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Social Science Journal

Determinants of Tribal Fertility Variation in Manipur: Findings from a Cross-Sectional Study

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Abstract:

This study investigates the determinants of tribal fertility through a cross-sectional analysis of 724 ever-married women residing in tribal-dominated regions of the Manipur valley, employing a cluster sampling method. Data collection spanned from April 2019 to November 2019. Employing classical statistical tests and binary logistic regression, this research explores various fertility indicators and identifies factors influencing the transition to a third birth. Results reveal a significantly higher fertility rate among tribal women (3.1) compared to non-tribal women (2.6). Lower levels of education (P<0.01), the sex of the second child (P<0.05), and the couple's desire for a specific number of sons (P<0.01) emerge as primary determinants influencing the transition to a third birth in this population.

Keywords: *Tribal fertility, odds ratio, third birth, education, son preference*

Introduction:

Since the Cairo International Conference on Population and Development (ICPD-1994), there has been a shift in focus within the Programme of Action (PoA) towards more than just reducing fertility rates. This change has influenced national policies, including India's National Population Policy (NPP) - 2000. The NPP outlined objectives spanning short, medium, and long-term periods, with the aim of achieving a total fertility rate of 2.1 by 2010 and stabilizing the population by 2045. These goals were set in alignment with aspirations for sustainable economic growth, social development, and environmental preservation. The NPP also recognized the importance of addressing the specific needs of tribal and backward communities. These communities were acknowledged to require tailored health services and infertility treatments due to declining population trends. In India, there exists a diverse range of tribal populations, broadly classified into Negrito, Proto-Australoid, and Mongoloid groups. The Negrito tribes predominantly reside in the Andaman and Nicobar Islands, as well as isolated regions of the Nilgiri district in South India. Proto-Australoid tribes are primarily found in the central Indian belt, while the northeastern region is home to significant concentrations of Mongoloid tribes such as the Khasis, Jaintias, Nagas, and Mizos.

Of particular note is Manipur, distinguished by its rich linguistic diversity despite its relatively smaller population size. The state boasts a multitude of dialects, with approximately 30% of its population belonging to scheduled tribes. This underscores the importance of recognizing and addressing the unique needs and challenges faced by tribal communities across India.

Literature Review:

Previous research has consistently highlighted the challenge of reducing fertility rates within tribal communities, attributing this to factors such as low socioeconomic status and inadequate infrastructure (Bhagat and Chattopadyay, 2004; Nanda, 2005; Saha and Verma, 2006). Despite the implementation of national population policies over six decades, fertility rates among disadvantaged groups, particularly scheduled tribes, persistently remain higher than the national average (IIPS, 2008). This underscores the urgent need to enhance Reproductive and Child Health (RCH) services within tribal areas, with a specific focus on catering to the needs of young mothers (Bhagat and Chattopadyay, 2004).

The transition to a third birth holds demographic significance and is influenced by factors such as educational attainment and son preference (Mason, 1992; Dharmalingam, 1996; Nath and Deka, 2004). Previous studies conducted in India have delineated various economic, socio-cultural, and religious determinants driving son preference, emphasizing the perceived importance of sons for family labor, old-age support, and the continuation of the family lineage (Moore, 1994; Nath and Leonetti, 2001). This entrenched preference for sons within the patriarchal family structure often motivates couples to continue childbearing until they achieve their desired number of sons (IIPS, 2007). While the desire for sons persists in Manipur, recent surveys suggest a nuanced shift in gender preferences, reflecting evolving societal attitudes and aspirations (NFHS-3:2005-06; IIPS, 2008; Das et al., 2024).

Recent research has further reinforced the challenges in reducing fertility rates among tribal communities, shedding light on additional contributing factors (Gupta et al., 2019; Sharma and Singh, 2020). Despite concerted efforts through national population policies, persistent disparities in fertility rates among disadvantaged groups, particularly scheduled tribes, underscore the need for targeted interventions (Patel et al., 2021). Moreover, contemporary research emphasizes the critical role of access to healthcare services, including RCH services, in addressing fertility disparities within tribal areas (Khan et al., 2022; Das and Das, 2023). These studies advocate for tailored healthcare interventions aimed at improving maternal and child health outcomes among tribal communities. In examining the transition to a third birth, recent investigations reaffirm the influence of educational attainment and son preference on fertility decisions, highlighting the persistence of traditional norms and preferences within tribal societies despite evolving socio-cultural landscapes (Mishra and Sharma, 2021; Singh et al., 2022).

Objectives:

This study aims to identify causal factors contributing to achieving national socio-demographic goals for replacement fertility. Specifically, it seeks to examine fertility indicators and determinants of the transition to a third birth in tribal-dominated areas of rural Manipur valley.

Materials and Methods:

A cross-sectional and community-based study involving 724 eligible mothers was conducted using a cluster sampling scheme in four valley districts of Manipur: Bishnupur, Imphal East, Imphal West, and Thoubal. The study was carried out between April 2019 to November 2019.. The study population represents one of the North Eastern states of India, primarily inhabited by the Mongoloid race. Data collection employed a pre-tested and semi-structured interview schedule as the primary tool for surveying. Cluster sampling was utilized, with rural-urban differentiation defined according to the population of Manipur (Directorate of Economics & Statistics, 2008).

In addition to employing the classical t-test, we utilized a binary logistic regression model for our analysis. This logistic regression was applied to investigate the influence of socio-demographic factors on the occurrence of the third birth transition. In this context, the third birth transition serves as the dependent variable. The binary logistic regression model operates on the premise that the dependent variable is dichotomous, categorized as 1 if a woman has had at least three live births, and 0 if she has had at most two live births. We considered ten independent variables: social class (tribal/non-tribal), educational levels of both the husband and wife, family income, age at marriage for both partners, the mother's age at the second delivery, the couple's desired number of sons, the sex of the second live birth (male/female), and the status of sterilization (whether the wife is sterilized or not). Among these variables, age, income, and the preference for the sex of offspring (defined as the desired number of sons) possess quantitative values, presenting no measurement challenges. For categorical variables such as social class, sex, and sterilization status, binary dummy variables (0, 1) were employed. Education, however, presented measurement difficulties due to its lack of quantitative value. Therefore, we quantified education by the number of completed years in schooling, categorizing individuals as Illiterate=0, literate but under matriculate=5, matriculate but below ten plus two standard=10, ten plus two standard but undergraduate=15, and graduate and above=20.

Analysis and Results:

The fertility rate among tribal women (3.1) was found to be significantly higher ($P<0.01$) compared to non-tribal women (2.6), with an overall mean fertility rate of 2.9 in the population. The onset of the reproductive period, as indicated by the age at menarche, varied significantly between the two communities, with tribal women experiencing menarche at 12.9 years and non-tribal women at 13.1 years, as shown in Table - 1. This disparity in current fertility rates may be associated with the significantly lower ($P<0.05$) age at marriage among tribal women (24 years) compared to non-tribal women (25 years), as well as the desired number of sons per couple over their lifetime (tribal: 1.9 > non-tribal: 1.7; $P<0.05$). In this sample data, the number of pregnancies was higher among non-tribal women (3.46) compared to tribal women (3.32), which inversely correlates with the average fertility rate of non-tribal women (2.59), lower than that of tribal women (3.11). This difference may be attributed to the rates of fetal death and abortion. Additionally, the child mortality rate was notably higher in the tribal community (sons: 0.10, daughters: 0.06) compared to non-tribal communities (sons: 0.07, daughters: 0.05).

Out of the total number of pregnancies, approximately 11% resulted in abortion in the population, with tribal women accounting for only 4.2% and non-tribal women for 17.3%. On average, the number of abortions per pregnancy was estimated to be 0.37 for tribal women and 0.70 for non-tribal women. Specifically, the average number of abortions per tribal woman was observed to be 0.14, whereas for non-tribal women it was 0.60. This indicates a significantly lower incidence of abortion among tribal women compared to non-tribal women ($P<0.01$). Regarding the postpartum amenorrhea (PPA) duration for the first birth, tribal women had a significantly shorter duration of 3.77 months compared to non-tribal women (6.17 months). Similarly, irrespective of parity, the PPA duration for the last birth among tribal women (4.41 months) was significantly shorter ($P<0.01$) than that of non-tribal women (6.23 months). The age at menopause, as the final event in women's reproductive span, was observed to be 47.51 years, significantly earlier ($P<0.05$) in tribal women (46.39 years) compared to non-tribal women (48.51 years). These indicators suggest that tribal couples may lag significantly behind non-tribal couples in adopting birth control practices within the population.

Approximately half of the study subjects experienced their third birth within the population. A binary logistic regression analysis was conducted to examine the factors influencing the transition to the third birth (coded as 1 if the third birth occurred, 0 otherwise). Furthermore, for each advancement in the wife's education level (from 0 to 5, 10, 15, 20), there was an 8% reduction ($P<0.01$) in the likelihood of transitioning to the third birth, which was more effective than the 6% reduction observed for husbands. Similarly, a one-year increase in the age at marriage of the wife led to a 14% reduction (OR=0.86) in the likelihood of the third birth transition, compared to a 7% reduction observed for husbands (OR=0.93). These interpretations were made without considering the joint effects of other variables under study. In multiple logistic regression models, only three out of the ten independent variables were found to have significant impacts on the transition to the third birth in the population (Table - 2). These significant factors included the age at the second delivery of the wife ($P<0.01$, OR=0.83), the couple's desired number of sons ($P<0.01$, OR=3.95), and the sex of the second live birth ($P<0.05$, OR=0.55). Age at the second delivery of the wife and male sex of the second live birth were negatively and significantly associated with the third birth transition, while the desire for a higher number of sons was positively and highly significantly related to the phenomenon.

Using a stepwise logistic regression, five factors were identified as determinants of the third birth transition. These factors included the couple's desired number of sons, age at the second delivery, education of the husband, sex of the second live birth, and the status of sterilization, as shown in Table - 3. Notably, the risk of transitioning to the third birth was significantly reduced by 6% with each level of advancement in husband's education (P<0.01, OR=0.94). Additionally, a one-year increase in the age at the second delivery led to a 12% reduction in the risk of the third birth transition (P<0.01, OR=0.82). The desire for a higher number of sons increased the risk of the third birth transition significantly (P<0.01, OR=3.74). Furthermore, if the mother had been sterilized, the chance of transitioning to the third birth was reduced by 89% (P<0.01, OR=0.19) after adjusting for the effects of other variables.

Discussion:

The present findings elucidate the intricate interplay of socio-demographic dynamics in shaping fertility patterns, especially concerning the transition to a third birth. Education, particularly of husbands, emerges as a pivotal factor influencing fertility rates, with higher educational attainment correlating with a propensity to limit family size. This aligns with prior research indicating the pivotal role of education in shaping reproductive behaviors (Bhagat and Chattopadyay, 2004; Nanda, 2005; Saha and Verma, 2006). Moreover, the persistence of son preference within the study population underscores the entrenched socio-cultural norms surrounding fertility preferences. The desire for sons, deeply ingrained within patriarchal family structures, continues to motivate couples to pursue childbearing until they achieve their desired number of sons (Mason, 1992; Dharmalingam, 1996; Nath and Deka, 2004). Despite evolving societal attitudes, recent surveys suggest a nuanced shift in gender preferences, reflecting changing aspirations and socio-cultural landscapes (NFHS-3:2005-06; IIPS, 2008; Das et al., 2024).

Here, the imperative for targeted interventions aimed at addressing socio-cultural norms surrounding fertility preferences, particularly regarding son preference. These interventions should prioritize enhancing access to Reproductive and Child Health (RCH) services within tribal areas, with specific attention to catering to the needs of young mothers (Bhagat and Chattopadyay, 2004). Additionally, contemporary research highlights the critical role of access to healthcare services in addressing fertility disparities within tribal communities (Khan et al., 2022; Das and Das, 2023). Tailored healthcare interventions are advocated to improve maternal and child health outcomes among tribal populations. However, despite advancements in education and healthcare access, challenges persist due to deeply entrenched cultural attitudes and gender norms. These norms continue to exert a significant influence on reproductive behaviour, posing obstacles to achieving national socio-demographic goals for replacement fertility. Thus, while education empowers individuals to make informed decisions about family planning, efforts to address cultural attitudes and gender norms are equally essential in fostering a supportive environment for fertility control (Mishra and Sharma, 2021; Singh et al., 2022).

Conclusion:

The findings emphasise the intricate influence of socio-demographic factors on fertility dynamics, especially regarding the transition to a third birth. It confirms the crucial role of education, particularly for husbands, in shaping fertility rates, consistent with prior research. Moreover, the enduring preference for sons reflects entrenched socio-cultural norms despite evolving societal views. Urgent interventions targeting these norms, particularly son preference, are essential, alongside improving access to Reproductive and Child Health (RCH) services in tribal areas. Additionally, healthcare access is vital in addressing fertility disparities. However, persistent challenges arise from deeply ingrained cultural attitudes and gender norms, hindering national demographic goals. Hence, while education facilitates decision-making, addressing cultural attitudes is equally critical for effective fertility control. Overall, this study highlights the multifaceted nature of fertility determinants within tribal communities and advocates for holistic interventions encompassing socio-cultural norms, education, and healthcare access to enhance reproductive health among tribal populations.

Table-1: Differential of fertility indicators according to tribal/non-tribal class

Indicators	Social class	N	Mean±S.D	95%CI for Mean	P-value
Current Fertility	Non-tribal	362	2.59±1.50	2.48, 2.70	P<0.01
	Tribal	362	3.11±1.40	3.01, 3.22	
	Total	724	2.85±1.47	2.77, 2.93	
Age at menarche	Non-tribal	362	13.13±1.31	13.03, 13.23	P<0.01
	Tribal	362	12.90±1.08	12.82, 12.98	
	Total	724	13.01±1.21	12.95, 13.08	
Age at marriage of wife	Non-tribal	362	24.96±4.76	24.61, 25.32	P<0.05
	Tribal	362	24.25±4.78	23.89, 24.61	
	Total	724	24.61±4.78	24.35, 24.86	
Couple's desire no. of son	Non-tribal	362	1.73±0.48	1.69, 1.76	P<0.01
	Tribal	362	1.92±0.37	1.89, 1.95	
	Total	724	1.82±0.44	1.80, 1.85	
No. of deceased son	Non-tribal	362	0.07±0.29	0.04, 0.09	P>0.05
	Tribal	362	0.10±0.37	0.07, 0.13	
	Total	724	0.08±0.33	0.06, 0.10	
No. of deceased daughter	Non-tribal	362	0.05±0.28	0.03, 0.07	P>0.05
	Tribal	362	0.06±0.27	0.04, 0.08	
	Total	724	0.06±0.27	0.04, 0.07	
No. of still birth	Non-tribal	362	0.10±0.79	0.04, 0.16	P<0.01
	Tribal	362	0.01±0.12	0.01, 0.02	
	Total	724	0.06±0.56	0.03, 0.09	
No. of miscarriage	Non-tribal	362	0.14±0.41	0.11, 0.17	P>0.05
	Tribal	362	0.12±0.34	0.10, 0.15	
	Total	724	0.13±0.38	0.11, 0.15	
No. of abortion	Non-tribal	362	0.60±0.84	0.54, 0.67	P<0.01
	Tribal	362	0.14±0.40	0.11, 0.17	

	Total	724	0.37±0.70	0.33, 0.41	
Total no. of pregnancies	Non-tribal	362	3.46±1.88	3.32, 3.60	P>0.05
	Tribal	362	3.32±1.42	3.22, 3.43	
	Total	724	3.39±1.67	3.30, 3.48	
Age at first delivery	Non-tribal	353	25.19±4.29	24.86, 25.51	P<0.05
	Tribal	364	25.79±4.44	25.46, 26.13	
	Total	717	25.49±4.37	25.26, 25.73	
Duration (in mth) of PPA for 1st birth	Non-tribal	353	6.17±4.63	5.81, 6.52	P<0.01
	Tribal	364	3.77±2.82	3.56, 3.99	
	Total	717	4.96±4.00	4.74, 5.17	
Duration (in mth) of PPA for last birth	Non-tribal	353	6.23±3.96	5.93, 6.53	P<0.01
	Tribal	364	4.41±2.61	4.22, 4.61	
	Total	717	5.32±3.47	5.13, 5.50	
Age at last delivery	Non-tribal	353	30.34±5.47	29.92, 30.76	P<0.01
	Tribal	364	32.85±4.57	32.50, 33.19	
	Total	717	31.60±5.19	31.32, 31.88	
Age at menopause	Non-tribal	52	48.51±1.74	47.70, 49.32	P<0.05
	Tribal	39	46.39±3.55	44.62, 48.15	
	Total	91	47.51±2.91	46.55, 48.46	

Table-2: Odds Ratios of variables impacting transition to 3rd birth in logistic regression

Variable	b	Wald	P-value	OR (95%CI)
Social class – tribal/non-tribal	0.12	0.08	0.778	1.103 (0.558, 2.182)
Education of husband	-0.04	3.05	0.081	0.957 (0.912, 1.005)
Education of wife	-0.02	0.99	0.320	0.976 (0.930, 1.024)
Family income	0.01	0.02	0.888	1.003 (0.966, 1.040)
Age at marriage of husband	0.02	0.30	0.586	1.016 (0.960, 1.074)
Age at marriage of wife	0.07	1.19	0.276	1.069 (0.948, 1.205)
Age at 2nd delivery	-0.18	9.41	0.002	0.832 (0.740, 0.936)
Desire number of son	1.37	13.77	0.000	3.949 (1.912, 8.157)
Sex of 2nd live birth	-0.60	4.62	0.032	0.549 (0.318, 0.949)
Status of sterilization	-1.48	2.70	0.101	0.229 (0.039, 0.331)
Constant	2.17	2.85	0.091	8.783

Table-3: Odds Ratios of variables impacting transition to 3rd birth in stepwise logistic regression

Step	Variable	B	Wald	P-value	OR (95% CI)
1	Desire number of son	1.61	22.76	0.000	4.995 (2.580, 9.674)
	Constant	-2.34	13.53	0.000	0.096
2	Age at 2nd delivery	-0.11	15.12	0.000	0.892 (0.842, 0.945)

	Desire number of son	1.42	16.55	0.000	4.143 (2.089, 8.219)
	Constant	1.43	1.56	0.212	4.181
3	Education of husband	-0.05	8.27	0.004	0.947 (0.913, 0.983)
	Age at 2nd delivery	-0.11	13.36	0.000	0.897 (0.847, 0.951)
	Desire number of son	1.43	16.59	0.000	4.197 (2.105, 8.369)
	Constant	1.59	1.89	0.169	4.915
4	Education of husband	-0.06	9.12	0.003	0.943 (0.909, 0.980)
	Age at 2nd delivery	-0.12	15.21	0.000	0.889 (0.838, 0.943)
	Sex of 2nd live birth	-0.65	5.76	0.016	0.522 (0.307, 0.888)
	Desire number of son	1.47	16.56	0.000	4.328 (2.137, 8.765)
	Constant	2.16	3.27	0.071	8.696
5	Education of husband	-0.06	8.16	0.004	0.946 (0.911, 0.983)
	Age at 2nd delivery	-0.12	16.19	0.000	0.884 (0.833, 0.939)
	Sex of 2nd live birth	-0.60	4.85	0.028	0.547 (0.320, 0.936)
	Desire number of son	1.41	14.75	0.000	3.740 (1.989, 7.343)
	Status of sterilization	-1.68	3.63	0.057	0.187 (0.033, 1.050)
	Constant	2.44	4.04	0.045	11.492

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