Exploring the Relationship between Household Structure and Utilization of Maternal Health Care Services in India

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Abstract

The role of mother-in-law (MIL) influencing daughter-in-law's maternal health care (MHC) seeking behaviour has been a continuing debate due to the former's advantageous position in the household. This study assesses the association of household structure and particularly the presence of MIL with MHC utilization in India using the National Family Health Survey-4 data (2015-16). Binary logistic regression was used to check the adjusted effects of the household structure on MHC utilization. The analyses were done with STATA (version 13) with a significance level of 5%. Adjusting the effects of socio-demographic and economic characteristics, women from non-nuclear households with MIL had significantly higher odds of full antenatal care (OR = 1.04, 95% CI = 0.99-1.08) and institutional delivery (OR= 1.05, 95% CI=1.01- 1.10) than their counterparts from nuclear households. Women from non-nuclear households without MIL had lower chances of postnatal care (OR =0.98, 95% CI=0.96-1.00) than women from nuclear households. The study unearths the beneficial role of MIL in MHC services utilization of the daughter-in-law, a notable change from the earlier literature often portraying MIL as a barrier. Involvement of MIL in existing policies/programmes aimed at improved maternal health would be helpful in MHC utilization in India.

Introduction

Family as a social institution play a key role in human life, and family relationships remain the most intense and enduring of all interpersonal and social bonds. Family structure is cyclical and dynamic like from an extended family, after the marriage of a child, a nuclear family is formed and then after the marriage of their children, the extended family again appears (Goode, 1964). The family members have respective roles in their inter-personal relationships governed by social norms though contemporary families have new and varied structures (Ratra, 2006). The family/household structure often shapes individual behaviour as well as health to a great extent. Social relationships, found in close families, decrease the chances of the onset of

chronic disease, disability, mental illness, and death (George & Durham, 2016). In the absence of people showing concern for their well-being, people living only with a spouse or in a nuclear family had higher physical and mental ill-health probabilities than their extended family counterparts (Turagabeci et al., 2007).

Maternal health care (MHC) services utilization has been a subject of continuing scientific interest in India due to its implication for maternal and child morbidity and mortality. The MHC is deemed to be influenced by many household level factors. Evidence suggests that the health outcomes of young married Indian women from nuclear households are not better than their counterparts from patrilocal extended families (Allendorf, 2012). Moreover, irrespective of the type of family, the quality of women's relationship with husbands and/or in-laws was found to influence the use of MHC services in Madhya Pradesh, central India (Allendorf, 2010). The presence/absence of in-laws in the household again contributes to the health care utilization of women in general and MHC in particular (Simkhada, Porter, & van Teijlingen, 2010). The role of mother-in-law (MIL) influencing daughter-in-laws' health-seeking behaviour has also been an enduring debate due to the former's advantageous position in the household. Literature often portrays the MIL as an experienced woman with dominance in MHC decision-making (Allendorf, 2010, 2013; Kumar, Bordone, & Muttarak, 2016; Saikia & Singh, 2008; Raju & Ann, 2000). The MIL's desired number of children is positively associated with women's preferred family size, though often intermediated by the women's education in Bihar, eastern India (Kumar et al. 2016). The MIL is further found to impact maternal health by restricting the autonomy of daughter-in-law, especially in patriarchal set-ups (Anukriti, Herrera-Almanza, Pathak, & Karra, 2020; Bloom, Wypij, & Das Gupta, 2001).

Family power dynamics, including the existing gender inequities, have reduced women's ability to seek health care for sexual and reproductive health concerns (Regmi et al., 2012), thus putting them at risk of adverse health outcomes. A study in north India found women with greater freedom of movement have higher likelihood of utilization of antenatal care services and safe delivery care (Bloom et al. 2001). However, the family as a social unit is undergoing rapid transition (Kapadia, 1982), and so also the family structure. The percentages of young married Indian women residing in nuclear households have increased during 1992-2016, although most continue to live in non-nuclear households (IIPS & ICF, 2017). Several socio-economic factors such as educational, occupational, legal and demographic factors such as population growth, migration and urbanization have been affecting the family structure in India.

Additionally, regulation of sexual behaviour and reproduction, which was often considered a primary function of the family, continues to erode (Ahuja, 19XX). Enhanced women's status usually due to modern education and economic independence, a decline in the patriarchal mindset, and a host of supply-side avenues have favoured young women's increased healthcare utilization. The factors above are also perceived to reduce the influential role of in-laws, specifically, MIL in daughter-in-law's health-seeking. Thus, it is imperative to do an in-depth analysis to assess the association of household structure and, more specifically, the presence of MIL with MHC utilization using recent representative data in India. Family and household

have theoretical difference but has been used interchangeably in the present study. The results contribute to the existing evidence on determinants of MHC services utilization besides highlighting the changing significance of family in women's health.

Data and Methods

The study used data from the fourth round of the National Family Health Survey (NFHS), 2015-16. The NFHS-4 is a nationally representative survey of 601,509 households that provides information for various monitoring and impact evaluation health and nutrition indicators. The survey's sampling design was a stratified two-stage sample with an overall response rate of 98 per cent. The Primary Sampling Unit (PSUs), i.e., the survey villages in rural areas and Census Enumeration Blocks (CEBs) in urban areas, were selected using probability proportional to size (PPS) sampling. Trained research investigators gathered the data using computer-assisted personal interviewing (CAPI). Only those respondents who gave voluntary consent were interviewed in the survey. For the present analysis, the sample of women aged 15-49 years who have given birth during the last five years preceding the survey (n=184641) was considered.

Outcome variables:

The outcome variables used in this study were full-antenatal care (ANC), institutional delivery, and postnatal care (PNC). Full-ANC was constructed with the standard form provided in NFHS-4, i.e., four or more ANC visits, at least one tetanus toxoid (TT) injection, and consumption of iron-folic acid (IFA) tablets/syrup for a minimum of 100 days. Full-ANC was categorized as "yes" for those who received it and "no" for those who did not. Women who had delivered their last child in any health institution (i.e., public or private or NGO) were considered institutional delivery. Women who had a postnatal check-up within 24 hours of their delivery (in case of institutional delivery) or within 12 hours of their delivery (in case of home delivery) were considered as received PNC.

Predictor variables:

The primary predictor variable used in the analysis was household structure. The household structure was categorized into three groups (1) *Nuclear household*: defined as households comprised of a married couple or a man or a woman living alone or with unmarried children with or without unrelated individuals; (2) *Non-nuclear household without MIL*: defined as household comprised of the married couple and other family members except MIL; (3) *Non-nuclear household with MIL*: defined as household comprised of a married couple and other family members including MIL.

To assess the adjusted effect of household structure on MHC utilization, selected socio-economic and demographic characteristics of the women such as current age (15-19, 20-24, 25-29, 30-34, 35-39, 40-49), years of schooling (no education, less than 10 years of schooling, more than 10 years of schooling), parity (1st, 2nd, 3rd, 4th and more), mass-media exposure (yes, no), wealth quintile (poorest, poorer, middle, richer, richest), religion (Hindu, Muslim, Others), caste (Scheduled caste-SC, Scheduled tribe- ST, Other Backward Classes- OBC, Others), place

of residence (rural, urban), and geographical region (north, central, east, northeast, west, south) were included in the analysis. Additionally, the number of ANC visits (no visit, less than four times and more than four times) was used as a predictor variable for institutional delivery and PNC. Place of delivery (health institutions, others) was included as the predictor variable only for PNC. Women with any exposure to Television/Radio/newspapers were considered to have mass media exposure. The wealth quintile is a measure of a household's living standard and was calculated using data on the household's ownership of selected assets, materials used for housing construction, and types of water access and sanitation facilities. These included socio-economic and demographic variables are well-established factors of MHC utilization (Alemayehu et al., 2020; Barman, Roy, Zaveri, Saha, & Chouhan, 2020; Pandey & Karki, 2014; Shahabuddin et al., 2017).

Statistical analysis:
Bivariate analysis was carried out to understand the individual association between the predictors and outcome variables. Then Chi-square test was performed to test the significance of the relationship between the variables included in the analysis. Binary logistic regression was used to check the adjusted effects of the predictor variables on MHC utilization. The regression model's outcome variables were categorized into binary, i.e.,1= yes, 0= no. The list of variables included for regression analysis was finalized after checking multicollinearity among the predictor variables. The VIF (Variable Inflation Factors) test was done to check multicollinearity. All the predictor variables included in the model had a VIF score below two, ruling out multicollinearity. In all the analyses, weights were used to restore the representativeness of the sample. The analyses were done through STATA (version 13) with a significance level of 5%.

Results:

MHC utilization by household structure and socio-demographic factors
Table 1 presents the utilization of full ANC, institutional delivery, and PNC among women aged 15-49 by household structure and socio-demographic factors. Of the women, 21% had full ANC, 79% had institutional delivery, and 60% had PNC. A lower percentage of the women living in nuclear households utilized full ANC services than those from non-nuclear households. For example-19% of women living in the nuclear household had full ANC compared with 23% of those from non-nuclear households with MIL and 22% of those from non-nuclear households without MIL. Seventy-four per cent of the women from nuclear households had institutional delivery compared with more than 80% of women from non-nuclear households. Fifty-seven per cent of the women from nuclear households had PNC than 62% of their counterparts from non-nuclear households.

A relatively higher percentage of younger women availed full ANC, institutional delivery and PNC than those older women. Women with 10 or more years of schooling received full ANC more than four times (34%) than women with no education (8%). For institutional delivery, the corresponding figures were 94% and 63%, respectively, and for PNC, 71% and 47%.

Utilization of the MHC services declined with increasing parity of the women. Of the women with 4+ ANC visits, 91% had institutional delivery, and 71% availed PNC against 57% and 31% of those without ANC visits. Seventy per cent of the women with institutional delivery availed PNC than 17% among women with non-institutional deliveries. Utilization of MHC services was found much higher among women exposed to mass media, from Non-SC/ST/OBC category, was Non-Hindu/Muslim, and from the urban area than their respective counterparts. MCH utilization further increased with the economic status of the women.

Determinants of MHC Utilization

Table 2 presents the result of logistic regression of factors affecting the MHC utilization. Adjusting the effects of socio-demographic and economic characteristics, women from non-nuclear households with MIL had significantly higher odds of full ANC (OR = 1.04, 95% CI = 0.99-1.08) and institutional delivery (OR= 1.05, 95% CI=1.01- 1.10) than their counterparts from nuclear households. Women from non-nuclear households without MIL had lower chances of PNC (OR =0.98, 95% CI=0.96-1.00) than women from nuclear households. The likelihood of MHC utilization increased with the increasing age of the women and decreased with higher parity of the women. Compared to women with no education, women with 10+ years of education had 72% (OR = 1.72) more chance of having full ANC and 87% (OR = 1.87) more likelihood of institutional delivery. The women with four or more ANC visits had more than four times (OR = 4.09, 95% CI = 3.95-4.24) higher chance to have an institutional delivery and more than three times (OR = 3.51, 95% CI = 3.40-3.63) higher chance to have PNC as against the women without any ANC visit. The women who delivered in a health institution had 10 times (OR = 9.93, 95% CI = 9.63-10.25) higher odds of utilizing PNC against women with non-institutional delivery. The women with mass-media exposure had respectively 64%, 15%, and 14% more chance to have a full ANC, institutional delivery, and PNC as against women without any mass-media exposure. Compared to SC women, ST and Non-SC/ST/OBC had higher odds of full ANC; OBC women had higher chances of institutional delivery; ST, OBC and Non-SC/ST/OBC had lower odds of PNC. Compared with Hindus, Muslims and Non-Hindu/Muslims had a lower probability of full ANC and institutional delivery but a higher probability of PNC. Compared to poorest women, richest women had more than 2 times (OR = 2.64, 95% CI = 2.49-2.81), more than 3 times (OR = 3.40, 95% CI = 3.16-3.66) and 1.3 times (OR = 1.38, 95% CI = 1.31-1.45) higher chance to have full ANC, institutional delivery and PNC. Rural women had 10% (OR = 0.90) and 13% (OR = 0.87) less chance to full ANC and institutional delivery whereas 8% (OR = 1.08) higher chances of PNC compared to urban women. The women of the south region had 3 times higher chance to have full ANC, 2.9 times more chances of institutional delivery and 34% lower odds of PNC than their counterparts from the north.

Discussion & Conclusion

The household structure was found to have a significant association with MHC utilization in India. The presence of MIL was beneficial for utilization of MHC services viz. full ANC, institutional delivery and PNC. Our result on a higher probability of full ANC among women staying in households with MIL conforms to past studies by Allendorf (2013) and Matsumura

& Gubhaju (2001). Women in non-nuclear households probably get more support in household works besides guidance on the importance of ANC. They thus are in a better position to avail themselves of the ANC services. As found in an earlier study (Speizer et al. 2015), we also found that women residing in a non-nuclear household with MIL are more likely to deliver in health institutions than those from nuclear households. Allendorf (2013) revealed that Indian extended families were advantageous in delivery assistance than nuclear families. Evidence also suggests that the relation between the mother-in-law and daughter-in-law is shaped by shifting physical, social and economic dependencies and future expectations, sometimes leading to DIL appeasement by MIL (Vera-Sanso, 1999). Women from a non-nuclear household without MIL were also found to have lower PNC, perhaps owing to a higher percentage lacking assistance from family for PNC.

Nevertheless, our findings of MIL as an enabler in MHC utilization contradicts many past studies in India and abroad, which portrays her as a barrier. Analyzing the Indian NFHS-3 data of 2015-16 (Saikia & Singh, 2008) did not find a higher likelihood of full ANC among women from non-nuclear households. A qualitative study in Nepal found MIL has a strong, often negative influence on ANC uptake (Simkhada et al., 2010). Dominating MIL has also been a barrier to institutional delivery in Nepal (Shrestha et al., 2012). A similar inverse association between the presence of MIL and institutional delivery was revealed in another study in Mali (White et al., 2013). Family members, including MIL's unwillingness for institutional delivery, has also been found as the reason for home delivery in another study in West Bengal, India (Gorain et al., 2017).

The outcome variables are also found to be significantly associated. The utilization of full ANC was a significant determinant of institutional delivery, and women with full ANC and institutional delivery had higher chances of seeking PNC. Many past studies also found similar results (Barman et al., 2020; Mishra & Retherford, 2008; Rai, Singh, & Singh, 2012; Shahabuddin et al., 2017; Thind, Mohani, Banerjee, & Hagigi, 2008), while a few studies have not assessed this association (Allendorf, 2013; Saikia & Singh, 2008). Additionally, in conformity with earlier studies, this study also found age, education, parity, caste, place of residence, religion, wealth status, mass-media exposure, and the region as significant factors associated with MHC services utilization (Alemayehu et al., 2020; Barman et al., 2020; Chaka, Abdurahman, Nedjat, & Majdzadeh, 2019; Pandey & Karki, 2014; Rai et al., 2012; Shahabuddin et al., 2017; Singh, Singh, & Singh, 2021; Thind et al., 2008; Zhou et al., 2020).

There are several strengths of this study. It is the first study to analyze the role of household structure in utilizing MHC services holistically as against past studies assessing only some components of MHC services. Secondly, this study uses the recent largescale nationally representative data of NFHS-4 with a robust sampling design; thus, results are contemporary and relevant. Thirdly, the role of MIL in MHC utilization is analyzed with great importance. There are some limitations also. Firstly, this study is based on cross-sectional data, and hence inferences drawn on the causal association between the predictor and outcome variables should

be carefully studied. Again, other socio-cultural factors may influence the utilization of MHC services, which could not be considered in this study due to a lack of data.

To conclude, the household structure has a significant association with MHC utilization-residing in non-nuclear households found beneficial for women. The non-nuclear household with MIL is an enabler in MHC utilization against many past studies portraying MIL as a barrier. Involvement of MIL in existing policies/programmes aimed at improved maternal health would be helpful in MHC utilization in India.

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Table 1: Full ANC, institutional delivery and postnatal care among women aged 15-49 by socio-economic and demographic characteristics, India, 2015-16:

Background characteristics	Full ANC	No of Women	Institutional Delivery	No of births	PNC Received	No of Women
Family Structure						
Nuclear	18.84	74345	74.35	102004	56.86	73768
Non-nuclear without mother-in-law	22.30	86686	82.84	115942	62.18	86056
Non-nuclear with mother-in-law	22.63	23609	81.31	31863	62.09	23452
Age of women						
15-19	18.82	6285	84.35	7123	59.69	6236
20-24	20.59	57840	82.61	80344	61.43	57443
25-29	22.41	69345	79.87	97317	61.13	68831
30-34	21.36	33860	76.83	43804	59.23	33571
35-39	17.95	12776	69.46	15826	55.67	12700
40-49	11.56	4536	56.44	5395	43.82	4494
Years of schooling of women						
No education	8.22	51290	61.92	75439	46.63	50964
<10 years	19.10	71145	81.04	97003	60.35	70599
10+ years	33.56	62206	93.68	77367	70.72	61712
Parity						
1	26.44	62002	91.13	61999	66.94	61478
2	24.22	63701	84.70	94292	62.69	63200
3	15.73	30603	72.88	48650	54.37	30412
4+	7.21	28334	57.89	44869	45.08	28187
Number of antenatal visits**						
No visits			57.14	30363	31.03	30239
<4 times			77.70	58096	56.83	57726
≥ 4 times			91.37	94541	71.27	93874
Place of delivery**						
Health institution					70.01	149032
Others					16.64	34142
Mass Media exposure						
No	6.67	45480	61.16	67130	43.60	45163
Yes	25.62	139160	85.80	182679	65.40	138113
Caste of women**						

SC	19.27	39059	78.66	53825	59.02	38805
ST	16.34	19002	68.33	26317	53.03	18823
OBC	20.71	80460	80.04	110330	59.97	79901
others	25.00	44560	83.18	57152	64.38	44213
Religion						
Hindu	21.02	145617	81.10	196488	60.56	144585
Muslim	17.61	29734	69.45	41367	54.82	29481
Others	30.47	9289	81.34	11955	68.23	9210
Wealth Index						
Poorest	6.75	43155	59.95	63343	43.44	42806
Poorer	14.26	39070	75.46	54890	54.95	38783
Middle	22.60	36721	85.25	49541	64.00	36469
Richer	29.21	35066	90.74	45290	69.43	34849
Richest	38.06	30627	95.47	36746	74.32	30368
Place of residence						
Rural	16.66	129794	75.40	179721	56.86	128805
Urban	31.10	54847	88.87	70089	67.51	54472
Region						
North	19.41	24351	83.36	32918	65.88	24226
Central	8.82	47398	71.60	67775	55.19	47186
East	12.21	46980	69.71	63598	51.60	46610
Northeast	18.38	7169	68.22	8834	53.98	6974
West	32.01	24258	89.93	31813	68.99	24170
South	43.38	34482	95.52	44871	68.96	34111
Total	**20.95**	**184641**	**79.18**	**249809**	**60.03**	**183276**

** means the total number is not matching with total frequency of the last

Table 2: Adjusted Odds Ratio (AOR) of socio-economic and demographic predictors of Full ANC, institutional delivery and postnatal care, India, 2015-16

Background characteristics	Full ANC AOR (95% CI)	Institutional Delivery AOR (95% CI)	PNC received AOR (95% CI)
Family Structure			
Nuclear ©			
Non-nuclear without mother-in-law	0.99 (0.96-1.02)	1.00 (0.98-1.03)	0.98* (0.96-1.00)
Non-nuclear with mother-in-law	1.04* (0.99-1.08)	1.05*** (1.01-1.10)	1.00 (0.97-1.04)
Age of women			
15-19 ©			
20-24	1.14*** (1.05-1.23)	1.06* (0.98-1.14)	1.05* (0.99-1.12)
25-29	1.35*** (1.25-1.46)	1.21*** (1.12-1.31)	1.14*** (1.07-1.22)
30-34	1.54*** (1.42-1.68)	1.42*** (1.30-1.54)	1.17*** (1.09-1.25)
35-39	1.63*** (1.49-1.79)	1.44*** (1.31-1.57)	1.21*** (1.12-1.30)
40-49	1.59*** (1.42-1.79)	1.18*** (1.07-1.30)	1.22*** (1.11-1.33)
Years of schooling of women			
No education ©			
<10 years	1.43*** (1.37-1.49)	1.30*** (1.26-1.34)	0.96*** (0.93-0.99)
10+ years	1.72*** (1.65-1.80)	1.87*** (1.79-1.96)	0.97 (0.94-1.01)
Parity			
1 ©			
2	0.82*** (0.79-0.84)	0.56*** (0.54-0.58)	0.96*** (0.94-0.99)
3	0.65*** (0.63-0.68)	0.41*** (0.39-0.43)	0.92*** (0.89-0.96)
4+	0.46*** (0.43-0.48)	0.33*** (0.31-0.34)	0.92*** (0.88-0.96)
Number of antenatal visits			
No visits ©			
<4 times		2.15*** (2.08-2.21)	2.23*** (2.16-2.31)
≥ 4 times		4.09*** (3.95-4.24)	3.51*** (3.40-3.63)
Place of delivery			
Health institution			9.93*** (9.63-10.25)
Others ©			
Mass Media exposure			
No ©			
Yes	1.64*** (1.56-1.71)	1.15*** (1.12-1.19)	1.14*** (1.11-1.17)

Caste of women			
SC ©			
ST	1.19*** (1.14-1.25)	0.69*** (0.66-0.72)	0.92*** (0.88-0.95)
OBC	0.94*** (0.91-0.98)	1.10*** (1.07-1.15)	0.96*** (0.93-0.98)
others	1.11*** (1.07-1.16)	1.01 (0.97-1.06)	0.97* (0.94-1.01)
Religion			
Hindu ©			
Muslim	0.86*** (0.83-0.90)	0.57*** (0.55-0.59)	1.02* (0.99-1.06)
Others	0.93** (0.89-0.98)	0.63*** (0.60-0.66)	1.05** (1.00-1.09)
Wealth Index			
Poorest ©			
Poorer	1.25*** (1.19-1.32)	1.29*** (1.24-1.33)	1.03* (1.00-1.07)
Middle	1.55*** (1.47-1.63)	1.66*** (1.60-1.74)	1.14*** (1.10-1.19)
Richer	1.85*** (1.75-1.96)	2.17*** (2.06-2.29)	1.26*** (1.21-1.32)
Richest	2.64*** (2.49-2.81)	3.40*** (3.16-3.66)	1.38*** (1.31-1.45)
Place of residence			
Rural	0.90*** (0.87-0.93)	0.87*** (0.83-0.90)	1.08*** (1.05-1.11)
Urban ©			
Region			
North ©			
Central	0.64*** (0.62-0.67)	0.85*** (0.81-0.88)	0.95*** (0.92-0.98)
East	1.00 (0.95-1.04)	0.98 (0.94-1.02)	0.96** (0.92-0.99)
Northeast	1.28*** (1.22-1.34)	0.61*** (0.58-0.64)	0.77*** (0.74-0.80)
West	2.00*** (1.91-2.10)	1.42*** (1.32-1.51)	0.83*** (0.79-0.87)
South	3.02*** (2.90-3.15)	2.89*** (2.66-3.14)	0.66*** (0.63-0.68)

*** indicates 99% level of significance, ** indicates 95% level of significance, * indicates 90% level of significance, © Reference category