

Original Article

Reproductive health status and life skills of adolescent girls dwelling in slums in Chennai, India

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ABSTRACT

Background. Adolescent girls dwelling in slums are vulnerable to poor reproductive health due to lack of awareness about reproductive health and low life skills. These girls are in a crucial stage of their life cycle and their health can impact the health of future generations. Despite adolescents comprising almost one-quarter of the Indian population they are ill served in terms of reproductive health.

Methods. This cross-sectional study was done among 130 slum-dwelling adolescent girls, aged 13–19 years, using multistage sampling method from five slums in Chennai, southern India. The reproductive and menstrual morbidity profile, personal and environmental menstrual hygiene was assessed to determine their reproductive health-seeking behaviour and life skills.

Results. Ninety-five (73%) girls (95% CI 66.23–81.36) reported menstrual morbidity and 66 (51%; 95% CI 50.74–52.25) had symptoms suggestive of reproductive/urinary tract infection. Of the girls surveyed, 55 (42%) were married. Nearly 25% (95% CI 23.07–26.92) of the married girls had a history of abortion and 18% (95% CI 11.32–25.07) had self-treated with medications for the same. Contraceptive use among ever-married girls was 22.7% (95% CI 20.83–24.56). Even though 75% of respondents knew about HIV/AIDS, their knowledge of modes of transmission and prevention were low (39% and 19%, respectively). Almost 39% of respondents felt shame or insecurity as the key barrier for not seeking reproductive healthcare. About 52% had low life skill levels. On logistic regression, menstrual morbidity was high among those with low life skills, symptoms suggestive of reproductive/urinary tract infection were high among those who were married before 14 years of age and life skills were high among those who belonged to the scheduled caste community.

Conclusion. There is a high prevalence of menstrual/reproductive morbidity, self-treated abortion and low knowledge about modes of HIV transmission/prevention and use of contraceptives among adolescent girls in slums in Chennai. There is a need to initiate community-level life skill education, sex education and behaviour change communication

for slum-dwelling adolescents as a part of the adolescent reproductive and sexual health programme.

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INTRODUCTION

The adolescent period is crucial for girls as their health determines the health of future generations.¹ It is a key phase in the reproductive cycle of a woman.² Failure of government policies, improper governance and inappropriate regulations have resulted in the proliferation of urban slums, and poverty and inequality have rendered these areas into centres of public health crises. It has been projected that in 2020 more than half the population of India would live in urban areas due to rapid urbanization, and nearly one-third of the urban population would be slum-dwellers.³ According to the 2011 Census data, the total slum population in Chennai was 1 342 337 (28.7% of the population of Chennai).³

In 2000, the National Population Policy recognized adolescents as an underserved and vulnerable group with special needs. The Phase-II Reproductive and Child Health (RCH) programme was dedicated to the health needs of the poor, specifically slum population. A special task force was formed by the National Rural Health Mission (NRHM) (2005–12) to develop strategies for urban healthcare which would address the need of slum-dwellers too. The Integrated Child Development Scheme (ICDS) works for adolescent health in Tamil Nadu; other parts of India have adolescent health programmes and distribution of sanitary napkins to address the needs of adolescents.⁴ WHO-UNFPA had published guidelines to prevent adolescent pregnancies and reproductive morbidity in low- and middle-income countries. The UN Adolescent task force of UNFPA supports the rights of marginalized adolescent girls. Adolescents comprise 22% of the Indian population,⁵ which stresses the need to understand the reproductive health of adolescents better to serve them well.

Indian culture considers menstruation as an unhygienic happening.⁶ Most gynaecological problems among girls happen because of deprived personal hygiene and unsanitary environment. Infections occur among adolescent girls chiefly due to lack of menstrual hygiene. The milieu of vaginal infection is primarily caused by reuse of unclean menstrual clothes and improper drying.² Slums not only lack appropriate shelter facilities but also have poor health and hygiene conditions. All these factors add to the toll of vulnerable adolescents already burdened with poverty. There are disparities in antenatal coverage among slum-dwellers and non-slum-dwellers.⁷ UNFPA found that, globally in a year, 70 000 deaths were due to pregnancy and childbirth among 15–19-year-old girls.⁸ Worldwide, about 14 million adolescents

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bear children every year and India contributes to nearly half of these (47%). The other major issue in adolescent reproductive health is unsafe abortions; developing countries have 2.2–4 million unsafe abortions every year.⁹

Life skills are a cluster of psychosocial competencies and interpersonal skills that allow people to make informed decisions, resolve problems, reflect critically and creatively, communicate effectively, empathize with others, and cope and manage their lives in a healthy and productive manner.¹⁰ WHO defines 'life skills as abilities for adaptive and positive behaviour that enables an individual to deal effectively with the demand and challenges of everyday life.' Life skills discourage high-risk behaviour and enhance problem-solving abilities.

I assessed the reproductive and menstrual morbidity profile, and the personal and environmental menstrual hygiene, to determine the reproductive health-seeking behaviour and life skills of adolescent girls living in slums in Chennai, southern India.

METHODS

This was a community-based, descriptive, cross-sectional study among girls aged 13–19 years, living in the slums of Chennai. The data were collected between June 2012 and July 2012. The sample size was calculated on the basis of prevalence of menstrual abnormalities among adolescent girls in Tamil Nadu (46%);¹¹ with 1.4 as design effect for multistage sampling, the sample size derived was 130 adolescent girls. Due to resource constraints, a larger sample was not feasible for the study.

Multistage sampling was adopted to select the respondents. In the first stage of sampling, Chennai city was clustered into 10 zones. Zone 3 was selected by simple random sampling from the 10 clusters. In the second stage, the technique of probability proportion to size was followed to select five slums in Zone 3. In the third stage, the number of adolescent girls in each slum was selected proportionate to the total number of girls in that slum. Respondents from those five slums were selected through simple random sampling with replacement.

Informed written consent was obtained in the native language from each respondent and the mother of the respondent/guardian, after explaining the purpose of the research. Participation was voluntary and the participants were free to withdraw from the study at any point. The participants were assured confidentiality of the data collected from them.

Data were collected using a semi-structured and pretested questionnaire. The questionnaire collected information on demographic characteristics, menstrual/reproductive profile and hygiene, reproductive health-seeking behaviour and life skills. The life skills profile of the respondents was based on the Likert scale questionnaire adapted from the National Institute of Mental Health and Neuro Sciences (NIMHANS) adolescent life skill training module. It measured the life skill components such as resilience, rational thinking, decision-making, problem-solving, coping, interpersonal relation and realizing emotions. The socioeconomic status was not included in the demographic domain since a majority of the families dwelling in the slums of Chennai were below the poverty line. The menstrual morbidity was assessed with a series of questions concerned with menstrual symptoms in the past 6 months. Questions regarding the history of pregnancies and abortions were put only to married respondents. Contraceptive and HIV awareness and knowledge were evaluated for all respondents. The interviewer was a public health graduate, trained in qualitative interview methods and survey techniques. All the

participants were interviewed by the investigator herself.

Data were entered in Epi Info-7 and analysed using Statistical Package for the Social Sciences version-17. Chi-square analysis, odds ratio to determine the risks, logistic regression and stratified analysis were done. Certain scoring modes were used out to categorize the data during analysis. The presence of any of the symptoms of menstrual morbidity, namely amenorrhoea/polymenorrhoea, dysmenorrhoea or menorrhagia, was scored 1 and none as 0. The presence of any of the symptoms of reproductive morbidity specifically vaginal itching, profuse foul smelling white discharge and burning micturition was scored 1 and none as 0. In health-seeking behaviour the respondents who sought the help of a doctor for their morbidity were scored 2, taking self-medication or home remedies were scored 1 and ignoring it were scored 0. The life skills were scored between 5 and 1 points on the Likert scale. The total scores were computed and the median obtained. Those who scored more than the median were classified as girls with high life skills.

RESULTS

The response rate of the study was 95%. Most (86%) of the adolescent girls in the study were between 15 and 19 years of age. Demographic characteristics of the study population showed that 31% of girls were married and 2% were young widows. The median age at menarche and marriage were 13 years and 14.5 years, respectively. The literacy rate was 95% among the respondents and the majority were students and housewives (Table I).

Only 25% of respondents were aware of the menstrual cycle before attaining menarche. Dysmenorrhoea was the most common menstrual morbidity (61%, 95% CI 60.06–61.53) followed by menorrhagia (31.5%, 95% CI 30.8–32.19) and amenorrhoea/

TABLE I. Demographic characteristics of adolescent girls

| Characteristic | n (%) |
|-----------------------|-----------|
| <i>Age (years)</i> | |
| 13–14 | 18 (14) |
| 15–17 | 57 (44) |
| 18–19 | 55 (42) |
| <i>Marital status</i> | |
| Single | 86 (66) |
| Married | 42 (32) |
| Widow | 2 (1.5) |
| <i>Community</i> | |
| Scheduled caste | 100 (77) |
| Most backward classes | 7 (5) |
| Others | 23 (18) |
| <i>Religion</i> | |
| Hindu | 92 (71) |
| Christian | 28 (21) |
| Muslim | 10 (8) |
| <i>Education</i> | |
| Illiterate | 7 (5.4) |
| Primary | 76 (58.5) |
| Secondary | 30 (23.1) |
| Vocational | 3 (2.3) |
| College | 14 (10.8) |
| <i>Occupation</i> | |
| Student | 74 (56.9) |
| Housewife | 37 (28.5) |
| Daily labour | 4 (3.1) |
| Skilled | 9 (6.9) |
| None | 6 (4.6) |

polymenorrhoea (20.8%, 95% CI 20.76–20.84). Overall, 74% (95% CI 66.23–81.36) of respondents had some menstrual morbidity in the past 6 months. Almost 57% of respondents were unable to perform their routine activities during the menstrual cycle.

Almost 70% of respondents knew the significance of menstruation, 82% thought menstruation was a natural event and 60% had cultural restrictions during menstruation. Mothers were the main source (85%) of information/teaching best menstrual practices to the girls. A doctor's consultation for reproductive health was felt mandatory by 72% of respondents. On the other hand, ignoring/not seeking help for dysmenorrhoea and menorrhagia was the most frequent behaviour observed. In case of polymenorrhoea, or amenorrhoea 49% of respondents sought a doctor's opinion and 45% ignored it. Nearly 39% of respondents felt shame or insecurity as a barrier in seeking healthcare. In addition, 31% thought their problem would resolve automatically, 19% were unaware regarding the type of treatment sought and few (5.4%) felt lack of family support and lack of confidentiality (5.4%) among health professionals as barriers for seeking health.

All the respondents had access to water and bathrooms for personal use. They were bathing daily during menstruation. Nearly 32% of respondents were dependent on public toilet facilities. Almost 84% of respondents used sanitary napkins as an absorbent for menstrual bleeding and the rest used a cloth. Among the cloth users, 81% used a detergent to wash and 52% dried it under sunlight. There was a significant association between menstrual protection used and occupation of the respondent ($p=0.007$). Girls who were not students had 2-times higher odds for using cloth as a menstrual protector compared to students (95% CI 1.49–11.494).

Among the married adolescent girls who were interviewed, 18% (95% CI 16.46–19.89) were currently pregnant. Of them, half were in the third trimester, followed by second trimester (37.5%) and first trimester (12.5%). There were 84% (95% CI 82.47–85.72) previous pregnancies among married girls and all of them had had an institutional delivery. The pregnancy rate was 35%. Stillbirths were 16% (95% CI 14.2–18.15) among the deliveries. Abortion rate was 25% (95% CI 23.07–26.92). Nearly 82% of those who reported abortions sought care from government hospitals and 18% had self-treated abortion.

The respondents had 52% prevalence of any symptom suggestive of reproductive tract infection (RTI) or urinary tract infection (UTI; Table II). Almost 63% (95% CI 62.37–63.82) were unaware of any methods of contraception. None of them had

knowledge about the fertile period of the menstrual cycle. Among the currently married girls, 24% were contraceptive users and only one was using a condom as the mode of contraception. Of the respondents, 75% were aware about HIV/AIDS but 39% and 19% only had knowledge about the mode of transmission and prevention of HIV infection, respectively.

The mean (SD) score of life skills was 34 (6.0). There was a significant association between life skills and overall menstrual morbidity ($p=0.043$). The respondents with low life skills had 4-times higher odds of reporting menstrual morbidity (95% CI 0.972–4.83) but it was not statistically significant. There was also an association between caste and life skills ($p=0.037$). Respondents from the scheduled caste (SC) community had 2.6-times higher odds of having high life skills compared with other respondents (95% CI 1.098–6.303).

Logistic regression analysis was done to determine the associations after multivariate adjustment. The respondents who belonged to the SC community had nearly 1.5-times higher odds of having high life skills compared to others (95% CI 1.040–2.146; Table III). Girls who had low life skills had 3.6-times higher odds of reporting menstrual morbidity compared with those with high life skills (95% CI 1.14–6.711; Table IV). Respondents who were single had 7.7-times higher risk of having reproductive/urinary tract symptoms compared to married girls (95% CI 1.034–57.883; Table V) and if the respondents were married before the age of 14 years, they had 2.5-times higher odds of having reproductive/urinary tract symptoms compared to those married after the age of 14 years (95% CI 0.724–3.236).

DISCUSSION

The reproductive health status and life skills among one of the most vulnerable population belonging to the reproductive age group were assessed. Early marriages, high levels of menstrual and reproductive morbidity, pregnancy and self-treated abortion were present. We also found low levels of knowledge about modes of HIV transmission and prevention, and the use of contraceptives among adolescent girls. The level of life skills was also high among respondents belonging to the SC community.

Almost one-third of adolescent girls in the study were married which is comparatively less than the NFHS-3 which showed that 69.6% of adolescent girls aged 15–19 years were married.¹² A smaller sample size and errors in reporting of age could be a reason for this discrepancy. The study sample included 2% widows which was relatively high for this age group.

Menstrual knowledge of the girls was poor before they attained menarche. This could impact their preparedness and reaction to attaining menarche. Similar findings were observed in another study which assessed the girls' knowledge as 36%.¹³ Some of the girls did not receive any education or advice from their mothers regarding menstruation and this too could considerably affect their life skills and preparedness.

A high prevalence of dysmenorrhoea was present in the study group. Previous studies showed menstrual irregularity as the most prevalent morbidity, with 53% complaining of dysmenorrhoea.¹³ A high prevalence of dysmenorrhoea might be due to over-reporting of menstrual pain. Even though dysmenorrhoea and menorrhagia were the most reported morbidity the respondents did not seek treatment for these. Treatment was sought for amenorrhoea or polymenorrhoea compared to any other morbidity due to apprehension about menstrual irregularity and the perception that menstrual irregularity would be more threatening than other menstrual abnormalities. Feeling of shame and insecurity were

TABLE II. Frequency of reproductive morbidity in the study population

| Morbidity | Frequency (%) | 95% confidence interval |
|---|---------------|-------------------------|
| Vaginal itching | 35 (26.9) | 26.2–27.6 |
| Vaginal discharge | 45 (34.6) | 33.8–35.30 |
| Burning micturition | 28 (21.5) | 20.9–22.1 |
| Symptoms suggestive of reproductive/urinary tract infection | 67 (51.5) | 50.7–52.3 |
| No. of abortions ($n=44$) | 11 (25) | 23.1–26.9 |
| Abortion care ($n=11$) | | |
| Government hospital | 9 (81.8) | 74.9–88.7 |
| Self-treated | 2 (18.2) | 11.3–25.1 |
| Type of abortion ($n=11$) | | |
| Medical | 5 (45.4) | 36.5–54.3 |
| Surgical | 2 (18.1) | 11.2–25.0 |
| Both | 4 (36.5) | 27.9–45.1 |

TABLE III. Factors associated with life skills

| Factor | Categories | Life skills (%) | | Regression coefficient | Significance | Adjusted OR | 95% confidence interval |
|-------------------------|-----------------|-----------------|------|------------------------|--------------|-------------|-------------------------|
| | | High | Low | | | | |
| Age (years) | 13–14 | 44.4 | 55.6 | -0.294 | 0.380 | 0.745 | 0.387–1.436 |
| | 15–17 | 43.9 | 56.1 | | | | |
| | 18–19 | 52.7 | 47.3 | | | | |
| Community* | Scheduled caste | 53 | 47 | 0.401 | 0.030 | 1.494 | 1.040–2.146 |
| | Others | 30 | 70 | | | | |
| Religion | Hindu | 51.1 | 48.9 | -0.019 | 0.957 | 0.982 | 0.500–1.926 |
| | Others | 39.5 | 60.5 | | | | |
| Education | Illiterate | 14.3 | 85.7 | -0.182 | 0.396 | 0.834 | 0.548–1.268 |
| | Primary | 48.7 | 51.3 | | | | |
| | Secondary | 46.7 | 53.3 | | | | |
| | Vocational | 0 | 100 | | | | |
| Occupation | College | 71.4 | 28.6 | 0.236 | 0.275 | 1.267 | 0.829–1.936 |
| | Students | 54.1 | 45.9 | | | | |
| Marital status | Others | 39.3 | 60.7 | -0.437 | 0.563 | 0.646 | 0.147–2.836 |
| | Single | 48.8 | 51.2 | | | | |
| Age at marriage (years) | Married | 45.5 | 54.5 | -0.131 | 0.752 | 0.877 | 0.389–1.977 |
| | ≤14 | 16.7 | 83.3 | | | | |
| Age at marriage (years) | 15–17 | 52.2 | 47.8 | -0.131 | 0.752 | 0.877 | 0.389–1.977 |
| | ≥18 | 66.7 | 33.3 | | | | |
| | ≥18 | 66.7 | 33.3 | | | | |

Cox and Snell R² 0.082 Nagelkerke R² 0.110 * significant adjusted OR

TABLE IV. Risk factors for menstrual morbidity

| Factor | Categories | Menstrual morbidity (%) | | Regression coefficient | Significance | Adjusted OR | 95% confidence interval |
|-------------------------|-----------------|-------------------------|--------|------------------------|--------------|-------------|-------------------------|
| | | Present | Absent | | | | |
| Age (years) | 13–14 | 61.1 | 38.9 | -0.312 | 0.409 | 0.732 | 0.350–1.533 |
| | 15–17 | 73.7 | 26.3 | | | | |
| | 18–19 | 78.2 | 21.8 | | | | |
| Community | Scheduled caste | 74 | 26 | 0.020 | 0.923 | 1.020 | 0.685–1.518 |
| | Others | 73.3 | 26.7 | | | | |
| Religion | Hindu | 75 | 25 | 0.244 | 0.509 | 1.277 | 0.618–2.635 |
| | Others | 71.1 | 28.9 | | | | |
| Education | Illiterate | 57.1 | 42.9 | -0.276 | 0.290 | 0.759 | 0.456–1.265 |
| | Primary | 73.7 | 26.3 | | | | |
| | Secondary | 70 | 30 | | | | |
| | Vocational | 100 | 0 | | | | |
| Occupation | College | 85.7 | 14.3 | -0.318 | 0.313 | 0.728 | 0.393–1.349 |
| | Students | 73 | 27 | | | | |
| Marital status | Others | 75 | 25 | -0.088 | 0.917 | 0.916 | 0.176–4.771 |
| | Single | 76.7 | 23.3 | | | | |
| Age at marriage (years) | Married | 68.2 | 31.8 | -0.571 | 0.211 | 0.565 | 0.231–1.383 |
| | ≤14 | 66.7 | 33.3 | | | | |
| Age at marriage (years) | 15–17 | 69.6 | 30.4 | -0.571 | 0.211 | 0.565 | 0.231–1.383 |
| | ≥18 | 66.7 | 33.3 | | | | |
| | ≥18 | 66.7 | 33.3 | | | | |
| Life skills* | High | 66.1 | 33.9 | -1.017 | 0.024 | 0.362 | 1.140–6.711 |
| | Low | 80.9 | 19.1 | | | | |

Cox & Snell R² 0.085 Nagelkerke R² 0.124 * significant adjusted OR

still a concern in seeking healthcare due to the lack of rational thinking and decision-making skills. A previous study showed that 62% of girls did not seek treatment for their menstrual morbidity since they thought it was not important.¹³ Adolescent girls should be taught about the importance of health-seeking when required and empowered to break their silence. This study showed a higher use of sanitary napkins among students and higher literacy rate than NFHS-3 (86.4%).¹² This suggests that improved education status of adolescent girls would lead to improved menstrual hygiene practices.

A higher prevalence (52%) of one or more symptoms suggestive of RTI / UTI was observed, which could be caused by unsanitary conditions and to a certain extent the use of unclean menstrual

protectors. While one study had a comparatively lower prevalence of RTI (16%), another study had a higher rate of 64%.^{14,15} Logistic regression showed that respondents who were unmarried or married before 14 years of age had a higher risk of RTI/UTI primarily due to a lack of hygiene practices and lower awareness regarding symptoms of RTIs.

Logistic regression showed that respondents with low life skills had more menstrual morbidity. Adolescent girls dwelling in slums with low life skills had reduced coping mechanism, rational thinking and decision-making which in turn could have had an impact on the reporting of their menstrual problems. This study found that adolescent girls from the SC community, dwelling in Chennai slums had a lower risk of menorrhagia. This finding was

TABLE V. Risk factors for symptoms suggestive of reproductive/urinary tract infection (RTI/UTI)

| Factors | Categories | RTI/UTI (%) | | Regression coefficient | Significance | Adjusted OR | 95% confidence interval |
|--------------------------|-----------------|-------------|--------|------------------------|--------------|-------------|-------------------------|
| | | Present | Absent | | | | |
| Age (years) | 13–14 | 61.1 | 38.9 | –0.108 | 0.745 | 0.898 | 0.469–1.719 |
| | 15–17 | 50.9 | 49.1 | | | | |
| | 18–19 | 49.1 | 50.9 | | | | |
| Community | Scheduled caste | 50 | 50 | –0.188 | 0.305 | 0.828 | 0.578–1.187 |
| | Others | 56.7 | 43.3 | | | | |
| Religion | Hindu | 55.4 | 44.6 | 0.582 | 0.087 | 1.789 | 0.919–3.483 |
| | Others | 42.1 | 57.9 | | | | |
| Education | Illiterate | 71.4 | 28.6 | 0.118 | 0.570 | 1.126 | 0.748–1.693 |
| | Primary | 51.3 | 48.7 | | | | |
| | Secondary | 46.7 | 53.3 | | | | |
| | Vocational | 66.7 | 33.3 | | | | |
| Occupation | College | 50 | 50 | 0.011 | 0.959 | 1.011 | 0.664–1.540 |
| | Students | 51.4 | 48.6 | | | | |
| | Others | 51.8 | 48.2 | | | | |
| Marital status* | Single | 53.5 | 46.5 | 2.046 | 0.046 | 7.735 | 1.034–57.883 |
| | Married | 47.7 | 52.3 | | | | |
| Age at marriage (years)* | ≤14 | 58.3 | 41.7 | 0.907 | 0.050 | 2.477 | 0.724–3.236 |
| | 15–17 | 47.8 | 52.2 | | | | |
| | ≥18 | 33.3 | 66.7 | | | | |
| Life skills | High | 45.2 | 54.8 | –0.427 | 0.265 | 0.653 | 0.309–1.381 |
| | Low | 57.4 | 42.6 | | | | |

Cox and Snell R² 0.077 Nagelkerke R² 0.103 * significant adjusted OR

supported by the study since adolescent girls belonging to the SC community had higher life skills scores and those with higher life skills had lesser menstrual morbidity. Therefore, adolescent girls belonging to the SC community had better life skills, hence their risk of menorrhagia or the risk of reporting of menorrhagia was less compared to other communities in this study. This study also found an association and increased chance for respondents belonging to the SC community having higher life skills compared to others. In contrast, another study done in Haryana revealed that adolescents who belonged to a certain community had significantly higher mental health status, self-control and self-sufficiency.¹⁶ A probable reason for the higher life skills observed among girls in the SC community could be their larger proportion in slums leading to better social cohesion compared to the non-SC girls who were the minority in that setting.

A higher pregnancy rate of 35% was observed in this study, possibly due to early marriage and poor contraceptive use. There was also a total lack of knowledge of the fertile period during the menstrual cycle, while the NFHS-3 found 5% adolescent girls had knowledge of the fertile period, which also acts as a contributing factor for the higher pregnancy rate.¹² It could also be due to poor adolescent sex education, awareness about complications of adolescent pregnancy and pre-marital counselling. Besides jeopardizing her well-being, a teenage pregnancy would be a hurdle for her further development and success. NFHS-3 had a higher total fertility rate (TFR) among 15–19-year-old girls in the slum community compared to the non-slum community and the pregnancy rate was 12.6% among slum-dwelling adolescent girls in Chennai.^{4,12}

A WHO study showed that 50% of stillbirths and neonatal deaths occurred in adolescent pregnancy in contrast with other ages.⁹ This study also showed that 16% of stillbirths among adolescent girls who delivered, were mainly due to early childbirth. The institutional delivery was 100% in the study and NFHS-3 also showed that institutional delivery was universal in slums in Chennai.⁴ Despite 100% institutional delivery and 82% seeking

abortion services from public hospitals, self-treated abortions (unsafe) were reported, which indicated a lack of awareness regarding complications of abortions, lack of women empowerment in the community to reach a health facility for abortion, stigma towards abortion, unfriendly health services, poor contraceptive knowledge, unmet needs and deliberate suppression of abortion-related facts.^{17,18}

WHO has stated that 13% of maternal mortality in developing countries is due to unsafe abortion-related deaths. Despite all these measures the issue of unsafe abortions remains one of the most neglected public health challenges.¹⁷ Fourteen per cent of unsafe abortions were accounted for by women below 20 years of age.¹⁸ Even though abortion has been legalized in India, accessibility to expert care remains restricted because of barriers such as geographical inaccessibility, shortage of trained care-providers and affordability impacting access to services.¹⁸ Lack of knowledge about the services and confusion about legality of abortion contributes to unsafe abortion practices.¹⁸ A study in Nigeria showed that unsafe abortions accounted for 72% deaths of girls below 19 years and those who survived had fertility problems.¹⁸

This study showed a higher awareness (75%) of HIV/AIDS than the NFHS, in which it was 66%.¹² But knowledge on modes of transmission and prevention was very low due to lack of sex education, leading to a higher risk of HIV/AIDS. This could also be due to lack of communication and stigma towards HIV/AIDS. A baseline study by the United Nations to strengthen life skills for positive youth health behaviour showed a high level of awareness and knowledge of HIV but not with prevention of HIV. On the other hand, post-life skill training showed a significant improvement in knowledge of HIV, modes of transmission and prevention.¹⁹

The study findings endorse the need to strengthen the existing adolescent reproductive health policies to reach vulnerable urban communities. Community-level adolescent health programmes such as ICDS and School Health Programme should be streamlined to provide better accessible care to adolescents living in slums.

There is an urgent need to initiate comprehensive community-level reproductive, sex and life skill education for slum-dwelling adolescents. Adolescent health clinics (ARSH) in public hospitals should be made more accessible to slum-dwelling adolescent girls to improve their knowledge on menstrual and sexual health. Urban health centres should expand their services to provide comprehensive abortion care to reduce unsafe practices or risk of abortion among adolescent girls in vulnerable sections of the community. Training and sensitization of health system staff on adolescent care should be expanded. The findings suggest the importance of implementing rational drug practices and the role of the public health system in ensuring barriers to self-access to drugs related to abortion. Strategies need to be developed to improve the reproductive health status and life skills of these vulnerable groups to have healthy future generations. Empowering adolescents and addressing social determinants in slums such as sanitation and education would be key to achieve the target of the Millennium Development Goal-5 (MDG-5).

Although the sampling method followed in this study was its core strength, the smaller sample size was a limitation due to constraints on resources. Since it was a multi-stage sampling the sample size needed to include the design effect, but it was not considered during the study which was one of the limitations of the methodology. However, at a later stage the design effect was included and it was found that the sample size remained the same. There could be reporting bias in the pattern of morbidity since it was based on only symptomatic diagnosis and not clinical diagnosis. The study did not assess the adolescent care services provided by the public health system and the community-level health/sex education provided for adolescent girls dwelling in slums, which could have contributed to specific recommendations. This could be an area for further research. A larger sample size would have allowed the results to be generalizable to other similar urban slum populations in the country. The causal association of adolescent reproductive and menstrual health and life skills could be an interesting finding when it is extrapolated to a larger sample size. There is scope to conduct a post-intervention survey after implementing effective reproductive/sex, life skill education and behaviour change programmes. An explorative study is required to understand the needs of adolescents' sex education and reasons behind unsafe abortion practices.

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