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Cross-border ties and the reproductive health of India's internal migrant women

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ABSTRACT

The literature on how social ties influence sexual and reproductive health is well established; however, one significant limitation of this research is the influence of social ties to hometowns among migrant women. Drawing from cross-border social ties literature, the objective of this study is to assess how cross-border social ties influence use of family planning and institutional deliveries among internal migrant women in India. Cross-sectional data come from 711 migrant women living in slums in Uttar Pradesh, India. Multivariable logistic regression was used to assess odds of modern use of family planning and odds of institutional deliveries with cross-border tie indicators. Results suggest that higher cross-border ties were associated with 2.35 times higher odds of family planning use ($p < 0.1$) and 2.73 times higher odds of institutional delivery ($p < 0.05$). This study suggests that social ties to hometowns may serve as a protective factor, possibly through increased social support, to migrants in regards to reproductive decision-making and use of reproductive health services. Future studies should explore potential mechanisms for these findings.

Introduction

Recent literature suggests the importance of cross-border ties on health and well-being (Acevedo-Garcia, Sanchez-Vaznaugh, Viruell-Fuentes, & Almeida, 2012), and that there is growing recognition that migrants are affected by both cultures at the destination and ties to sending communities (Olwig, 2006). Cross-border ties have been defined as the process of maintaining relationships across borders through various means (Mouw, Chavez, Edelblute, & Verdery, 2014). The impact of cross-border ties and health is mixed, suggesting that it may have both protective and adverse health effects for migrants (Torres, 2013). It can provide a type of social protection across borders that may have an effect on the health behaviors of migrants (Faist, Bilecen, Barglowski, & Sienkiewicz, 2015), including how healthcare services are accessed, where migrants seek health-related advice, and how they obtain medication (Heyman, Nunez, & Talavera, 2009; Menjivar, 2006; Wang & Kwak, 2015). One study of Korean immigrants to Canada found that migrants often return to their hometowns for health examinations, import their medications, and seek advice from people back home by phone or online platforms (Wang & Kwak, 2015). Therefore, ties to hometowns take on many forms with potentially wide-ranging consequences and effects.

Cross-border ties have been conceptualized primarily from the sociological literature in the context of international migration, with the concept of "border" pertaining to a nation-state boundary (Waldinger, 2015, 2013); however, there have been recent calls to better understand how international migration concepts, including cross-border ties, can translate to within-country migration streams (Ellis, 2012; King & Skeldon, 2010). In India, for example, rural-to-urban migrants frequently visited and sent remittances to their hometowns, with approximately 75% and 67% of participants, respectively, participating in these activities (Banerjee, 1981). Therefore, social ties to hometowns and remittance sending is also relevant for internal migrants, yet there is little known about how these activities may influence health. In fact, the majority of migrants globally move within national borders. According to a report from the United Nations, 740 million of the world's migrants were internal while 214 million crossed international borders (UNDP, 2009). Cross-border ties in the context of internal migration are especially of interest in India, where nearly 30% (309 million) of the nation's population is made up of internal migrants (Faetanini & Tankha, 2013). Researchers encouraging integration of international and internal migration concepts and approaches suggest that migration is a process that should not be confined to national borders (King & Skeldon, 2010). In the internal migration context, therefore, cross-border ties may refer to social ties with

hometowns that cross geographic boundaries such as block-levels, villages or sub-districts, districts, and states in India. The objective of this study is to understand how cross-border social ties influence internal migrant behaviors with respect to two reproductive health outcomes.

Cross-border social ties and the influence on internal migration: the role of social ties to hometowns and utilization of reproductive health services

Theories on how social ties may influence health suggest two potential mechanisms: social support and social influence, including peer pressure and social norms (Berkman, Glass, Brissette, & Seeman, 2000). It is known that social ties, social norms, and social support are important determinants of sexual behaviors and reproductive decision-making. According to *social norms theory*, perceptions of peer behaviors have an effect on the individual's own behavior (Maxwell, 2002; Unger & Molina, 1998). Adolescents are more likely to initiate sex if their friends have had sex (Sieving, Eisenberg, Pettingell, & Skay, 2006), or even if they perceive that their friends have initiated sex (Kinsman, Romer, Furstenberg, & Schwarz, 1998; Whitaker & Miller, 2000). This relationship is also true of online social networks with peers (Young & Jordan, 2013). Social support, including emotional (i.e., care and support), informational (i.e., advice), and instrumental support (i.e., money, aid) is protective of adolescent risk behaviors (Ennett, Bailey, & Federman, 1999; Mazzaferro et al., 2006; McNeely & Falci, 2004). One critical gap in the social ties literature is the lack of attention on the ties that migrants continue to maintain in their hometowns, referred to in this paper as cross-border social ties. Social support and social norms potentially mediate the social ties to hometowns and health outcomes.

First, there is evidence that while social networks in destination communities provide instrumental support, cross-border social ties in hometown communities are often critical in offering emotional support and maintaining a sense of belonging (Viruell-Fuentes & Schulz, 2009). A study in New York found that Caribbean migrants who traveled back to sending communities reported higher levels of social support, while other studies find that perceived social support may reduce adverse physical and psychological health outcomes (Kawachi & Berkman, 2001; Murphy & Mahalingam, 2004). While studies have identified a possible benefit of cross-border social ties on migrant health overall, there remains a limited literature on how such ties might benefit specific health outcomes that are most relevant to women including sexual, reproductive, and maternal health outcomes. The few studies that exist are mixed in terms of how social ties to hometown may impact migrant women during and after pregnancy. For example, one study found that Pakistani women in the United States experienced difficulties during pregnancy and birth due to their lack of kin support in destination communities. Some women reported maintaining transnational ties with family in Pakistan which resulted in emotional support and guidance during pregnancy and postpartum (Qureshi & Pacquiao, 2013). On the other hand, a study of migrant women and mammogram service uptake in Denmark found that women felt too busy working to provide financial assistance for family in sending communities and consequently did not seek preventative services for themselves (Kessing, Norredam, Kvernrod, Mygind, & Kristiansen, 2013). This led to greater morbidity among migrant women with strong cross-border ties. In India, extended family, friends, and neighbors play a significant part in care during and after childbirth (Choudry, 1997a). Therefore, cross-border social ties could be particularly important for reproductive decision-making.

Second, social ties to family and peers in hometowns may serve as an alternative source of influence for sexual attitudes and norms. Leading researchers suggest that cross-border social ties and

communication between migrants and sending communities can lead to sharing of ideas and information (Faist, Fauser, & Reisenauer, 2013), ultimately shaping attitudes and behaviors of migrants.

Past studies have found that migrants are influenced by exposure to hometown and destination sexual ideologies, and this results in transformations of sexual identities and behaviors after migration (Carrillo, 2004). More research is needed, however, on how social support and social norms from hometowns may influence reproductive health among migrant women.

Systematic reviews have identified various spheres of life where cross-border ties may make an impact; including familial, socio-cultural, economic, and political experiences and ideals (Faist et al., 2015). In the internal migration context, past studies suggest that the sexual attitudes and norms of hometowns may influence reproductive decision-making (Sudhinaraset, Mmari, Go, & Blum, 2012). Cross-border social ties to hometowns may include physically returning to one's sending community and remitting money. Contemporary migrants maintain such ties to their sending communities through various forms of communication including making phone calls and online communication (Faist et al., 2015; Torres, 2013). Researchers argue that these indicators may not impact a migrant to the same degree across his or her whole life but may differ by time since migration (Amelina & Faist, 2012; Faist et al., 2015). Furthermore, migrants cannot be simply labeled as having cross-border ties or not. Instead, these ties have been identified as existing on a continuum, where migrants vary in the degree to which they are connected to their sending communities and how these ties impact them (Amelina & Faist, 2012). How social ties to hometowns influence family planning and institutional deliveries have not been explored.

Current sexual, reproductive, and maternal health of internal migrant women in India

Sexual and reproductive health behaviors, particularly family planning use and institutional deliveries, are an area of concern for migrant women who generally lack access to contraception, sexually-transmitted disease information, and related health education and treatment services (Usher, 2005). Past studies have found disparities in reproductive health practices among migrants and non-migrants. For example, a study in Delhi based in an urban hospital that primarily served internal migrants found that only 52% of migrant women were using some form of contraception (Kumar et al., 2011). This percentage was found to be more comparable to rural levels of contraception use (48%) than of the non-migrant, urban population (81%) suggesting a low contraception use trend among migrant women (Kumar et al., 2011; Takkar, Goel, Saha, & Dua, 2005). Potential mechanisms for these differences include the lower educational attainment of migrant women, adherence to traditional health practices, and challenges with accessing services and health information associated with the migrant experience (Borhade, 2011; Kumar et al., 2011; Stephenson & Matthews, 2004).

Furthermore, studies have reported lower levels of maternal healthcare utilization by internal migrants compared to non-migrants, putting migrants at risk for worse maternal health outcomes (Shaokang, Zhenwei, & Blas, 2002). Stephenson and Matthews suggest migrant women are less likely to use maternal healthcare services if they lack social networks and found that only 20% of migrant women have an institutional delivery as opposed to 60% of non-migrants in the same urban setting (Stephenson & Matthews, 2004). Studies have found that the urban poor are subject to higher rates of birth abnormalities and delivery complications, including the proportion of low weight births (27% vs. 18% among non-slum women), although data differentiating between migrant and non-migrant slum women are lacking (Borhade, 2011; Kapadia-Kundu & Kanitkar, 2002). Adverse maternal health outcomes are further

complicated by the phenomenon of pregnant migrant women returning to their sending communities to deliver or opting for slum-home births that use untrained midwives despite the availability of delivery services in the urban centers they are living in (Borhade, 2011; Choudry, 1997b).

Programs and policies exist in India to protect the health of migrants although they have their limitations. Government supported Anganwadis are childcare centers that provide maternal health services for India's poor women and children. State-facilitated Jeevan Madhur Yojana programs provide micro health insurance coverage where government systems and migrants split premium costs to cover basic healthcare needs (Borhade, 2011). Despite available programs, migrant women may have trouble accessing services due to restrictions in the mobility of programs and gaps in outreach (Borhade, 2011). Studies have shown migrant women to be less knowledgeable about how to access services, how to obtain health insurance, and what services are available to them. Additionally, they may receive lower quality care due to language barriers, isolation, and stigma related to their migration status (Borhade, 2011; Derose, Pitkin, Escarce, & Lurie, 2007).

Societal complications are coupled with the fact that most migrant women face health challenges without the familial ties and social support of their sending communities (Borhade, 2011, p. 216). Studies have suggested the loss of protective socio-cultural factors may contribute to the deterioration of health status for migrants (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 2000). The existing health trends of India's migrant women are a result of the environmental and interpersonal conditions that these women inevitably face. India's urban slums are heavily populated by migrants who experience hazardous sanitary conditions and societal isolation resulting in poorer health outcomes overall (Borhade, 2011; Mahajan & Sharma, 2014; Yadav, Nikhil, & Pandav, 2011). Cross-border ties of migrants to their sending communities may affect protective socio-cultural factors to some degree and exploring this aspect of the migrant experience may be critical to better understand the reproductive and maternal health outcomes of India's internal migrant women.

Study objective and hypotheses

Research on whether cross-border ties lead to beneficial or adverse consequences among internal migrant women is limited. This paper explores these relationships using rich cross-border social ties data, focusing on internal migrant women in India and assessing not only remittance sending and physical visits, but also frequency of communication and health discussions with hometowns. The study explores the prevalence of cross-border social tie indicators, and the extent to which these cross-border social ties are associated with reproductive and maternal health outcomes, including use of family planning and having an institutional delivery. The objective of this paper is to assess the association between cross-border social ties and use of family planning and institutional deliveries. The hypotheses for the paper are as follow:

Hypothesis 1. Higher cross-border social ties will be associated with increase in family planning use;

Hypothesis 2. Higher cross-border social ties will be associated with institutional deliveries.

Methods

Data and sample

Data for this study come from a cross-sectional study of 759 women aged 16–30 years old living in Uttar Pradesh in India. The data was collected in May 2015. The purpose of the study was to assess the reproductive health behaviors and outcomes of women living in economically-disadvantaged areas. Inclusion criteria for the study were that women lived in a government slum-designated area in Lucknow and had given birth in the past five years. Since the objectives of this paper was specifically to assess the influence of cross-border ties and because of high in-migration rates in Lucknow, these analyses include only respondents who were born outside of Lucknow and considered a migrant. The full analytic sample for this paper was 711 internal migrant women. Because cross-border ties measures were specifically included in the study and because of the high migrant population, this dataset provides a unique opportunity to understand cross-border ties among internal migrants in India. This study recruited women from 38 slums using a list of all slums developed by the India government. Quota sampling was used in which research assistants went door-to-door to recruit 20 women from each slum. Four trained research assistants, all women, conducted the surveys, which lasted approximately one hour.

Measures

Dependent variables

The two variables assessed in this study relating to women's reproductive health include: (1) whether a woman *used a modern form of family planning* (yes/no); (2) whether she *delivered in a facility* for her most recent delivery (as opposed to a home delivery) (yes/no).

Independent variables

We constructed a summary score of cross-border ties (CBT) using a series of six questions relating to women's relationships and communication with their sending communities. These indicators were informed by existing literature on cross-border ties in the international literature (Bilecen & Sienkiewicz, 2015; Snel, Engbersen, & Leerkes, 2006). The individual items include remitting money, frequency of communication with their home (do not communicate, daily, weekly, monthly, annually, changes); if they talk with a parent (compared to other person or no one); how easy it is to travel back home (very easy, easy, difficult, very difficult); and whether they visited another place in the past 12 months. Each woman was given a score ranging from 0 to 0.833. Overall, the CBT score mean was 0.462. In the demographic table (Table 1), we present characteristics by high (above the mean) and low (below the mean) CBT scores. Sensitivity analyses were run including assessing the distribution of the CBT score using histograms.

We also include demographic and migration-specific indicators. Age of migration was constructed as a binary variable (< 20 years and 20+ years). Age categories included 16–19 years, 20–24 years, and 25–30 years. Religious categories included Hindu and Muslim. Caste category, a measure of socioeconomic status, was categorized as none, scheduled caste, scheduled tribe, and other backward caste (OBC). In this setting, people who are scheduled caste, scheduled tribe and OBC are generally more marginalized, less advantaged, lower socio-economic status than people with no caste. Marital status was a categorical variable and included currently married women, widowed, and separated. Educational status was a categorical measure that included none, < 5 years, 5–7 years, 8-9 years, 10–11 years, and 12+ years of schooling. The number of adults and number of children living in a household were also assessed. Finally, occupational status was also included as a categorical variable (none, service-oriented, rag picking, and other).

Table 1
Demographic characteristics, by low vs. high cross-border tie scores.

	Low CBT score (below the mean)	High CBT score (above the mean)	Total (N=711)
Age groups (years)			
16–19	25 (64.10)	14 (35.90)	39 (5.49)
20–24	83 (35.93)	148 (64.07)	231 (32.49)
25–30	222 (49.89)	221 (50.11)	441 (62.03)
Age at migration			
< 20 years	120 (52.40)	109 (47.60)	229 (32.21)
20 or older	208 (43.15)	274 (56.85)	482 (67.79)
Religion			
Hindu	213 (45.91)	251 (54.09)	464 (65.26)
Muslim	115 (46.56)	132 (53.44)	247 (34.74)
Caste			
None	41 (50.62)	40 (49.38)	81 (11.39)
Scheduled caste	168 (60.00)	112 (40.00)	280 (39.38)
Scheduled tribe	37 (55.22)	30 (44.78)	67 (9.42)
OBC	82 (28.98)	201 (71.02)	283 (39.80)
Marital Status			
Currently married	326 (45.98)	383 (54.02)	709 (99.72)
Widowed	1 (100.00)	0 (0)	1 (0.14)
Separated	1 (100.00)	0 (0)	1 (0.14)
Education Status			
None	152 (46.91)	172 (53.09)	324 (45.57)
< 5 years	111 (51.15)	106 (48.85)	217 (30.52)
5–7 years	26 (57.78)	19 (42.22)	45 (6.33)
8–9 years	20 (33.33)	40 (66.67)	8.44 (60)
10–11 years	12 (33.33)	24 (66.67)	36 (5.06)
12+ years	7 (24.14)	22 (75.86)	29 (4.08)
Number adults in the HH (μ (IQR))	2.47 (203)	2.59 (2-3)	2.53 (2-3)
Number children in the HH (μ (IQR))	2.34 (1–3)	2.15 (1–3)	2.24 (1–3)
Occupation (%)			
None	176 (40.46)	259 (59.54)	435 (61.18)
Service oriented	95 (54.29)	80 (45.71)	175 (24.61)
Rag picking	30 (63.83)	17 (36.17)	47 (6.61)
Other	27 (50.00)	27 (50.00)	54 (7.59)
Use of modern family planning method			254 (35.72)
No	223 (48.80)	234 (51.20)	457 (64.28)
Yes	105 (41.34)	149 (58.66)	254 (35.72)
Delivered last child in a facility			
No	184(53.03)	163 (46.97)	374 (48.80)
Yes	144 (39.56)	220 (60.44)	364 (51.56)

Analytic approaches

We conducted a series of analyses. First, the study examined basic descriptive and bivariate logistic regressions with demographic characteristics and cross-border ties. Second, we conducted multivariable logistic regressions on two binary outcomes: family planning use and institutional deliveries. Controlling for demographic characteristics, we assessed cross-border ties individually with each health outcome (Tables 3 and 4, Models 1–5),

all cross-border ties in one model controlling for demographic characteristics (Tables 3 and 4, Model 6), and then as a summary index with family planning use and institutional delivery (Table 5). Significance level was set at 0.1 in the analyses. Each cross-border tie indicator was modeled separately with demographic and migration-related factors to assess the association between individual indicators and health outcomes.

Results

Demographic characteristics

The majority of women in this study were 25–30 years old (62%), with 33% being 20–24 years and 6% being 16–19 years (Table 1). About the same percentage of women over 25 had high and low CBT scores, but a greater proportion of women aged 20–25 years had higher CBT scores (64.07%) and a greater percent of younger (16–19) women had lower CBT scores (64.10%). Most women migrated when they were 20 years or older (67.79%), and 56.85% of these women had higher CBT scores, whereas women who migrated under the age of 20 were more likely to have lower CBT scores (52.40% had low scores). The majority of respondents were Hindu (65%) and the remainder was Muslim. Roughly equal proportions of each of these groups had high and low CBT scores. About 40% of respondents were scheduled caste, 40% other backwards caste, 9% scheduled tribe, and 11% none. A higher percent of OBC women had high cross-border ties (71.02%), a lower percent of scheduled caste (40.00%) and scheduled tribe (44.78%) had high cross-border ties. The vast majority (over 99%) was currently married, and 54.02% of currently married women had high cross-border scores. Almost half (46%) had no education, 31% had less than 5 years, 6% had 5–7 years, 8% had 8–9 years, 5% had 10–11 years, and 4% had 12 or more years of education. Cross-border tie scores were higher among women with more education. Women lived in households with a mean of 2.53 adults and 2.24 children. Women with higher CBT scores had fewer children and lived in larger households. The majority (61%) had no occupation, 25% had a service-oriented occupation, 7% were rag pickers, and 8% other. Thirty-six percent of women who were rag pickers and 45.71% of women who were service oriented had lower CBT scores, and almost 60% of women with no occupation had higher CBT scores. About 36% were currently using a modern method of family planning, 52% delivered their last child in a health facility. CBT scores were evenly distributed for women not using family planning, but 58.66% of those using family planning had higher scores. Women who did not deliver in an institution had slightly lower CBT scores (53.03% had lower scores), and 60.44% of women who did deliver in an institution had higher CBT scores.

Women's prevalence of cross-border ties

Across the 711 migrant women, the study explored six indicators of cross-border ties (Table 2). Approximately 17% of women reported remitting money back home, the majority (63.7%) indicated that they communicated back home at least weekly or daily while only 4.6% reported not communicating at all. Of the people who communicated back home, most (89.7%) only indicated that they only communicated with one type, such as parents, friends, neighbors, etc. The majority of women communicated with their parents (approximately 82%). Traveling home was split evenly, with approximately 46% reporting that it was "very easy" or "easy" to travel back home. The majority (55.0%) did not visit another place in the past 12 months. Approximately 9.3% of women reported that they discussed health during their visit home in the past 12 months.

Table 2
Prevalence of CBT indicators.

Migrants (*n* = 711)	*n* (%)
Sends money back home	
No	593 (83.40)
Yes	118 (16.60)
Frequency communicate back home	
Do not communicate	33 (4.64)
Daily	87 (12.24)
Weekly	366 (51.48)
Monthly	143 (20.11)
Annually	6 (0.84)
Changes	64 (9.00)
Communicates only with parents back home	
Yes	518 (72.86)
How easy is it to travel back home	
Very easy	28 (3.94)
Easy	297 (41.77)
Difficult	305 (42.90)
Very difficult	40 (5.63)
Visited another place in the past 12 months	
No	391 (54.99)
Yes	319 (44.87)
Do not Know	1 (0.14)
Cross-Border Tie Summary Score (CBT Score) (μ (IQR))	0.462 (0.37–0.57)
Discuss health during visit in past 12 months (only asked of those who visited)	
No	250 (35.16)
Yes	66 (9.28)
Do not Know	3 (0.42)
Who do you communicate with back home	*N* = 666
Parents and others	546 (81.98)
Friends and neighbors only	5 (0.75)
Other family (in-laws, siblings, aunts, etc.)	115 (17.27)

Multivariate analyses: relationship between cross-border ties and family planning and maternal health behaviors

In the first analysis, exploring CBT predictors individually on use of modern use of family planning, only reporting remitting was significantly associated with increase odds of using modern family planning (OR = 1.728, $p < 0.05$) (Table 3, **Models 1–5**). When all CBT indicators were included in the analysis, only remitting home was significantly associated with increased modern family planning use (OR = 1.781, $p < 0.01$) [**Model 6**]. Belonging to scheduled caste was marginally associated with lower odds of modern family planning use (OR = 0.535, $p < 0.05$, full model), while belonging to a scheduled tribe was associated with higher modern family planning use (OR = 2.272, $p < 0.05$). Being of higher educational status was also consistently associated with increased odds of family planning use (OR = 1.263, $p < 0.01$, full model). Living in a household with more children was associated with higher odds of modern family planning use (OR = 1.213, $p < 0.05$). Other variables were not consistently associated, and not associated in the full model with all CBT indicators included.

The next set of models explored CBT indicators, individually and combined, and odds of institutional delivery (Table 4). Women who reported that it was easier to travel back home reported higher odds of an institutional delivery (OR = 2.920, $p < 0.01$). Women who reported visiting another place in the last 12 months also had high odds of institutional delivery (OR = 1.392, $p < 0.05$). In the full model, with all CBT indicators included, ease of travel

and visiting another place in the last 12 months, was still associated with higher odds of an institutional delivery (OR = 2.801, $p < 0.05$ and OR = 1.371, $p < 0.1$, respectively). Being a woman with higher educational status was associated with higher odds of an institutional delivery (OR = 1.419, $p < 0.01$), and being from scheduled caste, compared to no caste, was associated with lower odds (OR = 0.480, $p < 0.05$). None of the other variables were consistently significantly associated, or significant in the full model.

In the final set of models, we combine the six indicators of cross-border ties into a summary score (Table 5). Controlling for age of migration, age, religion, caste, educational status, and number of adults and children in the household, individuals with higher cross-border tie scores were 2.350 times more likely to use a modern form of family planning ($p < 0.1$) and 2.733 times more likely to deliver in a facility ($p < 0.05$). Scheduled caste were less likely to use family planning and deliver in a facility, while scheduled tribe were more likely to use family planning. As women's education increased, they were also more likely to use family planning and deliver in a facility. The higher the number of children in the household also increased the odds of using family planning among respondents (OR = 1.213, $p < 0.05$).

Discussion

This study contributes to the larger migration literature by assessing the influence of cross-border social ties on family planning and maternal health behaviors among young internal migrants in India. Study findings suggest that higher cross-border ties, measured by a combination of physical visits, communication, and remittance indicators, was associated with increased use of family planning and an institutional delivery. This study reflects findings from larger cross-border ties literature, which suggests that overall, there seems to be a positive impact of maintaining relationships with people back home on health related behaviors. Increased family cohesion and social support created by higher levels of communication back home may empower people or protect them against inequality in a new setting (Torres, 2013).

This study also assessed specific cross-border tie indicators and the relationship with family planning use and institutional deliveries. Findings suggest that remittance sending was associated with increased family planning use. This is in line with other studies that have found that remittance sending has protective effects, specifically decreasing the odds of past-year major depressive episodes and smoking (Alcántara, Chen, & Alegría, 2015a; Alcántara, Molina, & Kawachi, 2015b). Remittances have been conceptualized to influence health by generating a sense of belonging and connection between migrants and their sending community, mostly in Latino populations (Alcántara et al., 2015a; Torres, 2013). Alcántara et al. (2015a) suggests that remittances promote a greater sense of self-efficacy, and consequently, mental health. Similar mechanisms may be at play in explaining remittance sending and greater use of family planning. Additionally, both it being easier to visit back home and having visited another place in the last 12 months were associated with increased odds of an institutional delivery. While this study did not have enough power to detect differences across migration type, many of these women were from rural areas, where institutional deliveries are much lower compared to urban areas (Matthews et al., 2010). Facility deliveries have rapidly increased in the past few decades in India due to national insurance schemes promoting facility deliveries through the Janani Suraksha Yojana (JSY) program (Randive, Diwan, & De Costa, 2013).

The findings indicate that social support mechanisms may be at play, as opposed to the social norms of sending communities.

Table 3
Multivariable logistic regression of odds of use of modern family planning at most recent sex, indicators of cross-border social ties, and demographic characteristics.

	Model 1 OR (SD)	Model 2 OR (SD)	Model 3 OR (SD)	Model 4 OR (SD)	Model 5 OR (SD)	Model 6 OR (SD)
Sends money back home	1.728** (0.216)					1.781*** (0.222)
Communicates with back home frequently		1.411 (0.568)				1.180 (0.677)
Communicated with a parent			1.217 (0.236)			1.142 (0.256)
Ease of travel				1.520 (0.597)		1.585 (0.673)
Visited another place in the past 12 months					1.083 (0.183)	1.061 (0.190)
Age (years)	1.188 (0.198)	1.181 (0.197)	1.179 (0.196)	1.146 (0.195)	1.194 (0.198)	1.137 (0.197)
Religion (refer Hindu vs. Muslim)	0.986 (0.215)	1.032 (0.228)	0.988 (0.219)	1.108 (0.226)	0.996 (0.221)	1.081 (0.225)
Young Age at migration (<20 compared to >=20 years old)	1.151 (0.182)	1.209 (0.192)	1.180 (0.181)	1.174 (0.211)	1.188 (0.182)	1.141 (0.209)
Scheduled caste	0.609* (0.170)	0.558** (0.159)	0.619* (0.173)	0.531** (0.150)	0.604* (0.168)	0.535** (0.157)
Scheduled tribe	2.472** (0.869)	2.593*** (0.927)	2.439** (0.857)	2.263** (0.828)	2.446** (0.859)	2.272** (0.848)
OBC	0.846 (0.237)	0.831 (0.235)	0.865 (0.242)	0.768 (0.224)	0.868 (0.244)	0.673 (0.202)
Educational status (years)	1.285*** (0.0791)	1.261*** (0.0776)	1.261*** (0.0768)	1.249*** (0.0783)	1.258*** (0.0775)	1.263*** (0.0815)
Number of adults in household	1.020 (0.0761)	1.004 (0.0747)	1.005 (0.0744)	1.016 (0.0761)	1.005 (0.0744)	1.026 (0.0777)
Number of children in household	1.208** (0.103)	1.209** (0.104)	1.202** (0.102)	1.182* (0.104)	1.192** (0.101)	1.225** (0.110)
Constant	0.109*** (0.0757)	0.0991*** (0.0736)	0.110*** (0.0767)	0.124*** (0.0890)	0.121*** (0.0834)	0.0864*** (0.0715)
Observations	711	699	711	670	710	(0.828)

*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

Table 4
Multivariable logistic regression of odds of institutional delivery, indicators of cross-border social ties, and demographic characteristics.

	Model 1 OR (SD)	Model 2 OR (SD)	Model 3 OR (SD)	Model 4 OR (SD)	Model 5 OR (SD)	Model 6 OR (SD)
Sends money back home	0.897 (0.191)					0.862 (0.191)
Communicates with back home frequently		1.853 (0.728)				0.807 (0.459)
Communicated with a parent			1.265 (0.233)			1.023 (0.218)
Ease of travel				2.920*** (1.130)		2.801** (1.175)
Visited another place in the past 12 months					1.392** (0.228)	1.371* (0.239)
Age (years)	1.236 (0.196)	1.240 (0.198)	1.219 (0.194)	1.104 (0.182)	1.244 (0.198)	1.109 (0.186)
Young Age at migration (<20 compared to >=20 years old)	1.051 (0.192)	1.013 (0.187)	1.027 (0.188)	0.962 (0.182)	1.040 (0.190)	0.926 (0.179)
Religion (refer Hindu vs. Muslim)	0.934 (0.164)	0.955 (0.170)	0.923 (0.162)	0.954 (0.176)	0.932 (0.164)	0.976 (0.182)
Scheduled caste	0.541** (0.155)	0.480** (0.141)	0.558** (0.161)	0.498** (0.147)	0.536** (0.155)	0.480** (0.147)
Scheduled tribe	1.397 (0.517)	1.534 (0.582)	1.389 (0.515)	1.317 (0.512)	1.370 (0.508)	1.291 (0.515)
OBC	0.792 (0.233)	0.732 (0.219)	0.765 (0.226)	0.688 (0.214)	0.727 (0.217)	0.618 (0.198)
Educational status (years)	1.441*** (0.0970)	1.430*** (0.0967)	1.440*** (0.0968)	1.449*** (0.102)	1.420*** (0.0961)	1.419*** (0.101)
Number of adults in household	1.074 (0.0805)	1.077 (0.0813)	1.076 (0.0807)	1.057 (0.0812)	1.072 (0.0806)	1.055 (0.0816)
Number of children in household	0.867* (0.0722)	0.864* (0.0733)	0.876 (0.0733)	0.906 (0.0785)	0.869* (0.0726)	0.882 (0.0781)
Constant	0.441 (0.298)	0.330 (0.242)	0.386 (0.263)	0.418 (0.297)	0.403 (0.273)	0.535 (0.442)
Observations	706	695	706	666	705	659

*** p
** p
* p

Table 5
Multivariable logistic regression for family planning and institutional delivery and cross-border ties summary score.

	Family planning use OR (SD)	Institutional delivery OR (SD)
Cross border summary score	2.350[*] (1.104)	2.733[**] (1.241)
Age (years)	1.177 (0.196)	1.216 (0.194)
Religion (refer Hindu vs. Muslim)	1.006 (0.185)	0.946 (0.167)
Scheduled caste	0.607[*] (0.169)	0.541[**] (0.156)
Scheduled tribe	2.523[***] (0.889)	1.433 (0.533)
OBC	0.812 (0.230)	0.706 (0.211)
Educational status (years)	1.253[***] (0.0767)	1.431[***] (0.0964)
Number of adults in household	1.003 (0.0744)	1.075 (0.0809)
Number of children in household	1.213[**] (0.103)	0.885 (0.0744)
Young age at migration (< 20 compared to > =20 years old)	1.165 (0.217)	1.010 (0.185)
Constant	0.0893[***] (0.0637)	0.306[*] (0.213)
Observations	711	706

[***] $p < 0.01$.
[**] $p < 0.05$.
[*] $p < 0.1$.

Given that women in urban areas report higher levels of both family planning use as well as institutional deliveries, it would be hypothesized that if social norms were operating, that higher cross-border social ties would be associated with lower use. Rural areas are typically more conservative, with parents (and older cohorts) significantly more likely to have delivered at home compared to young people, and rural residents more likely to have a home delivery due to lack of available facilities and social norms around delivering at home (Thind, Mohani, Banerjee, & Hagigi, 2008). Therefore, our findings suggest that, as opposed to social norms from hometowns (which may promote greater acceptance of home deliveries), social support mechanisms garnered from the relationships with family and friends in hometowns may be operating to improve institutional delivery outcomes. Ease of visiting home may help maintain the social support and sense of belonging of hometowns, decreasing stress and improving wellbeing among women. Moreover, results suggest that cross-border social ties was only marginally significantly associated with family planning while strongly associated with an increase in institutional deliveries. Future studies should qualitatively explore whether there are specific predictors of social ties, such as ease of visiting home, that may more strongly explain and be more important factors in the association between cross-border social ties and different reproductive health outcomes.

Additionally, scheduled caste and tribe populations in India are often the most socially marginalized and discriminated against, live in slums and are poorer, and lack access to health care and have poorer health outcomes and behaviors (Navaneetham & Dharmalingam, 2002). Our study builds upon past work on understanding caste and reproductive health outcomes, which have often grouped together scheduled caste and tribe populations (Thind et al., 2008). Our findings suggest that, as expected, scheduled caste women were less likely to have an institutional delivery and use modern family planning; however, scheduled tribe populations were found to have higher odds of family planning use, controlling for demographic characteristics. These findings related to scheduled tribe are surprising, others have found that this population had the lowest family planning knowledge and use (Narzary, 2009). It is possible that since people with fewer cross-border ties are more marginalized, once factors associated with cross-border ties are taken into account, tribal populations actually do not have lower odds of family planning use than non-tribal populations. Finally, it is also possible that the relatively small sample size of this population ($N=67$) led to these unexpected results and a larger sample with more respondents from scheduled tribes are needed to fully interpret and validate these findings. Future studies may want to focus on qualitative data across caste categories to understand how cross-border social ties may operate differently on reproductive health outcomes across groups.

This study is novel in that it builds upon concepts developed in the international migration literature, specifically cross-border ties, and assesses whether this applies to internal migration streams in India. It demonstrates that cross-border ties occur frequently, both through physical contact/visiting home as well as communication with people at home. This study finds that women aged 20–24 years, who migrated at 20 years or older, are Hindu, identify as OBC, with either no education or 12+ years education, and had no employment are more likely to experience higher cross-border social ties. It is possible that younger women are less likely to migrate because they may have migrated with their parents; similarly, those who migrated at later ages may have higher cross-border social ties because they have lived for a longer period of time in their hometowns and may have left behind family and peers. This study also suggests that women who are not employed have higher cross-border social ties. Time availability and limited social networks in destination communities may explain these findings. Women who are not participating in the work force may have more time to communicate with their hometowns. It is also possible that women may actually require more support from their hometown kin if they feel more socially isolated. Others have found that "weak ties" garnered from interacting with others in the workplace serve an important source of support for integration and information (Hagan, 1998). Hometown ties may therefore be particularly important for women who are unable to, or decide not to, participate in the labor force. On the other hand, women who work may be limited in time and ability to visit hometowns. Employment may restrict the number of person-days missed, and women may face additional financial burden if they forgo income by taking leave. Moreover, only 17% reported remitting money, which may be due to the low socioeconomic status of women in these communities and low employment among participants. In this context, cross-border ties were maintained typically with a parent back home, as opposed to neighbor or peers. Young people typically communicated weekly, if not daily, with their parents, neighbors, and friends back home. Approximately 9.2% of women reported discussing health during a visit; however, the data is limited in the content of these discussions. Future studies using qualitative data should explore the nature and content of this communication.

There are a number of limitations to this study. First, the study focuses on internal migrants in slum areas in India and therefore may not be generalizable to other populations. However, this population represents a growing demographic in India, where about 20% of urban growth is due to rural-to-urban migration (Faetanini & Tankha, 2013). Studies suggest that women migrate to cities for multiple reasons, including marriage, better employment, and educational opportunities (Sridhar, Reddy, & Srinath, 2013). According to recent estimates, 70.7% of India's internal migrants are women (Faetanini & Tankha, 2013). Second, while the study uses indicators of cross-border ties found in past literature, future studies should more extensively validate these scales using

cognitive interviewing and factor analysis techniques. Additionally, while we ask questions around social ties, including frequency of communication, we do not have information on the quality of social ties or the nature of social ties. For example, it would be useful to know how communication occurred – whether by mail, online, or telephone. While we know how frequent they communicate with someone in their hometown, we are not aware of how long those conversations might last, or whether they are positive or negative discussions. Moreover, it would be helpful to be able to distinguish between family social ties vs. community social ties. We would expect the family to exert a stronger influence than friends or acquaintances in the place of origin. The survey included a question on what type of person they communicated with (i.e. parent, neighbor, family, friend), but there were few women who communicated with someone other than their parent. Future studies should recruit a larger sample of women who may have ties to community vs. only parents. These qualitative differences could significantly impact health behaviors differently. Third, these data come from cross-sectional data. Social relationships may substantially change over time, and it is important to understand how changing ties to hometowns may influence reproductive health. Our analyses tries to account for this by including age of migration, thus attempting to account for time as a migrant; however, longitudinal data would allow us to further examine how improvements or erosion in ties across time may impact reproductive decision-making, attitudes, and norms. Fourth, our definition of "migrant" is limited. We do not have statistical power to assess migration type (i.e. rural-to-urban, urban-to-urban, etc.), and we do not have information on whether they are a temporary/seasonal or permanent migrant worker. It is likely that temporary/seasonal workers may be more likely to physically return to their hometowns and have more opportunities to increase social ties to their hometowns. Moreover, it is also possible that temporary/seasonal workers may also be more likely to deliver in their hometown. This study is limited in that we do not ask women where they delivered; therefore, even though they indicate that they have an institutional delivery, we do not know whether the facility was in their hometown or destination community. Finally, as in other studies, there may be potential confounders that we were not able to control for in our analyses. This includes information about distance to the nearest facility, cost of delivery care, and health insurance information, which may determine choice of home delivery or health facility.

Despite these limitations, this study contributes to the migration health literature in a number of ways. First, it uses rich data among a vulnerable, but growing population to assess the association between cross-border ties and use of family planning and an institutional delivery. It finds mostly protective influences between higher cross-border ties and health outcomes. Second, this study builds upon the social ties literature by examining these issues among women, among internal migrants and the relationship they have with their hometowns, and among young people. We find similar protective effects of social ties to hometowns in this context compared to international migration contexts. It is important to note that the international migration context also finds that there are adverse consequences of cross-border ties to hometowns—specifically, separation from parents (Torres, 2013) and physical visits home particularly for women (Alcántara et al., 2015a). These findings diverge from our results, which found high levels of separation with parents (given that most communication occurred with parents in their hometown) and a positive association with visiting home. A possible explanation is that within country migration may be easier compared to international movement, both in terms of sociopolitical reasons as well as physical ease of movement within a country. Other studies should examine how international and internal migration contexts may

differ as it relates to social ties with hometown and reproductive decision-making.

This study has a number of public health implications. First, social ties to hometowns have been overlooked in interventions and programs for family planning and institutional deliveries. Given that cross-border social ties occur frequently and influence family planning use and institutional deliveries among women in India, it is important for future programs to engage with family and peers in their hometown. Educational materials can be developed to inform individuals in hometowns, and migrants may serve as bridge populations linking services and education to populations at home. Second, family and peers back home may serve as important social support for migrants. Policies should support migrant health, including improving infrastructure and promoting easier communication systems between urban and rural communities.

Given that more individuals move within a country compared to movement across international borders, it is important to understand how cross-border social ties influence women's reproductive health and decision-making. Future studies should focus on better understanding the mechanisms between cross-border ties and health outcomes. This includes understanding the quality of social ties, frequency and across which platforms, and with whom these social ties occur. The extent to which social support and social norms may be potential mechanisms to explain adverse behaviors should be explored in future studies. Exploring both hometown and destination communities gives a more comprehensive understanding of migrant health, and may inform future programs and policies for women's reproductive health.

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