applied wherever applicable.

FINDINGS

Mean weight and mean BMI in the 13–14 years age group was more in rural areas (38.83 kg and 16.97) than urban areas (38.59 kg and 16.95). However, the mean height was similar in this age group i.e. 1.5m. Thereafter, in successive age groups, all the three parameters were found to be more in urban adolescents than their rural counterparts. In both the rural and urban adolescents, mean weight, height and BMI showed an increasing trend with age, except in 15–16 years age group where mean BMI decreased slightly. Average weight and height gain among rural males was approximately 6 kg and 10 cm respectively from 13 to 16 years whereas the corresponding values for urban males were 8 kg and 11 cm respectively (Table1).

TABLE 1
MEAN WEIGHT, HEIGHT AND BMI OF MALES IN DIFFERENT AGE GROUPS IN URBAN AND RURAL AREAS (N=1140)

Age group (in years)	Area (n)	Mean weight (in kg) $\pm$ S.D.	Mean height (in m) $\pm$ S.D.	Mean BMI $\pm$ S.D.
13– 4	Rural (359)	38.83 $\pm$ 8.10	1.50 $\pm$ 0.07	16.97 $\pm$ 2.50
	Urban (255)	38.59 $\pm$ 8.34	1.50 $\pm$ 0.08	16.95 $\pm$ 2.67
	p value*	0.72	0.647	0.911
14–15	Rural (136)	42.43 $\pm$ 7.39	1.56 $\pm$ 0.07	17.26 $\pm$ 1.99
	Urban (169)	46.52 $\pm$ 9.91	1.60 $\pm$ 0.08	17.99 $\pm$ 2.77
	p value*	0.000	0.00	0.01
15–16	Rural (89)	44.34 $\pm$ 6.53	1.60 $\pm$ 0.08	17.19 $\pm$ 1.55
	Urban (132)	46.77 $\pm$ 9.03	1.61 $\pm$ 0.07	17.72 $\pm$ 2.40
	p value*	0.03	0.1	0.07

*independent 't' test.

Findings in Table 2 show that the mean weight and mean BMI among female subjects in urban areas was more than those from rural areas in all the age groups. However, mean height was found similar in both the areas except in the 15–16 years age group where urban females were taller than rural females approximately by 1 cm. Here also, all three parameters showed an increasing trend with age. Rural females gained 3 cm height and 3 kg weight and urban females gained 4 cm height and 4 kg weight from 13 to 16 years. Prevalence of stunting among males in rural areas ranged from 7.5 per cent in the 13–14 years age group to 20.2 per cent in subjects older than 15 years. This showed an increasing trend with age. Though stunting among females in the 14–15 years age group was found to be high (16.5%) but it did not show any definite pattern with age. The overall prevalence of stunting was almost similar in males (10.9%) as well as females (12.7%). The prevalence of thinness in males was almost twice than that of females and this difference was also observed in successive age groups. The prevalence of thinness in rural areas ranged from 24.5 to 31.5 per cent in males as

compared to 14.6 to 15.8 per cent in females (Table3).

TABLE 2
MEAN WEIGHT, HEIGHT AND BMI OF FEMALES IN DIFFERENT AGE GROUPS IN
URBAN AND RURAL AREAS (N = 860)

Age group (in years)	Area (n)	Mean weight (in Kg) $\pm$ S.D.	Mean height (in m) $\pm$ S.D.	Mean BMI $\pm$ S.D.
13–14	Rural (205)	40.32 $\pm$ 6.31	1.51 $\pm$ 0.06	17.56 $\pm$ 2.22
	Urban (200)	41.7 $\pm$ 6.54	1.51 $\pm$ 0.06	18.03 $\pm$ 2.46
	p value*	0.032	0.319	0.045
14–15	Rural (139)	42.18 $\pm$ 7.15	1.53 $\pm$ 0.06	17.89 $\pm$ 2.46
	Urban (143)	44.06 $\pm$ 6.44	1.53 $\pm$ 0.05	18.8 $\pm$ 2.44
	p value*	0.02	0.75	0.002
15–16	Rural (72)	43.23 $\pm$ 5.04	1.54 $\pm$ 0.04	18.10 $\pm$ 1.86
	Urban (101)	45.79 $\pm$ 8.58	1.55 $\pm$ 0.06	18.95 $\pm$ 2.95
	p value*	0.02	0.41	0.03

*independent 't' test.

TABLE 3
AGE AND SEX-WISE PREVALENCE OF STUNTING AND THINNESS IN RURAL
POPULATION*

Age group in years	Sex (n)	Stunting (%)	Thinness (%)
13 – 14	Males (359)	27 (7.5)	88 (24.5)
	Females (205)	23 (11.2)	30 (14.6)
14 – 15	Males (136)	19 (14)	42 (30.9)
	Females (139)	23 (16.5)	22 (15.8)
15 – 16	Males (89)	18 (20.2)	28 (31.5)
	Females (72)	7 (9.7)	11 (15.3)
Total	Males (584)	64 (10.9)	158 (27.05)
	Females (416)	53 (12.7)	63 (15.1)

*According to NCHS standards

Data given in Table 4 show that stunting in urban areas ranged from 6.5 to 15.2 per cent in males and 7 to 14 per cent in females. Maximum prevalence was observed in adolescents older than 15 years among males and almost equal proportion in females in the age groups of 14–15 and 15–16 years. It did not show any clear trend with age. Stunting in females was higher than the males in urban areas but no statistically significant difference was observed. Thinness was more prevalent in males than females and it ranged from 21.9 to 34.1 per cent in males and 11.5 to 19.8 per cent in females in urban areas indicating that females were nutritionally better than males. The prevalence of stunting and thinness was more in rural areas than in urban settings in both the sexes but the difference was statistically not significant (Table 5).

TABLE 4
AGE AND SEX-WISE PREVALENCE OF STUNTING AND THINNESS IN URBAN POPULATION*

Age group in years	Sex (n)	Stunting (%)	Thinness (%)
13–14	Males (255)	29 (11.4)	67 (26.3)
	Females (200)	14 (7)	23 (11.5)
14–15	Males (169)	11 (6.5)	37 (21.9)
	Females (143)	20 (14)	18 (12.6)
15–16	Males (132)	20 (15.2)	45 (34.1)
	Females (101)	14 (13.9)	20 (19.8)
Total	Males (556)	60 (10.7)	149 (26.7)
	Females (444)	48 (10.8)	61 (13.73)

*According to NCHS standards.

TABLE 5
COMPARISON OF NUTRITIONAL STATUS BETWEEN MALES AND FEMALES IN RURAL AND URBAN AREAS*

Sex		Rural (n = 584)	Urban (n = 556)	p value#
Males	Stunted (%)	64 (10.9)	60 (12.7)	0.93
	Thin (%)	158 (27.05)	149 (26.7)	0.92
Females	Stunted (%)	53 (12.7)	48 (10.8)	0.37
	Thin (%)	63 (15.1)	61 (13.7)	0.55

*According to NCHS standards

#chi-square test with degree of freedom=1

DISCUSSION

The mean height of rural males in the 13–14 years age group was 1.5 m which was similar to the mean height of urban males in same age group. Urban males showed a higher increase in mean height as it was 1.6 m in comparison to the mean height of 1.53 m for the rural males. Males attained a height of 1.6 m in rural areas and 1.61 m in urban areas in the 15–16 years age group. However, females in both urban and rural areas showed a similar increment in mean height at all ages. Height of females increased from 1.51 m to 1.54 m at 13–14 years of age in rural areas and from 1.51 m to 1.55 m in urban areas at 15–16 years of age.

Except in the 13–14 years age group, males had a higher mean height than females in both the areas. This might be due to delayed growth spurt in males than females. This variation was also observed in the study conducted by Anand et al in which mean height of males (143.86 cm) was less than females (145.44 cm) in the 13–14 years age group after which it increased to 152.61 cm and 160.37 cm at 14–15 and 15–16 years age groups respectively in males as compared to a relatively small gain in height from 149.09 cm at 14–15 years age group to 154.83 cm at 15–16 years age group among females⁷. Similarly, in the study conducted by Venkaiah et al, the mean height of males increased from 143 cm at 13–14 years age group to 153 cm at 15–16 years age group as compared to 144.1 cm at 13–14 years age group to 149.8 cm at 15–16 years age group respectively in females⁸. Thakor et al observed a mean height of urban males to be 133.7 cm at 10 years which increased to a maximum of 153.6 cm

at 15 years. Similarly, in females, mean height increased from 132.8 cm at 10 years to 150 cm at 15 years of age⁹. In all the studies, it was noted that males gained more height than females in all the age groups.

The mean weights among the rural males in the 13-14, 14-15 and 15-16 years age groups were 38.83 kg, 42.43 kg and 44.34 kg respectively while the same were 40.32 kg, 42.18 kg and 43.23 kg respectively among the rural females in the corresponding age groups. For the same age groups, the mean weights among urban males were 38.59 kg, 46.52 kg and 46.77 kg and among females, the mean weights were 41.7 kg, 44.06 kg and 45.79 kg for the respective age groups. The mean weight was more in urban subjects than rural subjects and more in males than females except in the 13-14 years age group. The values were much higher than those found in the study conducted by Venkaiah et al. In the present study, the age-wise mean weights were $30.8 \text{ kg} \pm 5.8 \text{ kg}$, $34.8 \text{ kg} \pm 6.4 \text{ kg}$ and $38.6 \text{ kg} \pm 6.4 \text{ kg}$ in the three respective age groups among males. In females, the values were $32.6 \text{ kg} \pm 5.6 \text{ kg}$, $36.0 \text{ kg} \pm 5.5 \text{ kg}$ and $38.9 \text{ kg} \pm 5.8 \text{ kg}$ in the respective age groups⁸. In the study conducted by Thakor et al, the mean weight of urban males increased from 30.2 kg at 13-14 years age to 36.2 kg at 15-16 years age group. It was lesser than females at all ages in which it ranged from 33.4 kg at 13-14 years to 38.0 kg at 15-16 years of age⁹.

The mean BMI and the standard deviation among the rural males were 16.97 ± 2.50 , 17.26 ± 1.99 and 17.19 ± 1.55 in the 13-14, 14-15 and 15-16 years age groups respectively while among the rural females, these were 17.56 ± 2.22 , 17.89 ± 2.46 and 18.10 ± 1.86 respectively for the corresponding age groups. Similarly, the mean BMI were 16.95 ± 2.67 , 17.99 ± 2.77 and 17.72 ± 2.40 among the urban males and 18.03 ± 2.46 , 18.8 ± 2.44 and 18.95 ± 2.95 among the urban females in the three respective age groups. It was found that the mean BMI was more in urban subjects as compared to the rural subjects and more in females than males. Anand et al reported a mean BMI and standard deviation of 15.99 ± 1.67 , 16.49 ± 1.18 and 16.83 ± 1.60 in males and 16.93 ± 2.29 , 17.39 ± 1.73 and 19.19 ± 2.47 in females in the respective age groups⁷. However, Thakor et al reported a lower mean BMI in the urban subjects where it ranged from 14.8 at 13-14 years age group to 15.3 at 15-16 years age group in urban males and 15.9 to 17.2 in 13-14 and 15-16 years age groups respectively in urban females⁹. Das et al in their study on adolescents in urban West Bengal found a consistently increasing trend of mean BMI in the both sexes from the age of 13 years onwards. In these studies, the mean BMI of females were more than that of males¹⁰. The mean BMI in the current study subjects were also more as compared to the studies conducted by Mukhopadhyay et al¹¹.

Nutritional status which reflects the state of health is influenced by environmental and dietary factors. In the present study, the nutritional status of adolescents was also assessed using NCHS standards. Stunting, which is considered as an index for chronic under nutrition and thinness which indicates acute under nutrition were observed among the subjects in all the age groups in both the areas. Among all the adolescents, the prevalence of stunting was found to be more in females (11.7%) than males (10.8%) while the prevalence of thinness was seen more in males (26.9%) than females (13.9%). In rural areas also, prevalence of stunting was more in females (12.7%) than males (10.9%) and prevalence of thinness was more in males (27.05%) than females (15.14%). Prevalence of both stunting and thinness increased with age in both the sexes except in females in the age group of 15-16 years where a decrease

in prevalence was noted. Similar findings were observed by Venkaiah et al where the prevalence of stunting was more in males than females and contrary to the common impression, the prevalence of under nutrition (weight for age) was observed more in males (53.1%) than females (39.5%)⁸. Contrary to both the above findings, Anand et al in their study noted a declining trend in the prevalence of stunting among males from 56 per cent at 12 years to 25 per cent at 17 years of age. The trend was similar for females also. The prevalence of thinness varied between 31 to 52 per cent among males and 4 to 59 per cent among females. In the current study also, the prevalence of thinness among females was found to be lower than among males⁷. Bose et al also observed a decreasing trend of under nutrition from 53.54 to 41.54 per cent among boys and from 45.76 to 20.17 per cent among girls from 10 years to 15 years of age¹². Mulugeta et al in their study among Ethiopian adolescent females, recorded the prevalence of stunting and thinness as 26.5 per cent and 58.3 per cent respectively using the WHO 2007 growth reference¹³. However, the prevalence of stunting and thinness were far less in the present study in comparison to other studies.

In the present study, in urban areas, the prevalence of stunting was almost similar in males (10.7%) and females (10.8%). The prevalence varied from 7 to 14 per cent in females and 6.5 to 15.2 per cent in males with no specific trend. The prevalence of thinness was more in males (26.79%) than females (13.73%). Thinness ranged from 22 to 34 per cent in males and showed an upward trend in females increasing from 11.5 per cent at 13 years of age to 19.8 per cent at 15 years of age. Medhi et al in their study found that the prevalence of stunting was 47.4 per cent and 51.9 per cent among males and females respectively and thinness was higher among males (59.5%) than females (41.3%)¹⁴. In an earlier study, Das et al found the overall prevalence rate of under nutrition as 28.6 per cent and the rate was significantly higher in males (37.59%) than females (19.43%)¹⁰. Jinabhai et al observed stunting among males to be more (21.9%) than females (9.4%) in their study among school going black teenagers in South Africa and the difference was statistically significant¹⁵. Haboubi et al found that regardless of gender, stunting was higher among Indian adolescents living in India (25.5 – 51%) when compared with the Indian adolescents in UAE (3.1-21%)¹⁶. In another study, de Onis et al noticed the prevalence of thinness as 50.5 per cent and stunting as 11.2 per cent among adolescent males aged 7–16 years in West Bengal¹⁷.

CONCLUSION

In the present study, the prevalence rate of stunting and thinness among males and females was lower than the prevalence rates found in other studies. Moreover, the prevalence was similar in urban and rural areas. However, the overall nutritional status among the rural subjects was poor than that of the urban subjects, for both the sexes. This suggests that there is a need for nutrition education among the rural population and more stress should be laid on planning and implementing nutritional programmes for adolescents in rural settings.

REFERENCES

1. GHAI O.P., GUPTA P. & PAUL VK (2004): Essential Paediatrics; 6th ed. CBS Publishers and Distributors, New Delhi, p. 66-7.
2. Adolescent Nutrition: A Review of the Situation in Selected South-East Asian Countries [online] (2006) and [cited 2009 Apr 9, 84 pages, Available

- on:URL:http://www.searo.who.int/LinkFiles/Nutrition_for_Health_and_Development_Executive_Summary.pdf.
3. LAL S. & ADARSH PANKAJ (2007): Textbook of Community Medicine; CBS Publishers and Distributors, New Delhi, p.128.
 4. RAO V.G., AGGARWAL M.C., YADAV R., DAS S.K., SAHARE L.K., BONDLEY L.K. et al (2003): Intestinal Parasitic Infections: Anaemia and Undernutrition among Tribal Adolescents of Madhya Pradesh; *Ind J Com Med*, 28(1): 26-29.
 5. Haryana, National Family Health Survey (NHFS-3) 2005-2006 (2007): IIPS and Macro-International, Mumbai, IIPS.
 6. JELLIFFE D.B. (1966): The Assessment of Nutritional Status of the Community; World Health Organization, Geneva, p.63-69.
 7. ANAND K., KANT S. & KAPOOR S.K. (1999): Nutritional Status of Adolescent School Children in Rural North India; *Indian Pediatr*, 36: 810-815.
 8. VENKAIK K., DAMAYANTI K., NAYAK M.U. & VIJAYARAGHAVAN K. (2002): Diet and Nutritional Status of Rural Adolescents in India; *Eur J Clin Nutr*, 56(11): 1119-1125.
 9. THAKOR H.G., KUMAR P., DESAI V.K. & SRIVASTAVA R.K. (2000): Physical Growth Standards for Urban Adolescents (10-15 years) from South Gujarat; *Ind J Comm Med*, 25(2): 86.
 10. DAS B.K. & BISAI S. (2009): Prevalence of Undernutrition among Telaga Adolescents: An Endogamous Population of India; *The Internet Journal of Biological Anthropology* [serial online, cited on 12 January 2009], 2(2). Available on: http://www.ispub.com/journal/the_internet_journal_of_biological_anthropology/volume_2_number_2_60/article/pRevalence_of_Undernutrition_among_Telaga_Adolescents_An_Endogamous_Population_of_India.html.
 11. MUKHOPADHYAY A., BHADRA M. & BOSE K. (2005): Anthropometric Assessment of Nutritional Status of Adolescents of Kolkata, West Bengal; *J Hum Ecol*, 18(3): 213-216.
 12. BOSE K. & BISAI S. (2008): Prevalence of Undernutrition among Rural Adolescents of West Bengal, India; *J of Trop Pediatr*, 54(6): 422-423.
 13. MULUGETA A., HAGOS F., STOECKER B., KRUSEMAN G., LINDERHOF V. & ABRAHA Z. et al (2009): Nutritional Status of Adolescent Girls from Rural Communities of Tigray, Northern Ethiopia; *Ethiopia J Health Dev*, 23(1): 5-11.
 14. MEDHI G.K., HAZARIKA N.C. & MAHANTA J. (2007): Nutritional Status of Adolescents among Tea Garden Workers; *Indian J of Pediatr*, 74(4): 343-347.
 15. JINABHAI C.C., REDDY P., TAYLOR M., MONYEMI D., KAMABARAN N., OMARDIEN R. et al (2007): Sex Differences in under and over Nutrition among School Going Black Teenagers in South Africa: An Uneven Nutrition Trajectory, 12(8): 944-952.
 16. HABOUBI G.J. & SHAIKH R.B. (2009): A Comparison of the Nutritional Status of Adolescents from Selected Schools of South India and UAE: A Cross- Sectional Study; *Indian J of Community Med*, 34(2): 108-111.
 17. de ONIS M., DASGUPTA P., SAHA S., SENGUPTA D. & BLOSSNER M. (2001): The National Centre for Health Statistics, Reference and the Growth of Indian Adolescent Boys, *Am J Clin Nutr*, 74(2): 248-53.

PREVALENCE OF BEHAVIOURAL RISK FACTORS OF CARDIO-VASCULAR DISEASES AMONG SCHOOL GOING ADOLESCENTS OF AHMEDABAD, GUJARAT

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ABSTRACT

Cardio-vascular diseases are considerably increasing in India for the last few decades, comparatively at a higher rate in urban areas. Their risk factors start very early in life. So, this study was done in school going adolescents to know the prevalence of behavioural risk factors and to know the difference between rural and urban areas. In this cross-sectional study, 18 urban and 12 rural schools were selected by proportional stratified random sampling. 900 students were selected by systemic random sampling from 30 schools that included 30 students from each school. Oral questionnaire method was used to collect information. The mean ages of urban and rural boys were 14.65 ± 1.03 years and 14.96 ± 1.13 years respectively and 14.97 ± 1.14 years and 15.02 ± 0.96 years respectively for urban and rural girls. 4.26 per cent of the urban students were physically inactive which was significantly higher than the rural students. Table salt and high-energy food intake were higher among the urban students while tobacco chewing practice was more prevalent among the rural students. The study revealed that prevalence of behavioural risk factors is considerably higher both in urban and rural areas which requires behavioural skill training in schools.

Key words: Adolescents, Behavioural risk factors, Cardio-vascular diseases

In the modern world, prevalence of non-communicable diseases is increasing and cardiovascular diseases have a major share in these non-communicable diseases¹. Cardiovascular diseases (CVDs) had caused 16.6 million or 1/3rd of the global deaths in 2001 in which 7.2 million died of ischemic heart disease, 5.5 million due to stroke and 3.9 million due to hypertension and other heart diseases. Cardiovascular diseases are responsible for 10 per cent of disability adjusted life years (DALYs) lost in low- and middle-income countries and 18 per cent in high income countries. As compared to 2000, the number of years of productive life lost to CVDs by 2030 will increase up to 95 per cent in India while the figure will stand at 20 per cent for the U.S. Among the different cardiovascular diseases, hypertension and coronary heart diseases top the list in India².

Earlier, increased prevalence of CVDs was experienced in developed countries but now it is increasing in developing countries like India because of the epidemiological transition and adoption of western life-style like low physical activity, high energy food and substance abuse like tobacco and alcohol. However, this life-style is adopted faster

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by the urban population than the rural population³. Difference in the prevalence of CVDs has been notified in various studies with higher prevalence rate in urban areas^{4,5}. Mortality in adulthood is largely due to behaviour initiated in adolescence. According to WHO, 70 per cent of the deaths in adulthood are due to life-style behaviour like tobacco use and indulging in unsafe sex during adolescence⁶. Risk factors of CVDs like physical inactivity, tobacco and alcohol use, unhealthy diet and obesity are generally adopted during this period. 21.4 per cent of the population in India is adolescents. This large group of future adults is at a major risk of cardiovascular diseases. Taking into consideration these facts, the present study was carried out amongst the most vulnerable group of adolescents.

MATERIALS AND METHOD

Study Population: The present cross-sectional study was conducted in the urban and rural areas of Ahmedabad district, Gujarat, India. The study population was adolescents studying in 9th and 11th standards in schools of urban and rural areas of Ahmedabad.

Sample Size: Considering the prevalence rate of any of the cardiovascular risk factors, approximately 35 per cent⁷⁻⁹ sample size was calculated by the following formula¹⁰:

Sample size = $4PQ/L2$.

Where, P = Prevalence of any of the cardiovascular risk factors in adolescents = 35%

Q = 100 – P = 65%

L = 10% of P = 3.5

The estimated sample size was 742. To adjust non-response, if any, sample size of 900 was decided.

Sampling Technique: 30 schools were selected from the list by proportional stratified random sampling which was procured from the District Education Officer, Ahmedabad. 18 schools were selected from the urban areas and 12 schools from rural areas. Estimated sample of 900 students (rural-540, urban-360) was taken from 30 schools by systemic random sampling technique.

Data Collection: Prior permission was taken from the concerned principals of the respective schools. After explaining the aims and objectives of the study, consent was taken from the students. A pilot study was carried out in 5 schools and then the questionnaire was revised as per the observations. Socio-economic class of the students was decided by the modified Prasad's classification¹¹. Past and current tobacco (all the forms of tobacco) users were put as tobacco chewers. Time spent for walking, running, cycling, indoor and outdoor games were calculated for each student. Accordingly, students were classified as physically inactive if physical activity was <1 hr/day¹². Daily diets of the students was analyzed for fruits and vegetable intake. Students were given stress code by Glazer's stress coding system and classified accordingly¹³. Fried food, fast food, bakery items and cold drinks were considered as high energy food. Students were classified as per their consumption of high energy food per week.

Data Analysis: Data were entered in master chart and then analyzed by Microsoft Excel and Epi info 3.4.

FINDINGS

Looking at the socio-demographic background of the students, the mean ages of the urban and rural boys were found as 14.65 ± 1.03 years and 14.96 ± 1.13 years respectively. Mean ages of urban and rural girls were 14.97 ± 1.14 years and 15.02 ± 0.96 years respectively. Students belonging to the socio-economic classes II and III were comparatively more in rural areas (80%) while students belonging to the socio-economic class I were comparatively more in urban areas (32.2%). In rural areas, around 50 per cent of the family members were illiterates or had taken education up to primary level. Family members with post-graduate education were more in urban areas. Family members who were unskilled labourers were more in number in rural areas than in urban areas. Rate of unemployment was also higher in rural areas. Family characteristics are shown in Table 1.

As per the findings in Table 2, physical inactivity and use of extra salt in diet was significantly higher amongst the urban adolescents. Tobacco chewing practices amongst the rural adolescents (3.05%) were significantly higher than the urban adolescents ($P < 0.05$). Weekly intake of high energy food was found to be more among the urban habitats. The number of urban students taking vegetables and fruits was more in comparison to their rural counterparts which was also statistically significant. Prevalence rate of stress was higher in urban areas but it was statistically not significant ($P > 0.05$).

TABLE 1
SOCIO-DEMOGRAPHIC PROFILE OF THE STUDY POPULATION

Characteristics		Urban (n=540)	Rural (n=360)	Total (n=900)
Mean Age		Boys 14.65 ± 1.03	Boys 14.96 ± 1.13	
		Girls 14.97 ± 1.14	Girls 15.02 ± 0.96	
Mean Family Size		4.97 ± 1.13	5.13 ± 1.25	
Socioeconomic Class	Class I	174(32.2)	36(10)	210(23.3)
	Class II	206(38.1)	143(39.7)	349(38.8)
	Class III	117(21.7)	145(40.3)	262(29.1)
	Class IV & V	43(8)	36(10)	79(8.8)
		Urban (n=2085)	Rural (n=1477)	Total (n=3562)
Education of Family Members	Illiterate	203(9.7)	255(17.3)	458(12.9)
	Primary	594(28.5)	495(33.6)	1089(30.6)
	Secondary & Higher Secondary	915(43.9)	604(40.8)	1519(42.6)
	Graduate	336(16.1)	114(7.7)	450(12.6)
	Post Graduate	37(1.8)	9(0.6)	46(1.3)

Occupation of Family Members	Skilled	166(7.9)	92(6.2)	258(7.2)
	Semi-skilled	401(19.3)	121(8.2)	522(14.6)
	Unskilled	145(6.9)	256(17.3)	401(11.2)
	Housewife	550(26.4)	361(24.5)	911(25.7)
	Unemployed	193(9.3)	195(13.2)	388(10.9)
	Students	630(30.2)	452(30.6)	1082(30.4)

TABLE 2
PREVALENCE OF BEHAVIOURAL RISK FACTORS FOR CARDIO-VASCULAR CONDITIONS IN ADOLESCENTS

Risk Factors		Urban (n=540)	Rural (n=360)	Z value	P value
Tobacco chewing	Present	4(0.74)	11(3.05)	2.37	<0.05
	Absent	536(99.26)	349(96.95)		
Physical activity	<1 hour/day	23(4.26)	6(1.66)	2.43	<0.05
	≥1 hour/day	517(95.74)	354(98.34)		
Added salt	Taken	50(9.3)	12(3.3)	3.84	<0.05
	Not taken	490(90.7)	348(96.7)		
Veg. and fruits	<400 gm/day	491(90.9)	347(96.4)	3.52	<0.05
	≥400 gm/day	49(9.1)	13(3.6)		
Stress	Present	13(2.40)	7(1.95)	0.46	>0.05
	Absent	527(97.60)	353(98.05)		
Risk Factors		Urban (n=540)	Rural (n=360)	X ² value	P value
High energy food	≤ once a week	452(83.70)	328(91.11)	10.83	<0.05
	2-3 times/week	61(11.30)	21(5.83)		
	>3 times/week	27(5.00)	11(3.06)		

(X² = Chi square)

DISCUSSION

Study of the prevalence of CVDs' risk factors and their evaluation in childhood may be important for planning preventive strategies. Studies like urban-rural comparison for cardiovascular risk factors have been carried out extensively among adult population^{14,15} while very few studies are conducted among adolescent population¹⁶.

In the present study, 3.05 per cent of the rural adolescents have admitted to tobacco chewing which was lower than 19.16 per cent as observed in another community-based study by Naresh R. et al in Gujarat⁹ which had included non school going adolescents also. But in the present study, only school going adolescents were included which may be the reason for this observed difference in the prevalence rate of tobacco chewing. Various studies in urban areas of India had reported prevalence of tobacco chewing/smoking ranging 0.2 per cent to 41.1 per cent among adolescents¹⁷⁻¹⁹. The children who have tried tobacco in the present study, would have a high risk of becoming regular tobacco users which would lead to an increase in their risk of developing non-communicable diseases. A study by Thakor et al showed that 3 per cent of boys and

16.5 per cent of girls were not engaged in any outdoor playing²⁰ which is similar the findings of the present study. Salt is an independent risk factor for hypertension and has dose-response relationship with hypertension²¹. In this study, 9.3 per cent of the urban students were taking extra salt and at risk of developing hypertension. However, this relationship depends upon the genetic make-up of the subjects.

WHO has stated that minimum 400 gm/day of vegetables and fruits should be taken as a preventive measure for cardiovascular disease because of their high fibre and potassium content²². In the current study, consumption of vegetables and fruits at the rate of >400 gm/day was found to be more among urban students which may be because of the easy availability of vegetables and fruits in urban areas. In the present study, 5.7 per cent of the adolescents were taking vegetables and fruits above the recommended level which was much higher than the finding of WHO-ICMR study (1%)²³. It is generally agreed that stress aggravates blood pressure and predisposes the individual to develop hypertension²⁴. Taking this as a risk factor, in the present study, stress was not found significant between urban and rural adolescents. Stress was elicited through the oral questionnaire which may have subjective error and the limitation of this study. High energy food intake was found significantly higher among the urban adolescents. In the present study, 5 per cent of the urban adolescents were taking high energy food >3 times a week. Similarly, high intake of fast food was found in an earlier study by S Kumar et al²⁵.

Thus, it was observed that there was a significant difference between rural and urban areas for behavioural risk factors like dietary habits, physical inactivity and tobacco chewing. Except tobacco chewing, prevalence of other behavioural risk factors was found higher among urban adolescents. Still prevalence rate is also high in rural areas as well. Schools should promote positive health behaviour as students spend most of their time in the school environment. So, as part of preventive strategies, schools must formulate policies for addressing foods and snacks consumed in the school premises as well as outside, for behavioural skill training, for promotion of sports and recreational activities and for tobacco free settings.

REFERENCES

1. WHO Bulletin (2005): WHO, Geneva, 83: 100-108.
2. PATEL J.L., PATEL L.D. & GOYEL R.K. (2007): Epidemiology and Current Status of Major Cardio-vascular Diseases; *Trendz*, 4(5): 11-193.
3. GUPTA R & GUPTA VP (1996): Meta Analysis of Coronary Heart Disease Prevalence in India; *Indian Heart J*, 48: 241-245.
4. GUPTA R. (2005): Burden of Coronary Heart Disease in India; *Indian Heart J*, 57: 632-638.
5. GUPTA R. (2004): Coronary Heart Disease in India: Absolute Numbers and Economic Burden: Rapid Response to Ghaffar A, Reddy KS, Singhi M. Burden of Non-communicable Diseases in South Asia; *British Medical J*, 328: 807-810.
6. Adolescent and Child Health Programme-Family and Reproductive Health (1998): WHO, Geneva, 18.
7. SING A.K., MAHESHWARE A., SHARMA N. & ANAND K. (2006): Life-Style Associated Risk Factors in Adolescents; *Indian J of Pediatrics*, 73: 901-906.
8. CHATTERJEE P. (2002): India Sees Parallel Rise in Malnutrition and Obesity; *Lancet*, 360: 1948.

9. MAKWANA N.R., SHAH V.R. & YADAV S. (2007): A Study on Prevalence of Smoking and Tobacco Chewing among Adolescents in Rural Areas of Jamnagar District, Gujarat State; *J Med Scn Research*, 1(1): 47-49.
10. MAHAJAN B.K. (2002): *Methods in Biostatistics*, 6th ed.
11. P Kumar (1993): Social Classification-Need for Constant Updating; *Indian J Community Medicine*, 28(2): 60-61.
12. WHO [Homepage on the Internet]: Programmes and Projects: Global Strategy on Diet, Physical Activity and Health; Available on: <http://www.who.int/dietphysicalactivity/pa/en/index.html>.
13. Derbyshire County [Homepage on the Internet]: Stress-Related Behavioural Pattern: The Glazer Stress Control Lifestyle Questionnaire. Available on: [http://www.derbyshirecountypct.nhs.uk/content/Health Psychology Service/Stress Related Behaviour Patterns.pdf](http://www.derbyshirecountypct.nhs.uk/content/Health%20Psychology%20Service/Stress%20Related%20Behaviour%20Patterns.pdf).
14. CHADHA S L, GOPINATH N. & SHEKHAWAT S. (1997): Urban-Rural Differences in Prevalence of Coronary Heart Disease and Its Risk Factors in Delhi; *WHO Bulletin*, 75: 31-38.
15. WILLIAMS B. (1995): Westernised Asians and Cardiovascular Disease; *Lancet*, 345: 401-402.
16. MOHAN B., KUMAR N., ASLAM N., RANGBULLA A., KUMBKARNI S. & SOOD N. et al (2004): Prevalence of Sustained Hypertension and Obesity in Urban and Rural School Going Children in Ludhiana; *Indian Heart J*, 56: 310-314.
17. ARORA M. & REDDY K.S. (2005): Global Youth Tobacco Survey- Delhi; *Indian Pediatrics* [serial on Intertnet, cited on 17 August 2005]; 42: [about 2 p.], on: <http://indianpediatrics.net/aug2005/850.pdf>
18. PD MADAN KUMAR, S POORNI & S RAMACHANDRAN (2006): Tobacco Use among School Children in Chennai City; *Indian J Cancer*, 43(3): 113-127.
19. TRIPATHI B.M. & LAL RAKESH (1999): Substance Abuse in Children and Adolescents; *Indian J Pediatrics*; 66: 569-575.
20. THAKOR H.G., KUMAR P. & DESAI V.K. (2004): Effect of Physical and Mental Activity on Blood Pressure; *Indian J Paediatrics*, 71: 307-312.
21. SACKS F.M., SVETKAY L.P., VOLLMER W.M., APPEL L.J. & BRAY G.A. (2001): Effects of Blood Pressure of Reduced Dietary Sodium and the Dietary Approaches to Stop Hypertension (DASH) Diet: DASH-Sodium Collaborative Research Group; *N Engl J Med*; 344: 3-10.
22. WHO [Homepage on the Internet]. Programmes and Projects: Global Strategy on Diet, Physical activity and Health: Documents and Publication; Chronic disease information sheets. Available from: <http://www.who.int/dietphysicalactivity/publications/facts/fruit/en/index.html>
23. ANAND K. & KAPOOR S.K. (2004): Development of Sentinel Health Monitoring Centers in India, Ballabgarh Center; Final Report, WHO, New Delhi, ICMR: AIIMS.
24. P. MUSTACCHI et al 1990): Stress and Hypertension in Adolescents; *West J Med*, 153(2): 180-185.
25. S. KUMAR, MAHABALARAJU D.K. & ANUROOPA M.S. (2007): Prevalence of Obesity and Its Influecing Factor among Affluent School Children of Davangere City; *Indian J Community Medicine*, 32(1): 15-17.

REPRODUCTIVE HEALTH OF ADOLESCENT GIRLS IN AN URBAN POPULATION OF MEERUT, UTTAR PRADESH

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ABSTRACT

Today, the developing world has 84 per cent of the world's adolescent population. There are an estimated 200 million adolescents in India who comprise one-fifth of the total Indian population. As many as 40-45 per cent of the adolescent girls reports menstrual problems. These are mainly due to psycho-social stress and emotional changes. To study the reproductive health of adolescent girls in the urban field practice area of LLRM Medical College, Meerut, Uttar Pradesh, India; 402 adolescent girls in the 10-19 years age group were interviewed with a pre-tested questionnaire. 72.1 per cent of the girls had attained menarche at the time of the survey, of which 66.9 per cent reported of having regular periods and 5.2 per cent of them had irregular periods. 40.3 per cent of them reported of feeling pain or cramps during menstrual periods. The average age of menarche was found to be 13.16 years. 60 per cent of the girls had heard about HIV/AIDS and 31.8 per cent of them had heard about RTI. 16.42 per cent of the girls suffered from one or the other symptoms of RTI of which 80.3 per cent suffered from excessive vaginal discharge. 14.28 per cent of the girls sought treatment from government facilities. 29.6 per cent of the girls had knowledge about contraception.

Key Words: Adolescent, RTI, Menarche, Reproduction, Contraception.

The entire period of transition from childhood to adulthood is considered as "adolescence". This critical period of transition is identified by a range of ages. The World Health Organization (WHO) has defined adolescence as the age group of 10-19 years. Adolescence in India has been defined to be a period between 10-18 years. Lately, the girls in the age of 11-18 years have been included in the national adolescent girls scheme under integrated child development scheme (ICDS)¹. Adolescents' problems constitute a bulk of morbidities which are generally unrecognized and uncared furthering the disease burden. A large variety of morbidities such as nutritional deficiency disorders (stunting, wasting), menstrual disorders, etc. prevail among adolescents. RTIs/STIs/HIV/AIDS have already appeared as serious problems. Teenage pregnancies with complications, unsafe abortions, etc. also exist considerably. Moreover, the complex psycho-social morbidities and high risk behaviour of adolescents have been recognized as a threat to survival, growth and development¹. Hospital-based retrospective studies in India show that primary amenorrhoea, thyroid disorders, genital anomalies, ovarian enlargement, menstrual disorders, leucorrhoea and genital infections are very common among adolescent girls².

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OBJECTIVES

The study was conducted with the following objectives:

- i. To study the reproductive health of adolescent girls in the urban population of Meerut city; and
- ii. To suggest recommendations and measures for the health promotion of adolescent girls.

MATERIALS AND METHOD

The cross-sectional study was conducted in the population registered at the Urban Health Centre, Surajkund, which is a Field Practice Area of the Department of Community Medicine, LLRM Medical College, Meerut, Uttar Pradesh, India. The families belonging to the localities of Old and New Arya Nagar, Old and New Hanumanpuri, Laxmi Nagar, Saraswati Mandir, Devi Nagar, Rambagh and Gandhi Nagar, are registered at the centre. A total of 402 adolescent girls in the 10-19 years age group were interviewed with a pre-tested questionnaire. While calculating the sample size, the prevalence of anaemia was considered as the most common health problem among the adolescent girls. Therefore, by taking the prevalence of anaemia as 50 per cent for confidence level, 95 per cent with a relative precision of 10 per cent, an optimum sample size for the study was obtained by applying the following formula:

$$n = \frac{3.84 p q}{SE^2} = \frac{3.84 \times 50 \times 50}{5 \times 5} = 384$$

where SE = Standard Error of Prevalence (Precision)

p = prevalence

q = (1-p)

n = sample size

The study was carried out during 1 March - 31 October 2006. In order to have an effective completion of the study, a house-to-house survey was conducted in different locales till the 40-45 adolescent girls were covered in each locality to cover the desired number of samples. During the home visits, demographic profile of the family was taken along with the interview and examination of eligible subjects i.e. adolescent girls in the age group of 10-19 years. Each adolescent girl of the family was interviewed using an oral questionnaire method. If any of the adolescent girls in the family was absent or hostile at the time of the study, the girl in the next family was interviewed. For proper response, the heads of the families were explained in detail the purpose of the study. Detailed information was collected on a pre-designed and pre-tested proforma about their socio-demographic characteristics and contributory factors responsible for reproductive health by oral questionnaire methods supplemented by physical examination. The data, thus collected, were first coded and then transferred on to a master chart, from which simple as well as co-relation tables were prepared, analyzed and statistically evaluated.

FINDINGS

The mean age at menarche was found to be 13.16 years. Maximum number of girls (60.7%) reported to have attained menarche between 10 and 13 years of age as shown in Table 1. Of the study group, 72.1 per cent of the girls had attained menarche by the time of the survey. Of the girls who attained menarche; 66.9 per cent of them reported to have regular periods and 40.3 per cent of the girls complained of pain and cramps during periods as shown in Table 2. Findings in Table 3 reflect that 29.6 per cent of the girls had knowledge about contraception. 60 per cent of the girls had heard HIV/AIDS and 31.8 per cent of the girls knew about Reproductive Tract Infection (RTI). Out of the total 402 girls studied, only 66 (16.4%) girls reported of symptoms of RTI, of whom maximum girls 53 (80.3%) had vaginal discharge followed by low backache (13.6%) and burning micturition (4.5%) as shown in Table 4. Data in Table 5 depict that prevalence rate of RTIs was maximum (90.9%) with poor personal hygiene and the lowest with good personal hygiene (10.6%). This difference in the prevalence of RTI in relation to personal hygiene was found to be statistically significant ($P < 0.001$). Of the 66 girls reported to have symptoms of RTI, only 7 (10.6%) of them sought treatment for their symptoms, of whom maximum number of girls went for private treatment (71.4%) followed by government (14.3%) and homoeopathy (Table 6).

TABLE 1
AGE AT MENARCHE

Age in Years	Number	%
Below 10	4	1.4
10-12	176	60.7
13+	110	37.9
Total	290	100.0

TABLE 2
REPRODUCTIVE HEALTH

	Having menses		Regular		Pain/cramps	
	No.	%	No.	%	No.	%
Yes	290	72.1	269	66.9	162	40.3
No	112	27.9	21	5.2	128	31.8
Total	402	100.0	290	72.1	290	72.1

TABLE 3
KNOWLEDGE ABOUT CONTRACEPTION, HIV/AIDS AND RTI

	Contraception	HIV/AIDS	RTI
Yes	120 (29.6%)	241 (60%)	128 (31.8%)
No.	282 (70.4%)	161 (40%)	274 (68.2%)
Total	402 (100.0%)	402 (100%)	402 (100%)

TABLE 4
DISTRIBUTION OF GIRLS ACCORDING TO SYMPTOMS OF RTI

Symptoms	No.	%
Vaginal discharge	53	80.3
Genital ulcer	0	0.0
Lower abdominal pain	1	1.5
Low backache	9	13.6
Burning micturition	3	4.5
Total	66	100.0

TABLE 5
RELATION OF PERSONAL HYGIENE WITH RTIS

Personal hygiene	Total	No.	%
Poor	22	20	90.9
Fair	126	19	15.1
Good	254	27	10.6
Total	402	66	16.4

a and b have been merged for calculation $\chi^2=16.84$ df=1; $P<0.001$

TABLE 6
DISTRIBUTION OF GIRLS ACCORDING TO TREATMENT FACILITY SOUGHT FOR SYMPTOMS OF RTI

Treatment	No.	%
Govt.	1	14.3
Private	5	71.4
Homoeopathy	1	14.3
Total	7	100.0

DISCUSSION

From the total 490 adolescent girls enumerated in the study, 402 (82.0%) could be covered in the study through house-to-house visit and the rest 18.0 per cent could not be covered due to either non-availability or non-cooperative attitude. In India, very few studies have been carried out on this topic in such elaborate details. It was observed that 72.1 per cent of the study subjects had attained menarche with a mean age of 13.16 years which is comparable to 13.5 years and 13.7 years as reported in studies conducted earlier by Hegde et al³ and Chaturvedi et al⁴ respectively but higher than the mean age of 12.8 years as reported by Mahadevan⁵ among urban adolescent girls. In the present study, 66.9 per cent of the girls reported to have regular periods and 40.3 per cent of them complained of pain and cramps during periods in comparison to 83.87 per cent and 62.37 per cent respectively as reported in another study by Majumdar et al⁶.

In the present study, 60 per cent of the girls were aware of AIDS and 31.8 per cent of RTIs whereas studies by Ravish et al⁷ and Majumdar et al⁶ have reported that 66.76 per cent and 85.6 per cent of the girls had awareness about HIV/AIDS respectively. In the present study, it is seen that 29.6 per cent of the girls had knowledge about contraception of which 76.6 per cent were aware of oral contraceptive pills (OCPs) which was lower than the figures reported by Acharya et al⁸ in which 51.2 per cent of the girls had knowledge about contraception of which 98.4 per cent of them knew about oral contraceptives. Singh⁹ had reported 12 per cent awareness about contraceptives among girls. In the present study, 16.42 per cent of the girls suffered from one or the other symptoms of RTI of which 80.3 per cent suffered from excessive vaginal discharge. Khanna et al, in his study¹⁰, reported that 27 per cent of the girls who had one or the other symptoms of RTI of which white discharge and pain in the lower abdomen was 41 per cent each and Majumdar et al¹¹ reported 8.2 per cent for vaginal discharge. In the present study, prevalence of RTIs was maximum (90.9%) with poor personal hygiene and the lowest with good personal hygiene (10.6%). This relationship was significant ($P<0.001$) as compared to the findings by Khanna et al¹⁰. Of the 66 girls reporting symptoms of RTI, only 10.6 per cent of them sought treatment, of whom maximum number of girls went for private treatment (71.4%) followed by government facilities and homoeopathy (14.3% each).

CONCLUSION

Initiatives should be taken to develop adolescent-friendly health services and strengthening them. Parents should be involved in the reproductive education and one-to-one home-based counselling. This would require that parents be educated, be able to change their perceptions and attitude about reproductive and sexual health and show a willingness to initiate age appropriate dialogues with their children. Family-life education sessions to early adolescents and pre-marital counselling sessions for late adolescents should be held.

REFERENCES

1. Indian Journal of Public Health, Vol. XXXXVIII, No. 4, Oct.-Dec. 2004, 155-156.
2. Course Manual for Adolescent Health Part- II Indian Perspective, Swati Y. Bhawe, IAP-ITPAH, 319-332, 6-9, 115-121.
3. HEGDE K. et al (1990): Adolescent Menstrual Pattern; J Obs Gynae India, 40: 269-276.
4. CHATURVEDI S., KAPIL U., GNANASEKARAN N., SACHDEV H.P., PANDEY R.M. & BHANTI T. (1996): Nutrient Intake amongst Adolescent Girls Belonging to Poor Socio-economic Group of Rural Area of Rajasthan; Ind J Pediatric, 33(3): 197-201.
5. MAHADEVAN S. (1965): *ibid*, 53: 669.
6. MAJUMDAR R., GANGULI S.K. & RAJE SWATI (2001): A Study of Adolescents in Rural Area; Health and Population- Perspective and Issues, NIHFV, New Delhi, 24(4): 18-205.
7. RAVISH H.S., HAVERI S.P., KATTI S.M. & WANTAMUTTE A.S. (2003): A Cross-Sectional Study on HIV/AIDS Awareness among Adolescent Girls of Rural Community; p.104, Souvenir XXX, National Conference of Indian Association of Preventive and Social Medicine, Belgaun.
8. ACHARYA A., REDDAIAH V.P. & BARIDALYNE N. (2005): Reproductive Health

- Awareness of Female Adolescents in an Urban Resettlement Colony of Delhi, p.55, IPHA Souvenir, 49th All India Annual Conference of IPHA.
9. SINGH J.V. (2004): Awareness about Reproductive Health and Essential Newborn Care amongst Adolescent Girls in Slums of Lucknow City; p. 137, IAPSM Souvenir, 31st Annual National Conference of IAPSM.
 10. KHANNA A., GOYAL R.S. & BHAWSAR R. (2005): Menstrual Practices and Reproductive Problems: A Study of Adolescent Girls in Rajasthan; Journal of Health Management, 7, 1.
 11. MAJUMDAR R. AND GANGULI S.K. (2000): A Study of Adolescent Girls in Pune; Health and Population-Perspectives and Issues, NIHFV, New Delhi, 23(2): 95-104.

PERCEPTION ABOUT POPULATION AND SEX EDUCATION AMONG COLLEGE STUDENTS OF NAGPUR, MAHARASHTRA

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ABSTRACT

A cross-sectional study was conducted in 7 junior colleges of Nagpur district, Maharashtra, India. A total of 410 students were enrolled in the study and given a specially designed structured self-administered pre-tested questionnaire. Students were invited to ask any queries on the topic. Majority (44.14%) of the students were 18 years old. Most of the students (52.68%) belonged to the Social class III. 74.87 per cent of the students knew that China is the most populous country in the world. 58.78 per cent of the students did not know the ideal spacing between two children. An overwhelming number of students (77.31%) desired only two children. Results are encouraging in some areas while disappointing in some others. Small-family norm and preference for the female child are slowly gaining acceptance.

Key Words: Population, Sex education, Knowledge, Child spacing, Gender preference, Secondary sexual characters.

India crossed the 1 billion mark in population on 11th May 2000 contributing to 16 per cent of the world population. However, the land area of India as compared to the rest of the world is only 2.4 per cent. India will overtake China to become the most populous country by 2045. What is more disturbing that besides the population growth, the sex-ratio (number of females per 1000 males) is also declining in India; more in some parts and lesser in others. Kerala is the sole state in the country which has a sex-ratio favourable to females. There are many factors which have contributed to this scenario. It is a well known fact that age of marriage of girls is low in India. The educational status of females is also not at par the males¹. There is relatively low decision-making capacity vested with them as well². There is unfavourable attitude among people about family planning measures and the implementation of related programmes. Low or absent of knowledge regarding these crucial issues, when it is needed, most exposes the teens and the youth to unwarranted and accidental problems like teenage pregnancy and its associated physical and psychological complications³⁻⁵. Considering all this prevalent facts, this study was undertaken to understand the loopholes in the knowledge of the target group and to simultaneously educate them on the same.

OBJECTIVES

The study was undertaken with the following objectives:

- i. to assess the knowledge of college students about population and teenage

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- pregnancy;
- ii. to study their perception about sex education;
 - iii. to impart health education concerning the above issues; and
 - iv. to recommend policies based on the study findings.

MATERIALS AND METHOD

The cross-sectional study was carried out in 7 junior colleges of Nagpur district, Maharashtra, India. A prior appointment with the concerned heads of all the institutes was taken and they were briefed about the objectives of the study. A total of 410 students were enrolled in the study and given a specially designed structured self-administered pre-tested questionnaire. The questionnaire consisted of a total 11 questions with sections of general information of the students followed by facts about population, knowledge about sex education and teenage pregnancy and related issues. Lastly, students were invited to ask any queries on the topic.

FINDINGS

Findings in Table 1 show that majority of the students were 18 years old (44.14%) closely followed by 17 years olds (41.70%). Since the survey was conducted in schools and colleges in rural areas where most of the population belongs to the Social Class III. Hence, it was found that 52.68 per cent of the students belonged to the Social Class III according to Prasad's Scale (Table 2).

TABLE 1
DISTRIBUTION OF COLLEGE STUDENTS BY AGE AND SEX

Age	Males (%)	Females (%)	Total (%)
16	3 (1.74)	5 (2.10)	8 (1.95)
17	66 (38.37)	105 (44.11)	171 (41.70)
18	72 (41.86)	109 (45.79)	181 (44.14)
19	16 (9.30)	13 (5.46)	29 (7.07)
20	5 (2.90)	6 (2.52)	21 (5.12)
Total	172 (100.00)	238 (100.00)	410 (100.00)

TABLE 2
DISTRIBUTION OF COLLEGE STUDENTS BY THEIR SOCIO-ECONOMIC STATUS

Social Class	Socio-economic Status*	No.	%
I	>2430	8	1.95
II	1215 – 2429	10	2.92
III	729 – 1214	216	52.68
IV	364 – 728	116	28.29
V	< 364	60	14.63

*According to Prasad's Scale.

The study revealed only a very few students (23.41%) could state the correct population of India while a majority of them (57.07%) reported it incorrectly. 74.87 per cent of the respondents knew that China is the most populous country in the world. Surprisingly, 23.90 per cent of the students still think that every woman must have at least a male child whereas 6.09 per cent of them were not sure of it. The knowledge about ideal child spacing was found lacking among the students with 58.78 per cent not knowing the meaning of spacing between two children. An overwhelming 77.31 per cent of the students desired only two children and a minority (16.34%) number of students wanted more than two (Table 3).

TABLE 3
AWARENESS AND PERCEPTION ABOUT POPULATION ISSUES

Parameter	Correct Response (%)	Incorrect Response (%)	Don't Know (%)
Population of India	96(23.41)	234(57.07)	80(19.51)
Most populous country	307(74.87)	96(23.41)	7(1.70)
Should every woman have one male child	287(70.00)	98(23.90)	25(6.09)
Ideal child spacing	96(23.41)	73(17.80)	241(58.78)
Desired number of children	1	2	More than 2
	26(6.34)	317(77.31)	67(16.34)

Data in Table 4 show that knowledge about secondary sexual characters was found to be overall satisfactory with 81.46 per cent, 54.14 per cent and 69.75 per cent of the respondents correctly stating that breast development, change in voice and axillary and pubic hair growth respectively are signs of secondary sexual characters. Similarly, almost everyone correctly stated that testis and ovary are the reproductive organs of males and females respectively while kidney and liver are not. Knowledge about sexually transmitted diseases was not adequate with mixed responses about the signs and symptoms of the disease. Regarding knowledge about HIV, 74.63 per cent of them correctly stated that fever as one of the symptoms whereas 55.12 per cent of the students thought vomiting was also a symptom of the disease. Regarding syphilis, 80.00 per cent and 72.19 per cent stated correctly that discharge and ulcer were the signs of the disease respectively. Almost half of them knew the correct phase of fertility in the menstrual cycle whereas about a quarter said the first 9 days and another quarter stated that the last 10 days are fertile. Television was the main mode of knowledge for 63.90 per cent of the students.

TABLE 4
KNOWLEDGE ABOUT SEX EDUCATION

Sr. No.		Yes (%)	No (%)
Knowledge about secondary sexual characters			
1	Height increases	126 (30.73)	284 (69.26)
2	Breast development	334 (81.46)	76 (18.53)
3	Graying of hair	84 (20.48)	326 (79.52)
4	Change in voice	222 (54.14)	188 (45.86)

5	Axillary and pubic hair	286 (69.75)	124 (30.25)
Knowledge about human reproductive organs			
1	Kidney	22 (5.36)	388 (94.64)
2	Testis	364 (88.78)	46 (11.22)
3	Ovary	302 (73.65)	108 (26.35)
4	Liver	146 (35.60)	264 (64.40)
Knowledge about HIV			
1	Weight loss	238 (58.04)	172 (41.96)
2	Diarrhoea	282 (68.78)	128 (31.22)
3	Fever	306 (74.63)	104 (25.37)
4	Vomiting	226 (55.12)	184 (44.88)
Knowledge about Syphilis			
1	Discharge	328 (80.00)	82 (20.00)
2	Ulcer	296 (72.19)	114 (27.81)
3	Pain	306 (74.63)	104 (25.37)
4	Headache	109 (26.58)	301 (73.42)
Which is the fertile phase of Menstrual Cycle			
	1-9 days	10-18 days	19- 28 days
	120 (29.26)	195 (47.56)	95 (23.17)
Source of information			
	TV	Print	Group talk
	262 (63.90)	101 (24.63)	47 (11.46)

With regard to teenage pregnancy, 50.24 per cent of the students informed that it does not pose a risk to the mother and 35.36 per cent stated that it doesn't pose a risk to the baby. Majority (68.29%) of them stated that they would like to delay the first pregnancy. Their knowledge about contraceptives was very limited and orthodoxy. 50.48 per cent of them did not know that barrier contraceptives prevent STD and 90.73 per cent of the respondents were unaware of contraceptive vending machine. 68.29 per cent of the students said that contraceptives must not be provided in the college campus. 75.60 per cent and 79.02 per cent of the respondents could correctly state the right ages for marriage for boys and girls respectively (Table 5).

TABLE 5
KNOWLEDGE ABOUT TEENAGE PREGNANCY AND RELATED ISSUES

Sl. No.	Parameter	Yes (%)	No (%)	Don't know (%)
Teenage pregnancy can lead to				
1	Risk to mother	180 (43.90)	206 (50.24)	24 (5.85)
2	Risk to baby	254 (61.95)	145 (35.36)	11 (2.68)
First pregnancy				
	Is delaying the first pregnancy desirable?	280 (68.29)	96 (23.41)	34 (8.29)

Knowledge about contraceptives				
1	Does barrier contraceptive prevent STDs?	116 (28.29)	87 (21.21)	207 (50.48)
2	Should contraceptives be provided in college?	122 (29.75)	280 (68.29)	8 (1.95)
3	Awareness about contraceptive vending machines	38 (9.26)	372 (90.73)	00 (00.00)
Teenage is which age group				
		5-12 years	13-19 years	Don't know
		22 (5.36)	382 (93.17)	6 (1.46)
Desirable age of marriage				
1	For boys	19	20	21
		44 (10.73)	66 (16.09)	310 (75.60)
2	For girls	16	18	20
		22 (5.36)	324 (79.02)	64 (15.60)
Source of information				
		TV	Print	Group talk
		280 (68.29)	110 (26.82)	20(4.87)

DISCUSSION

Females comprised 58.04 per cent of the study population. This is because some of the colleges surveyed were girls' colleges or colleges where co-education was there. 216 (52.68%) respondents belonged to the lower middle class. This is an expected finding as the studied colleges were mostly in the rural areas. 57.07 per cent of the students could not state the correct population of India with reasonable precision while 19.5 per cent of the students didn't know the answer. Most of the students (75%), however, knew that China is the world leader in population. One satisfactory finding is that though the respondents were living in rural areas adjacent to Nagpur, an overwhelming majority (70%) of them expressed that it is not imperative to have at least one male child. This finding is in contrast to many studies which demonstrated that students show more liking towards having at least one male child⁶⁻⁸.

The aspect that is less popularized amongst the masses regarding population is probably the ideal spacing between children and it reflects in the knowledge of the students as 58.78 per cent of the students said that they didn't know the ideal spacing and 17.80 per cent of the students gave incorrect answers. Only 67 students (16.34%) wanted more than two children. This finding reflects that the population awareness and family welfare programmes have finally almost succeeded in selling the idea to the people that a two-child norm is healthy and in favour of a good family life^{9,10}. Development of breast, axillary and pubic hair, and change in voice were rightly attributed as secondary sexual characters with 81.46 per cent, 69.75 per cent and 54.14 per cent replied in affirmative respectively. Similarly, 89 per cent and 7.65 per cent of the respondents correctly informed that testis and ovary were as the reproductive organs of male and

female respectively. The high accuracy amongst the students regarding the secondary sexual organs may be due to the fact that this aspect is covered in the school and college curricula in India. This is a good thing as it prevents the unnecessary anxiety and apprehension regarding the physiological changes taking place in the body of adolescents during puberty¹¹⁻¹³. As far as their knowledge about HIV was concerned, majority (74.63%) of the students knew that fever was a symptom of the disease while 58.04 per cent of them also recognized weight loss and 68.78 per cent recognized diarrhoea as a symptom of the disease. However, many students thought that vomiting was also a symptom of the disease. This indicates that though people are gaining knowledge about the disease through various means, the symptomatology of the disease is not known to them at large¹⁴. 80 per cent of the students said that discharge is present in syphilis while 296 (72.19%) said that an ulcer is also present. However, some students felt that headache was also a symptom of the disease. The students were pretty much divided in opinion about the fertile phase of the menstrual cycle with only 47.56 per cent of them replying correctly and 29.26 per cent responded the first nine days and 23.17 per cent stated that the last 10 days were the days when conception could take place.

When the students were confronted with the questions on teenage pregnancy and related issues, the results were dismal. Only 43.90 per cent of the students said that it could lead to risk to the mother while 61.95 per cent said that a teenage pregnancy can harm the baby. Only 68.29 per cent of the students thought that delaying the first pregnancy is advisable. Overall knowledge about contraceptives amongst students was found to be low which is similar to the findings of another study¹⁵. Almost half of the students didn't know that barrier contraceptives prevent STDs. 68 per cent of the students said that contraceptives must not be provided in the college campus. This reflects the conservative attitude of the students in the Indian scenario and their inhibitions on this issue. Only 38 (9.26%) students were aware of the contraceptive vending machines installed at various places. 75.60 per cent and 79.02 per cent of the respondents correctly knew the right ages of marriage for boys and girls respectively.

CONCLUSION AND RECOMMENDATIONS

Low awareness about ideal child spacing is a matter of concern in the study population. The study showed multiple lacunae in the knowledge of college students especially regarding teenage pregnancy, contraceptives and symptoms of HIV. It is satisfying to notice that most of the students did not show any male-child preference. Health education was successfully imparted to the study population. From the study, the following recommendations emerge:

- i. Sex and family life education must be openly discussed in schools;
- ii. Teachers must be trained in method and content of sex and population education;
- iii. Topics covering sex and population education must be included in the school syllabi and textbooks;
- iv. Girls and boys in the reproductive age group must be educated in fertility control methods; and
- v. Mass media must be used more extensively, especially the television, to propagate and percolate this knowledge to the grassroots.

REFERENCES

1. ADINMA J.I. & OKEKE A.O. (1995): Contraception Awareness and Practice amongst Nigerian Tertiary School Girls; *West Afr J Med.*, 14(1): 34-38.
2. BUGA G.A., AMOKO D.H. & NCAYIYANA D.J. (1996): Adolescent Sexual Behaviour, Knowledge and Attitudes to Sexuality among School Girls in Transkei, South Africa; *East Afr Med J.*, 73(2): 95-100.
3. FANTAHUN M. & CHALA F. (1995): Knowledge, Attitude and Practice of Family Planning among Senior High School Students in North Gonder; *Ethiop Med J.*, 33(1): 21-29.
4. MONTAZERI A. (1995): Health Education Campaign on Population Control: Lessons from Iran; *Public Health*, 109(6): 425-430.
5. ZABIN L.S. (1986): The School-based Approach to Teen Pregnancy Prevention; *Plan Parent Rev.*, 6(2): 8-10.
6. BUGA G.A., AMOKO D.H. & NCAYIYANA D.J. (1996): Adolescent Sexual Behaviour, Knowledge and Attitudes to Sexuality among School Girls in Transkei, South Africa; *East Afr Med J.*, 73(2): 95-100.
7. STYCOS J.M. (1987): Attitudes of Costa Rican Students and Teachers on Sex and Population Education; *Perspect Int Planif Fam.*, (Spec No): 1-6.
8. SMITH P.B., BECK J.G. & DAVIES D. (1987): Contraceptive Use among High-Risk Individuals; *J Sex Educ Ther.*, Fall-Winter, 13(2): 52-57.
9. BHAVAN S. (1995): Demographic Profile and Future Strategies for Development of the Girl Child in India; *Soc Change.*, 25(2-3): 19-29.
10. GHOSH S. (1990): Discrimination against the Female Child; *Indian J Matern Child Health*, 1(4): 104-108.
11. WESTLEY S.B. (1995): Evidence Mounts against Sex-Selective Abortion in Asia; *Asia Pac Pop Policy*, May, (34): 1-4.
12. MILLER B.D. (2001): Female-Selective Abortion in Asia: Patterns, Policies and Debates; *Am Anthropol.*, 103(4): 1083-1095.
13. BHATIA V. & SWAMI H. (2000): Fertility Control Methods: Knowledge of Adolescent Girls in Schools of Chandigarh; *Indian J Med Sci.*, 54(8): 342-346.
14. FANTAHUN M., CHALA F. & LOHA M. (1995): Knowledge, Attitude and Practice of Family Planning among Senior High School Students in North Gonder; *Ethiop Med J.*, 33(1): 21-29.
15. MERCADO C. (1985): Establishing Evaluation Indicators on the Population Knowledge, Attitudes, Practices and Skills (KAPS) of Secondary School Teachers and Students in the Philippines; *Philipp Popul J.*, 1(2): 67-93.