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Effects of Spousal Separation and Internal Migration on Modern Contraceptive Use in Nepal: Evidence from the 2022 NDHS

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Abstract

Spousal separation by male out-migration and women's own migration may influence access to and use of modern contraception. This study examines the effects of spousal separation and women's internal migration on the use of modern contraceptives in Nepal. This study utilized cross-sectional data from the 2022 Nepal Demographic and Health Survey (NDHS). Descriptive statistics were used to estimate prevalence, and multivariate logistic regression models were employed to assess the association between migration status and modern contraceptive use, controlling for socio-demographic covariates. Descriptive analysis revealed a substantial disparity in modern contraceptive use among non-migrant wives (62.4%) compared to left-behind wives (27.6%). Multivariate analysis confirmed that left-behind wives were significantly less likely to use modern contraception than non-migrant wives (AOR=0.21, 95% CI: 0.18–0.23, $p < 0.001$). Women's internal migration status and stream also influenced modern contraception use. Women migrating from urban-to-urban (AOR = 0.80, 95% CI = 0.55-0.98) and rural-to-urban (AOR = 0.85, 95% CI = 0.74-0.99) areas had lower odds of contraceptive use compared to those migrating from rural-to-rural areas. However, internal migration did not significantly affect contraceptive use among left-behind wives, suggesting that spousal separation plays a more dominant role than women's own mobility. These findings add to our understanding of how women's and their husbands' migration status influences the use of modern contraception. These findings suggest that family planning programs should address migration issues, target the needs of migrant couples, and increase access for women left behind during spousal return.

Keywords Family planning, left-behind wives, migration, modern contraception

Introduction

Nepal has experienced a significant rise in both internal and international migration. According to the 2021 census, the lifetime internal migration rate was 29.2 percent of the total native-born population (NSO, 2025b). Similarly, emigration has also increased, with the absentee rate reaching 3.3 percent to 7.5 percent of the total population of Nepal during 2011 to 2021 (NSO, 2025a). About 23.3 percent of the total households have at least one absent member (NSO, 2025a). Most of the migrants are within the age

groups of reproductive age for both internal and international migration (NSO, 2025a, 2025b). Internal migration, primarily rural to urban and hill to Tarai, contributes to population redistribution in Nepal (NSO, 2025b; Suwal, 2014), while emigration is the major source of remittance in Nepal (Asian Development Bank, 2014; Sunam, 2020; Gartaula & Niehof, 2013). Both internal and international migration have significant demographic, social, and health impacts for migrants themselves, as well as their families left behind (Ghimire et al., 2018; Thapa et al., 2019).

Migration affects physical and mental health as well as reproductive behaviors, including contraceptive use (Mahapatra et al., 2020; Mukherjee et al., 2021; Shattuck et al., 2019). The impact of migration on contraceptive use varies depending on who migrates, the timing of migration and place of origin and destination (McKay et al., 2003). Existing literature shows a diverse link between migration and contractive use were diverse. One stream of research is particularly focused on spousal migration and its effects on contraception use (Chen et al., 2015; Samanta & Munda, 2023), while another stream of research focuses on the impact of female migration on their contraceptive behaviors (Dulal et al., 2024; Ochako et al., 2016;Thapa et al., 2019). So, there is diverse research particularly focused on migration aspects as male out-migration and migration of women themselves.

In the case of spousal migration, particularly male outmigration, most studies argue that spousal separation due to male out -migration reduces the immediate need for contraception, delaying adoption until the husband's return (Mukherjee et al., 2021; Shattuck et al., 2019). In the context of Nepal, previous research by Mukherjee et al. (2021); Shattuck et al. (2019); Khanal et al. (2013); Ban et al. (2012) showed a significantly lower use of modern contraceptives among the left behind women compared with non-migrant wives. Spousal separation was shown to play a crucial role in the decline of total fertility in the absence of a corresponding rise in the contraceptive uptake in Nepal (Khanal et al. 2013). Evidence from Nepal and other contexts suggests that spousal separation due to male out-migration reduces coital frequency and immediate contraceptive demand, contributing to declining fertility even without a corresponding increase in contraceptive use (Khanal et al., 2013; Ban et al., 2012). Analyses of NDHS data showed significantly lower contraceptive use among left behind wives compared to non-migrant wives (Khanal et al., 2013; Thapa et al., 2019).

Similarly, there are several studies that focus on contraceptive behaviors of migrant and non-migrant women. These studies provide diverse finding that depends on the migration nature and context-specific. Some of the studies articulate that there was a distinct pattern of contraceptive use among migrant and non-migrant women (Ochako et al., 2016; Thapa et al., 2019). These studies argue that migrant women had greater access of information and service at the destination, particularly in urban and international context (Stephenson & Hennink, 2004). So, migrant women were more likely to use modern contraception than non-migrant women (Ochako et al., 2016). The

study also found that urban non-migrants were more likely to use modern contraception compared with rural non-migrants (Lindstrom & Herrera Hernéndez, 2006). A study in Kenya by Ochako et al. (2016) found that internal migrant women from rural to urban areas were more likely to use modern contraception than non-migrant rural women. Similar results were found in Guatemala that urban migrants were greater likely of modern contraceptive use than non-migrant women (Lindstrom & Herrera Hernéndez, 2006).

Nepal has achieved major gains in reproductive health in recent decades. Fertility has reached near replacement level (TFR = 2.1), and modern contraceptive prevalence among married women has stagnated since 2006 (Ministry of Health and Population et al., 2022). Previous research using NDHS 2016 and earlier surveys examines the associations between internal migration and modern contraceptive use (Thapa et al., 2019; Khanal et al., 2013) and other studies (Mehata et al., 2020), particularly focused on left behind wives and their contraceptive use. In the context of increasing migration within households, particularly husbands and women themselves, what happens to the use of modern contraception due to the migration of their husbands and women themselves? This study aims to examine how migration influences modern contraceptive use in Nepal, focusing on both women's internal migration status and spousal migration.

Data and methods

We used Nepal Demographic and Health Survey (NDHS) 2022 data in this study. NDHS is a part of the worldwide Demographic and Health Surveys (DHS) which was conducted under the authority of the Ministry of Health and Population (MOHP) of the Government of Nepal, with funding from the United States Agency for International Development (USAID) and technical assistance by ICF through the DHS Program. There were 14,845 women interviewed during the survey; we selected 7,741 women based on our variable selection criterion for the study.

Study variables

The dependent variable in this analysis was the use and non-use of any modern contraceptive among the reproductive women aged 15-49. Use and non-use of modern contraceptive was the dependent variable in this study. A female respondent aged 15-49 or her husband using any modern method of contraception at the time of the survey was considered a current user. The dependent variable was constructed from the NDHS datasets from the variables 'current contraceptive methods. We define the current use of modern contraception as women reporting using any one of these methods, such as contraceptive pill, an intrauterine device, injectable contraceptives, male condom, implants, female sterilization, or male sterilization. Women who report that they did not use any contraceptive methods and practice of traditional methods were considered

non-uses of contraceptive. So, selection of the respondents includes currently married and fecund women who were not pregnant at the time of the survey.

We calculate two migration-related variables to examine the use of modern contraception among reproductive age women. The first variable captures women's migration status, distinguishing between migrants and non-migrants. To measure this, we used information on the respondent's current place of residence and respondents were asked: *"How long have you been living continuously in the current place of residence?"* Women who answered "always" were classified as non-migrants, while those who reported a specific number of years were classified as migrants. For this, we exclude those who were temporary visitors (n=534) and moved to the area from abroad (n=684). Based on the current place of residence and previous place of residence, we calculate six types of migration categories as: rural to rural, rural to urban, urban to rural, urban to urban, non-migrant rural and non-migrant urban. The second measure of migration was male out-migration and identifying left-behind wives. To capture this, we focused on currently married women whose husbands had no other wives. Respondents were asked: *"Are you living with your husband now or is he staying elsewhere?"* Based on this, women were categorized into two groups: those living with their husbands as non-migrants' wives and those whose husbands were staying elsewhere, categorized as migrants' wives or left-behind wives.

We use several socio-demographic variables that available in NDHS dataset for covariates of the study. It includes women's age, education, caste/ethnicity, occupation, and wealth quintile. Women's age was grouped into three categories: 15–24, 25–35, and 35–49 years. The caste/ethnicity were categorized into four main groups which includes Brahman/Chhetri, Janajati, Tarai caste and Dalit and Muslim. Similarly, women occupation was categorized into three groups in to not working, non-agriculture and agriculture.

Data analysis

We used descriptive, bivariate, and multivariate data analyses in this research to explore the association between the use of modern contraception and the migration status of women and their husbands. Descriptive statistics such as percentage were used to summarize the characteristics of the study population. For bivariate analysis, we used chi-square ($\chi 2$) test to assess the association between the outcome variable (use of modern contraception) and the selected independent variables and covariates. A p-value of less than 0.05 was considered statistically significant in bivariate chi-square test. After bivariate analysis, we used binary logistic regression models to estimate the adjusted effects of migration and other predictors on the likelihood of contraceptive use. To capture potential differences, three models were specified: Model 1 for non-migrant wives, Model 2 for left-behind wives, and Model 3 for the total sample of women. The results are reported as adjusted odds ratios (AORs) with 95 percent confidence intervals (CIs). All statistical analyses were performed using R software (version 4.4.3).

Results

In this section, we first present the migration status of respondents. Then, we describe the patterns of contraceptive use in relation to the migration characteristics of women and their husbands. Following this, we examine the bivariate associations between the background characteristics of women and their use of modern contraceptive methods for both groups. In the subsequent section, we present findings from the multivariate analysis, where adjusted odds ratios are employed to assess the net effects of migration status and other covariates on modern contraceptive use.

Migration status of the women and their husband

Table 1 shows the distribution of women by their own and their husband's migration status. A majority of women were migrants (68.6%), while about one-third (31.4%) were non-migrants. Among migrant women, the most common migration stream was rural-to-urban (29.0%), followed by rural-to-rural (24.4%). Smaller proportions reported urban-to-urban (10.7%) and urban-to-rural (4.5%) migration. With respect to husbands' migration status, nearly two-thirds of women (64.4%) were non-migrants' wives, whereas more than one-third (35.6%) were left-behind wives whose husbands had migrated.

Table 1. Migration status of the women and their husband Nepal DHS 2022

Migration status of women	Number	Percent
Migrants	5,314	68.6
Non-migrants	2,427	31.4
Migration stream		
Rural to rural	1,890	24.4
Rural to urban	2,243	29.0
Urban to rural	351	4.5
Urban to urban	830	10.7
Rural non-migrant	1,338	17.3
Urban non-migrant	1,089	14.1
Husband Migration		
Non-migrants' wives	4,986	64.4
Left-behind wives	2,755	35.6
Total	7,741	100.0

Background characteristics and use of modern contraception by migration characteristics

Table 2 presents the percentage of use of modern contraception among women aged 15–49 years according to migration status of women's husband and themselves and selected

background characteristics of the respondents. Contraceptive use varied significantly across migration-related factors. Women whose husbands are non-migrants have a higher rate of modern contraception use (68.0%) compared to left-behind wives whose husbands have migrated (29.9%). Similarly, differences were observed across migration streams for non-migrants' wives, which is a statistically significant difference between these groups and the use of modern contraception. However, this difference was not statistically significant difference for left behind wives. Contraceptive use increased with age and education level showed an inverse association for both groups of women. It is also observed that the use of modern contraception was significantly different with women's occupation, ethnicity and wealth status for both group of women.

Table 2. Percentage distribution of modern contraceptive use of women by migration status and selected background characteristics, Nepal DHS 2022

Background characteristics	Use of any modem contraception					
	Non-migrants' wives (n=4986)		Left-behind wives (n= 2755)		Total women (n=7741)	
	%	χ^2 p-value	%	χ^2 p-value	%	χ^2 p-value
Husband migration status						<0.001
Non-migrants' wives	-		-		62.1	
Left-behind wives	-		-		27.6	
Migration status of women		<0.001		0.053		<0.001
Migrants	59.4		26.4		47.9	
Non-migrants	68.0		29.9		53.8	
Migration stream		<0.001		0.256		<0.001
Rural to rural	66.5		28.4		52.8	
Rural to urban	59.0		24.7		47.2	
Urban to rural	55.6		24.8		43.6	
Urban to urban	46.9		27.2		40.7	
Rural non-migrant	70.2		29.7		54.5	
Urban non-migrant	65.4		30.3		53.0	
Age group		<0.001		<0.001		<0.001
15-24	40.2		13.6		28.5	
25-34	64.0		24.2		48.0	
35-49	67.9		41.7		60.7	
Education level		<0.001		<0.001		<0.001
No education	74.3		44.5		64.8	
Basic	63.1		24.6		48.7	
Secondary	49.7		17.2		37.2	
Higher	42.8		20.8		36.8	

Ethnicity		<0.001		<0.001		<0.001
Brahman/Chhetri	57.8		25.8		46.2	
Janajati	64.5		25.9		52.0	
Tarai caste	63.3		37.2		54.4	
Dalit	65.3		32.1		51.4	
Muslim	57.1		10.6		36.3	
Occupation		<0.001		<0.001		<0.001
Not working	52.0		19.0		40.1	
Non-agricultural	54.9		26.5		46.9	
Agriculture	67.9		30.1		53.5	
Wealth quintiles		<0.001		0.054		<0.001
Lowest	68.0		30.1		52.9	
Second	66.8		28.8		53.5	
Middle	64.6		27.7		50.5	
Fourth	57.0		25.3		45.8	
Highest	50.1		21.7		42.9	

Multivariate analysis

Following the bivariate analysis, we used binary logistic regression analyses to estimate the adjusted odds ratios (ORs) and examine the independent effects of all significant sociodemographic covariates on the likelihood of modern contraceptive use. Three models non-migrants' wives (Model I), left-behind wives (Model II), and total women (Model III) were set to examine the migration effects on contraception use. For model fit, we assess multicollinearity through VIF, and it was found to be less than 1.6 among all predictors, which is acceptable under the thresholds of 5. Furthermore, the overall model fit was assessed by the Hosmer–Lemeshow test, whose value ranges from 0.08 to 0.81, implying that the model exhibits a good fit for predictions. Nagelkerke R^2 value indicated that approximately 11–23 percent of the variability in any modern contraceptive was explained by factors associated with the model.

Among non-migrants' wives (model I), internal migration status of women who migrated from urban-to-urban area had significantly lower odds of using modern contraception compared to rural-to-rural migrants (OR=0.65, 95% CI: 0.51–0.81). Other migration streams, including rural-to-urban, urban-to-rural, rural non-migrant, and urban non-migrant, were not significantly associated with contraceptive use. Age was a strong predictor, with women aged 25–34 (OR=2.66, 95% CI: 2.23–3.19) and 35–49 (OR=2.56, 95% CI: 2.13–3.11) having higher odds of using contraception compared to the 15–24 age group for non-migrant wives. Education showed an inverse relationship for use of modern contraception among the non-migrant wives. Women with basic education were less likely to use modern contraception (OR =0.74, 95% CI: 0.64-0.88) than women with no education. This relationship was more deviate with both

secondary (OR= 0.45, 95% CI: 0.45-0.65) and higher level of education (OR=0.44, 95% CI: 0.32-0.63) among the non-migrant illiterate wives. Agricultural workers were more likely to use modern contraception than non-working women (OR=1.27, 95% CI: 1.06–1.52). Among ethnic groups odds of using contraception compared to Muslim non-migrant wives was not statistically differ.

Table 3. Adjusted odds ratio between migration status and modern contraceptive use among non-migrants' wives and left-behind wives, Nepal DHS 2022.

Background characteristics	Non-migrants' wives I	Left-behind wives II	Total women III
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Migration status of husband			
Non-migrants' wives			1.00
Left-behind wives			0.22***(0.19-0.24)
Internal migration status of women			
Rural to rural	1.00	-	1.00
Rural to urban	0.86 (0.72-1.02)	-	0.85* (0.74-0.99)
Urban to rural	0.75 (0.55-1.02)	-	0.83 (0.64-1.08)
Urban to urban	0.65** (0.51-0.81)	-	0.76** (0.62-0.92)
Rural non-migrant	1.12 (0.91-1.37)	-	1.07 (0.91-1.25)
Urban non-migrant	1.07 (0.87-1.32)	-	1.10(0.93-1.30)
Age group			
15-24	1.00	1.00	1.00
25-34	2.66***(2.23-3.19)	1.83***(1.40-2.41)	2.33*** (2.01-2.70)
35-49	2.56***(2.13-3.11)	3.20*** (2.38-4.29)	2.71*** (2.31-3.18)
Education level			
No education	1.00	1.00	1.00
Basic	0.74**(0.64-0.88)	0.52***(0.41-0.64)	0.64***(0.56-0.73)
Secondary	0.54***((0.45-0.65)	0.39*** (0.30-0.52)	0.47***(0.40-0.55)
Higher	0.44***(0.31-0.63)	0.40**(0.21-0.77)	0.40***(0.29-0.55)
Ethnicity			
Muslim	1.00	1.00	1.00
Brahman/Chhetri	1.14 (0.744-1.57)	3.54** (1.68-7.46)	1.359** (1.12-2.26)
Janajati	1.45 (0.94-2.21)	3.28**(1.56-6.86)	1.84** (1.37-2.61)
Tarai caste	1.54 (0.98-2.28)	5.97*** (2.79-12.71)	2.36***(1.63-3.40)
Dalit	1.47 (0.94-2.28)	4.02***(1.90-8.48)	1.99***(1.39-2.84)
Occupation			
Not working	1.00	1.00	1.00
Non-agricultural	0.97 (0.80-1.17)	1.39* (1.01-1.93)	1.06 (0.90-1.25)

Agriculture	1.27**(1.06-1.52)	1.45** (1.09-1.92)	1.30**(1.12-1.51)
Wealth quintiles			
Lowest	1.00	1.00	1.00
Second	1.01 (0.84-1.22)	0.97 (0.75-1.275	0.99 (0.85-1.15)
Middle	0.97 (0.79-1.18)	0.98 (0.71-1.27)	0.97 (0.83-1.14)
Fourth	0.85 (0.69-1.05)	0.95 (0.72-1.26)	0.88 (0.74-1.04)
Highest	0.86 (0.67-1.09)	0.86 (0.59-1.26)	0.84 (0.68-1.03)
Hosmer–Lemeshow test	0.112	0.08	0.81
Nagelkerke R^2	0.115	0.14	0.23

***p<0.001, ** p<0.01, * p<0.05

For left-behind wives (model I), age remained a positive predictor, with higher odds among women aged 25–34 (OR=1.83, 95% CI: 1.40–2.41) and 35–49 (OR=3.20, 95% CI: 2.38–4.29). Education was inversely associated, with basic, secondary, and higher education linked to lower contraceptive use compared to no education. Women engaged in non-agriculture (OR=1.39, 95% CI: 1.01–1.93) and agricultural work (OR=1.45, 95% CI: 1.09–1.92) had higher odds of use than not working women. Among ethnic groups Bhrahmn/Chhetri, Janajati. Tarai caste and Dalit had higher odds of using contraception compared to Muslim non-migrant wives.

The logistic regression analysis in model III shows significant inverse association between being a left-behind wife and modern contraceptive use even after controlling for a comprehensive set of sociodemographic factors. Left-behind wives had lower odds of using modern contraception compared to non-migrants' wives (OR=0.22, 95% CI: 0.19–0.24). Women migrating from rural-to-urban (OR=0.85, 95% CI: 0.74–0.99) and urban-to-urban (OR=0.76, 95% CI: 0.62–0.92) areas were less likely to use contraception than rural-to-rural migrants. Age remained a strong positive predictor for use of modern contraception increased significantly with age and women engaged in agriculture whereas increasing the level of education was consistently associated with lower odds of modern contraceptive use. Agricultural occupation was positively associated with contraceptive use (OR=1.32, 95% CI: 1.14–1.55), while ethnic differences were observed for use of modern contraception.

Discussion

This study examined the effects of spousal separation and women's internal migration on the use of modern contraceptives in Nepal. Our findings revealed that the disparity in modern contraception use between non-migrants' wives (62.4 %) and left-behind wives (27.6 %). This finding shows that spousal separation by male out-migration reduces contraceptive use in Nepal. The multivariate results (model III) further confirm that left-behind wives were less likely to use modern contraception compared to non-migrants' wives. This finding aligns with the previous research (Khanal et al., 2013; Mehata et

al., 2020; Shattuck et al., 2019; Mukherjee, Mahapatra, & Saggurti, 2021). However, our study contrast to the findings from a study in Mozambique, revealed that left-behind wives were more likely to use modern contraceptives than non-migrant wives (Agadjanian et al., 2011). In general, this might be a reason that left-behind wives do not need to use contraception for fertility regulation, resulting in low use of contraception (Shattuck et al., 2019). But, specific reasons that the use of contraceptives may depend on accessibility of service and women's autonomy on contraceptive choice (Mehata et al., 2020). This large difference in contraceptive use between non-migrant wives and left-behind wives suggests that women are more likely to avoid using contraceptives when their husbands are away.

Similarly, our study shows that the use of modern contraceptive was differed by women's own internal migration status. Overall, non-migrant women reported higher contraceptive use (53.8%) compared to migrant women (47.9%). It is also found that there was a different pattern of modern contraceptive use by the women's migration stream. Women migrating from rural-to-urban and urban-to-urban areas were less likely to use contraception than rural-to-rural migrants. This finding aligns with Thapa et al. (2019) and Ochako et al. (2016) noted that internal migration status stream influenced the use of contraceptives in Nepal. This variation was more observed by spousal migration status women. Non-migrant women living with a spouse (non-migrant wives) reported a higher percentage of contraceptive use (68.0 %) than migrant women (59.4 %). It is also found that the migration stream of women, particularly migration from urban to urban, had the lowest use of contraception among non-migrant wives. Women living with their spouse and migrating from urban-to-urban areas showed lower odds of contraceptive use compared to rural-to-rural migrants (model I). In contrast, among left-behind wives, internal migration status did not significantly affect contraceptive use. This indicates that spousal separation itself, rather than women's mobility, is the dominant factor shaping contraceptive behavior among left-behind wives.

Our result shows that age and education level were the significant factors influencing contraceptive use across all groups. Women aged 25–34 and 35–49 had higher odds of using modern contraception compared to those aged 15–24. This trend is consistent with existing literature, which suggests that older women are more likely to use contraception due to factors such as completed childbearing, increased awareness, and greater autonomy in decision-making (Dulal et al., 2024). Findings also demonstrate that there was an inverse relationship between education and use of modern contraception, similar to previous research (Dulal et al., 2024; Thapa et al., 2019; Tiwari & Dhungana, 2025). This finding contrasts with studies that report higher contraceptive use among educated women (Ministry of Health and Population et al., 2023; MOHP, 2017). Findings also shows that ethnicity and occupation status of the women significantly differ in the uses of modern contraception among all groups of women. However, wealth quintiles did not show significant associations with contraceptive use.

Conclusion

This study confirms that both women's and their husbands' migration status significantly influence the use of modern contraception in Nepal. Left-behind wives were substantially less likely to use modern contraception compared to non-migrant wives, which indicates the impact of spousal separation on reproductive behavior. Women's own internal migration status also shaped contraceptive use, with migrant women reporting lower use than non-migrants, particularly among those living with their husbands. However, internal migration status did not significantly affect contraceptive use among left-behind wives, suggesting that spousal separation is a stronger determinant of contraceptive behavior than women's own mobility. These findings add to our understanding of how women's and their husbands' migration status influences the use of modern contraception in Nepal.

Limitations of the study

This research adds to our understanding of contraception with migration variables particularly, the migration status of women and their husbands but it has certain limitations. The analysis relies on cross-sectional data from the NDHS, which means we cannot determine causality from these findings. We construct migration variables based on information available in the NDHS data, which was an important limitation of the study. Future research should explore the effects of spousal separation and migration status on modern contraception use by incorporating these limitations.

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Ethics approval and consent to participate: For this study, we used DHS data accessed upon request. Consequently, further ethical approval was not needed. All procedures adhered to the relevant guidelines and regulations.

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Author contributions: Conceptualization: PRT; Analysis PRT and GPD; drafted the main text: PRT with input from GPD; Reviewed the original draft: PRT; Both authors reviewed and approved the final manuscript.

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