

Assessment of Health Aspects of Tribal Adolescent Girls in India's Most Populous Tribal State: A Two-Decadal Review

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ABSTRACT

Madhya Pradesh is India's largest tribal population state, with 46 tribal groups accounting for 21.1% of the total population. While numerous studies on tribal health in general were conducted, research on the health risks coverage of adolescent girls in Madhya Pradesh was inadequate. This paper aimed to identify the current health delinquencies of tribal adolescent girls living in Madhya Pradesh. In the present study, 23 research papers published from 1st January, 2000 to 18th July, 2022 were selected for review, while another 38 papers were reviewed to understand the background of adolescent health issues. The papers for review were selected by applying certain criteria in accordance with the study objective. Google Scholar and the PubMed database were used to search for relevant research articles, and the final selection was done after an in-depth reading and suitability of the subject. Major health risks are identified as anaemia and IFA supplementation, reproductive health, malnutrition, and menstrual hygiene. High proportion of anaemia (52%-94%) was observed. Rate of underweight (20.1% to 72.7%), wasting (9% to 61.1%), and stunting (20.1% to 32.3%) indicated undernutrition among adolescence girls. Girls were infected by Human Papillomavirus and Sexually Transmitted Disease. Limited knowledge on Human Immunodeficiency Virus, contraceptive methods, and sexual routes of transmission were found among tribal girls. Low birth weight babies as a result of early marriage and stillbirth were major concerns among adolescent tribal girls. The analysis revealed that lack of information on health services, social-cultural factors and deprivation from health care access are responsible for unfortunate health situation of tribal girls. More comprehensive studies with a holistic approach on identified issues are essential for effective adolescent friendly policy implication in favour to improve prospective health.

Keywords: [Health Risk, Tribes, Adolescent Girls, Anaemia, Undernutrition, Madhya Pradesh]

INTRODUCTION

Adolescent age is the most significant stage of human life as it is the time when an individual transited through various mental and physical changes for health and body growth. WHO define adolescent as “phase of life between childhood and adulthood, from ages 10 to 19, experience rapid physical, cognitive and psychosocial

growth”¹. Adolescent girls constituted 1.2 billion globally² and it is nearly 21 % of India’s population (243 million). WHO identified that leading health risks for 10-14-year-old girls are mostly related to water, hygiene and sanitation; while 15-19-year age group girls are vulnerable for unsafe sex, abortion and pregnancy related complexity². Adolescent girl’s health is

more pathetic among tribal communities as they are shy in nature³, face precise barriers in accessing health care service and also unavailability of those services⁴.

Tribes in India accounted 104 million which is 8.6 % of its total population⁵. Constitutionally these communities are known as 'Schedule Tribe' (Article 342); presently the number of such communities⁶ is 635 out of which 75 tribal communities are designated as 'Primitive Vulnerable Tribal Group' (PVTG) based on their degree of use of pre-agricultural technology, low literacy, decreased population and relative isolation^{6,7}. Tribes in India mainly reside in five geographical zone primarily in remote hill and forest areas of the country⁷. Nonetheless they are mostly marginalized and vulnerable section of the society⁸ as report suggested tribes are considerably behind non-tribal population in terms of health and livelihood issues⁹. Health deprivation was observed through different studies conducted by scholars on various dimension of health vulnerability among tribes^{10, 11}. Disease burden are relatively high in tribes compared to non tribes¹². Major prevailing disease among the tribes are communicable disease (Tuberculosis, Malaria, Sexually Transmitted Disease), non-communicable disease (Malnutrition, Anaemia, Vitamin deficiency) and genetic disorder or disease (Sickle cell anaemia, G6PD) in nature^{13, 14}. Moreover, 80 % of malaria cases are predominantly detected in areas where tribes are numerically higher and 46 % deaths were happened due to malaria occurred in tribal districts¹⁵. High prevalence of tuberculosis¹⁶ chronic malnutrition^{17, 18} anemia among reproductive women^{19, 20} etc. are decidedly prevail among tribes of India.

Tribal health situation in Madhya Pradesh is not much differ from the national scenario. Socio-economic obstacles^{21, 22}, complex terrain²³ and unavailability of health care services²⁴, were playing crucial role in prevailing disease burden among tribes in Madhya Pradesh. Under five child mortality is alarming (54.6 %) among tribes compared to others 45.4 %; frequency of antenatal

care visit by tribes is 55.5% whereas it is 62 % for others; 76.9 % of tribal children belong to 6-59 months age group are affected by anemia, 64.2% women in reproductive age group (15-49) are anemic²⁵. Significant number (70%) of anemic adolescent girls were found in Baiga tribe in Mandala district²⁶. Child and adolescent malnutrition are exceedingly observed among tribal districts of Madhya Pradesh²⁷⁻²⁹. Tuberculosis is disproportionately high among Saharia tribe of Madhya Pradesh compared to not only from general population, but also much high from other tribes of India³⁰. Information and knowledge about health and hygiene practices specifically during menstruation period among tribal adolescent girls and women were found to be lower as compared to others³¹.

Plenty of studies are available which have examined health vulnerability of tribes from different perspective. However, health risk of adolescent girls was not adequately examined compared to other age group of tribes. Existence of socio-psychological barriers prevented tribal girls to express their health problem³². Even unhealthy environment of workplace disposed them to disease burden³³. For example, Tribal girls are engaged in household activities including collection of fuel wood from forest, involved in agricultural works, village market, worked as labour³⁴⁻³⁵. These places are not provided with basic necessities to maintain hygiene and it caused for many diseases among tribal girls. In this perspective, this paper is aimed to identify the prevailing health hazards among tribal adolescent girls. This review article provides an inclusive understanding of the health-related hazards of tribal adolescent girls of Madhya Pradesh as well as an insight to take effective adolescent friendly measures and policy implication in favour to improve prospective health.

MATERIALS & METHODS

This paper basically concentrated on tribal adolescent girls of Madhya Pradesh. The State has highest number of tribal

populations in the country, constituted 21.1 % of its total population. The Ministry of Tribal Affairs, Govt. of India has recognized 46 tribe of Madhya Pradesh as 'Scheduled Tribe', among them 3 tribes namely Baiga, Bharia and Saharia of Madhya Pradesh are identified as 'Primitive Vulnerable Tribal Group', based on their backwardness from mainstream population⁶. Economically, tribes of Madhya Pradesh are marginalized and extensively depend on locally available natural resources for their livelihood. Tribes in Madhya Pradesh are ranked low in Human Development. Illiteracy, poverty and poor health care access are acted as obstacle among tribes of Madhya Pradesh^{23, 36}. These are reason to select Madhya Pradesh as study state, particularly the assessment of health issues of adolescent tribal girls.

The data for this paper was collected from published research articles of 2 decades for the period of January, 2000 to July, 2022 through Goggle Scholar and PubMed database. Systematic review method was applied to select research articles and reports. After initial review, articles were further scrutinized to short out more appropriate research articles keeping the

purpose of present review. Eventually articles for main review were categorized based on criteria like location of the study should be in Madhya Pradesh and it must focus on adolescent tribal girls as study population. However, in certain cases few articles were considered for review in which comparative information available between tribes of Madhya Pradesh and its neighbouring states. After applying these criteria, 23 papers were particularly found to be suitable for review and results. Though, another 38 papers on tribal health in general were reviewed to understand the background of the problem. These articles were analysis thoroughly in order to comprehend the health risk of tribal girls in Madhya Pradesh.

RESULT

Analysis of the papers revealed that four type of health hazards are mainly prevail among tribal girls of Madhya Pradesh. According to available research articles, identified health risks are (1) Anaemia and IFA Supplementation (2) Reproductive Health Problem (3) Growth and Nutritional (4) Menstrual Hygiene Habits. The outcome of the analysis is interpreted below.

Table 1: Anaemia and IFA Supplementation among Tribal Girls

SN	Findings	Data source and Used Method	Study Area /State	Reference
1	Prevalence of anaemia in the age group 15-20 is 56%. Only 26% consumed iron supplements. Strong association was established between anaemia and malnutrition	National Family Health Survey (NFHS) 2015-16 Statistical Method	Madhya Pradesh	37
2	Prevalence of anaemia-76.7% Significant correlation of mean Hb, mean corpuscular Hb (MCH) and mean corpuscular volume (MCV) between α gene deletion mutations was observed.	Hb electrophoresis and or high-performance liquid chromatography for hemoglobinopathies and α -thalassemia for polymerase chain reaction.	Dist.-Mandala, Chindwada, Dindori, Madhya Pradesh	38
3	Overall prevalence of anaemia among female (including adolescent girls and women) is 52 %. BMI, illiteracy and mother's parity were the determinants of anaemia in rural areas.	National Family Health Survey (NFHS) 2015-16 Statistical techniques were used to identify the social causes of anaemia.	Madhya Pradesh	39
4	57.65% girls were anaemic out of which 20.4 % are affected by severe anaemia. 29.4 % and 51.7 % girls were unaware about the cause and symptom of anaemia.	Cross sectional study Anthropometric and socio demographic data collected through semi structured questionnaire. Hemoglobin level was estimated using Hemocue (Hb 201)	Bhopal, Madhya Pradesh	40
5	Prevalence of anaemia was higher in girls ((83%) who have worms in their stool. Excessive bleeding was found among anaemic girls	Cross section study. Anaemia was confirmed after Haemoglobin estimation and analysis. Statistical tools were employed in data analysis.	Belkhera PHC, Jabalpur, Madhya Pradesh	41
6	Post intervention anaemia was 94 %, it reduced to 69% after providing IFA supplementation pill to tribal adolescent girls. Various social factors are examined to test the feasibility of IFA supplementation pills.	Community based pre-& post intervention clinical study. Stat Pac Statistics Calculator was used to analysis the data.	Dist.- Mandala Madhya Pradesh	26
7	Anaemia among girls was highly presented (86.5%). Closed association was observed between malnutrition and anaemia as 61.7% anaemic girls were underweight. Heavy worm load also found among anaemic girls.	Cross sectional study Nutritional status was determined according to Standard Deviation (SD) classification. Haemoglobin estimation was done through 'cyanmethaemoglobin method'.	Block- Kundam Dist.- Jabalpur Madhya Pradesh	42

Table 1 reveals various information on anaemia affected tribal adolescent girls in Madhya Pradesh. Analysis showed that anaemic girls are significantly higher compared to other age group belong to both tribes and non-tribes. Percent range of anaemia affected girls varied from 52% to 94% including severe anaemia. Anaemia is a very serious and commonly seen problem in adolescent girls as compared to adolescent boys, which also gives rise to

other health problems as mentioned in table 1. Adjacent relationship between malnutrition and anaemia was noticed among tribal girls as studies reported most anaemic girls are affected by malnutrition^{37, 42}. An intervention study among tribal girls revealed that IFA supplementation tablet can reduce iron deficiency which is necessary to prevent anaemia. Girls with lower hemoglobin are also disposed to worm infection as mentioned by studies^{41, 43}.

Table-2: Reproductive Health Risk of Tribal Girls

SN	Findings	Data source and Used Method	Study Area	Reference
1	Awareness of adolescence changes is 40 % among tribal girls compared to others 70 %. Only 32% of tribal girls have knowledge about STD/HIV/family welfare against 71% of general population.	Cross sectional study Predesigned questionnaire Used SPSS to analysis the data	Gwalior, Madhya Pradesh	43
2	Tribal girls (12.3 %) of Madhya Pradesh was infected by Human papillomavirus (HPV). Menarche and sexual partner were associated factor for HPV infection	Cross sectional study. Questionnaire used for Collecting socio economic data. Self-collected urine sample was collected and analysis in PCR to detect HPV	Hosangabad (Now Narmadapuram), Madhya Pradesh	44
3	Knowledge about contraceptive method (e.g. use of condom) is 41.5 in tribal girls against 71.5 % among non-tribal. Usage of contraceptive is lower compared to non-tribes. Self-resistance to use contraceptive was observed due to lack of knowledge.	NFHS III (2007-2008) Bivariate technique and cross tabulation method used to understand level of knowledge.	Madhya Pradesh	45
4	Saur tribal girl mostly marriage at 15 years age (21.18%), marriage at 16 is 20.68%, while mean age of marriage is 16.6. High infant (89.07%) and child (86.93%) mortality was found in case delivery was conducted by <i>dai</i> in home (84.2%).	Door to door survey, formal and informal interview and group discussion	Chattarpur, Madhya Pradesh	46
5	Knowledge about STI is 9%, while only 19% knew that its sexual route of transmission. 27 % them went to traditional healers and 30 % of them used home remedies for STI treatment	Cross sectional study	Jabalpur Madhya Pradesh	47
6	Out of 2206 study sample, 172 had symptomatic reproductive tract infections. Bacterial vaginosis is most common RTI	Cross sectional study having clinical test.	Jabalpur Madhya Pradesh	48

Table 2 informed about the studies conducted on reproductive health risk of tribal girls of Madhya Pradesh. It revealed that tribal girls were unaware about coming of age changes and its proper behavior. Knowledge about Sexual Transmitted Infection (STI)/HIV/family welfare is extremely low compared to non tribes⁴⁴⁻⁴⁵.

Presence of reproductive tract infection like HPV infection was found among tribal girls⁴⁸. Onset of early age marriage was observed among tribal adolescent girls and infant mortality was high in case of non-institutional delivery conducted by unskilled person⁴⁶.

Table-3: Growth and Nutritional Status

SN	Findings	Data source and Used Method	Study Area	Reference
1.	38.46% and 32.3% of adolescent tribal were underweight and stunted respectively. Similarly, alarming situation was found as 69.2% of adolescent girls were undernourished when determined by BMI.	Cross sectional study Purpose sampling method was used to collect information	Chhindwara, Madhya Pradesh	49
2.	Mother of Low Birth Weight (LBW) babies were found malnutrition during their adolescent stage.	Cross sectional study Pretested and predesigned questionnaire was used to collect primary data	Alirajpur, Barwani and Khandwa of Madhya Pradesh.	50

3	High growth between 11 to 12 years for Korku girls (8.02%) and the lowest 0.37% between ages 15 to 16 years, and 6.78% and 0.56%, respectively, for Gond girls.	A cross-sectional study in Korku and Gond tribal girls aged 6 to 18 years	Betul district, Madhya Pradesh	51
4	Fruit, flesh food, oil, fat, vegetables, milk and milk products are inadequate in daily intake against recommended allowance among tribe. Consumption of micronutrient are significantly low which lead to nutritional deficiency.	Community based cross sectional study Pretested and predesigned questionnaire was used to collect demographic data	Baihar block, Balaghat district, Madhya Pradesh	52
5	Waste and Stunt percentage was 36.2% and 42.2% respectively. Severely stunt and waste was 20.1% and 9% among tribal girls	Random sampling using pre-tested and structured interview schedule. Dietary information was collected by 24hr recall method.	Dindori district in Madhya Pradesh.	53
6	Girls are more vulnerable to malnutrition (72.7% are underweight and 61.1 % are wasted) compared to boys (66.2% underweight and 56.4% wasting). In girls aged 10-12, there was 40.4% (34gm/dl) deficiency in protein intake in contrast to RDA (57gm/dl). Also, there was 57.5% deficiency in energy intake (K cal/d) than RDA.	Cross-sectional study In-built 24-hour diet recall method was used to assess food and nutrient intakes	Indore, Madhya Pradesh	54
7	The BMI according to the Indian standard was normal. but when the data was compared with the international standard malnutrition in both sexes was noticed in childhood	Cross sectional study	Dindori, Madhya Pradesh,	55

Table 3 describes the growth and nutritional status of tribal adolescent girls. Analysis shows that underweight varied from 20.1% to 72.7%, wasting varied from 9% to 61.1%, whereas stunting varied from 20.1% to 32.3%. A cross-sectional study conducted in Indore among girls of the Bhil tribe found the prevalence of underweight and wasting to be 72.7% and 61.1%, respectively. In another study⁴⁹, the prevalence of

underweight and stunting was reported to be 38.46% and 32.3%, respectively. According to a study conducted by Ajeet Jaiswal in 2013, the author found 36.2% wasting and 42.2% stunting among Baiga tribe. A relationship was noticed between women who were suffering from malnutrition during their adolescence are subjected to give low birth weight babies who are subsequently become malnourished⁵⁰

Table-4: Menstrual hygiene knowledge and habits

SN	Findings	Data source and Used Method	Study Area	Reference
1.	12.5% of total adolescent girls were unaware of the sanitary napkin/pad, whereas 25% of tribal adolescents used old cotton during the menses. 75% used soap and water, and 25% used only water for cleaning of the genital area. 63% of adolescent girls used a method that was hidden under other clothes.	Field survey was used Pre-designed questionnaire was used by trained female investigator to collect relevant information.	Tamia block. Chhindwara district. Madhya Pradesh.	56
2.	Pre-Intervention cloth use is 16.21%, and Sanitary pads use: 83.78%. Post Intervention cloth use reduced to 13.57%, Sanitary pads use: 86.48%	Cross-sectional study	Jabalpur (rural area) M.P	57
3	Significant association seen between pre-menarche knowledge and the type of absorbent used during periods. Educating teenage girls about menstruation throughout school years leads to acceptance of safe menstrual hygiene practices. Correlation was reported on maintaining cleanliness of the external genitalia during menstruation and the inhabited area between urban or rural girls inferring that urban girls practiced better MHM.	Cross sectional study Cramer's V	Bhopal, Indore, Balaghat, Rewa, Jhabua and Bhind, Madhya Pradesh	58
4.	Compared to 73% of urban adolescent girls, 53% of tribal girls correctly answered the usage of sanitary napkins during menstruation. Only 43% of tribal girls said that personal cleanliness was important throughout the menstrual cycle. However, only 30% of tribal teenage females were aware that good hygiene prevents STDs.	Cross sectional study Predesigned questionnaire was used to collect	Gwalior, Madhya Pradesh.	59

Table 4 represents the menstrual hygiene knowledge and habits of tribal adolescent girls. According to a study conducted⁵⁸ in 6 districts of MP, reported poor hygiene

practices of external genitalia in rural girls as compared to their urban counterparts. A pilot survey conducted by Kumar et al. in Bharia tribal girls aged 10 to 19 years found

use of old cotton during the menses in 25% of the respondents. In his study, Jain et al. 2022 reported that awareness of personal hygiene was important during menses in 43% of tribal girls⁵⁹. A cross-sectional

study⁵⁷ which included pre and post surveys found a decrease in cloth use and an increase in sanitary pad use in rural areas after an intervention (IEC aided educational) program.

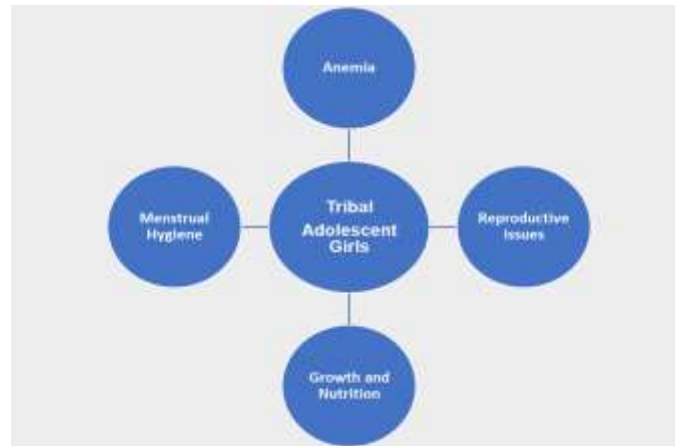


Figure1. Health Risk Factors of Tribal Adolescent Girls

Identified four major health gaps, these are: Anaemic, Unhygienic menstrual, inadequate growth. Reproductive issues are responsible to the poor health of tribal adolescent girls in Madhya Pradesh State.

DISCUSSION

Present review highlighted the prevalence of health risk factors among adolescent tribal girls of Madhya Pradesh. Based on an in-depth analysis four major type of health risk were identified. Among these, problem of anaemia and IFA supplementation and

growth and nutritional status were mostly studied by scholars (Fig 1) along with problem of growth and nutrition. The analysis revealed that menstrual hygiene practice and habits was least studied matter, though it is one of the important health risk factors among adolescent tribal girls considering the poor socio-economic background. These reflected that studies on health specific issues of adolescent girls are very rare in Madhya Pradesh even though they constituted a majority number in tribal population.

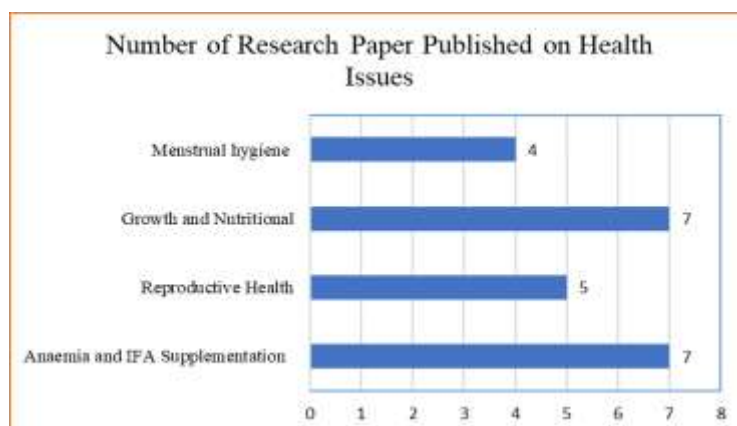


Figure 2. Number of Research Paper Published on Health Risk of Adolescent Tribal Girls

Tribal girls are suffering with many health issues including problems of anaemia caused by iron deficiency which was mostly

researched. Adolescent tribal girls belong to the tribal districts of Madhya Pradesh are severely affected by this public health

problem (Table 1). The highest prevalence of anaemia was seen among tribes of Mandala district²⁶ while overall anaemic women is 52 %³⁹. Three studies reported more than 80% of adolescent girls were anaemic among tribes^{26, 38, 42}. Various socio-economic factors like food insecurity, illiteracy, negligence of girl children, low hygiene practice and lack of willingness towards health and wellbeing are strongly associated with prevalence of anaemia³⁷.

In order to overcome the burden of anaemia among Indian population including marginalized section of society, the Government of India has introduced a country wide programme known as “Anaemia Mukta Bharat (AMB)” (Anaemia Free India) in 2018⁵⁹ with the aim to reduce maternal and child anaemia by 3% per year⁶⁰. The AMB programme has six key intervention plans, these are “(1) IFA supplementation, (2) deworming, (3) behaviour change communication campaigns (4) testing of anaemia using digital methods and point of care treatment, (5) mandatory provision of IFA fortified foods in public health programmes and (6) redressal of non-nutritional causes of anaemia in endemic pockets with special focus on malaria, haemoglobinopathies and fluorosis”⁶¹. The programme was launched in several states including Madhya Pradesh. So far, the performance was satisfactory compared to other states. As IFA supplementation coverage in Madhya Pradesh was increased from 46.7% in 2017-18 to 60% in 2018-19, increased by 13.3%⁶¹. However, despite this massive intervention programme, prevalence of anaemia in Madhya Pradesh was not reduced appropriately. NFHS 5 (2019-21) reported that 73 % children aged 6-59 months were anaemic compared to 69 % in NFHS- 4. In case of women, 55 % are affected by anaemia, increased by 2 % compared to NFHS 4. The analysis of the paper has also shown high occurrence of anaemia among adolescent girls. Effective supply chain system is very necessary for successful intervention programme.

Concern authorities should take care that IFA tablets, iron fortified foods and proper communication should reach to remote tribal areas in order to overcome the problem of anaemia as one study reported that post intervention of IFA pills reduced anaemia to some extent among Baiga tribal girls²⁶.

Several studies have found that underweight, wasting, and stunting are common among adolescent girls. A cross sectional study⁵³ reported a higher prevalence of underweight (72.7%) in the Bhil tribe as compared to a study done by Ahirwar et al. in 2020 in Bharia girls, in which 38.46% were underweight⁴⁹. Additionally, deficiency in protein (40.4%) and energy intake (57.5%) in comparison to the recommended daily allowance was observed in a study⁵³. A special article⁵⁰ described that pregnant women who gave low birth weight babies are often experienced malnutrition during their adolescence period. The inference from the above observation is that the nutritional status of adolescent girls is low and may vary across different tribes. Again, it is found that, studies were inadequate to address nutritional status and its underline socioeconomic causes of tribal girls in Madhya Pradesh as it was observed most studies were focused on nutritional status of pre-school children during the review. Further, there is a need to examine the effectiveness of several government policies aimed to reduce the burden of undernutrition. For example, sufficient studies are unavailable to inspect the impact of Poshan Abhiyan (India's flagship programme to reduce nutritional deficiency among children, adolescent girls and boys, pregnant and lactating mothers), National Food Security Mission and Mid-Day Meal programme as these are particularly aimed to decrease the burden of malnutrition among children and adolescent. Moreover, community specific programme and their participation is needed to enhance nutritional deficiency. For active implementation of this kind of programme

required properly trained manpower (like ASHA, Anganwadi workers), appropriate infrastructure, regular food supply in tribal areas and development of logistic arrangement.

Reproductive health problems are another neglected health issue among tribal girls. The paper observed that, girls are significantly unaware about changes during adolescence period. Knowledge about contraceptive methods, HIV and STI are severely low compared to non-tribes among adolescent girls⁴³⁻⁴⁵. Tribal girls are also suffered by disease like HPV and reproductive tract infection as revealed by analysis^{44, 47}. Adolescent girls who were married before prescribed age are likely delivered low birth weight babies while child mortalities are high due to delivery by unskilled person. Similarly, the problems menstrual hygiene and practices are ignored as there is lack of empirical studies on adolescent girls. Tribal and urban adolescent girls were different in their awareness of menstruation⁴³ with tribal girls reporting that personal hygiene is important during menses at a proportion of 43% and urban girls at a rate of 69%. Similar results were noticed in a study⁵⁷ which reported that rural girls practiced poor cleanliness of external genitalia as compared to urban counterparts. However, use of other clothes during menses is prevalent among various tribes which were reported by various studies⁵⁵⁻⁵⁶.

CONCLUSION

It assumed that very few research studies have focused on tribal adolescent girl's reproductive health with holistic view. When we search about health status of tribal adolescent girl of Madhya Pradesh, we found a large proportion of research and study on this subject has merged with the context of overall adolescent (boy and girl) as well as with other state. Therefore, there is a special need for effective policies, programmes and adolescent-friendly services with special attention on adolescent girls with all-inclusive approach. Remedial

measures should include improvement of female literacy in tribal pockets, educating family members and influential village person who will promote health education and spread awareness on correct knowledge regarding reproductive health and menstrual practices. An effective Implementation Education Communication (IEC) programme on family welfare, STD, Menstrual Hygiene should be started immediately in tribal areas to create awareness among tribal girls.

Declaration by Authors

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