

A Cross Sectional Study of Knowledge and Practices about Reproductive Health among Female Adolescents in An Urban Slum of Mumbai

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Abstract

Objective: To study knowledge about reproductive health among female adolescents and to assess their treatment seeking behavior regarding reproductive health problems in an urban slum of Mumbai.

Materials and methods: Cross sectional descriptive study was undertaken in an urban slum area of Mumbai for period of 3 months. All adolescent girls from 10 – 19 years of age, who had attained menarche, attending general OPD and STI clinic were included. Subjects were interviewed face to face using pretested semi-structured questionnaire after obtaining informed consent. The questionnaire contained information regarding socio demographic parameters and that related to reproductive health i.e. menstrual hygiene, knowledge and practices related to HIV / AIDS, contraception, abortion, Medical Termination of Pregnancy (MTP), etc. and their treatment seeking behavior in last 3 months for reproductive health problems. Privacy and confidentiality was strictly maintained. Analysis was done with SPSS version 17.

Results: Seventy nine (32.8%) subjects had unsatisfactory menstrual hygienic practices. Two hundred twelve (88%) women were aware about availability of ANC services. Sixty six percent of women had correct knowledge of modes of transmission of HIV while only 18.7% knew about safe sexual practices. Education status and early adolescents age group (10 -14 years) was found to be significantly associated with knowledge of adolescents regarding menstruation.

Conclusion: Female adolescents should be given appropriate knowledge regarding puberty and sexual health to help them confidently deal with their reproductive and sexual health issues.

Keywords: adolescents, menstrual hygiene, HIV/AIDS, safe sexual practices, menarche

Introduction

Adolescents (10-19 years) in India represent almost one-third of the total country's population. A large

number of them are out of school, get married early, work in vulnerable situations, are sexually active, and are exposed to peer pressure. These factors have serious social, economic and public health implications. Adolescents are not a homogenous group. Their situation varies by age, sex, marital status, class, region and cultural context. This calls for interventions that are flexible and responsive to their disparate needs. Some of the public health challenges for adolescents include pregnancy, excess

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risk of maternal and infant mortality, sexually transmitted infections and reproductive tract infections in adolescence, and the rapidly rising incidence of HIV in this age group (1).

Actions have to be taken to ensure that adolescents are well informed about the availability of health services. Adolescents have to be knowledgeable about their health problems including sexual and reproductive health problems (2). Gender inequality damages the health of millions of girls and women across the globe. Taking action to improve gender equity in health and to address women's rights to health is one of the most direct and potent ways to reduce health inequities overall and ensure effective use of health resources (3). Because of social taboos surrounding reproductive and sexual health, many young married women are too embarrassed to voice their needs and instead forgo health services (4). It is difficult to define which factors influence adolescent risk-taking and health-seeking behavior, since multiple categories of risk-related factors are operating at individual, family, community and societal level play important contributions (5). In a case study of Nigeria, the impact of reproductive health on socio-economic development was studied (6). Studies have been done to assess the cultural and social practices regarding menstruation among adolescent girls where it was observed that factors like cultural and social restrictions; myth, and misconceptions are associated with menstruation (7). In a review of DHS survey across 11 nations it was observed that adolescent women have lower use of contraception, poorer knowledge of family planning and less access to information and services than adult women (8). In improving students' knowledge on reproductive sexual health matters the effectiveness of Reproductive Sexual Health Education Package has been proved in Thiruvananthapuram (9). Similarly a study done in Tanzania concluded that reproductive health program improved the students' knowledge and behavior about sexuality and decision-making for both girls and boys (10). Most of the sexually active youth do not feel that they are at risk of contracting HIV and have never been tested. Based on the findings in a study done in Uganda it was emphasized that there is a need to encourage condom use and help protect adolescents at risk of HIV infection (11). Pediatricians can play a key role in preventing and controlling HIV infection by promoting risk-reduction counseling and offering routine HIV testing to adolescent and young adult

patients (12). Hence, this study was planned to understand the health problems related to menstruation and the health seeking behaviour of the young girls, their awareness about pregnancy and reproductive health.

Methods & Materials

A cross sectional descriptive study was undertaken in an urban slum area of Mumbai. The study was conducted for a period of 3 months from September 2010 to November 2010. All adolescent girls in the age group of 10 – 19 years attending general OPD and STI clinic during the study period and willing to participate in the study were included as study subjects after explaining them the aim of the study. Inclusion criteria – adolescent girls who had attained menarche were included. Rapport was established with the study subjects with the help of Medical Social Worker. These subjects were then interviewed face to face using a pretested semi structured questionnaire after obtaining their informed consent. The questionnaire contained information regarding socio demographic parameters and that related to reproductive health i.e. menstrual hygiene, knowledge and practices related to HIV / AIDS, contraception, abortion, Medical Termination of Pregnancy (MTP), etc. and their treatment seeking behavior in last 3 months for reproductive health problems. Knowledge about AIDS was evaluated based on (a) Full form of the term HIV/AIDS (b) Modes of transmission of AIDS (c) Safe sexual practices. Subjects having correct knowledge about any two modes of transmission of HIV/AIDS were considered as having correct knowledge about modes of transmission of HIV/AIDS. Utmost care was taken to maintain confidentiality and privacy. Menstrual hygiene was classified as satisfactory (Frequency of cleaning of external genitalia is ≥ 2 /day using soap and water) and unsatisfactory (Frequency of cleaning of external genitalia is 0-1/day using water) (13). Safe sexual intercourse was defined as protected sex (using effective barrier methods during sexual act, e.g., condoms, etc.) with any partner having any HIV status" or "even unprotected sex (without using effective barrier methods during sexual act, e.g., condoms, etc.) with any partner with proven HIV negative status as was used in previous study done in Delhi (14). Legal age at marriage for males in India is 21 years and that for females is 18 years (15). ANC services utilization included ANC visits, Tetanus Toxoid immunization, Iron and Folic Acid supplementation, etc. MTP in India is legal only

up to 20 weeks of gestation according to the MTP Act, 1971 (16).

The subjects' knowledge and practices were scored using an arbitrary scoring system. Each correct response under knowledge attracted one point, whereas any wrong or don't know answer attracted no mark. In scoring the subjects' practices of menstrual hygiene however, students that used sanitary pad during their last menstruation scored two (2) points whereas those who used new cloth pieces or cotton scored one (1) point and those using old cloth pieces or any other method scored zero (0) point. Correct responses for the other questions under practice attracted one (1) point each and the wrong answers attracted no mark. This gave a total score of five (5) points for practice and eight (8) points for knowledge. Respondents that scored 0-3 points under knowledge were adjudged as having poor knowledge; whereas those that scored 4-6 and > 6 were adjudged as having fair and good knowledge respectively. Similarly those subjects who scored 3-5 points and 0-2 points under practice were adjudged as having good and bad practices respectively. Institutional Ethics Committee approval was taken prior to the commencement of study. Statistical analysis was done using SPSS software version 17 using frequencies, percentages and chi square test.

Results

Table 1 reveals that majority 131(54.4%) of the subjects had menarche at the age of 13 – 14 years. Only 49(20.3%) of the participants were aware about

menstruation before menarche, the main source of information being mother in 27(55.1%) subjects and relatives in 13(26.5%). Two hundred seventeen (90%) of the subjects faced restrictions during menstruation at religious occasions, 72(29.9%) for household work. Only 24(10%) subjects did not face any such restrictions. One fifty six (64.7%) participants agreed to being scared on their first menstruation while 73(30.2%) felt irritated.

Table 2 shows the details regarding respondents' knowledge and practice of menstruation and menstrual hygiene. Though 137 subjects were educated till secondary or higher level, 206(85.5%) did not know that from which organ the menstrual blood comes. This reveals that most of the teachers are not talking about reproductive system in schools. Though 174(72.2%) of the subjects were knowing that sanitary pads should be used during menstruation but out of them only 104(59.8%) were actually using it. One sixty seven (69.3%) subjects were aware that poor hygiene predisposes to infection but still cleaning of external genitalia was found to be unsatisfactory in 79(32.8%) subjects. Frequency of changing sanitary pad or cloth varied from once per day to 3 times per day depending upon the day of menstrual period and type of absorbent material used.

Table 3 shows that subjects in late adolescent age group (15-19 years) were found to have better knowledge about menstruation as compared to their counterparts in early adolescent group. Ten (52.7%) of the illiterate subjects had poor knowledge about menstruation while those educated up to secondary

Table 1: General information about menstruation

		Number	Percentage
Age at menarche (years)	11-12	59	24.4%
	13-14	131	54.4%
	15	51	21.2%
Awareness about menstruation before menarche		49	20.3%
Source of information before menarche ^a	Mother	27	55.1%
	Relative	13	26.5%
	Friend	9	18.3%
Source of information after menarche ^a	Mother	183	75.9%
	Father & Mother	14	5.8%
	Sister & Friends	76	31.5%
	Teacher	29	12%
	Religious occasion	217	90%
Restrictions during Menstruation ^a	Physical activity/playing	58	24.1%
	Schooling	37	15.4%
	Household work /Attending family functions	72	29.9%
	No Restrictions at all	24	10%
Reaction to first menstruation ^a	Scared	156	64.7%
	Irritated	73	30.2%
	Others	84	34.9%

Table 2: Parameters used for assessing respondents' knowledge and practice of menstruation and menstrual hygiene

		Number	Percentage
Cause of menstruation	It is a physiological / hormonal process	154	63.9%
	It is caused by a disease	38	15.8%
	Others	49	20.3%
From which organ does the menstrual blood come?	Uterus	35	14.5%
	Bladder	24	10%
	Don't know	182	75.5%
Which absorbent / material should ideally be used during menstruation?	Sanitary pad	174	72.2%
	Cloth piece	53	22%
	Others	14	5.8%
Aware that poor hygiene predispose to infection		167	69.3%
Knew that personal hygiene has a place in prevention of menstrual pain		46	19.1%
Aware of the duration for a normal period		182	75.5%
Knew duration of a normal menstrual cycle		79	37.8%
Awareness about safe period		26	10.8%
Material used during menstruation	Sanitary pads	104	43.2%
	New cloth pieces	26	10.8%
	Old cloth pieces	74	30.7%
	Others	37	15.4%
Cleaning of external genitalia	Satisfactory ^a	162	67.2%
	Unsatisfactory ^b	79	32.8%
Medium used for cleaning purpose	Only water	103	42.7%
	Soap and water	138	57.3%
Method of disposal	Cloth pieces reused	74	30.7%
	Sanitary pads / cloth pieces disposed in dust bin	132	54.8%
	Sanitary pads / cloth pieces thrown indiscriminately	35	14.5%

^a Satisfactory: Frequency of cleaning of external genitalia is ≥ 2 /day;

^b Unsatisfactory: Frequency of cleaning of external genitalia is 0-1/day (1)

Table 3: Socio-demographic factors influencing respondents' knowledge and practices regarding menstruation

Socio-demographic parameters		Knowledge			Total	P value
		Good	Fair	Poor		
Age group (years)	10 – 14	24(22.2%)	67(62%)	17(15.8%)	108	<0.05
	15 – 19	74(55.6%)	45(33.8%)	14(10.6%)	133	
Religion	Hindu	37(40.2%)	47(51.1%)	8(8.7%)	92	>0.05
	Muslim	61(40.9%)	65(43.6%)	23(15.4%)	149	
Education	Illiterate	4(21%)	5(26.3%)	10(52.7%)	19	<0.05
	Primary	28(32.9%)	40(47.1%)	17(20%)	85	
	Secondary & above	66(48.2%)	67(48.9%)	4(2.9%)	137	
Marital status	Married	36(46.7%)	29(37.7%)	12(15.6%)	77	>0.05
	Single	62(37.8%)	83(50.6%)	19(11.6%)	164	
Socio-demographic parameters		Practice		Total	P value	
		Good	Bad			
Knowledge	Good/Fair	191(91%)	19(9%)	210	<0.01	
	Poor	11(35.5%)	20(64.5%)	31		
Age group (years)	10 – 14	86(79.6%)	22(20.4%)	108	>0.05	
	15 – 19	116(87.2%)	17(12.8%)	133		
Religion	Hindu	79(85.9%)	13(14.1%)	92	>0.05	
	Muslim	123(82.6%)	26(17.4%)	149		
Education	Illiterate	5(35.7%)	14(64.3%)	19	<0.05	
	Primary	67(78.8%)	18(21.2%)	85		
	Secondary & above	130(94.9%)	7(5.1%)	137		
Marital status	Married	63(81.8%)	14(18.2%)	77	>0.05	
	Single	139(84.8%)	25(15.2%)	164		

level and above, only 4(2.9%) had poor knowledge. Significant association was observed between having good/fair knowledge and good practices. In illiterate

adolescents only 5(35.7%) had good menstrual practices while it was good in 130(94.9%) among those educated up to secondary and above.

Table 4: Parameters used for assessing respondents' knowledge and practices about marriage, pregnancy, contraception, MTP, transmission of HIV / AIDS and safe sex

Knowledge		Number	Percentage
Legal age of marriage	Males	79	32.8%
	Females	168	69.7%
Min spacing of 1 year for 1 st child after marriage		106	44%
Availability of Antenatal services		212	88%
Ideal spacing between 2 deliveries	≥ 3 yrs	61	25.3%
Modes of contraception (n=241)*	Oral contraceptive pills	194	80.5%
	IUD	89	36.9%
	Condom	117	48.5%
	Sterilization /Others	158	65.5%
Abortion in India	Legal	148	61.4%
	Not legal / don't know	93	38.6%
Safe abortion till which gestational age	<20 weeks	110	45.6%
	>20 weeks / don't know	131	54.4%
Preference for undergoing MTP	Government hospital	142	59%
	Private hospital	81	33.6%
	Home	18	7.4%
Consent of partner mandatory	Yes	106	43.9%
	No	45	18.7%
	Don't know	90	37.3%
Full form of the term HIV/AIDS	Correct	77	32%
	Incorrect / Don't know	164	68%
Modes of transmission of HIV / AIDS	Correct	159	66%
	Incorrect / Don't know	82	34%
Safe sex	Correct	45	18.7%
	Incorrect / Don't know	196	81.3%
Practices		Number	Percentage
Age at marriage (n = 77)	<18 years	23	29.9%
	>18 years	54	70.1%
Spacing for 1 st child (n = 56)	<1 year	31	55.4%
	>1 year	25	44.6%
ANC services utilized (n = 56)		45	80.4%
Pre-marital sexual activity (n = 164)	Yes	25	15.2%
	No	139	84.8%
Contraceptives used {n = 102(77+25)}	Oral contraceptive pills	73	71.6%
	IUD / Condom	22	21.6%
	Others	7	6.9%
Abortion done (n = 19)	<20 weeks	15	78.9%
	>20 weeks	4	21.1%
Safe sex practiced (n = 102)	Yes	18	17.6%
	No	84	82.4%
Treatment seeking behavior for medical conditions (n = 157) ^a	Dysmenorrhoea	59 (87) ^b	67.8%
	Menstrual irregularity	32 (49)	65.3%
	Cervical / vaginal discharge	40 (56)	71.4%
	Amenorrhoea	13 (13)	100%
	IUD related problems / others	25 (27)	92.6%
Reasons for not seeking treatment (n = 157) ^a	Shy / Male doctors	122	77.7%
	Felt no need of treatment	31	19.7%
	Took medicines over counter	24	15.3%

^a Responses are not mutually exclusive

^b Number in parenthesis includes total number of subjects with medical complaints

Table 4 shows that only 79(32.8%) and 168(67.9%) of the participants correctly knew about the legal age of marriage for males and females respectively. Two hundred and twelve (88%) were aware about availability of ANC services. Only 61(25.3%) knew about spacing of 3 years between two deliveries. 93(38.6%) of the subjects did not have knowledge about the legal status of abortion in India. One hundred and six (43.9%) also believed that consent of the partner is mandatory for abortion and majority 142(59%) preferred government hospitals for undergoing abortion. One hundred and fifty nine (66%) subjects had correct knowledge about modes of transmission of HIV/AIDS while 196(81.3%) subjects did not know correctly about safe sexual practices. Out of the total 77 married subjects, 23(29.9%) were married before the age of 18 years. Out of the total 56 subjects with children, only 25 (44.6%) delivered after 1 year of marriage. ANC service utilization was 80.4%. None of the participants had more than one child. Of the 164 unmarried subjects, 25(15.2%) were sexually active. Fifty six (54.9%) subjects were using contraception, most commonly used method was barrier method using condom by 25(24.5%) subjects. Nineteen participants had undergone an abortion, of which 4(21%) were after 20 weeks of gestation. Only 18(17.6%) participants were practicing safe sex. Dysmenorrhoea was the most common complaint found in 87 subjects, however, amenorrhoea was the most common complaint for which treatment was sought in 13(100%).

Discussion

Menstruation is a normal physiology in females. Poor hygiene during menstruation has been associated with serious ill-health ranging from reproductive tract infection, urinary tract infection, etc. Females are generally expected to exercise good hygienic practices during menstruation to prevent themselves from these problems. In our study, only 49(20.3%) of the participants were aware about menstruation before menarche, the main source of information being mother in 27(55.1%) subjects and relatives in 13(26.5%) whereas in a Nigerian study it was observed that most of the adolescents (97.0%) were aware that mature women experience monthly /cyclical flow of blood (menstruation), and knew that girls attain menarche around the ages of 11 to 16 years (77.8%) (17). Collective knowledge of age at menarche, menstrual cycle and duration of menstrual flow in adolescents is also useful for allaying fears

and psychological trauma that may arise from an unexpected appearance of blood per vagina at menarche. In the present study, 72(29.9%) of the subjects faced restrictions during menstruation for doing household work. Only 24(10%) subjects did not face any such restrictions. Similarly, in a study done in Wardha it was observed that 87% of the girls did not attend religious functions during menstruation while 17% girls reported that they did not have any restrictions (18). In contrast to our findings, in a study done in Delhi it was revealed that 70% of adolescents were restricted from participating in household activities, and 56% girls did not eat oily, cold, or spicy foods such as pickles during menstruation, 1.6% avoided bathing during menstruation (14). Also, in a study done in Karachi, nearly 50% of the participants reported that they were restricted from taking bath during menstruation (19). In our study, 206(85.5%) did not know that from which organ the menstrual blood comes revealing the fact that most of the teachers are not talking about reproductive system in schools. In a similar study done in Karachi it was observed that 50% of the girls lacked an understanding of the origin of menstrual blood (19). In another study in Pakistan it was recorded 15%, 11% and 34% participants reported that menstrual blood comes from the rectum, urinary bladder and urethra respectively (20). In the current study, despite knowledge of sanitary pads in 174(72.2%) subjects, only 104(59.8%) were actually using sanitary pads. Totally 167(69.3%) subjects were aware that poor hygiene predisposes to infection but still cleaning of external genitalia was found to be unsatisfactory in 79(32.8%) subjects. In a similar study done in West Bengal it was observed that 78(48.75%) girls knew the use of sanitary pad during menstruation but only 18 (11.25%) girls used sanitary pads during menstruation. For cleaning purpose, 156 (97.5%) girls used both soap and water (13). In a study done in Turkey it was observed that out of the total women who menstruated, 83.4% used hygienic pads during menstrual periods (21). In a study done in Nigeria unsanitary menstrual absorbents were used by 55.7% of the respondents (22). Majority of the girls were using cloth (46.67%) and only 15.67% were using sanitary napkins in a study done in Wardha (18). The use of sanitary pad as absorbents is simple, hygienic and convenient as the pads come in different sizes that a female can choose from depending on her menstrual flow. Soiled pads can be easily discarded and as such saves the trouble of re-

treatment for future use. In our study, subjects in late adolescent age group (15-19 years) were found to have better knowledge about menstruation as compared to their counterparts in early adolescent group. Ten (52.7%) of the illiterate subjects had poor knowledge about menstruation while those educated up to secondary level and above, only 4(2.9%) had poor knowledge. Significant association was observed between having good/fair knowledge and good practices. In illiterate adolescents only 5(35.7%) had good menstrual practices while it was good in 130(94.9%) among those educated up to secondary and above. In a similar study done in Nigeria, students' menstrual practices was also associated with respondents' age group ($\chi^2 = 61.85$, $p < 0.05$) and their knowledge of menstruation and menstrual hygiene (Fisher's exact $p < 0.05$), but not with the type of school they attended or religion (17).

In our study, only 79(32.8%) and 168(67.9%) of the participants correctly knew about the legal age of marriage for males and females respectively similarly in a study done in Haryana, it was observed that 165 (65%) of the subjects knew the correct legal age of marriage (23). In our study, 194(80.5%) and 158(65.5%) subjects had knowledge about use of oral contraceptive pills and sterilization methods for contraception respectively while in a Mexican study, condom was the best known contraceptive (73.3%) (24). In our study, out of the 164 unmarried subjects, 25(15.2%) were sexually active while in adolescents in Thailand it was found to be 7.6% females (25). In the present study, dysmenorrhoea was the most common complaint found in 87 subjects, however 59(67.8%) sought treatment. In contrast to our findings, in a Malaysian study out of the 76% adolescent girls who reported dysmenorrhoea, only 14.8% sought medical treatment (26). In a study done in girls of higher secondary schools, only 11.5% of the girls who had menstrual problems sought treatment (27). Being shy and presence of male doctors at hospitals was the major deterrent for seeking treatment among 122(77.7%) subjects in our study. Youth friendly services provide good milieu for the adolescents to interact and learn more about their health. The government and developing partners should tap from these wealth of experience and facilitate access to these services for all adolescents both in school and at homes. Providing such kind of services is the need of hour. Many of the mental, reproductive and nutritional health needs of adolescents are required to be addressed and can be

addressed if the current health care system can be re-organized. This restructuring will be more effective for this population if adolescent friendly approaches, public-private partnership and policy as well as sectoral linkages between the NRHM and other national programs are achieved. The health programs for this age group should have promotive and preventive as well as curative components. The study recommends that the female adolescent should be given appropriate knowledge regarding puberty and sexual health to help them confidently deal with their sexual health issues. A multi-dimensional approach focusing on capacity building of mothers and teachers on sexuality education skills, using religious organizations, community groups, peer groups, school curriculums as avenues for sexuality education is recommended towards improving adolescents' perceptions and practices of menstruation. Also, print and electronic media can be utilized to address the sexual and reproductive issues of the adolescents and especially the female adolescents in a culturally sensitive way.

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References

1. Adolescent Reproductive and Sexual Health (ARSH) Strategy under NRHM / RCH-II. <http://mohfw.nic.in/NRHM/ARSH.htm>
2. Implementation guide on RCH II ARSH strategy. http://mohfw.nic.in/NRHM/Documents/ARSH/Implementation_guide_on_RCH%20II.pdf
3. Unequal, Unfair, Ineffective and Inefficient Gender Inequity in Health: Why it exists and how we can change it. Final Report to the WHO Commission on Social Determinants of Health, September 2007. http://www.who.int/social_determinants/resources/csdh_media/wgekn_final_report_07.pdf
4. Gender based constraints: Improving the Reproductive Health of Married and Unmarried Youth in India. <http://www.icrw.org/files/images/Addressing-Gender-Based-Constraints-in-Youth-Reproductive-Health-Findings-from-Intervention-Studies-in-India.pdf>
5. Karim AM, Magnani RJ, Morgan GT, Bond KC. Reproductive health risk and protective factors among unmarried youth in Ghana. *International Family Planning Perspectives* 2003; 29: 14-24.
6. Adinma JI, Adinma ED. Impact of reproductive health on socio-economic development: a case study

- of Nigeria. *Afr J Reprod Health* 2011 ; 15:7-12.
7. Kumar A, Srivastava K. Cultural and social practices regarding menstruation among adolescent girls. *Soc Work Public Health* 2011; 26:594-604.
 8. Kennedy E, Gray N, Azzopardi P, Creati M. Adolescent fertility and family planning in East Asia and the Pacific: a review of DHS reports. *Reprod Health* 2011; 8:11.
 9. Nair MK, Paul MK, Leena ML, Thankachi Y, George B, Russell PS, et al. Effectiveness of a Reproductive Sexual Health Education Package among School Going Adolescents. *Indian J Pediatr.* 2011 May 27. [Epub ahead of print]
 10. Madeni F, Horiuchi S, Iida M. Evaluation of a reproductive health awareness program for adolescence in urban Tanzania - a quasi-experimental pre-test post-test research. *Reprod Health* 2011 ; 8:21.
 11. Kayiki SP, Forste R. HIV/AIDS related knowledge and perceived risk associated with condom use among adolescents in Uganda. *Afr J Reprod Health* 2011 ; 15:57-63.
 12. Committee on Pediatric AIDS, Emmanuel PJ, Martinez J. Adolescents and HIV infection: the pediatrician's role in promoting routine testing. *Pediatrics* 2011; 128:1023-9.
 13. Dasgupta A, Sarkar M. Menstrual Hygiene: How Hygienic is the Adolescent Girl? *Indian J Community Med* 2008; 33:77-80.
 14. Nair P, Grover VL, Kannan AT. Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescents in a rural area of East Delhi. *Indian Journal of Community Medicine* 2007; 32: 156-7.
 15. India: First Periodic Report on the CRC. <http://wcd.nic.in/crcpdf/CRC-2.PDF>
 16. The medical termination of pregnancy act, 1971 no. 34 of 1971
<http://www.mp.gov.in/health/acts/mtp%20Act.pdf>
 17. Lawan UM, Yusuf NW, Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *African Journal of Reproductive Health* 2010 ; 14: 201- 7.
 18. Mudey AB, Kesharwani N, Mudey GA, Goyal RC. A cross-sectional study on awareness regarding safe and hygienic practices amongst school going adolescent girls in rural area of Wardha District, India. *Global Journal of Health Science* 2010 ; 2: 225-31.
 19. Ali TS, Rizvi SN. Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. *J Adolesc* 2010 ; 33:531-41.
 20. Ali TS, Ali PA, Waheed H, Memon AA. Understanding of Puberty and related Health Problems among Female Adolescents in Karachi, Pakistan. *J Pak Med Assoc* 2006; 56: 68-72.
 21. Ocaktan ME, Baran E, Akdur R. Evaluation of habitual behavior related to genital hygiene in women living in a health care center area. *Saudi Med J* 2010 ; 31:1251-6.
 22. Adinma ED, Adinma JI. Perceptions and practices on menstruation amongst Nigerian secondary school girls. *Afr J Reprod Health* 2008; 12:74-83.
 23. Pattanaik D, Lobo J, Kapoor SK, Menon PS. Knowledge and attitudes of rural adolescent girls regarding reproductive health issues. *Natl Med J India* 2000;13:124-8.
 24. De la Ayala-Castellanos MM, Vizmanos-Lamotte B, Portillo-Dávalos RA. [Sexual and reproductive health among adolescents in high school in Guadalajara, México]. *Ginecol Obstet Mex* 2011 ; 79:86-92. Spanish.
 25. Peltzer K, Pengpid S. Prevalence and social Correlates of sexual intercourse among school-going adolescents in Thailand. *Scientific World Journal* 2011; 11: 1812-20.
 26. Wong LP. Attitudes towards dysmenorrhoea, impact and treatment seeking among adolescent girls: a rural school-based survey. *Aust J Rural Health* 2011; 19: 218-23.
 27. Nair MK, Chacko DS, Ranjith Darwin M, Padma K, George B, Ps R. Menstrual Disorders and Menstrual Hygiene Practices in Higher Secondary School Girls. *Indian J Pediatr* 2011 May 28. [Epub ahead of print].