Puberty Rituals, Reproductive Knowledge and Health of Adolescent Schoolgirls in South India

Public celebration of girls' coming of age would seem to offer a vehicle for broadened transmission of information about reproductive health issues

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In India, programmes and research concerned with women's health until very recently have focused mainly on the reproductive functions of married

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women. The recent paradigm shift in the Government's primary health programme was intended to increase the attention given to gynaecological problems and other aspects of women's health. Nonetheless, the attention given to the health problems of adolescent girls is still meagre, even though adolescence is a time when looking after health and nutrition can help to build a buffer against the heavy physical demands of the reproductive years. High rates of gynaecological morbidity have been reported in rural populations, adolescents included (Bang and others, 1989; Koenig and others, 1998). However, the health knowledge and problems of adolescents have so far received only minimal attention (Koblinsky and others, 1993).

Vaginal discharge is frequently the most common gynaecological symptom reported by both rural and urban Indian women (Bang and Bang, 1994; Patel, 1994; Narayan and Srinivasan, 1994; Koenig and others, 1998), but very few studies have explored the determinants of these complaints. Koenig and others (1998) compared results from seven studies in different parts of India, and found wide variations in all types of gynaecological problems, ranging from 33 to 65 per cent for menstrual disorders and 13 to 57 per cent for excessive discharge. The same study noted strong evidence to suggest that frequencies of conditions such as "excessive discharge" are subject to serious under-reporting in one-shot interviews, citing supporting data from Haryana and Karnataka.

Adolescent girls who are fortunate enough to be given relevant textbooks and health education materials by their teachers gain some information about reproductive functioning and reproductive health problems from school sources. But a great deal of their scant knowledge is dependent on informal communications with peers and family members. Some studies of Indian women have found that young girls are generally told nothing about menstruation until their first personal experience of it (for example, George, 1994). A study of women in Mumbai noted: "The silence surrounding menstruation burdens young girls by keeping them ignorant of this biological function" (George, 1994:179). The events and experiences surrounding menarche can be a significant influence on young girls' view of themselves, as well as on their understanding of reproductive health issues, and on appropriate behaviour for hygienic management of menstruation.

Materials and methods

This study of the social dimensions of menarche and menstruation was carried out in the urban and rural field-practice areas of the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) in Pondicherry,

which is located in the northern part of Tamil Nadu State. JIPMER is a medical school for undergraduate and postgraduate medical education, with a strong mandate for community-based training and research. The urban practice area is in the centre of Pondicherry town, contiguous to the Bay of Bengal. It is a low-income residential area that is currently in the process of development. Multi-storeyed new apartment buildings are intermingled with numerous individual huts and other semi-permanent and permanent habitations. The population has a wide range of occupations, including fishing, construction labour, small-scale business and others.

The rural practice area is about 13 km from Pondicherry, in a cluster of villages comprising approximately 8,000 inhabitants. Most of the people in the villages are employed in agriculture.

The first phase of this study consisted of in-depth interviews, collection of free lists, and other qualitative data from adolescent girls as well as older women. Information was collected about first menstruation, celebrations during menarche, issues about hygiene and other topics. Attempts at using "body-mapping" to assess adolescent girls' knowledge of female anatomy were not encouraging. Therefore, the second phase of the study (the quantitative survey) used a diagram of the female torso showing the different body organs; the girls were then asked to identify the organ from which menstrual blood flows. From those responses, it was possible to rate the girls' different levels of knowledge of female anatomy.

The questionnaire was developed from the detailed information gained during qualitative interviewing. It included questions about first menstruation, celebrations of the onset of menarche, issues and problems (if any) related to genital hygiene, storage and washing of the menstrual cloth, traditional beliefs and practices related to menstruation, and health problems such as dysmenorrhoea, white discharge and irregular periods. Open-ended questions were used to generate information about food preferences and avoidance, opinions about marriage, perceptions and attitudes about menstruation, and other topics.

Sample size and selection

A sample size of about 800 was chosen for the survey. All schools in the two areas were selected. The sample was stratified across the 12-17 age group to capture the changes in knowledge with age. Equal numbers of rural and urban girls were interviewed. The number of girls in classes 7-12 in each school was noted. In the rural area, there was a shortfall in the number of girls

in the schools, especially in the higher classes. Consequently, a school in the adjoining area of Katerikuppam was also sampled to give the desired numbers. The schools in the rural study reached only class 10, so the eleventh and twelfth standards in a school at Villianur, where the girls from the sample area studied, were also sampled.

Data collection

The questionnaire was self-administered in schools in both rural and urban areas, by a total of 823 girls, of whom 619 had attained menarche. The statistical analyses are based on the 619 respondents. An interviewer was present with the girls to clarify questions and minimize missing data. No girl refused to participate. However, no effort was made to interview girls who were absent on the day of data collection.

About 60 in-depth interviews were conducted with mothers, elderly women, and astrologers to understand the significance of the rituals associated with menarche. The place of washing and storing the menstrual cloth were observed in a subsample. A focus group discussion was held with school girls to probe their perceptions on menstrual morbidity with an emphasis on white discharge.

Data analysis

The quantitative data were analysed using the SPSS statistical software package. After computing frequencies and cross-tabulations of some main variables, factor analysis was used to identify clusters of items for developing indices of "traditional beliefs", "menstrual hygiene" and "material style of life" (for measuring socio-economic status). Logistic regression was used to establish the associations among major variables, including the composite indices.

Results

Celebration of first menstruation

In the first part of the study, qualitative data were gathered through in-depth interviews with both young girls and older women, in order to gain an understanding of the patterns of ritual observance of first menstruation among contemporary rural and urban people in the study area. The interview data, plus our own experiences in this cultural system, indicate that detailed beliefs and practices vary between different castes and communities, but the overall patterns are broadly similar throughout the area.

Table 1. Age at menarche among adolescent schoolgirls in Pondicherry, South India

Age	Number	Per cent
11	13	2.1
12	82	13.2
13	195	31.5
14	213	34.4
15	98	15.8
16+	18	3.0
Total	**619**	**100.0**

First menstruation is often a traumatic and very negative experience for young girls in most parts of India (George, 1994) although among almost all communities in Tamil Nadu the event is marked with a festive celebration Bhattacharyya (1980; 1996) described the menstrual rites widely prevalent in ancient India. Evidently, in ancient times such puberty celebrations for young girls pervaded all parts of India (and many other parts of the world), but this extensive public celebration of the onset of menarche has all but disappeared from much of central and northern India, although it is still observed among Tamilians and some other groups in South India. It is celebrated as *manjal neer-attu vizha* (turmeric bathing ceremony), during which relatives and friends of the girl are invited to a grand feast, and the girl receives expensive gifts of clothing and jewellery. The traditions surrounding the *manjal neer-attu vizha* require strict rules of seclusion (in a separate "hut" referred to as a *kudisai*, inside or outside the house), ritual bathing, practices and proscriptions concerning washing and management of the menstrual cloths or pads, as well as newly invoked restrictions on mobility and contacts with males.

South Indian female puberty rites can be divided into three main segments of ritual action. The ritual series begins when the girl "comes of age" *(vaisuku varuvathu)*, at the age of 13,14 or thereabouts (see table 1). This is a period of ritual seclusion. The girl sits separately on a wooden plank in a corner. Neighbourhood women gather for a ceremonial meal that is served on plantain leaves, after which they paint the girl's feet with a mixture of red ochre, turmeric and limestone. This *nalangu* ceremony is enacted in the same manner for first menstruation, as part of wedding festivities, and the celebration of a woman's pregnancy.

For ritual seclusion, a *kudisai* (hut) is made of fresh leaves, for example, those of coconut, neem and mango, among others. This hut may be either inside or outside the house. The *kudisai* is furnished with all the things needed by the girl, including toiletries, clothing and vessels. Food is brought to her, and she takes complete rest. She is helped by other women while bathing. Daily bathing alternates between "head-bath" and "ordinary bath". When she goes to the toilet, she must carry neem leaves and something made of iron, to ward off evil spirits. Special foods are prescribed for this seclusion, which is continued for 9, 11 or 13 days (it must be an odd number of days).

During the seclusion, the girl is instructed not to look at birds on an empty stomach, not to go out alone, and especially not to go into the *pooja* (prayer) room. She is warned not to leave leftover food where dogs could get it, because she would get a stomach ache if a dog ate the leftovers. Further restrictions symbolize her ritually dangerous status: she should not touch flowering plants (they might wilt), and she should not touch stored food items such as tamarind, rice or salt, which might be spoiled by her contact. The girl is relieved of the seclusion only after a purification ritual called *puniya-thanam*, which is the second step in the ritual process.

The third and final step in the series is the *manjal-neeru*, or *satangu*. The ritual is often performed in the third month after the *puniya-thanam*, but can be any time before the girl marries. The *manjal-neeru* is celebrated with pomp and splendour. Even poor families borrow money, or pledge their jewellery in order to make this event a grand occasion. This major celebration has many of the same elements as a wedding — large numbers of relatives and friends are invited; a priest officiates at a *pooja* (prayer ritual), a wide assortment of food with many sweets is served, and the girl receives gifts of jewellery and clothing.

In view of the number of rituals, restrictions and all the associated beliefs and symbolisms, it is surprising that young girls are not prepared for it with information about menstruation, about the social meanings (including social readiness for marriage), and other knowledge. One would expect that, somehow, during the early phases of this elaborate enactment, useful information about menses, reproduction and hygiene could be imparted. But from this study, it appears that adolescent girls were not prepared in any way for their first menstruation. Two thirds of the girls described the onset of menarche as a shocking or fearful event, which often came as a distinct surprise to them. Many of them cried when they first saw the menstrual blood. According to their testimony, the little information they were given was about

"keeping the cloth", and much of the "new information" they gleaned during the rituals came in the form of restrictions and cautions about behaviour towards males. To some extent, the evidence suggests that families rely increasingly on schools for imparting the information.

The attention paid to a girl's first menstruation would appear to provide an opportunity for important health education, including genital hygiene. Certainly there is evidence that young women do have a great need for information about the management of menstruation. The levels of information about menstruation, genital hygiene and related reprodnctive health issues are gradually increasing, but it appears to be a very slow process.

Knowledge and practices

The results from the quantitative survey showed that adolescent girls' knowledge of anatomy (particularly their knowledge of the source of menstrual blood) is very weak. Only one third of the girls identified the uterus correctly. Nearly as many girls (28 per cent) mistakenly identified the urinary bladder as the source of menstrual blood. Older girls had somewhat better anatomical knowledge, as would be expected, and the urban girls scored better than the rural girls.

Beliefs and restrictions related to menstruation

The qualitative interviews revealed a large number of traditional beliefs and restrictions surrounding menstruation. Most of the restrictions are based on concepts of pollution surrounding the condition of menstruation, which translate into prohibitions of acts that may be dangerous to others, as well as behaviours or situations in which the girl herself may be vulnerable to harm. In the questionnaire, the girls were asked whether they had been told about these beliefs.

Table 2 lists the 16 items included in the questionnaire, and the frequencies of the "yes" responses. The frequencies vary considerably, with generally high numbers associated with the prohibitions regarding religious places (*pooja* room and temple), which are deeply ingrained in Hindu practice. Also, some seemingly "irrelevant" or trivial beliefs received a large percentage of affirmatives, including "should not sit on the threshold", and "dog should not eat her leftover food".

A factor analysis of those 16 items was conducted in order to identity those that are statistically interrelated, and hence could be used to construct an

Table 2. Percentage of adolescent schoolgirls believing in specified taboos at menarche and menstruation in Pondicherry, South India

Type of taboo	Per cent
Shouldn't see birds	11.0
Shouldn't sit on the threshold	70.0
Dog shouldn't eat leftover food	72.7
Shouldn't touch stored foods	39.6
Shouldn't see men before bathing	31.5
Mother shouldn't be first to see menarche girl	48.8
Widow shouldn't be first to see menarche girl	12.8
Lizard shouldn't eat blood tissues	35.7
Shouldn't touch *pooja* things	63.8
Shouldn't touch plants	69.3
Shouldn't keep flowers	58.8
Shouldn't touch infants	38.6
Shouldn't go to temple	85.8
Take neem twig while going out	58.2
Shouldn't go out at noon	54.6
Take neem and piece of iron while going to school	34.1

index of "traditionality". This made it necessary to eliminate items 1, 10 and 12, as they did not fit the overall model. The remaining items were then used to derive individual scores. Those raw scores were collapsed into five groups to form the "traditionality index". Higher scores are associated with greater familiarity with and adherence to the traditional practices. Traditionality was found to be higher among rural girls, and the correlation coefficient with socio-economic status is -0.2 which is significant at the 95 per cent confidence level.

Hygiene practices

Questions focused on the types of menstrual pads used, and the washing and storage of the pads. It seems possible that these items may be related to the likelihood of infections of the genital area, either directly from contact with infection sources, or indirectly through association with bathing and other aspects of personal hygiene. Of the 10 items in the questionnaire, five indicators were statistically interrelated, and could therefore be combined in a hygiene index. Those items are as follows: type of pad used, where the pad is washed, structure of the washing place, where the pad is dried, and where it is stored (table 3). For example, a small number of girls (6.5 per cent) used only their undergarments during menstruation, and an even smaller number (5.2 per

Table 3. Percentage distribution of menstrual hygiene characteristics among adolescent schoolgirls in Pondicherry, South India

	Area		Total (n = 619) (percentage)
	Rural (n = 327) (percentage)	Urban (n = 292) (percentage)	
Type of pad used			
Only undergarments	11.0	2.4	6.5
Old cloth	82.5	72.2	77.1
Old cloth and napkins	4.8	17.1	11.3
Commercially available disposable napkins	1.7	8.3	5.2
Number of times pad is washed			
1	19.9	10.4	14.9
2	46.6	37.9	42.0
3	22.3	32.7	27.8
4	9.6	10.7	10.2
Use disposable napkins	1.7	8.3	5.2
Place where pad is dried			
Hidden under other clothes	4.1	3.1	3.6
Hidden elsewhere	30.1	32.1	31.2
In shade	22.3	14.4	18.1
In sun	41.8	42.2	42.0
Use disposable napkins	1.7	8.3	5.2
Place where pad is stored			
Cowshed, tree-hole etc.	49.0	29.7	38.8
Bathroom	40.8	49.8	45.6
With other clothes	8.6	12.2	10.5
Use disposable napkins	1.7	8.3	5.2

cent) used “modern” commercially available sanitary napkins. The rural girls tended to report the “less modern”, and probably less hygienic materials, but the vast majority of both rural and urban girts used “old cloth”.

Differences between rural and urban girls are also evident in other items in the hygiene index. The places where the cloth was stored were observed and found in many cases to be the most unhygienic places. The structure where the cloths were washed was also examined. The majority of the urban girls had a permanent structure for a bathroom or wash area. However, in the rural areas, the bathroom was genetally an enclosure made from palm leaves with no flooring, and a stone for washing the cloths. Hence, the girls faced difficulty while bathing and while washing the menstrual cloths.

Table 4. The reporting of white discharge, by selected characteristics, among adolescent schoolgirls in Pondicherry, South India

	Percentage reporting white discharge	N = 619
Hygiene score		
Low	34.1	290
Medium	22.3	233
High	12.5	96
Socio-economic score		
Very low	35.1	131
Low	26.5	162
High	29.5	200
Very high	11.9	126
Residence		
Rural	32.2	292
Urban	21.1	327
Index of traditionality		
Very traditional	36.0	75
Traditional	29.7	202
Modern	24.7	215
Very modern	18.1	127

The Pearson correlation coefficient between the "traditionality scale" and the hygiene index was -.244 ($p<.0l$), indicating that girls who are higher in "traditionality" have poorer hygienic practices with regard to type of menstrual pads, as well as their washing and maintenance of these items.

Reported health problems

The girls were asked about health problems associated with menstruation such as dysmenorrhoea, white discharge, diarrhoea and vomiting. Menstrual pain and/or discomfort was reported by 87 per cent of the girls, a quarter had white discharge and 4 per cent had some urinary problems. The reporting of a white discharge was significantly higher among rural girls and those with lower socio-economic status and was negatively associated with the hygiene score (table 4).

Since the prevalence of white discharge was significantly related to the hygiene score, a logistic regression was performed to test whether the relationship between reported white discharge and the hygiene score might be an artefact of rural/urban differences, or perhaps confounded by socio-economic status. The girls using commercially manufactured napkins were

Table 5. Logistic regression analysis of the link between hygiene and reporting of white discharge, among adolescent schoolgirls in Pondicherry, South India

	Unadjusted odds ratios	Adjusted odds ratios[a]	95 per cent confidence intervals
Hygiene index			
High	1.0	1.0	–
Medium	2.0	1.8	0.8-4.0
Low	3.6	2.1	1.2-6.3

[a] Adjusted for socio-economic score and rural-urban residence and age.

removed from this analysis. Table 5 shows the results, which indicate that white discharge is significantly related to the level of hygiene as measured by the index of hygiene. Odds of reporting white discharge were 2.7 times higher when the index was poor than when it was high.

Discussion and conclusions

The study shows that the ceremonial attention to the onset of menarche in the *manjal neer-attu vizha* rituals, accompanied by seclusion and other restrictions on the girls' behaviour, continue to be maintained in the Tamilian culture. But despite the prominence of this ceremonial attention to "coming of age", very little attention is paid to informing adolescent girls about the "facts of life" of menstruation; most girls in the Pondicherry area are unprepared for the trauma of their first menses. A restriction appears to have been imposed on the extent to which mothers confide in their daughters about menstruation. This restriction in communication is symbolized in the "rule" that the mother should not be the one to see and "verify" her daughter's first menstrual bleeding. Aunts, neighbours, older sisters and grandmothers have been the traditional sources of information about the management of menstruation, but the amount of information transmitted has generally been extremely sparse.

Even after the attainment of menarche, very little information is given to young girls about the physiological processes involved and the hygienic practices to be followed. Data from Mumbai show that this reticence about giving relevant information to adolescent girls is indeed widespread (George, 1994). Some information is given to girls in science classes in school, but even there the information is very inadequate, because at least half the girls in our sample could not identify the reproductive organs.

Much of the "information" about menstruation imparted to a young girl is in the form of restrictions on her movements and behaviour, along with "superstitions" about the possible harmful effects of her "polluting touch" and the equally polluting potential of the menstrual cloth.

The restrictions and other traditional features affecting adolescent girls are stronger in rural areas. In the urban sector, the girls from poorer families also report both poorer hygiene practices and more traditional restrictions and beliefs.

The reports of white discharge among adolescent girls in the study suggest the presence of gynaecological morbidity, but these data should be interpreted cautiously. As pointed out by Koenig and others (1998), as well as researchers in other countries (Bulut and others, 1995), the correspondence between women's self-reported white discharge and detectable infections is rather low. Clearly, some of the reported white discharge reflects reproductive tract infections (RTIs). On the other hand, some of the reported complaints may be excessive worry about "normal" vaginal secretions. Patel and Oomman (1999) have suggested a psychological dimension related to the reports of white discharge, which remains to be investigated. Despite the lack of strong correspondence between women's reports of white discharge and the presence of detectable RTIs, these manifestations are experienced by women as problematic illness. More research is needed, in India and elsewhere, concerning the physical and psychological concomitants of vaginal discharge. Our data suggest that at least some of the occurrences can be related to unhygienic management of menstruation. Although the primary cause of cervical cancer is the human papilloma virus, which is sexually transmitted (Bishop and others, 1993, the possibility of contributing factors related to poor genital hygiene has also been suggested.

Patterns of menstrual hygiene that are developed in adolescence are likely to persist into adult life. Our data suggest that young girls should be taught more effective procedures of washing their menstrual cloths, as well as careful, more sanitary, storage of the pads, or preferably using new cloths for each monthly cycle. Some simple procedures are likely to be available to most young girls, even in relatively poor families. Some of the traditional beliefs and practices could be linked to new forms of dissemination of hygiene information.

The teaching of hygienic practices related to menstruation should be linked to an expanded health education in which young girls can learn about

reproductive physiology and functioning, as well as practical information about reproductive tract infections, sexually transmitted infections, and other useful knowledge. Some of this knowledge is spreading in the adolescent population, but the dissemination is slow and uncertain. Sanitary napkins for menstruation are now advertised in television commercials, and the use of commercially available pads has increased. In view of the fact that issues surrounding puberty and menstrual hygiene are extremely sensitive and conventional sources of health information such as popular media or brochures do not generally include them, more informal means of dissemination may be needed. Community groups, peer groups, school curriculums, and other such channels are likely to be more effective means of transmitting important health messages and advice to young women entering puberty.

The visible, expressive public celebration of girls' coming of age in Tamil Nadu would seem to offer a vehicle for broadened transmission of information about reproductive health issues, including specific information about menstrual hygiene. Although people increasingly look to the school system to impart this knowledge, some of this transmission could take place in the informal sector, provided health educators and providers develop new strategies of dissemination. More effective education about hygienic menstrual practices could be a major contribution to improving women's reproductive health, including reduction of reproductive tract infections.

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