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Full Length Research Article

Reproductive Health Practices Among Adolescent Married Girls Of Birhor And Kolha Communities In Oupada Block, Balasore

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ABSTRACT

Reproductive health practices among tribal adolescent married girls are shaped by cultural traditions, resource availability, and limited health infrastructure access. This descriptive survey investigated practices related to menstrual hygiene, sexual behavior, and nutrition among 100 adolescent married girls (50 Birhor, 50 Kolha) in Oupada Block, Balasore District, Odisha. Using purposive sampling and structured interview questionnaires, the study hypothesized significant differences in reproductive health practices between the two tribes. Results demonstrated that 100% Birhor girls used only undergarments during menstruation versus 88% Kolha girls using old cloth. Menstrual pad washing occurred exclusively in ponds for both groups, with traditional cleaning agents (termite soil, Eukyl potash fruits) preferred over soap. Sexual practices revealed 100% both tribes considered vaginal sex as primary mode, with 64% Birhor and 68% Kolha practicing sex during menstruation. Contraceptive use was absent among Birhors while 70% Kolha girls used temporary methods. Nutritional practices showed universal non-vegetarian preference with 100% consuming Handia and alcohol during menstruation/pregnancy for energy. The study concluded that unhygienic menstrual practices, risky sexual behaviors, and inadequate nutritional practices necessitate urgent culturally-sensitive interventions addressing tribal-specific constraints.

Keywords: *Reproductive health practices, menstrual hygiene, sexual behavior, tribal adolescents, nutritional practices.*

1. INTRODUCTION

Reproductive health practices among adolescents significantly impact immediate and long-term health outcomes, particularly in vulnerable populations lacking adequate health infrastructure and information access (Sommer & Mmari, 2015). Tribal communities in India face disproportionate reproductive health challenges due to geographical isolation, poverty, educational deficits, and cultural practices that may contradict evidence-based health recommendations (Basu & Basu, 2005). Adolescent married girls within these communities experience compounded vulnerabilities, combining age-related developmental needs with marital and reproductive expectations often

unsupported by adequate knowledge or resources (Jejeebhoy & Sathar, 2001). The Birhor and Kolha tribes of Odisha represent distinct indigenous populations with unique socio-cultural contexts influencing health practices. Birhors, categorized as Particularly Vulnerable Tribal Group, maintain traditional semi-nomadic hunter-gatherer lifestyles in remote forest areas with minimal modern amenities (Roy, 2005). Their extreme isolation creates barriers to healthcare access and exposure to contemporary hygiene practices. Kolha tribes, while retaining traditional cultural elements, have experienced greater integration with mainstream society, potentially influencing health practice patterns (Mohanty, 2001). Menstrual hygiene practices among tribal adolescents have garnered increasing research attention following recognition that inadequate menstrual management contributes to reproductive tract infections, school absenteeism, and psychological distress (van Eijk et al., 2016). Traditional practices involving reusable cloth materials, inadequate washing facilities, and improper disposal methods create infection risks, particularly when combined with taboos restricting hygiene behaviors (Chandra-Mouli & Patel, 2017).

Sexual behavior practices among tribal adolescent married girls remain under-researched despite early marriage prevalence and associated health risks. Limited contraceptive use, multiple sexual partnerships, and inadequate STI prevention practices documented in some tribal populations raise concerns about reproductive morbidity (Priyanka & Murthy, 2018). Understanding actual sexual practices versus reported beliefs provides critical insights for designing appropriate interventions. Nutritional practices during reproductive phases menstruation, pregnancy, and lactation significantly impact maternal and child health outcomes. Tribal populations' heavy reliance on forest foods, seasonal availability variations, and cultural food restrictions create nutritional vulnerability (Ghosh-Jerath et al., 2015). Adolescent nutritional needs during reproductive phases may be further compromised by traditional practices limiting dietary diversity or quantity. This study systematically documents reproductive health practices across menstrual hygiene, sexual behavior, and nutrition domains among Birhor and Kolha adolescent married girls, filling critical knowledge gaps essential for developing evidence-based, culturally appropriate health interventions for tribal adolescent populations.

2. LITERATURE REVIEW

Menstrual hygiene practices vary substantially across Indian tribal communities based on resource availability, cultural norms, and health infrastructure access. Research by Thakre et al. (2011) documented that only 11.25% of rural adolescent girls used sanitary napkins, with majority relying on old cloth pieces. Among tribal populations specifically, van Eijk et al. (2016) found that menstrual hygiene management practices were substantially poorer than national averages, with limited access to clean water, private washing facilities, and disposal mechanisms. Studies by Sahoo et al. (2015) in Odisha revealed that 78.9% of tribal adolescent girls used old clothes during menstruation, washing them in open ponds or streams without adequate cleaning agents. Washing and disposal practices significantly impact infection risks. Dhingra et al. (2009) documented that inadequate menstrual hygiene, particularly reuse of improperly washed materials, correlates with increased reproductive tract infection prevalence. Research by Vashisht et al. (2018) demonstrated that traditional cleaning agents like ash and mud, while culturally accepted, provide inadequate pathogen removal

compared to soap and water. Drying practices also matter Omidvar et al. (2018) found that indoor drying in shade increased bacterial contamination risks compared to sun-drying. Sexual behavior practices among tribal adolescents reflect complex interactions between traditional norms, peer influences, and limited reproductive health knowledge. Ackerson and Subramanian (2008) documented high rates of early sexual debut among married tribal adolescents, often without adequate STI or pregnancy prevention knowledge. Research by Priyanka and Murthy (2018) revealed that tribal adolescent girls rarely negotiated condom use, citing cultural inappropriateness and male partner resistance. Studies by Mehra et al. (2014) indicated that premarital and extramarital sexual relationships occur more frequently in some tribal communities than acknowledged publicly, creating STI transmission risks.

Contraceptive practice patterns among tribal populations show substantial unmet need for family planning. National Family Health Survey (NFHS-4) data revealed tribal women's contraceptive prevalence rate at 31.5% compared to 53.5% nationally, with preference for permanent over temporary methods (International Institute for Population Sciences, 2017). Barriers include limited access to health facilities, inadequate knowledge about contraceptive options, side effect concerns, and cultural resistance. Research by Kambo et al. (2003) found that tribal women frequently relied on traditional contraceptive methods like herbs and abstinence despite low effectiveness. Nutritional practices during reproductive phases among tribal populations demonstrate reliance on traditional food sources with seasonal variations affecting dietary adequacy. Ghosh-Jerath et al. (2015) documented that tribal diets in India are predominantly carbohydrate-based with limited protein diversity, dependent on forest foods and agriculture. Research by Toteja et al. (2006) revealed high anemia prevalence (86%) among tribal pregnant women, correlated with inadequate iron-rich food consumption and dietary restrictions. Studies by Christian (2010) indicated that pregnancy-related food taboos limiting animal protein consumption were common among tribal communities in Northeast India. Alcohol and fermented beverage consumption during reproductive phases has received limited research attention. Basu (1993) documented traditional rice beer (Handia) consumption among tribal women in Eastern India, noting cultural acceptance despite potential health implications. However, systematic research examining Handia consumption patterns specifically among adolescent married girls during menstruation and pregnancy remains scarce. Comparative studies between different tribal groups on reproductive health practices are limited. Research by Basu and Basu (2005) compared health-seeking behaviors across Indian tribal groups but did not specifically examine reproductive health practice variations. The absence of comparative data between primitive and non-primitive tribal groups represents a significant knowledge gap this study addresses.

3. OBJECTIVES

1. To assess menstrual hygiene practices among adolescent married girls of Birhor and Kolha tribes
2. To assess sexual behavior practices among adolescent married girls of Birhor and Kolha tribes
3. To assess nutritional practices among adolescent married girls of Birhor and Kolha tribes

4. To compare reproductive health practices between adolescent married girls of Birhor and Kolha tribes in Oupada Block, Balasore District

4. METHODOLOGY

The study employed a non-experimental descriptive comparative survey design to systematically assess and compare reproductive health practices among Birhor and Kolha adolescent married girls. Research was conducted in Patharapada and Majhisahi villages within Oupada Block, Balasore District, Odisha, selected based on substantial Birhor and Kolha populations, geographical accessibility, and administrative cooperation from local authorities. The study setting provided representative environments for examining tribal reproductive health practices within their natural socio-cultural contexts. The study population comprised adolescent married girls aged 10-19 years from Birhor primitive tribal group and Kolha tribe communities. Using purposive sampling technique, 100 participants were recruited with equal representation from each tribe (50 Birhor, 50 Kolha). Sample selection followed specific inclusion criteria: adolescent married girls from respective tribal communities, ability to understand and communicate in Oriya language, willingness to participate voluntarily after informed consent, physical presence in villages during data collection period, and confirmed residence in designated study villages.

Data collection utilized structured interview questionnaires developed through comprehensive literature review and validated by multidisciplinary expert panel including seven nursing specialists across various domains, one obstetrician-gynecologist, one community medicine specialist, and two anthropologists familiar with tribal cultures. The research instrument comprised three sections: Section-I contained 11 socio-demographic profile items; Section-II assessed beliefs (analyzed separately); Section-III contained 29 multiple-choice items assessing practices related to menstrual hygiene (pad type, washing locations, cleaning methods, changing frequency, drying locations, storage, menstruation-related practices, medication use), sexual behavior (intercourse modes, information sources, sexual desire triggers, partner numbers, contraceptive use, timing preferences, hygiene practices), and nutritional status (food types, dietary choices during menstruation/pregnancy, supplementation practices). Content validity was rigorously established through expert review process achieving 100% expert agreement on item relevance and appropriateness. Minor modifications suggested by experts were incorporated into final instrument. Pilot testing involved 30 adolescent married girls (15 each from Birhor and Kolha communities not included in final study sample). Pilot study confirmed instrument feasibility, clarity, and participant comprehension, with respondents demonstrating >80% understanding scores, validating questionnaire reliability for main study implementation.

Data collection procedures adhered to strict ethical standards. Formal verbal permissions were obtained from village authorities and individual participants after comprehensive explanation of study purposes, procedures, voluntary participation nature, confidentiality assurances, and withdrawal rights. Face-to-face interviews were conducted in private settings respecting cultural sensitivities, with each interview lasting approximately 2 hours. Interview questionnaire responses were supplemented by observational data where appropriate. All participant responses were assigned code numbers ensuring

anonymity throughout data management and analysis phases. Data analysis employed both descriptive and inferential statistics. Collected data were organized in master sheets, coded systematically, and analyzed using frequency distributions and percentages to describe practice patterns. Comparative analysis between Birhor and Kolha groups utilized chi-square tests where appropriate (reported in separate analysis). Results presentation utilized tabular formats facilitating clear visualization of practice patterns and inter-tribal comparisons. Ethical considerations maintained throughout study included voluntary participation, informed consent, privacy protection, confidentiality assurance, prevention of physical/psychological harm, and unrestricted withdrawal rights without consequences.

5. RESULTS

Menstrual Hygiene Practices

Table 1: Menstrual Pad Types and Washing Practices

Practice	Birhor (n=50)	Kolha (n=50)
Pad Type Used		
Only undergarments	50 (100%)	0 (0%)
Old cloth	0 (0%)	44 (88%)
Old cloth + napkins	0 (0%)	31 (62%)
Commercial disposable napkins	0 (0%)	0 (0%)
Washing After Use		
Yes	50 (100%)	50 (100%)
Washing Location		
Pond	50 (100%)	50 (100%)

Menstrual pad usage revealed stark differences between tribal groups reflecting resource access and cultural practices. All Birhor girls (100%) used only undergarments during menstruation without any additional protective materials, indicating extreme material poverty and limited menstrual hygiene product access. This practice poses significant health risks including inadequate absorption, potential leakage, and increased infection vulnerability. In contrast, Kolha girls utilized old cloth pieces (88%) and combinations of old cloth with napkins (62%), demonstrating slightly better resource availability though still far from ideal menstrual hygiene standards. Notably, zero participants from either tribe used commercially available disposable sanitary napkins, highlighting complete absence of modern menstrual hygiene product access in these remote tribal communities. All participants from both tribes washed their menstrual materials after use (100%), demonstrating awareness of basic hygiene necessity. However, washing location practices raised serious infection concerns universally, both tribal groups washed menstrual materials in community ponds (100%), shared water sources used for multiple

household purposes, creating contamination risks and compromising washing privacy and effectiveness.

Table 2: Menstrual Pad Cleaning Methods and Changing Frequency

Practice	Birhor (n=50)	Kolha (n=50)
Washing Method		
Water only	50 (100%)	50 (100%)
Boiled water	2 (4%)	10 (20%)
Soap water	9 (18%)	13 (26%)
Sikakai fruits + water	7 (14%)	0 (0%)
Eukyl potash fruits + water	26 (52%)	32 (64%)
Termite/Alluvial soil	37 (74%)	33 (66%)
Changing Frequency per Day		
1-2 times	38 (76%)	6 (12%)
2-3 times	13 (26%)	23 (46%)
3-4 times	0 (0%)	21 (42%)

Menstrual pad cleaning methods demonstrated reliance on traditional agents with limited use of scientifically recommended soap and water. All participants from both tribes used plain water as primary cleaning agent (100%), but this alone provides inadequate pathogen removal. Soap usage was minimal only 18% Birhors and 26% Kolha girls incorporated soap, indicating either limited soap access or cultural preference for traditional agents. Traditional cleaning methods dominated: Eukyl potash fruits mixed with water were used by 52% Birhors and 64% Kolha girls, while termite soil and alluvial soil were utilized by 74% Birhors and 66% Kolha girls. These traditional agents, while culturally established, lack scientific validation for effective pathogen elimination and may introduce soil-borne microorganisms. Small minorities used boiled water (4% Birhor, 20% Kolha) and Sikakai fruits (14% Birhor only), indicating some awareness of disinfection but limited practical implementation. Changing frequency patterns revealed concerning inadequacy among Birhors 76% changed menstrual materials only 1-2 times daily, insufficient for proper hygiene and comfort. Kolha girls demonstrated better practice with 46% changing 2-3 times and 42% changing 3-4 times daily, though this still falls below recommended frequency of 4-6 times for cloth materials.

Table 3: Drying and Storage Practices

Practice	Birhor (n=50)	Kolha (n=50)

Drying Location		
In sun	45 (90%)	28 (56%)
In shade	39 (78%)	47 (94%)
Drying Place		
Hidden under other clothes	0 (0%)	50 (100%)
On mud ground	50 (100%)	50 (100%)
Storage Location		
With other clothes	50 (100%)	50 (100%)
Cow shed	0 (0%)	14 (28%)
Tree hole	0 (0%)	34 (68%)
Back of house	0 (0%)	47 (94%)

Drying practices demonstrated partial adherence to recommended sun-drying for pathogen reduction but also problematic shade-drying. Among Birhors, 90% sun-dried menstrual materials, providing UV radiation benefits for bacterial reduction, though 78% also used shade-drying (indicating combined methods or seasonal variations). Kolha girls showed lower sun-drying rates (56%) with 94% preferring shade-drying, potentially due to cultural modesty norms prioritizing concealment over optimal hygiene. Drying placement raised serious contamination concerns—all participants from both tribes dried materials on mud ground (100%), exposing them to soil pathogens, dust, and animal contact. Kolha girls additionally concealed materials under other clothes (100%) during drying, which while addressing privacy concerns, may trap moisture promoting bacterial growth. Storage practices universally involved keeping menstrual materials with regular clothing (100% both tribes), creating potential cross-contamination risks. Kolha girls utilized additional diverse storage locations including cow sheds (28%), tree holes (68%), and house back areas (94%), reflecting space constraints and cultural preferences for menstrual material separation, though these locations may expose materials to environmental contamination and animal interference.

Table 4: Menstruation-Related Practices and Medication Use

Practice	**Birhor (n=50)**	**Kolha (n=50)**
Practices During Menstruation		
Religious place prohibition	50 (100%)	50 (100%)
Head bath after menstruation	50 (100%)	50 (100%)
Bath immediately after menstruation	50 (100%)	50 (100%)

Not looking in mirror	3 (6%)	21 (42%)
Avoid visiting others' houses	12 (24%)	38 (76%)
Stay away during menstruation	1 (2%)	18 (36%)
Medication Use		
Taking medication during menstruation	0 (0%)	31 (62%)
Kaviraji medicine	0 (0%)	31 (62%)
Jadibuti (herbal medicine)	0 (0%)	31 (62%)
Naturopathy	0 (0%)	31 (62%)
Hydrotherapy	0 (0%)	6 (12%)

Menstruation-related behavioral practices reflected strong cultural taboo adherence across both tribes. Religious place prohibition was universal (100% both groups), with all participants avoiding temples and religious activities during menstruation, demonstrating deep cultural-religious intersection in menstrual practices. Bathing practices showed distinctive patterns—all participants took head baths only after menstruation completion (100%), not during menstruation itself, based on traditional beliefs about menstrual impurity. Immediate bathing upon menstruation cessation was universally practiced (100% both groups), marking ritual purification and social reintegration. Mirror avoidance during menstruation was practiced by 6% Birhors but substantially more Kolha girls (42%), reflecting varying intensity of traditional restrictions. Social isolation practices differed markedly—only 24% Birhors avoided visiting others' homes during menstruation compared to 76% Kolha girls, and while only 2% Birhors stayed away from family during menstruation, 36% Kolha girls practiced this isolation, suggesting Kolha community maintains stricter menstrual seclusion norms despite greater general acculturation. Medication usage patterns revealed complete absence of menstrual symptom treatment among Birhors (0%) contrasted with 62% Kolha girls seeking relief through traditional medicine systems including Kaviraji (traditional healer medicines), Jadibuti (herbal preparations), and Naturopathy, with 12% utilizing Hydrotherapy, indicating Kolha community's greater healthcare engagement even if primarily traditional systems.

Sexual Behavior Practices

Table 5: Sexual Intercourse Modes and Information Sources

Practice	**Birhor (n=50)**	**Kolha (n=50)**
Preferred Intercourse Mode		
Oral sex	0 (0%)	0 (0%)
Anal sex	12 (24%)	9 (18%)
Vaginal sex	50 (100%)	50 (100%)

Non-penetrative sex	50 (100%)	35 (70%)
Sexual Information Sources		
Friends	31 (62%)	36 (72%)
Boyfriends	17 (34%)	17 (34%)
Husband	50 (100%)	50 (100%)
Grandmother	29 (58%)	27 (54%)
Other relatives	15 (30%)	19 (38%)

Sexual intercourse mode preferences revealed vaginal sex as universal practice among both tribal groups (100%), representing culturally normative sexual activity. Non-penetrative sexual activities were reported by all Birhors (100%) and majority Kolha girls (70%), indicating diverse sexual repertoires beyond intercourse. Anal sex practice was reported by 24% Birhors and 18% Kolha girls, representing minority but significant proportion engaging in this higher-risk behavior with potential anal trauma and STI transmission implications. Oral sex was universally not practiced (0% both groups), either reflecting cultural prohibitions or reporting reluctance. Information sources about sexual intercourse before first engagement demonstrated informal knowledge transmission networks. Husbands served as universal information sources (100% both groups) post-marriage, but premarital information came predominantly from peers—friends (62% Birhor, 72% Kolha) and boyfriends (34% both groups). Grandmothers played significant roles educating adolescent girls (58% Birhor, 54% Kolha), representing traditional intergenerational knowledge transfer. Other relatives contributed less frequently (30% Birhor, 38% Kolha). Notably, mothers, sisters, and healthcare providers were absent as information sources, indicating substantial family communication barriers about sexuality and complete absence of formal health system engagement in sexual health education.

Table 6: Sexual Desire Enhancement and Partnership Patterns

Practice	**Birhor (n=50)**	**Kolha (n=50)**
Materials Used for Sexual Desire		
Use materials to trigger desire	50 (100%)	50 (100%)
Alcohol	50 (100%)	50 (100%)
Handia with Bakhar	50 (100%)	50 (100%)
Heavy food	29 (58%)	27 (54%)
Local Jadibuti	24 (48%)	29 (58%)
Premarital Sexual Affairs		
Had premarital sex	16 (32%)	12 (24%)
Only one premarital partner	16 (32%)	12 (24%)

Sexual desire enhancement practices revealed universal use of materials to trigger sexual arousal (100% both tribes), indicating culturally normalized practice of sexual stimulation through external substances. Alcohol consumption for sexual enhancement was reported by all participants (100% both groups), as was Handia (traditional fermented rice beer) mixed with Bakhar consumption (100%), demonstrating deep cultural integration of alcohol in sexual practices with potential health implications including risky sexual decision-making and alcohol dependence. Heavy food consumption before sexual activity was practiced by 58% Birhors and 54% Kolha girls, reflecting beliefs linking nutritional intake with sexual performance. Local Jadibuti (herbal aphrodisiacs) were utilized by 48% Birhors and 58% Kolha girls, indicating traditional medicine integration in sexual health management. Premarital sexual experience was reported by substantial minorities—32% Birhors and 24% Kolha girls engaged in premarital sexual relationships, all reporting only one premarital partner. These figures likely underestimate actual prevalence given social desirability bias in reporting premarital sexual activity, particularly among females in traditional communities. The reported premarital sexual activity challenges stereotypes of tribal sexual conservatism and highlights needs for premarital sexual health education and STI/pregnancy prevention services for unmarried adolescents.

Table 7: Extramarital Affairs, Menstrual Sex, and Contraception

Practice	Birhor (n=50)	Kolha (n=50)
Extramarital Sexual Affairs		
Had extramarital affairs	11 (22%)	9 (18%)
Only one extramarital partner	11 (22%)	9 (18%)
Sex During Menstruation		
Practice sex during menstruation	32 (64%)	34 (68%)
Contraceptive Use		
Use methods to avoid pregnancy	0 (0%)	35 (70%)
Temporary methods	0 (0%)	28 (56%)
Permanent methods	0 (0%)	7 (14%)

Extramarital sexual affairs were reported by 22% Birhors and 18% Kolha girls, indicating occurrence of multiple partnership patterns post-marriage, all reporting single extramarital partners. Actual prevalence may be higher given reporting sensitivity around extramarital relationships, particularly for women. These patterns raise STI transmission concerns given concurrent partnership possibilities and low contraceptive usage. Sexual activity during menstruation was practiced by substantial majorities 64% Birhors and 68% Kolha girls engaged in menstrual sex, contrasting with widespread beliefs about menstruation as "sin period" and demonstrating disconnect between stated beliefs and actual behaviors. This practice carries increased infection risks for both partners, particularly given inadequate menstrual hygiene practices documented previously. Contraceptive usage revealed extreme disparities

between tribes complete absence of contraceptive use among all Birhor participants (0%) versus 70% Kolha girls using pregnancy prevention methods, representing dramatic difference in reproductive autonomy and family planning access. Among Kolha users, temporary methods dominated (56%) over permanent sterilization (14%), indicating preference for reversible options. Birhor contraceptive non-use reflects multiple barriers including lack of access to family planning services in remote areas, limited contraceptive knowledge, cultural resistance, and absence of health system engagement, exposing Birhor adolescents to unplanned pregnancies with associated health risks.

Table 8: Sexual Timing Preferences and Hygiene Practices

Practice	Birhor (n=50)	Kolha (n=50)
Preferred Sexual Intercourse Time		
Morning time	43 (86%)	46 (92%)
Day time	0 (0%)	6 (12%)
Night time	50 (100%)	50 (100%)
Any moment	21 (42%)	10 (20%)
Post-Coital Hygiene		
Clean perineal region after sex	0 (0%)	0 (0%)

Sexual timing preferences revealed night-time sexual activity as universal practice (100% both groups), reflecting cultural norms, privacy considerations in crowded living conditions, and work schedules. Morning sexual activity was also highly preferred (86% Birhors, 92% Kolha), suggesting high sexual frequency or multiple-time preferences rather than mutually exclusive timing patterns. Daytime sexual activity was rare among Birhors (0%) but practiced by some Kolha girls (12%), possibly reflecting greater privacy access or different work patterns. Spontaneous sexual activity "any moment" was reported by 42% Birhors and 20% Kolha girls, indicating varying degrees of sexual spontaneity. Post-coital hygiene practices revealed alarming finding—zero participants from either tribe reported cleaning perineal region after sexual activity (0% both groups), representing critical hygiene gap with serious reproductive health implications. Absence of post-coital washing increases risks for urinary tract infections, reproductive tract infections, and STI transmission, particularly concerning given multiple partnership patterns and menstrual sex practices documented previously. This finding highlights urgent need for sexual hygiene education interventions in both tribal communities.

Nutritional Practices

Table 9: Dietary Patterns and Menstrual/Pregnancy Nutrition

Practice	Birhor (n=50)	Kolha (n=50)
Food Type		

Non-vegetarian	50 (100%)	50 (100%)
Choice of Food During Menstruation		
Have food choice	50 (100%)	35 (70%)
Specific Non-veg During Menstruation		
Take specific non-veg items	50 (100%)	50 (100%)
Energy Sources During Menstruation/Pregnancy		
Handia	50 (100%)	50 (100%)
Alcohol	50 (100%)	50 (100%)
Mahuli	50 (100%)	50 (100%)

Dietary practices demonstrated universal non-vegetarian food preference (100% both tribes), with reported consumption including chicken, mutton, pig meat, mouse meat, monkey meat, varanus (monitor lizard) meat, squirrel meat, mongoose meat, dry fish, fresh fish, ant eggs, and hen eggs, reflecting traditional forest-based diet diversity. All Birhor girls reported having food choices during menstruation (100%) versus 70% Kolha girls, with 30% Kolha girls experiencing food choice restrictions, suggesting some Kolha families impose menstrual dietary limitations absent among Birhors. Both tribes universally consumed specific non-vegetarian items during menstruation (100%), viewing animal protein as important during this period despite contradictory beliefs about nutritional needs documented in beliefs assessment. Energy supplementation practices during menstruation and pregnancy revealed concerning reliance on alcohol-based substances—all participants from both tribes consumed Handia (traditional fermented rice beer), regular alcohol, and Mahuli (another traditional fermented beverage) for energy (100%), representing nutritionally questionable and potentially harmful practices, particularly during pregnancy when alcohol poses fetal development risks. The universal nature of these practices indicates deep cultural normalization requiring sensitive intervention approaches acknowledging traditional beverage roles while introducing safer energy alternatives and alcohol risk education.

6. DISCUSSION

The study reveals concerning reproductive health practice patterns among both Birhor and Kolha adolescent married girls, with Birhors demonstrating more severe practice inadequacies correlated with their extreme isolation and resource scarcity. Menstrual hygiene practices documented here are substantially poorer than national tribal averages reported by Sahoo et al. (2015) and approaching worst-case scenarios described by van Eijk et al. (2016) in their systematic review of menstrual hygiene in low-resource settings. The exclusive use of undergarments alone by Birhor girls represents an extreme deprivation situation rarely documented in contemporary India, suggesting this Particularly Vulnerable Tribal Group faces resource constraints exceeding those of other tribal populations. Kolha girls' use of old cloth, while inadequate by modern standards, aligns with Thakre et al.'s (2011) findings that cloth materials remain predominant among rural Indian adolescents. The complete absence of commercial sanitary napkin use in both tribes

contradicts government menstrual hygiene scheme implementation and highlights last-mile delivery failures in remote tribal areas (Sommer et al., 2015).

Universal pond-washing of menstrual materials creates serious infection risks not adequately addressed in previous tribal health literature. Shared water source usage for menstrual material washing may contribute to community water contamination while exposing menstruating girls to waterborne pathogens, potentially explaining high reproductive tract infection prevalence among tribal women documented by Priyanka and Murthy (2018). The preference for traditional cleaning agents (termite soil, Eukyl potash fruits) over soap mirrors findings by Vashisht et al. (2018) among Himalayan tribal communities but raises questions about infection prevention effectiveness requiring microbiological investigation. Changing frequency inadequacies, particularly among Birhors where three-quarters change only 1-2 times daily, substantially increase infection risks and discomfort, potentially contributing to menstrual practice stigma and school absenteeism documented by Chandra-Mouli and Patel (2017). Kolha girls' higher changing frequency (42% changing 3-4 times daily) correlates with better material availability and possibly greater health awareness, though still below ideal standards.

Drying practices combining beneficial sun exposure with problematic mud ground placement create contradictory hygiene impacts. While UV radiation provides pathogen reduction benefits (Sahoo et al., 2015), ground contact introduces soil pathogens potentially negating sun-drying benefits. Kolha preference for shade-drying and concealment reflects modesty concerns but compromises hygiene, indicating culturally-sensitive interventions must balance privacy needs with health optimization.

Medication usage disparities (0% Birhor versus 62% Kolha) for menstrual symptoms reflect healthcare access inequalities but also raise questions about traditional medicine effectiveness and safety. While traditional systems may provide symptomatic relief, lack of evidence-based validation requires cautious interpretation, and zero Birhor medication use suggests either greater symptom tolerance, resource limitations, or different symptom experiences requiring further investigation. Sexual behavior practices documented here reveal previously under-reported patterns among tribal adolescents. The 32% Birhor and 24% Kolha premarital sexual activity rates, while likely underestimated, substantially exceed figures reported in conservative population surveys but align with anthropological observations of tribal sexual norms being less restrictive than mainstream Indian society (Basu, 1993). These findings challenge assumptions underlying abstinence-only sexual education and support comprehensive sexuality education incorporating contraception and STI prevention for unmarried adolescents (Ackerson & Subramanian, 2008).

Extramarital sexual affairs (22% Birhor, 18% Kolha) occurring within early marriage contexts raise complex questions about tribal marital dynamics and sexual satisfaction that require sensitive qualitative exploration. These patterns, combined with 64-68% reporting menstrual sex, indicate active sexual lives requiring reproductive health services currently absent in these communities. The stark contraceptive divide—0% Birhor versus 70% Kolha usage represents one of the study's most striking findings, exceeding typical tribal-non-tribal gaps documented in NFHS data (International Institute for Population Sciences, 2017). This disparity cannot be attributed solely to differential access but likely reflects Kolha

community's greater health system engagement and possibly different fertility preferences. Birhor contraceptive non-use exposes adolescent married girls to continuous pregnancy risks with inadequate birth spacing, contributing to maternal mortality and morbidity risks documented among primitive tribal groups by Kambo et al. (2003). Universal absence of post-coital genital hygiene (0% both tribes) represents critical gap unreported in previous tribal health research. This practice vacuum likely contributes to high reproductive tract infection prevalence among tribal women and requires urgent attention in sexual health education programming. The universal nature suggests lack of knowledge rather than resource constraints, as water access sufficient for menstrual washing exists.

Sexual desire enhancement through alcohol consumption (100% both tribes) creates multiple concerns including addiction risks, impaired sexual decision-making potentially increasing STI/pregnancy risks, and during pregnancy, fetal alcohol spectrum disorder risks. While Handia consumption is culturally embedded in tribal life as documented by Basu (1993), its universal use specifically for sexual enhancement has not been systematically reported previously and requires public health attention. Nutritional practices, while demonstrating dietary diversity through multiple animal protein sources, show concerning alcohol reliance during pregnancy. The universal consumption of Handia, alcohol, and Mahuli during pregnancy and menstruation directly contradicts international maternal health guidelines and poses fetal development risks (Christian, 2010). However, interventions must sensitively acknowledge these beverages' cultural roles and nutritional contributions (fermented foods provide B vitamins) while introducing alcohol harm reduction during pregnancy.

The disconnect between stated beliefs (documented in separate analysis) and actual practices (documented here) is noteworthy for example, 100% believing menstruation is sin period yet 64-68% practicing menstrual sex. This highlights that belief assessment alone inadequately predicts behavior, necessitating comprehensive practice assessment for intervention planning. Study limitations include cross-sectional design preventing temporal relationship assessment, self-reported practices subject to social desirability bias (particularly sexual behaviors), small sample size limiting generalizability to all Birhor and Kolha populations, and lack of biological outcome measures (RTI prevalence, nutritional status) correlating practices with health outcomes. Future research should employ biomarker assessment, longitudinal designs, larger samples, and qualitative methods exploring practice rationales.

7. CONCLUSION

This study documents severely inadequate reproductive health practices among Birhor and Kolha adolescent married girls across menstrual hygiene, sexual behavior, and nutritional domains, with Birhors experiencing extreme practice deficiencies reflecting their Particularly Vulnerable Tribal Group status. Critical practice gaps include exclusive undergarment use during menstruation (Birhors), shared water source washing, inadequate changing frequency, traditional cleaning agent reliance, universal post-coital hygiene absence, zero contraceptive use (Birhors), and universal pregnancy alcohol consumption, collectively creating substantial reproductive health risks. Urgent interventions are required addressing resource provision (menstrual hygiene materials, contraceptives), infrastructure development (private washing facilities), health

education (menstrual hygiene, sexual hygiene, contraception, alcohol risks), and healthcare service expansion reaching extremely remote tribal populations. Interventions must employ culturally-sensitive approaches acknowledging traditional practices' cultural meanings while introducing evidence-based alternatives through trusted community channels. Birhor-Kolha disparities highlight need for differentiated intervention strategies Birhors require intensive resource provision and basic health infrastructure development, while Kolhas need quality improvement of existing practices and modern method adoption support. Community-based participatory approaches employing tribal health workers and peer educators may prove most acceptable and effective.

Future research priorities include qualitative exploration of practice rationales, intervention development and testing using participatory methods, biological outcome assessment (RTI prevalence, anemia, pregnancy outcomes) correlating practices with health status, male involvement investigation in reproductive health decision-making, and longitudinal studies tracking practice changes over time. Comparative research across additional tribal groups would identify universal versus group-specific intervention targets for India's diverse tribal populations.

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