Household Migration, Social Support, and Psychosocial Health: The Perspective from Migrant-Sending Areas

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Abstract

An extensive literature demonstrates various negative health consequences of family disruption in Western societies, which is largely due to marital dissolution. In developing settings, family disruption commonly arises in the context of labor out-migration. However, studies on household emigration often focus on the economic benefits from remittances, overlooking emigration as a source of stress and loss of social support. This research examines the psychosocial consequences of internal out-migration using longitudinal survey data collected in Indonesia between 1993 and 2007. Results demonstrate considerable psychosocial costs of out-migration, with adults left behind by migrants more susceptible to stress-related health impairments such as hypertension and to psychological distress such as depressive symptoms. These findings largely hold when specific relations are investigated, including spouses left behind and parents left behind by adult children. This study also finds some support for the stress-buffering role of social support from extended families and the differential psychosocial processes for men and women.

Keywords

Introduction

As the process of urbanization and globalization has intensified, an increasing number of people are affected by migration. Many of them are left behind by migrants in sending areas to circumvent the costs and uncertainties associated with migration. Migration is often conceptualized as a household strategy for risk diversification and income maximization. Hence, the economic benefits of out-migration through remittances (earnings sent by migrants to their families) are usually considered the most crucial channel of the migration effects. This perspective, however, overlooks potential psychosocial costs of household migration, as migration often entails family disruption and prolonged separation.

The previous literature on family disruption, mostly focused on marital dissolution in Western societies, provides the basis for understanding how emigration may influence the psychosocial health of the family members left behind. This line of research documents

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divorce as a social stressor with deleterious health effects (Amato, 2000). In the context of out-migration, the absence of key family members potentially leads to a loss of social support and heightened stress. As documented in the social support and stress literature (Aneshensel, 1992), such experiences likely have substantial deleterious influences on physical and psychological well-being. Studying migration as a social process with psychosocial implications helps enrich our knowledge of the mechanisms accounting for the influences of family and social support on health. However, the existing work largely concentrates on Western societies and immigrants in these settings. Little attention has been given to how these paradigms function in developing settings and from the perspective of migrant-sending areas.

The present study seeks to bridge this gap by conducting empirical analysis in Indonesia, a compelling setting with a high rate of internal migration and a changing health profile. The country is also a developing country for which high quality longitudinal data are available. This study first examines the general effects of out-migration on the psychosocial health of people left behind and investigates the specific impacts by major categories of the relationship between migrants and the left-behind (spouses and parents left behind by migrants). It further assesses the stress-buffering role of social support and the differential effects by gender. While most existing scholarly work has centered on the health of the elderly or children left behind, the current study focuses on adults, who are not only important in their own right but also serve as providers for the young and the elderly. The findings demonstrate internal out-migration as a source of psychological distress and heightened stress for those left behind in migrant-sending communities.

Background

The stress process, social support, and health

Stress is conceptualized as a socially embedded process with important consequences for mental and physical well-being (Lin and Ensel, 1989; Aneshensel, 1992). The sources of stress consist of discrete life events or chronic life strains that entail a considerable amount of change or are perceived as disruptive or undesirable. In developing countries, for instance, poor living conditions and potential sociopolitical tensions are commonly thought to contribute to acute or chronic stress (Patel and Kleinman, 2003). Stress may show a variety of manifestations, including psychological disorder, cardiovascular illness, and weakened immune system (Pearlin et al., 1981). These detrimental health consequences occur as a result of a disequilibrium of organism functioning and the physiological stress reactivity.

The stressful experience, however, does not render all people equally vulnerable because various social resources that people mobilize in response to stress, in particular social support, can intervene at different points in the process and alter the consequences of stress through management of stressful circumstances or modification of the perceptions of problems (Cohen and Willis, 1985). Social support represents resources provided by others in the social structure. These resources can be emotional or instrumental (physical, material, and informational) that help meet an individual's functional needs. It is often found to protect individuals from the adverse influences of stressful circumstances (Lin and Ensel, 1989).

Social support also has a direct and positive effect on health because it produces positive experiences and a sense of stability and self-worth (Aneshensel, 1992). This is mainly reflected in the emotional support and companionship made available by the intimate members of the social structure. Informational and physical resources also can be crucial to

health if trusted members of the network promote healthier behaviors, help with daily needs, or provide necessary material resources.

Previous studies have noted the relations between stress, social support, and family roles. Women and men are expected to differ in the sources of stress. Relatively speaking, work-related stress would likely have a significant influence on the well-being of men, whereas experiences within the family domain would be primary for women's psychosocial well-being (Aneshensel and Pearlin, 1987). Gender variations in the health consequences of stress and social support are also documented. Gove and Tudor (1973) and Kessler et al. (1985) demonstrate the ramifications of gender roles for mental health and attribute higher levels of emotional vulnerability observed among women to the experiences of gendered socialization. This is also related to differing norms of acceptable emotional expression for males and females. As a result, men likely exhibit externalized expressions of distress (i.e., various risk behaviors, anger) when facing stress, whereas women tend to show internalized or emotional reactions to stress such as depression. Furthermore, gender roles account for the variation in the use of social support (Greenglass and Burke, 1988). Women tend to be less likely to suffer from the adverse effects of stress than men because seeking help is congruent with the traditional feminine gender role, and thus, women often mobilize social support more effectively than men to buffer the impacts of stress.

Family status and health

An extensive literature has linked the stress and social support paradigms with family processes, especially marital dissolution. There is unambiguous evidence of an adverse effect of divorce, such as a higher risk of mortality, mental health disorders, stress-related chronic illnesses, and unhealthy behaviors (Amato, 2000; Lillard and Waite, 1995). The key claim is that divorce is a stressful process involving a loss of social resources. Such an experience generates emotional strains and reduces social integration and reciprocal responsibilities. Economic strain is also thought to partially account for this detrimental impact. Economic deprivation, instability, and in extreme cases, poverty, are often associated with divorce, especially among women (Holden and Smock, 1991).

Other forms of family disruption have also been investigated with respect to health. The death of a spouse is often perceived as a severe life stressor (widowhood effect), leading to the loss of psychological, social, and economic resources, and subsequently bearing deleterious health implications (Elwert and Christakis, 2008). Incarceration, during which individuals are removed from their families, is often linked to adverse health outcomes because it diminishes families' economic resources as well as destabilizes and stigmatizes them (Braman, 2004). Military deployment constitutes a stressful experience due to the frequent separation of family members, possible financial concerns, and substantial uncertainties (Kelley et al., 2001).

Migration as a form of family disruption

The New Economics of Labor Migration (NELM) links migration and the families left behind (Stark and Bloom, 1985). This theory contends that migration decisions are made collectively by families to diversify risks and maximize household economic welfare, particularly in less developed societies with inadequate credit systems and little institutionalized provision for insurance against crop failure or loss of productivity in old age. Thus, families send some of their members out to work in wage labor while others tend the fields, generating surplus capital from the income of the migrants. Family ties often remain strong in the face of migration and a large proportion of migrants' income is devoted to remittances (Azam and Gubert, 2006). These transfers not only occur between husbands and wives but also intergenerationally between adult children and older parents

(Frankenberg and Kuhn, 2004). The remittances not only increase household consumption and improve living standards, but can also direct more resources to health-related investments and improve health utilization (Amuedo et al., 2007). Beyond financial remittances, emigration also brings about social transfers of knowledge, attitudes, and practices (Levitt, 1998).

Previous research usually perceives monetary remittances to be the most crucial channel of the emigration effects. What has been largely neglected is the important psychosocial dynamics that cannot be directly attributed to the economic transfers (McKenzie, 2005). The out-migration of family members disrupts family life and transforms social structures within the family. This change diminishes reciprocal social support, subsequently increasing the family members' emotional burden and resulting in added stressors to compensate for the reduced labor supply needed at home (Taylor et al., 1996). The detrimental impact of labor shortage is especially strong in areas dominated by agricultural activities. These families have to handle additional agricultural tasks and take charge of the daily operation of the family business. They must also fulfill added family obligations such as child care and family maintenance. In these respects, out-migration gives rise to stressful circumstances and likely has adverse effects on physical and mental health. These impacts tend to extend to the entire family, rather than restricting to particular family members (Deb and Seck, 2009). This comes as an unintended consequence of the migration decision-making process, and the stress level of people left behind is exacerbated when migrants encounter especially stressful circumstances. Meanwhile, it should not be neglected that out-migration could have some beneficial effects on emotional health, by reconstructing local gender relations and increasing left-behind women's autonomy and decision-making power (Parrenas, 2005). This change may create emotional gains and mitigate the detrimental psychosocial consequences of emigration.

Earlier empirical research has placed much emphasis on the health of migrants and depicts migration as a stressful process for migrants (Walsh and Walsh, 1988; Lu 2010). Only recently have researchers begun to examine the health impact of migration for families left behind. Most existing work has focused on children (Kanaiaupuni and Donato, 1999). There is limited but growing evidence concerning the health impact on the adult population. Kuhn (2005) shows a strong positive impact of out-migration on physical functioning and survival in rural Bangladesh. Roy and Nangia (2005) find a negative impact of migration on sexually transmitted diseases in rural India among women, which is speculated to be a result of reduced support when their husbands are away. Gibson et al. (2009) demonstrate that those left behind are more likely to report poor general health in New Zealand.

The present study

The present research examines the psychosocial consequences of out-migration for adults, focusing on the larger-scale internal out-migration in the study setting. For the reasons discussed above, I expect out-migration to be a stressful experience among people left behind and thus to have an adverse effect on psychosocial health. These health effects are likely to exist for both spouses and parents left behind. I further assess the differential effects by gender and the moderating role of social support. First, due to the differences in gender roles, people likely respond to stress and distress with sex-typical outcomes. Women left behind may be more likely than men to exhibit internalized affective reactions such as depression. In addition, in many developing societies, men assume greater obligations to maintain their families, which may put a greater level of stress on them. Also, women may use social support more effectively because seeking help is more congruent with the traditional feminine gender role. Consequently, men may be more susceptible to stress induced by out-migration.

Given the stress-buffering role of social support, the level of disruption due to out-migration depends on the amount of social support one receives. In many migrant-sending areas, kinship linkages, usually reflected in co-residence of extended family members, may influence an individual's adaptation to migration. Extended families often fill the roles normally assigned to the absent migrants and offer emotional and instrumental support. Therefore, emigration may have a weaker effect on the psychosocial health when support from extended family is present. Also, the influence of out-migration may depend on the length of emigrant's absence. From a cumulative effects perspective, the longer the absence, the greater the distress experienced by family members left behind. Over time, however, households may develop better coping strategies as migration becomes ingrained in local life. The psychosocial impact of out-migration may thus increase over the early stages of migration and diminish over the long term.

The study context

Indonesia is the fourth most populous nation (234 million) and has the largest Muslim population in the world. Over the past few decades, Indonesia has experienced rapid economic change. The country has also experienced concomitant improvements in access to health care and in common measures of health status, such as life expectancy and infant mortality rate (Frankenberg and Thomas, 2001). More recently, the country is undergoing an epidemiologic transition, with hypertension, diabetes, and mental disorders emerging as important health concerns (World Health Organization, 2002).

Indonesian cultures have consistently been documented as collectivistic (Mulder, 1996). Many Indonesians, especially those in rural areas, live in extended families that adopt the strong tradition of exchange and provision of goods and assistance. Children also have a strong sense of obligation toward their parents. Although over time there has been a shift from extended to nuclear family living arrangements, the cultural emphasis on collectivism has continued (Hugo, 1995). It is also worth noting that the kinship system in Indonesia is predominately bilateral; this social structure supports a relatively high status for women (Jones, 1994).

Urbanization has occurred at a rapid pace in Indonesia, exceeding that of many other developing countries (United Nations, 2002). The 2000 census reports that one in ten Indonesians can be classified as migrants (Hugo, 2000). The internal migrant stream is largely characterized by economically motivated migration. Indonesia also is one of the world's major sources of international migrant workers into Southeast Asian countries and the Middle East, sending a total of around 2.5 million immigrants (Hugo, 2002). But the strong economic growth makes domestic migration destinations equally attractive and the internal migrant stream is considerably larger than that of international migration (for this reason, the present study focuses on internal migration). Migrants often maintain strong ties with their families and return periodically to their home areas. As in many other settings, Indonesian migrants remit a considerable proportion of their income to their families (Foundation for Development Cooperation, 2007). In the late 1990s, 25% of rural households in the country relied on labor migration and remittances (Hugo, 2002).

Data and methods

Data

The data used come from the Indonesia Family Life Survey (IFLS), a national representative longitudinal survey of individuals, households, and communities. The first round of data (IFLS1) was collected in 1993 using multi-stage probability sampling and included interviews with 7,224 households and 22,347 individuals. In 1997, IFLS2 was conducted to

reinterview all IFLS1 households and respondents (Frankenberg and Thomas, 2000). Considerable efforts were made to minimize attrition. Following the practice of IFLS2, IFLS3 and IFLS4, which were conducted in 2000 and 2007, successfully interviewed over 90% of the households in previous waves (Strauss et al., 2009). The high follow-up rate substantially reduces data concerns that can arise from selective attrition.

The IFLS collected a broad array of demographic, socioeconomic, and health information. Much of the information was repeated across waves. Importantly, the IFLS contains a detailed household roster, migration histories, and a wide range of health indicators. The household roster includes information on whether a member who lived in the household in previous waves had moved out, and, if so, the main reason for their migration. In the migration histories, information on place of residence at age 12, each trip longer than six months since age 12, and the date and purpose of the trips were gathered. Starting in IFLS2, measurements of blood pressure were included. IFLS3 and 4 further included questions measuring depressive symptoms. For these reasons, this study uses IFLS2-IFLS4.

Variables

As measures of psychosocial health, I used hypertension (stress-related conditions) and depressive symptoms (mental health). Three readings of blood pressure were taken to improve accuracy and the average was used in the analysis. I created a dichotomous indicator using the WHO cutoffs: a systolic blood pressure of at least 140 or a diastolic blood pressure of at least 90. The IFLS3 and 4 included a short screening survey for psychological distress. One question was designed to measure depressive symptoms: "Have you experienced sadness in the last four weeks?" This measure has been shown to identify people with depressive affect reasonably well in Indonesia and in other settings (Goldberg, 1972; Salomon et al., 2003). I constructed a dichotomous variable of depressive symptoms, coded 1 if the respondent had often or sometimes experienced the symptom. A better measure of depressive symptoms, a short version (10-question) of the Center for Epidemiologic Studies Depression Scale (CES-D), was added in IFLS4. CES-D is a widely used across many societies (Radloff, 1977). I first constructed a continuous scale by adding all 10 inventories (each in a four-point Likert scale from 0 to 3). This measure ranges from 0 to 30, with higher scores representing more depression. I then applied the standard cutoff of 16 to create a dichotomous indicator (Weissman et al., 1977). The present study focuses on the dichotomized health measures because they are based on clinically meaningful thresholds. It takes a conservative view that only values in the abnormal range of the health outcomes should be treated as possible cases of disorder. I also carried out sensitivity analysis examining the continuous health measures.

The major predictor, household out-migration status, was constructed from the rosters and migration histories. The rosters asked whether each individual recorded since the first wave lived in the household and, if not, the date of and main reason for moving out. A member is considered a labor migrant if he or she was absent from the original household and was reported to have moved out for work-related reasons. A household was defined as an emigrant household if it sent out at least one labor migrant. To separate the immediate and longer-term effects of out-migration, a discrete measure of length of out-migration was constructed to distinguish nonmigrant households, households with recent labor migrants (within one year), households with medium-term migrants (1–3 years), and those with longer-term migrants (over 3 years), based on the distribution of length of out-migration. Other covariates include standard demographic and socioeconomic characteristics of the individual and household: age (both linear and quadratic age terms to capture the nonlinear health trajectories), gender, years of schooling, current work status, logged per capita annual household income, marital status, family structure, household size, and female head of household.

The analytic sample is rural adults (age 18–65) who never moved across the selected waves. The strategy is to contrast eligible rural adults living in emigrant households with those in nonmigrant households. By definition, I eliminated people who ever moved during the study period (migrants). This is to avoid confounding the effect of out-migration with that of a person's own migration experience. I used age 65, the life expectancy in the late 1990s, as the upper age limit to avoid bias due to differential mortality at older ages. I focused on rural households, which make up over 50% of the data and represent over 80% of the emigrant households.

Methods

The effect of migration may be subject to unobserved heterogeneity—unmeasured factors influencing migration decisions (i.e., previous life exposure, household socioeconomic circumstances, personal traits) that may also affect the health status of household members. This study exploited longitudinal data to obtain fixed-effect (FE) estimates. The FE approach compares the same individuals over successive waves, which effectively adjusts for time-invariant heterogeneity at various levels. Although there may be time-varying unobserved factors at play, this assumption may not be seriously violated because many important unobserved factors are either past events (i.e., previous life exposure) or are highly heritable (i.e., personal traits). In each year:

$$\log(\frac{p_{it}}{1 - p_{it}}) = \mu_t + \beta Mig_{it} + \gamma \mathbf{X}_{it} + \alpha_i$$

where p_{it} is the probability that an individual i experiences a health problem at year t; Mig_{it} is the measure of household out-migration status; $\mathbf{X}_{it}$ is a column vector of the explanatory variables; μ_t is an intercept; and α_i represents time-invariant individual unobserved heterogeneity. The basic idea is to cancel out α_i using conditional maximum likelihood (CML), by conditioning the likelihood function on the total number of events observed for each person (Wooldridge, 2002). The interpretation of the FE models is similar to logistic regressions. A caveat to the FE approach is that time-invariant factors cannot be explicitly modeled (i.e., gender). Also, when the outcome is dichotomous, the method deletes individuals without outcome variations over time. While this can lead to reduced statistical power, it is not a major concern because there is generally sufficient variation in the sample. To increase the sample size for FE modeling, I employed all three waves (IFLS2-IFLS4) to retain respondents with at least two observations, which captures any change over the 10-year period. This procedure preserved close to 50% of the cases. I also included interaction terms between province of residence and survey year to account for macroeconomic shocks and province-level contextual effects.

The analysis of depression resorted to the lagged dependent variable (LDV) method, because the measure based on CES-D is available only in 2007. This approach models depressive symptoms in 2007 as a function of household out-migration status and other covariates while controlling for prior depressive symptoms in 2000. Similar to the FE method, LDV helps address possible selection bias to the extent preexisting differences are captured in the lagged measure. Because CES-D was not measured in 2000, I included a lag measure of depressive symptoms measured by the single-item question asking about sadness. I also conducted sensitivity analysis using a FE model with sadness as the outcome.

In all analysis described above, the Huber-White robust estimator was used to correct the standard errors for clustering of individuals within households (White, 1980). Finally, it should be acknowledged that the approaches described above may not adequately adjust for other aspects of potential bias, such as selection of return migration and of the situation

where all household members moved (Gibson et al. 2010). I conducted sensitivity analysis to evaluate the robustness of the results to return migration and discussed the implications of the other aspect of selection for the results.

Results

Descriptive statistics

Table 1 presents descriptive statistics for IFLS2-IFLS4. In 1997, 16% of rural households had sent someone out for work. This fraction increased almost 8% between 1997 and 2000 and over 10% between 2000 and 2007. The measure does a reasonably good job of capturing households with emigrants, as the estimate is close to those of other studies (Hugo, 2002). When breaking down the overall change by different types of transitions, the majority of the transitions (70%) are accounted for by moving from nonmigrant to emigrant households. Additional analysis suggests that many of the left behind were parents and spouses of migrants. With respect to health, in 1997, 27% of rural adults had high blood pressure. It increased to 29% by 2000 and 34% by 2007, partly owing to the aging of the population. Of note is the substantial increase in the fraction of people who experienced some depressive symptoms, reaching around 30% by 2007. The fraction with severe depressive symptoms was close to 10% in 2007.

In the analytic sample, the quantity of missing information is relatively small. The final sample is based on complete cases, after deleting 7.5% of cases with any missing data. The individual attrition between 1997 and 2000 was about 18% and between 2000 and 2007 was 29%. Since a large fraction of the people lost to follow-up were migrants (respectively over 13% and 18%) and thus would not qualify for inclusion (people left behind), the concerns due to selective attrition are largely reduced.

Household out-migration and health

Table 2 shows that household out-migration is a crucial determinant of psychosocial health compared to most other explanatory variables in the models. Adults in migrant households seem to be more vulnerable to high blood pressure and depressive symptoms. Put in statistical terms, the odds of experiencing hypertension increase by about 37% and the odds of having depressive symptoms almost double for members of households with emigrants as compared to those in nonmigrant households. The analysis with sadness as the outcome yields similar findings, which suggests that the results are relatively robust to different measures of depressive symptoms. Since a binary change in health indicates a substantial state transition, these results can be taken as evidence of strong impacts of out-migration.

With respect to hypertension, the hypothesis is that increased physical and emotional burden is manifested in heightened stress, which in turn reveals in cardiovascular disorders such as hypertension. To strengthen this claim, other important risk factors for hypertension, smoking and overweight (BMI>=25), were included. The large and significant impact of out-migration after adjusting for overweight and smoking suggests that factors other than unhealthy lifestyles, most likely stress, tend to play a crucial role in the disease process. This study further assesses the possibility that improved economics due to remittances may be associated with changes in consumption patterns, leading to overweight that subsequently contributes to high blood pressure. This possibility is not supported by the data, as household out-migration is not significantly related to overweight ($\beta = -0.011$, s.e. = 0.285).

Several additional analyses were conducted to evaluate the robustness of the results to several potential sources of bias. First, the out-migration measure may have underestimated circular migration and recent return migrants. I incorporated information from the migration histories to create a broader measure that includes circular and recent return migrants if the

person reported having moved back to the current household within six months of the interview and having previously taken at least one other trip for work-related reasons. The analyses with and without circular and recent return migrants give highly consistent results and differ by only a small number of households (line 1 Appendix A). I also performed analysis that excludes individuals in households with return migrants across waves (e.g., changed from emigrant to nonmigrant households) because migrants may return for health problems of other family members. This procedure does not seem to change the main story (line 2 Appendix A). Both analyses suggest that return migration is not likely to seriously bias the results. In addition, because several independent variables included in the models may be endogenous to out-migration, I retained only basic demographic variables (e.g., age) that are unlikely to be affected by migration. The results (line 3) are highly consistent with models including the full set of control variables in Table 2.

Furthermore, I studied the continuous measures of blood pressure (averaged systolic and diastolic measures) and CES-D as the dependent variables. This analysis is estimated for the full sample and leads to qualitatively similar results (line 4). This is especially true with respect to depressive symptoms that out-migration is associated with heightened psychological distress. When I examined diastolic and systolic blood pressure separately, the results appear to be largely driven by diastolic blood pressure, which is particularly sensitive to the levels of tension and physical activity and which is considered to be of more concern than a high systolic blood pressure that is often momentary (Beevers et al., 2001). This result suggests that the detrimental health repercussions of family disruption due to out-migration can be quite serious, as they are especially evident in diastolic blood pressure. Lastly, for the models of hypertension and CES-D in Table 2, I performed corresponding linear FE and LDV regression models, which is expected to yield more efficient estimates (line 5). This analysis also provides an estimate of marginal effects (as opposed to odds ratios in the logistic regressions), which is more straightforward to interpret and can be understood as the probability of the health deficit occurring. Whereas the magnitude of the coefficients is considerably smaller, the results tell a similar story: people left behind tend to experience a 3% and 5% increase, respectively, in the probability of developing hypertension and depression.

Variations by relationship, social support, and gender

I specifically examine the effects by major categories of relationships between migrants and people left behind, namely spouses left behind and parents left behind (age 45 and above) by adult children (Table 3). The results show that parents left behind are especially likely to develop hypertension and depressive symptoms when a primary household labor and caregiver migrated for work. This is also likely to be attributable to the wear and tear on the body with age, which tends to increase the responsiveness to life stressors. By contrast, for spouses left behind, the health costs exist largely with respect to depressive symptoms, and to a lesser extent hypertension. This may be because many spouses left behind are women and that the different gender roles suggest varying vulnerabilities for men and women. This speculation seemed to be supported when I stratified the analysis by gender. But these relation-specific analyses should be interpreted with caution because the procedures used to derive the relationships between migrants and left-behind household members may introduce considerable error (i.e., the relation was recorded with respect to the household head) and lead to smaller sample sizes.

With respect to gender differences, women have a higher risk of experiencing depressive symptoms when separating from spouses than men. This may be explained by gender norm expectations that are linked to the exhibition of mental health problems. The other possibility—that migration transforms gender relations and leads to improved psychological well-being for women—is not supported by the data, as the relationship between out-

migration and the decision-making power of women is negligible. This is not surprising in Indonesia because a bilateral rather than patrilineal kinship system has predominated and women in general hold relatively high status. As for stress-induced physical health, men seem to be more vulnerable to hypertension. This is partly because men tend to assume greater work obligations and the well-being of men is more closely tied to work-related stress. Men thus tend to face greater pressure when experiencing household labor shortages. In addition, women are more likely to mobilize social support from kin and co-villagers than men. The data lend some support to these conjectures: men left behind tend to work eight hours more per week than women left behind (49 vs. 41 hours). Also, in emigrant households, women were more likely to live with extended kin than men (over 50% of women vs. 35% of men).

Regarding the potential buffering role of social support, I find that the negative consequences of out-migration for hypertension become smaller in extended families, but the difference lacks statistical significance. The effect on depressive symptoms is reduced by over half for individuals in extended family arrangements. These findings provide some evidence that additional social support from extended families helps compensate for the disruption associated with out-migration, especially in the form of emotional support. With respect to the length of out-migration, results show that the detrimental psychosocial effects are not immediate but tend to accumulate over time. Within the first year of out-migration, there is little impact on physical health. The effect on emotional health is more evident, suggesting that the distress of separation tends to be more immediately felt than stress induced by labor shortage. But this effect is still relatively small. With extended periods of absence (1–3 years), we see a greater impact of out-migration as prolonged stressors lead to chronic strains. Over a longer period of time, the speculation is that households may develop better coping strategies and remittances may come in to compensate for some of the deleterious effects. However, the data provide insufficient evidence. The pace of recovery seems to be faster for psychological health than for physical health. This may in part be because emotional health is generally more responsive to change than physical health. Also, over time as people age and start to experience diminishing physiological functioning, they are less likely to recover from abnormal blood pressure. More work is needed to definitively pin down the longer-term effect of out-migration.

Conclusions and discussion

This research links several strands of research on family, the stress process, and social support to examine the psychosocial consequences of household out-migration. It adds to the understanding of the role of migration for individual well-being from the perspective of sending areas. The findings suggest that the influence of out-migration should be understood as a result of not only a socioeconomic process associated with remittances, but also a psychosocial process due to family disruption and reduced social support. In the Indonesian setting, adults left behind by internal migrants tend to be more prone to stress-related health conditions and psychological distress. These findings are consistent when parents and spouses left behind are examined separately. The results also demonstrate the buffering role of social support from extended families and the moderating role of gender.

These findings add a demonstrative case to the literature on family dynamics and well-being by documenting out-migration as a form of family disruption, both similar and different to other stressful family transitions. Examining the case of migration is crucial, as in less developed settings the majority of split families arises from labor migration rather than from marital dissolution. In addition, whereas most studies on the health consequences of the stress process concentrate on Western societies and the immigrant population, this study

offers important insights in a resource-constrained setting and in the context of internal migration.

The use of high quality panel data permits various sensitivity analyses to reduce potential biases due to endogeneity, data quality, and measurement. Although consistent impacts of out-migration are shown across models, these analyses cannot completely rule out all possible sources of bias, in particular time-varying factors associated with both household out-migration and depression. In addition, several other limitations warrant discussion. First, it would be informative to explicitly examine the moderating role of remittances as well as the frequency of contact between migrants and families. This is because remittances may help mitigate the excessive distress on families by reducing the demand for subsistence labor, and may even generate nonpecuniary psychological gains due to improved economic status and standards of living. Improved resources from remittances may also enhance the physical health status (i.e., nutritional status) of people left behind, which has been shown to lead to better psychological well-being. The analysis of depressive symptoms by length of emigration lends some modest support to these speculations. It shows that over time (i.e., as left-behind households receive regular remittances), the psychological costs of emigration are reduced and become marginally significant. Ideally, the analysis would compare migrant households with and without remittances, but the data do not supply such information. The study also cannot adequately capture migrant households where everyone has moved as they may be different from households where some members are left behind. In addition, the data are limited with respect to direct measures of stress and social support. Some findings regarding the stress process thus have to rely on relatively indirect inference.

Despite these limitations, this study has yielded some useful observations about the health consequences of out-migration. These observations warrant particular attention in an age of global migration and of surging psychological and cardiovascular illness. The solution is not to impose stringent mobility restrictions, but to devise effective programs that can address the psychosocial costs of out-migration. Facilitating regular contacts between migrants and families left behind, such as those that lower the cost of communication and transportation services, is promising. This strategy may be especially effective because it helps reduce the distress encountered by both migrants and their families in the origin, as earlier research demonstrates strong mental health costs for migrants themselves (Walsh and Walsh, 1988; Lu, 2010).

The story told here is part of a broader process of how migration has reshaped individual well-being. The Indonesian case provides lessons for other settings, not only other examples of internal migration but instances of international migration. For internal migrants, movement between work locales and home villages is relatively simple. The consequences for families left behind by international migrants, especially undocumented immigrants, may be substantially stronger, given the greater difficulties in visiting home and longer episodes of separation. Comparative work examining how the effect of emigration is contextualized within the larger sociocultural sphere would greatly advance our current understanding on the association between migration and health.

Acknowledgments

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Highlights

• Adults left behind in migrant-sending households in Indonesia are more vulnerable to psychosocial health disorders

• This adverse effect can be buffered by social support from extended families

• The psychosocial process related to emigration varies for men and women

Table 1

Means and Percentages of Variables, IFLS 1997–2000 (Standard Deviations in Parentheses; N=4,391)

Variables	1997	2000	2007
Age	40.4 (12.4)	43.2 (12.6)	49.4 (11.9)
Male	45.5	45.5	45.5
Currently working	68.0	79.9	81.1
Education			
0–5	58.7	58.8	58.8
6–9	32.0	32.2	32.1
>=10	9.2	9.0	9.0
Marital status			
Never married	6.2	5.9	3.1
Married, living with spouse	82.0	82.9	80.3
Married, not living with spouse	3.0	1.3	0.9
Marriage dissolution	8.9	9.9	15.6
Ever migrated prior to IFLS2	37.7	37.7	37.7
Household with labor migrants	15.9	23.8	34.6
Per capita household annual income [a]	1,247,356 (1,736,374)	1,456,004 (2,468,195)	2,071,297 (3,464,197)
Family structure			
Nuclear	64.5	63.9	63.9
Extended	34.0	34.5	34.6
Other	1.6	1.6	1.5
Female-head household	14.7	14.3	14.5
Household size	4.5 (1.9)	4.4 (1.9)	4.1 (1.8)
Hypertension	27.1	29.3	34.0
Depressive symptoms (sadness)	--	28.1	29.5
Depressive symptoms (CES-D)	--	--	9.3

[a] The variables are adjusted for inflation (in thousands of constant 2000 Indonesian Rupiah). In 2000, 1 US dollar = 8,290 Indonesian Rupiah under 5,000 Rupiah.

Table 2

Fixed-effect and Lagged Dependent Variable Models of Health Status on Household Migration and Other Covariates, IFLS 1997–2007 (odds ratios shown; 95% confidence intervals in parentheses)

	Hypertension	Depressive symptoms (CES-D)	Depressive symptoms (sadness)
Household with labor migrants (ref. nonmigrant household)	1.373 * (1.814, 1.039)	2.052 * (3.588, 1.174)	1.241 † (1.564, 0.985)
Age	1.019 (1.171, 0.887)	0.957 (1.049, 0.873)	0.957 * (0.995, 0.920)
Age squared	0.999 (1.001, 0.997)	1.059 (2.552, 0.439)	1.288 (1.876, 0.884)
Male	—	0.910 (1.704, 0.486)	0.926 (1.181, 0.726)
Currently working	0.835 (1.071, 0.651)	−0.522 † (1.096, 0.248)	0.981 (1.322, 0.728)
Education (ref. 0–5 years)			
6–9 years	1.095 (1.589, 0.755)	0.587 † (1.057, 0.326)	0.843 (1.081, 0.657)
>=10 years	0.948 (2.406, 0.374)	0.534 (1.316, 0.217)	0.959 (1.370, 0.671)
Marital status (ref. never married)			
Married, living with spouse	0.783 (2.249, 0.273)	1.153 (3.257, 0.408)	1.153 (1.830, 0.726)
Married, not living with spouse	0.977 (3.262, 0.293)	6.104 * (25.780, 1.445)	2.206 † (5.004, 0.972)
Marriage dissolution	1.468 (4.746, 0.423)	1.948 (6.952, 0.546)	1.611 (2.833, 0.916)
Per capita household annual income (log)	0.990 (1.014, 0.967)	0.983 (1.076, 0.898)	0.968 * (0.998, 0.938)
Family structure (ref. nuclear families)			
Extended families	1.059 (1.434, 0.781)	0.584 (1.208, 0.282)	0.976 (1.270, 0.751)
Other	0.895 (2.485, 0.322)	1.239 (6.883, 0.223)	0.931 (1.909, 0.455)
Household size	0.969 (1.113, 0.843)	1.104 (1.252, 0.974)	1.065 * (1.125, 1.008)
Female-head household	0.809 (1.442, 0.454)	0.614 (2.075, 0.182)	0.849 (1.237, 0.583)
Overweight	1.229 (1.917, 0.787)	—	—
Currently smoking	1.108 (2.184, 0.563)	—	—
Previous depressive symptoms (sadness)	—	3.333 *** (5.771, 1.926)	1.960 *** (2.456, 1.565)
Log Likelihood	−827.5	−272.7	−1214.9
N	3,924	4,107	4,311

Note: Estimates for year, province dummy variables, and their interactions are not shown.

***
 p value < 0.001;

**
 p value < 0.01;

*
p value < 0.05;

†
p value < 0.1; two-tailed tests.

Table 3

Coefficients of Household Migration Status by Relationship to Migrants, Level of Social Support, Gender, and Length of Emigration, IFLS 1997–2007 (odds ratios shown; 95% confidence intervals in parentheses)

	Hypertension	Depressive symptoms (CES-D)
By relationship with migrants		
Parents left behind	1.520 * (2.185, 1.058)	2.280 * (4.791, 1.085)
N	1,078	1,352
Spouses left behind	1.423 (2.355, 0.860)	1.972 * (3.810, 1.021)
N	1,352	1,630
Gender		
Males		
Household with labor migrants (ref. nonmigrant household)	1.721 * (2.707, 1.094)	1.448 (3.996, 0.525)
N	1,785	1,869
Females		
Household with labor migrants (ref. nonmigrant household)	1.192 (1.714, 0.830)	2.026 * (4.039, 1.016)
N	2,139	2,238
Difference by gender	†	†
Level of social support		
Nuclear Households		
Household with labor migrants (ref. nonmigrant household)	1.527 * (2.224, 1.048)	2.197 * (4.510, 1.070)
N	2,511	2,628
Extended Households		
Household with labor migrants (ref. nonmigrant household)	1.269 (1.941, 0.829)	1.365 (3.214, 0.580)
N	1,354	1,417
Difference by family structure	Insignificant	*
By length of emigration (ref. nonmigrant household)		
Household with labor migrants <=1 year	1.137 (1.725, 0.749)	1.328 † (1.857, 0.950)
Household with labor migrants 1–3 years	1.578 ** (2.210, 1.126)	2.195 ** (3.829, 1.258)
Household with labor migrants >3 years	1.657 * (2.575, 1.066)	1.906 † (3.998, 0.909)
N	3,874	4,063

Note: Estimates of other covariates are not shown, which are the same as those presented in Table 2.

*
p value < 0.05;

†*p* value < 0.1; two-tailed tests.

Appendix A

Results from Sensitivity Analysis, IFLS 1997–2007 (95% confidence intervals in parentheses)

	Hypertension	Depressive symptoms (CES-D)
1. Broader household migration definition	1.443 * (1.918, 1.086)	2.008 * (3.849, 1.047)
2. Excluding households with return migration	1.478 * (2.100, 1.041)	2.022 * (3.999, 1.022)
3. Control for only exogenous independent variables	1.327 * (1.696, 1.039)	2.195 ** (3.747, 1.285)
4. Continuous health outcomes	0.846 * (diastolic) (0.089, 1.603)	0.256 * (0.035, 0.477)
	0.405 (systolic) (−0.265, 1.075)	
5. Linear FE and LDV models for dichotomous outcomes	0.033 ** (0.009, 0.057)	0.051 * (0.002, 0.100)

Note. All coefficients refer to the coefficients for household with labor migrants. Lines 1–3 show odds ratios.

**
p value < 0.01;

*
p value < 0.05; two-tailed tests.