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Migration and Depressive Symptoms in Migrant-sending Areas: Findings from the Survey of Internal Migration and Health in China

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Abstract

Objectives—China has experienced large-scale internal migration and growing mental health disorders. Limited research has examined the relationship between the two processes. We examined the association between labor out-migration and depressive symptoms of family members left behind in migrant-sending areas.

Methods—We conducted a multistage probability sample survey of Chinese adults in 2008 ("Internal Migration and Health in China"), including 787 people in rural migrant-sending areas. To study whether adults in out-migrants households were more likely to experience depressive symptoms (CES-D) than were adults in non-migrant households, we used multivariate regressions and adjusted for a wide range of confounding factors and for the complex sampling design.

Results—Adults in households with labor out-migrants were more likely to report depressive symptoms than those in households without out-migrants, presumably a result of the absence of family members. However, monetary remittances from labor migrants buffered the mental health costs of out-migration.

Conclusions—Labor out-migration has important consequences for the mental health in migrant-sending communities. There is an urgent need to address the psychological costs of migration and to promote regular remittances.

Keywords

Depression; Mental health; Migration; Internal migration; Sending areas; China

Introduction

Studies of migration and health have mainly focused on the health conditions of immigrants to developed nations (Abraído-Lanza et al. 2005). With respect to mental health, an initial advantage of immigrants ("healthy migrant effect") and a deterioration of this advantage over time ("negative assimilation") are both widely established, the latter attributable to the accompanying stress process, loss of social support, and negative aspects of the acculturation process (Bhugra 2004; Takeuchi et al. 2007). A limited but emerging literature

also has documented the unfavorable mental health conditions of internal migrants in developing societies (Lu 2010).

The impact of migration on mental health is likely to extend to family members left behind by labor migrants. This is because rural-to-urban labor migration is often employed as a family strategy to diversify incomes in developing societies, which means that often some family members go out for work while others remain behind, tending the family agricultural holdings (Stark and Bloom 1985). Unfortunately this possibility has not been adequately assessed. Some recent studies link migration with child health, women's reproductive health, and health utilization from the perspective of sending families (Hilderbrandt and McKenzie 2005; Hirsch et al. 2002). But very limited empirical work has explicitly examined the consequences of migration for the mental health of people left behind.

Studying mental health in developing settings, especially as consequences of family separations due to migration, is of great importance both for theoretical understanding and to devise effective interventions for several reasons. First, mental illness has become an increasing concern in many parts of the developing world, with depression being the most prevalent mental health problem (Miller 2006). Also, fueled by urbanization and globalization, labor migration has become an integral feature of family life in many parts of the world and is expected to accelerate in the coming decades (International Organization for Migration 2005). As a result, having one or more family members away for work has become a common life experience in the developing world.

China is particularly appropriate for our study for two reasons. First, China is undergoing an epidemiologic transition: most deaths in recent decades are due to noncommunicable rather than infectious diseases, and there have been emerging health problems associated with rapid industrialization such as obesity and mental health disorders (He et al. 2005). Second, China has experienced very large-scale internal migration since the late 1970s. Currently, an estimated 220 million people are labor migrants who have moved from villages to cities or factory enclaves in search of work, representing perhaps the largest movement of labor in human history (NBS 2011). The rate of migration is anticipated to grow at an annual increase of approximately 10 million (Zhang and Song 2003). While legal restrictions on geographic mobility have been reduced in recent years, various structural barriers remain that preclude most peasant migrants from permanently settling in cities and result in little welfare provision for migrants (Chan and Zhang 1999). As a consequence, many internal migrants in China regard their labor sojourns as temporary or circulate frequently between their home villages and their workplaces, maintaining strong ties with families left behind (Murphy 2002). Because of a similar circular migration process and considerable structural and social barriers facing migrants at their destination, internal migration in China has been compared to irregular migration from Mexico and Central America to the U.S. (Roberts 1997).

Drawing on previous migration and family research from diverse settings, we expect the absence of family members who have gone out for work to represent a distinct form of family disruption that may affect the mental health of those left behind. Out-migration may diminish reciprocal social support of the sort that can produce positive emotional and social experiences (Cohen and Wills 1985). It may also bring added stress because the left-behind members often have to undertake multiple responsibilities to compensate for the shortage of household labor (Taylor et al. 1996). Both changes may create considerable psychosocial costs for those left behind.

Nevertheless, in contrast to other forms of family disruption (i.e., marriage dissolution, incarceration), out-migration often entails substantial economic improvement through

remittances (earnings sent by migrant workers to their families). These monetary transfers represent an important source of family income in resource-constrained settings, now exceeding $80 billion dollars per year worldwide from international migrants (World Bank 2003). In China, migrants remit as much as $25 billion dollars back to their families in the countryside annually (Li et al. 2008). Remittances are likely to benefit the left-behind family members by improving household standards of living and the utilization of health services (Hilderbrandt and McKenzie 2005). The family's improved economic status may also bring non-pecuniary psychological benefits. Given the widely documented protective effect of economic resources on mental health (Kahn et al. 2000), remittances may mitigate the stressful circumstances resulting from the out-migration of some family members.

In the present study, we examined, for a rural Chinese population, whether living in households with adult members absent for work is associated with a higher risk of reporting depressive symptoms. We also assessed the potential buffering role of remittances and hypothesized that the negative association between having members away and psychological health is weaker when families receive remittances. To our knowledge, this is the first study evaluating the multiple influences of internal migration on the mental health of families left behind in China.

Methods

Data

The Internal Migration and Health in China (IMHC) survey is a multi-stage national probability sample of 3,000 Chinese adults age 18 to 64 (http://www.ccpr.ucla.edu/IM-China). It is designed to study the determinants, dynamics, and consequences of internal migration for health and well-being. The study was conducted between November 2007 and May 2008, and is the first national probability sample of China with full coverage of the migrant population. Using information from the most recent Chinese census, we created a stratified multistage probability sample designed to over-sample high in-migration areas, with 150 township-level primary sampling units and 20 interviews per selected township. Each township was subdivided into enumeration districts (EDs) consisting, for rural townships, of administrative villages; and for densely settled townships or parts of township, of geographical units approximately 250 by 250 meters, and four EDs within each township were selected at random. Within each ED, all households were listed and approached in random order. Five households were chosen at random as the primary sample and additional households were chosen at random as a back-up sample. Adults within each household were then sampled probability proportional to size in such a way as to produce completed interviews for five people in each ED and thus 20 interviews per township, resulting in a total sample of 3,000 participants (one adult, or more in large households, were selected to be interviewed). The response rate was close to 70% for the analytic sample, which is comparable to other surveys conducted in China.

Professional interviewers, accompanied by trained local community doctors, used a questionnaire to conduct face-to-face interviews and collected information on demographic and socioeconomic characteristics, including remittances and other forms of income; educational, work, and residential histories; marriage and fertility histories; and self-reports of psychosocial and physical health, health utilization, and health behaviors. Particularly useful for the purpose of this study, the survey included a complete household roster, with information on the basic demographic and socioeconomic status of each household member, including current residence. In addition, dried blood spot samples and other biometric measurements were collected by the community doctors. The questionnaire was designed in English, translated into Chinese, back-translated, and then field-tested to ensure accuracy

and relevance. We used trained interviewers and doctors from the same townships as the respondents to facilitate the interviews because they know the local dialects.

Measures

The dependent variable was depressive symptoms measured by the Chinese version of the 20-item CES-D scale (Center for Epidemiologic Studies Depression Scale; Radloff 1977). The CES-D is a widely used depression measure that was developed by the National Institute of Mental Health to detect common symptoms of depression in adolescents and adults through self-report. It includes a range of related symptoms occurred over the past week. The CES-D has been shown to be a reliable and valid screening instrument for symptoms of depression, with scale scores highly correlated with diagnoses of clinical depression (Roberts and Vernon 1984). The Chinese version we used has been translated from the standard English version and validated for use with the Chinese population (Wang 1993). We constructed a continuous scale by adding scores for all 20 questions, each in a four-point Likert scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). Examples of questions include “I was bothered by small things that don’t usually bother me” and “I felt hopeful about the future” (the exact wording of the 20 questions can be found in Radloff 1977, Pp 387). Thus, our scale ranged from 0 to 60, with higher scores representing more depressive symptoms.

The key explanatory variable was household migration status, indicating whether any member of the household currently lived elsewhere because s/he had “gone out for work” (non-migrant vs. migrant households). This measure was constructed from the household rosters. We focused on labor migrants because they represented the largest migrant stream and have sparked the most theoretical discussion. A small number of rural households with non-labor migrants (N = 42) was omitted from the analysis (these non-labor migrants were away for education, health, or personal reasons). Their inclusion in the analytic sample did not change the story reported below.

We also incorporated information on remittances from the question asking about the total amount of monetary remittances or gift received last year from migrants or brought home by migrants who came back to visit. We then constructed a three-category predictor that distinguished non-migrant households, migrant households not receiving remittances, and migrant households receiving remittances. In all analyses using the binary or three-category household migration measures, non-migrant households were used as the reference category.

Other covariates included factors shown to be important predictors of migration and/or depression: age, gender, marital status, education, current working status, individual monthly income, household size, and previous migration experience (whether the respondent had ever migrated and then returned, as previous research suggests that the migration experience is often associated with heightened psychological distress [Lu 2010]). As sensitivity analysis, we additionally controlled for several physical and psychosocial risk factors for depression to reduce potential confounding bias. These included self-reported health, current smoking behavior, and heavy alcohol use (Mino et al. 2001; Sullivan et al. 2005). Inclusion of these factors did not change the results.

Analyses

The analytic sample for this study was adults in rural China, the origin of most labor migrants (N=745). The quantity of missing information was relatively small. After deleting cases with any missing data (4.8%), the analytic sample size was 709.

We used ordinary least squares regressions (OLS) to predict the level of depressive symptoms based on whether the respondent resided in a household with labor out-migrants

vs. a household with no out-migrants. We estimated two models. The first contrasted households with no members living away and households with at least one labor migrant. The second contrasted three types of households: those with no out-migrants, those with labor out-migrants but no remittances, and those with labor out-migrants and remittances.

We accounted for the complex sampling design (described above and in greater detail on the project web site cited above) by adjusting all analyses for stratification and clustering and by weighting the data to be representative of the adult population of rural China. The weight was constructed as the multiplication of the inverse of the sampling rate for each township and a correction factor that resulted in a weighted population that exactly represented the demographic (age and sex) distribution of the Chinese population in 2005. Our adjustment procedures were those implemented in the survey estimation routines in Stata version 11.

Results

Descriptive statistics

Table 1 presents descriptive statistics for the overall sample and the sample subdivided by household migration status. About a third of the rural households in our sample included household members who had gone out for work. About a third of these households had received remittances in the previous year (82/(82+165)). The mean CES-D score was around 12, with about a quarter of the sample exhibiting depressive symptomatology. Interestingly, respondents living in households receiving remittances were a bit more likely to be depressed (CES-D>=16) than those living in households with out-migrants but no remittances; but, as the multivariate analysis will reveal, this is misleading, because respondents in such households were more likely to be female and relatively old, and to be worse off economically. About 90% of the sample was currently married. As other studies have found, our rural sample was not well educated—about 45% had no more than primary schooling—and was quite poor, with mean monthly incomes of about 820 rmb (about U.S. $120). In 2008, the mean individual income is close to 1,000 rmb (National Bureau of Statistics 2008). Respondents in households with labor migrants were even less well off than households without migrants, which is consistent with the commonsense observation that the incentive to go out for work is greater among those who are not doing well at home.

While the current analysis does not include labor migrants themselves, in an additional analysis, we examined the profiles of the migrants in our sample (note that these are not out-migrants from the sampled left-behind households), who were asked about contacts with their families left behind, and found evidence of strong ties between migrants and their families left behind (results not shown in Table 1 but are available upon request). Migrants in general maintained regular contacts with families left behind. About 70% contacted their family members at least once a month and 60% returned home at least once every year. A considerable proportion of migrants, over one third, remitted regularly to their families at the origin at least once a year, which is consistent with the receipt of remittances shown in Table 1.

Regression results

Table 2 presents the results from OLS regressions of the relationship between household migration and depressive symptoms in the analysis sample of rural adults, adjusting for a wide variety of potential confounding factors. It is clear that, net of other factors, the level of depressive symptoms is higher for respondents in out-migration households: those left behind average about 2.4 more symptoms than respondents in households with no out-migrants (Model 1).

We conducted sensitivity analyses to evaluate the robustness of the OLS results to the distribution of the CES-D score (Table 3). Because the CES-D score is not perfectly normal distributed, we estimated poisson regression models that adjust for the distribution of the dependent variable. This analysis presents very similar findings to the OLS results. Because OLS regressions are much more straightforward to interpret, we focused on the OLS models in this study. We also show results including additional controls in Table 3 (health risk behaviors such as smoking and heavy drinking), which lead to a very similar story.

Model 2 differentiates out-migrant households that do and do not receive remittances. From this model, it appears that the mental health cost of out-migration mainly falls on those left behind who receive no remittances to compensate for the loss of family members. Respondents in migration households without remittances averaged about 2.6 additional depressive symptoms relative to those in non-migrant households but those in migrant households with remittances averaged only 1.5 additional symptoms and this is not significant. This result points to a reduction of mental health costs by over 40% (from 2.6 to 1.5). The difference between migrant households with and without remittances is significant at the .05 level. While there may be some underreporting of the receipt of remittances, especially when they are relatively small or irregular, more accurate reporting is likely to increase the mental health cost of out-migration among those without remittances and decrease it among those with remittances, by shifting some cases from the former to the latter group. For analysis of household migration and remittance status, we also conducted sensitivity results to evaluate the robustness of the OLS results to a poisson model specification and to the inclusion of health-related behaviors (Table 3, bottom panel). The qualitative story remains very similar that remittances help mitigate some of the mental health costs of emigration.

The effects of the remaining covariates are largely as expected. It appears that depressive symptomatology increases with age, is higher for females than for males, decreases with education and income, and is lower among the currently married and, counter-intuitively, even more so among the divorced, separated, and widowed (but this result is less stable because divorce and separation are very rare in rural China). The remaining covariates have no effect. We also considered the possibility that men and women left behind might respond differently, but found no significant interactions between gender and household migration status, suggesting that the mental health costs of out-migration were governed by similar processes for both men and women left behind.

Discussion

Our findings extend the previous focus on the mental health of immigrants to people left behind by migrants. We show that migration has important consequences for the psychological well-being of individuals left behind in sending communities. In rural China, adults left behind by labor migrants were significantly more vulnerable to psychological distress as measured by depressive symptoms.

The consequences of out-migration, however, appear to be multifaceted. Migration also may benefit sending families via receipt of remittances. Receipt of remittances appears to partly compensate for the absence of family members, reducing the mental health costs by nearly half, so that they are no longer statistically significant. Presumably this is because remittances improve living standards and the utilization of health services. Alternatively, they convey a sense of connection between the migrant and families left behind. Exploring this alternative is beyond the scope of this paper. However, our data show little relationship between sending remittances and the extent of contact of migrants with their families (correlation is around 0.04). We believe that the results should be interpreted as suggesting

that the influence of migration in sending areas reflects both psychosocial processes resulting from family disruption and socioeconomic processes associated with remittances.

One important limitation of the study is that the data are cross-sectional, thereby hindering our ability to control for unobserved differences between households of different migration status in drawing causal inferences. But the observed outcomes—particularly the offsetting effects of out-migration and of remittances—are consistent with the processes we have posited. We also sought to reduce potential bias by focusing on labor migration, which is usually motivated by economic-related factors exogenous to health, whereas migration for other reasons (i.e. family-related such as divorce) may result from rather than result in depression among family members. Another limitation is that the relatively small number of out-migrant households precludes further subdividing the sample by factors such as the relationship of people left behind to migrants. It is also possible that the small number of respondents in remittance households contributes to the nonsignificance of the results in such households, though it is unlikely to be the sole explanation because the magnitude of the coefficient was largely reduced in remittance households. In addition, we were able to focus on only one aspect of mental health—depression. In sum, we need to gather longitudinal data and a larger sample and more detailed health and relationship measures to better understand the connections between migration and health.

Despite these limitations, this analysis has revealed important information about the mental health consequences of migration from the perspective of sending families. Our study adds to the literature on the detrimental mental health impact of family disruptions (Braman 2004; Kelley et al. 2001; Richards et al. 1997). Although in developed nations family disruption is primarily due to marital dissolution, military deployment, and incarceration, in many developing nations family disruption is most commonly the result of migration. Importantly, in contrast to the persistent negative effects of family disruption in developed nations, migration constitutes a distinct form of family separation, leading to psychosocial vulnerabilities but also bringing about economic improvement.

The consequences of migration for depressive symptoms among family members left behind warrant particular attention in an age of both global migration and surging mental illness. Over 170 million people in developing nations live outside their home country, sending back over $80 billion per year. The number of internal migrants and the amount of remittances by internal migrants are even greater (IOM 2005). While some migrants move with their families, most leave some or all of their family members behind to circumvent the costs and uncertainties associated with migration.

Our study has sought to assist in the identification and development of useful interventions. The solution is not to impose stringent mobility restrictions, but to devise effective programs that simultaneously can address the psychosocial costs of migration and promote regular economic transfers. One strategy could be to boost the amount and regularity of remittances by diversifying transfer methods and reducing transfer costs. Although we lack direct evidence that diminished contacts result in mental distress, families of out-migrants may benefit from programs that facilitate regular contacts between migrants and families left behind, such as those that lower the cost of communication and transportation services. This strategy may be especially effective because it could help reduce the distress encountered by both migrants and their families.

Although the relationship between migration and mental health no doubt depends on the larger socioeconomic and cultural sphere, the Chinese case provides lessons for other settings, not only other instances of internal migration but also instances of international migration, for example from Latin America to the U.S. For internal migrants, movement

between work locales and home villages is relatively simple. The consequences for families left behind by international migrants, especially undocumented international migrants, may be substantially stronger, given the greater difficulty both in returning home for visits because of border restrictions and in transferring money across countries. We hope this study inspires studies of the consequences for families left behind of internal migration in other nations and also of international migration.

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Table 1

Sample characteristics, adults in rural Chinese households, 2008 (all figures are percentages except when explicitly identified as means; percentages and means are weighted to be representative of adults living in rural Chinese households).

	Total sample	Subsamples		
		Non-migrant households	Migrant households with no remittances	Migrant households with remittances
Migrant households	32.1	--	--	--
CES-D score [mean]	12.1	11.3	13.9	13.7
Depression (CES-D>=16)	26.8	24.7	29.9	35.0
Male	54.0	55.9	52.9	47.0
Age (years)				
18–24	5.8	6.5	6.1	0.0
25–34	21.6	27.3	12.4	1.7
35–44	32.9	34.7	28.9	29.6
45–54	23.7	18.4	31.4	43.9
55–64	16.0	13.1	21.1	24.9
Marital status				
Never married	6.6	8.8	2.7	0.0
Currently married	90.3	88.5	93.8	95.2
Divorced, separated, widowed	3.1	2.7	3.6	4.8
Currently working	87.2	82.9	96.0	96.6
Education				
No education	12.0	9.0	19.2	16.0
Primary school	33.1	30.9	32.8	50.2
Lower middle school	37.5	38.4	37.4	30.7
Upper middle school and tertiary	17.4	21.7	10.5	3.0
Monthly individual income (rmb) [mean]	818	923	600	591
Household size [mean]	4.3	3.9	5.2	4.7
Respondent had previously migrated	22.1	17.1	29.6	40.2
Sample size *N*	709	462	165	82

About a third of migrant households had received remittances in the previous year (82/(82+165)=0.33).

Table 2

Ordinary least squares coefficients for a model of number of depressive symptoms by household out-migration status, rural Chinese households, 2008 (n=709; 95% confidence intervals in parentheses).

CES-D score	Model 1 Dichotomous migration status	Model 2 Migration and remittances status
Migrant household	2.38 *	
	(0.34, 4.42)	
HH migration status (ref. non-migrant HH)		
Migrant HH without remittances		2.65 *,a
		(0.29, 5.01)
Migrant HH with remittances		1.53
		(−0.94, 3.99)
Male	−2.28 *	−2.31 **
	(−4.01, −0.54)	(−4.05, −0.57)
Age (ref. 18–24)		
25–34	3.92	3.96
	(−1.91, 9.75)	(−1.85, 9.78)
35–44	5.27 *	5.36 *
	(0.13, 10.41)	(0.19, 10.52)
45–54	5.87 **	6.02 **
	(1.65, 10.08)	(1.63, 10.40)
55–64	5.39 *	5.52 *
	(0.50, 10.28)	(0.61, 10.42)
Marital status (ref. never married)		
Currently married	−3.93 *	−3.92 *
	(−7.34, −0.52)	(−7.36, −0.49)
Divorced, separated, or widowed	−5.35 *	−5.36 *
	(−10.45, −0.24)	(−10.47, −0.24)
Currently working	−1.59	−1.59
	(−4.88, 1.69)	(−4.86, 1.69)
Education (ref. no education)		
Primary school	−1.45	−1.39
	(−4.19, 1.28)	(−4.02, 1.23)
Lower middle school	−3.09 *	−3.06 *
	(−5.78, −0.41)	(−5.69, −0.44)
Upper middle school	−2.48 +	−2.46 +
	(−5.00, 0.46)	(−5.01, 0.08)
Monthly income	−0.57 +	−0.57 +
	(−1.17, 0.02)	(−1.17, 0.02)
HH size	−0.29	−0.30

CES-D score	Model 1 Dichotomous migration status	Model 2 Migration and remittances status
	(−0.97, 0.39)	(−0.98, 0.38)
Previous migrant	0.24	0.33
	(−2.66, 3.14)	(−2.45, 3.10)
Intercept	19.46***	19.38***
	(13.36, 25.57)	(13.25, 25.50)
R-square	0.13	0.13

+ $p<0.1$;

* $p<0.05$;

** $p<0.01$;

*** $p<0.001$

[a] The difference between migrant households with and without remittances is statistically significant at .05 level.

Table 3

Sensitivity analysis of the relationship between household out-migration status and depressive symptoms, rural Chinese households, 2008 (n=709; 95% confidence intervals in parentheses).

CES-D score	Poisson model (incidence-rate ratios)	OLS model (further controlling for health risk behaviors)
HH migration status (dichotomous) (ref. non-migrant HH)	1.22 **	2.06 *
Migrant HH	(1.06, 1.40)	(0.22, 3.90)
HH migration status (three-category) (ref. non-migrant HH)		
Migrant HH without remittances	1.24 **,a	2.37 *,a
	(1.06, 1.46)	(0.27, 4.46)
Migrant HH with remittances	1.14	1.09
	(0.96, 1.35)	(−1.47, 3.65)

Health risk behaviors include current smoking status and heavy drinking.

* p<0.05;

** p<0.01;

*** p<0.001

[a]The difference between migrant households with and without remittances is statistically significant at .05 level.