

The Feminization of Migration and Mental Health of Older Parents Left Behind: Evidence from Indonesia

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Abstract

While an extensive literature documents the economic consequences of migration for sending families, less is known about its psychological impacts on non-migrant family members, particularly in the context of rising female outmigration for work. This study addresses this gap by investigating whether having a labor migrant daughter distinctly impacts the mental wellbeing of older parents who remain at origin. It examines the case of Indonesia – one of the largest sources of female labor migration in the world – using panel data for 1,880 individuals ages 50+ in the 2007 and 2014 Indonesia Family Life Survey and individual-level fixed effects regressions. Results reveal gendered health implications for parents: parents who had a labor migrant daughter saw a bigger increase in depression in the interval compared to (i) parents with no labor migrant children, and (ii) parents with only labor migrant sons. Further analysis shows that parental depression increases when the migrant daughter is unmarried, suggesting that a daughter's departure is particularly burdensome for parents when it involves conditions that may threaten her sexual reputation and marital prospects. Results examining heterogenous impacts by care conditions at origin household and migrant children's precarity at destination are also discussed. Findings underscore the importance of examining gender-based heterogeneities in the experiences of sending homes as more women migrate for work globally.

Keywords: migration; gender; elderly; depression; left behind; Asia; Indonesia

1. Introduction

The growing movement of workers across regional and national boundaries is reconfiguring family life across the Global South. In addition to changing the economic conditions of sending homes, labor migration is disrupting established family dynamics and shifting individual risk exposures in ways that significantly influence the health and wellbeing of migrants and their family members at origin (Hugo 2002; World Bank 2006; Schmalzbauer 2004; Graham and Jordan 2011; Hochschild 2003). The implications of labor outmigration are not similar across sending families though; origin and destination conditions, as well as the composition of migrants and those left behind, influence the nature of transregional or transnational life that emerges (De Haas 2010). One increasingly important factor shaping the migrant-left-behind nexus is the feminization of labor migration, i.e., the growing number and share of female migrant workers evidenced since the 1980s. Women in low and middle-income countries increasingly move for economic reasons in response to the rising demand for manufacturing workers, and more recently, service sector workers in destination areas (Ehrenreich and Hochschild 2002; UNFPA 2006). Their outmigration generates distinct family dynamics as they have different characteristics than their male counterparts, including in terms of remittance behaviors (Curran and Saguy 2001; Lim and Oishi 1996; Martin 2009), they often face higher risks during the migration process due to their marginalized status and job sectors (Sijapati 2015), their departure leads to care disruptions for sending homes (Cortes 2013; Parreñas 2005a), and they are subject to different moral expectations than their male counterparts (Chan 2014; Hofmann and Buckley 2013). This, in turn, means that that their outmigration has distinct health implications for family members left behind.

This study investigates the gendered impacts of labor migration for non-migrant family members using panel data from Indonesia – one of the most predominant sites of labor migration, and especially female labor migration, in the world (BNP2TKI 2019; Listiani 2017). It specifically asks how a daughter’s labor migration impacts the mental health of older parents left behind, net of changes in economic status and other sociodemographic factors. Data come from panel surveys of 1,880 individuals ages 50 or more in the 2007 and 2014 Indonesia Family Life Survey. Individual fixed effects regressions with controls for time-varying confounders are used to capture hypothesized associations. Parents with no labor migrant children, and parents with only labor migrant sons, are used as control groups to identify the distinct impact of having a daughter move for work.

The study extends existing research on the impacts of migration on sending families in important ways. Most studies on migration conceptualize it as a livelihood strategy intended for the benefit of the collective family unit, and therefore focus on how remittance transfers have shifted the economic and physical wellbeing of non-migrant family members (Yang 2008; Quisumbing and Mcniven 2010; Garip 2014; Zezza et al. 2011; Vogel and Korinek 2012). Relatively less is known about the psychological impacts on family members left behind, particularly in the context of rising female outmigration for work. Some recent studies have paid attention to the psychological burdens experienced by those left behind (Lu 2012; Song 2017; Yahirun and Arenas 2018; Nobles, Rubalcava, and Teruel 2015; Parreñas 2005a), but these studies do not explore whether psychological impacts on older parents vary by the gender composition of migrant children. If and when studies acknowledge the unique conditions generated by women’s departure for work, they typically focus on the welfare of female migrants themselves (Chung and

Mak 2020; Van Bortel et al. 2019; Ohno 2012; Næss 2020) or on that of children left behind (Graham and Jordan 2011; Parreñas 2001; Jordan and Graham 2012; Arguillas and Williams 2010). Existing investigations on the socioemotional experiences of left behind older parents of migrant daughters are largely qualitative in nature (for Indonesia, see Aminuddin et al., 2019; Noveria, 2015; Wolf, 1992. For other countries, see Dreby, 2006; Gamburd, 2000; Pantea, 2012; Parreñas, 2005b; Knodel and Saengtienchai, 2007). The handful of quantitative studies that consider variations in parental health by migrant child's gender focus on China (Song 2017; Cong and Silverstein 2008; Wahba and Wang 2019), and even some of these studies (Song 2017; Cong and Silverstein 2008) are limited as they use only self-rated health as an outcome and/or as they restrict the sample to rural China or specific provinces within China. This study, therefore, represents one of the first investigations to employ nationally representative panel survey data from a setting with high male and female outmigration to examine whether daughter's labor migration has distinct mental health implications for older parents left behind.

It is imperative to focus on older parent's mental health outcomes as population ageing, combined with the outmigration of young men and women for work, is increasingly bringing elderly wellbeing and care into question. This is particularly true in Asian countries that have seen a more rapid decline in family size than their Western counterparts (World Bank 2016). Most elderly in these contexts not only have cultural expectations for personal care from adult children but are also reliant on their families given the lack of social safety nets and alternatives to family-based care (Jackson and Peter 2015; Mujahid 2012). The outmigration for adult children threatens this system of old-age care as it reduces the number of potential caregivers in close proximity, and reduces the incentives and pressures on children to fulfil normative intergenerational contracts (He

and Ye 2014; Ye et al. 2013). Moreover, when adult children migrate without proper documentation, it can heighten concerns for parents back home (Antman 2010; Grant, Falkingham, and Evandrou 2009). Some could argue that migrant children can support and reassure parents via transfers and frequent communication (Knodel and Saengtienchai 2007). There is no guarantee, however, that such arrangements will materialize, or that they can override the psychological toll that family separation can bring about. If and when such psychological disruptions occur, it can not only make it harder for impacted individuals to perform daily tasks and maintain relationships, it can also amplify physical disability risk (Ferrari et al. 2013).

2. Background

The economic security that potentially arises from migration and remittances can be significant in reducing chronic stress and enhancing the psychological wellbeing of parents at origin (Kan 2021; see Lund et al. 2010 on the economic correlates of mental disorders). There is some evidence to suggest that parents with migrant *daughters* are especially likely to experience such economic and related health gains, as female migrant workers tend to remit with greater frequency, and over longer durations, than their male counterparts (IOM, n.d.). Female migrants also tend to remit a higher share of their income than male migrants (Holst, Schäfer, and Schrooten 2012; Vanwey 2004; Pearson and Kusakabe 2012; Rahman and Fee 2009), and during periods of heightened need for origin households, they are more likely to be reliable insurers, remitting a higher absolute amount than male migrants (de la Brière et al. 2002).

Yet, while the sense of financial stability that migrant children/daughters can offer parents is significant, it is just as important to consider the familial, social, and psychological changes and challenges that arise from children's, namely daughter's, migration. The arguments presented in the following sub-sections shed light on some of the non-economic ways in which a daughter's migration can disrupt non-migrant parent's daily lives and impact their mental wellbeing.

Care Disruptions

Because female kin are often the primary caregivers for dependent members, their departure from the household can create a care deficit (Agree and Glaser 2009), and consequently increase feelings of loneliness, abandonment, and dissatisfaction among aging parents (Miltiades 2002; Scheffel and Zhang 2019). In the Indonesian context specifically, it is expected that norms about intergenerational caregiving and property transfers make proximity to, and care from, daughters highly desirable in matrilineal communities (Schröder-Butterfill and Fithry 2012). Yet, recent ethnographic studies find that even in Javanese communities that are governed by bilateral kinship systems and reciprocal norms, there is a tendency and preference for receiving old-age care from daughters and other female kin via co-residential or quasi-coresidential arrangements (Keasberry 2001; Schröder-Butterfill and Fithry 2012; Kreager and Schröder-Butterfill 2014).¹

¹ In terms of intimate and physical care, i.e., scenarios that can make cross-gender care taboo, both elderly mothers and elderly fathers in Javanese communities (communities where kinship systems are more flexible) reported care from daughters (Schröder-Butterfill and Fithry 2012).

Daughter's outmigration is therefore particularly likely to increase parental distress by disrupting established and preferred care arrangements for older Indonesians.

Apart from creating a care gap, daughter's outmigration can also increase care responsibilities for (female) parents at origin who end up addressing emergent care needs of younger and older dependents left behind. For elderly who experience this reversal of care, the resultant decline in leisure time, the physical and emotional demands of caregiving, and the challenges of navigating new technological, healthcare, and educational environments can be an added source of stress (Parreñas 2010; Ingersoll-Dayton et al. 2018; Siriwardhana et al. 2015). In resource-poor households, such increases in responsibilities can be particularly detrimental for caregivers left behind who may set aside their needs and direct resources towards dependents (Cong and Silverstein 2012; Hoang, Yeoh, and Wattie 2012).

Gendered Moralities

In addition to shifting care arrangements, daughter's migration can present a social challenge for older parents. Cultural rigidities about acceptable female activities and deep-seated patriarchal norms can result in daughters being perceived as abdicating their domestic responsibilities when they migrate for work (Yeoh 2016; Hofmann and Buckley 2013). Furthermore, gendered moralities about pre-marital sexual relations can heighten parental anxieties if unmarried daughters move away for work and are outside the purview of family supervision.

In Indonesia, an unmarried women's sexual 'purity' is central to her immediate and extended family's repute (Bennett 2005; Platt 2012; Silvey 2000). Cultural customs affirm the value of virginity by exalting 'virtuous' women. Single women are closely monitored by kin to make sure they behave appropriately as even the insinuation of sexual deviance can invite shame and diminish women's marital prospects (Davies 2014). The importance of women's sexual fidelity is emphasized by state-level actors as well: for example, some public-sector employers (police, military) filter out single, female job applicants suspected of premarital relationships using virginity tests, allegedly to maintain a workforce that reflects the nation's moral values (McDermott 2015; Davies 2018). The predominance of these gender ideals is reflected in women's responses as they conduct premarital relationships in secret, or extract a promise of marriage before entering a relationship, to safeguard their honor and project images of sexual 'purity' (Bennett 2005).

In such a moral landscape, the migration of unmarried daughters can be a challenging experience for parents at origin. Migration increases the physical distance between generations, migrant daughter's autonomy, her exposure to the 'depraved' aspects of modern life, and her potential for 'improper' interactions with members of the opposite sex at destination (Chan 2014; Mills 2017; Silvey 2000). In other words, it creates conditions that can threaten daughter's sexual reputation and marital prospects, and thereby amplifies the gossip and social stigma endured by her family at origin. Qualitative studies from sending communities in Indonesia (Aminuddin et al. 2019; Wolf 1992) shed light on the social costs borne by families in these situations. Similar

findings are observed in other Asian contexts as well (Oishi 2005; Bélanger and Rahman 2013; Lynch 2007).²

Gendered Risks

It is not only the conditions at origin that make daughter's outmigration troubling for parents. Precarious conditions at destination are known to be a source of distress for non-migrant parents (Antman 2010; Kumar 2021), and migrant daughters are particularly likely to experience precarity given the higher risks women face due to their marginalized status and job sectors. As a result of accumulated disadvantages over the life course, female migrants are likely to face additional challenges throughout the migration process (e.g., due to the lack of finances, necessary family support, information, language skills). The implications of these disadvantages are compounded as gender-segregated labor markets result in migrant women working in occupations (e.g. domestic work, sex work) with high risk of exploitation and abuse (Sijapati 2015; Lim and Oishi 1996).

Studies of Indonesian women working abroad reveal a range of negative experiences including long and unpaid work hours, heavy workloads, delayed or slashed salaries, abuse, and sexual harassment. This is particularly the case when women work in the Middle East and Malaysia – destinations characterized by high undocumented migration and limited labor protections (World

² More generally, the importance of young women's safety and sexual reputation in these contexts is reflected in the gendered educational and transportation choices parents make (Williams, Archavanitkul, and Havanon 1997; Porter and Turner 2019).

Bank 2017; Silvey 2004). To make matters worse, when the Indonesian government looked to address these abuses by issuing moratoriums against work travel to these countries in 2010-15, it worsened female workers' precarity by pushing them into undocumented migration (World Bank 2017). Such circumstances underscore the importance of regular reassurance for left behind family members of female migrants. However, the fact that a significant portion of this female employment is overseas can be an added barrier as it diminishes opportunities for frequent meetings and increases uncertainty regarding daughter's safety.

While the risks experienced by female migrants is significant, it is important to note that in the case of Indonesia, male migrants are also likely to face dangerous conditions at destination. More than a quarter of Indonesian international migrants are male migrants to Malaysia who work as casual workers in agriculture or construction, without proper documentation, protections, or stable pay. Their precarity is worsened by the fact that they are disincentivized from pursuing high-cost legal migration channels, and the relative ease of moving to neighboring Malaysia (World Bank 2017). In-depth interviews highlight the continued distress experienced by return migrant men and their non-migrant family members because of the debilitating living and work conditions in Malaysia (Surtees 2018).

Hypotheses

Based on the discussion above, I hypothesize that, net of changes in economic life and other dimensions of wellbeing, parents who have a labor migrant daughter will see a larger increase

in depressive symptoms than parents with no labor migrant children, and parents with only labor migrant sons (H1).

One possible reason for H1 is that parents with labor migrant daughters are more likely to experience a care gap than those with no labor migrant daughters. Under this hypothesis, I expect parents who have a labor migrant daughter and no female adults co-residing in the household to serve as a potential caregiver to see a bigger increase in depression than parents who have a labor migrant daughter and a female adult co-residing in the household (H1a).

Another possible reason for H1 is that a daughter's migration, particularly an unmarried daughter's migration, can represent a moral violation and increase social pressures on parents. Under this hypothesis, I expect parents who have an unmarried labor migrant daughter to see a bigger increase in depression than parents whose labor migrant daughters are all married (H1b). Given that moral expectations are different for daughters and sons, I also expect parents who have an unmarried labor migrant son and no unmarried labor migrant daughter(s) to not experience more depression than parents whose labor migrant children are all married (H1c).

In the context of Indonesia, both migrant daughters and migrant sons are likely to experience some form of workplace precarity. To the extent the available data allow me to measure migrant precarity, I expect parents who have a labor migrant daughter in a precarious situation to experience a bigger increase in depression than parents with no labor migrant children and parents with labor migrant children in less precarious situations (H1d). Under this hypothesis, I also expect parents with a labor migrant son in a precarious occupation or location to experience a bigger

increase in depression than parents with no labor migrant children and parents with labor migrant sons in less precarious situations.

3. Data

This study uses individual panel survey data from the 2007 and 2014 Indonesia Family Life Survey (IFLS). The IFLS is a broadly representative, longitudinal survey that was fielded in 1993, 1997-8, 2000, 2007 and 2014. The 1993 sample included more than 7,000 households and 22,000 individuals across 13 of the 27 provinces in the country, and the follow-up rate of households across subsequent waves was over 90 percent. This relatively low attrition rate makes the IFLS apt for longitudinal analysis as it minimizes concerns from selective attrition. This study uses the last two waves of IFLS because depression – the outcome of interest – was consistently measured only across those waves (Strauss et al. 2009; Strauss, Witoelar, and Sikoki 2016a).

To construct my analytical sample, I begin by pooling observations for older parents who were age 50 or more in 2007, who were not reported to have died between waves, who did not move within or outside their community between 2007 and 2014 (so that parent's own migration does not confound the relationship of interest), and who had at least one adult child in both waves. Following IFLS conventions, the cutoff of age 50 was used to identify an older individual, and the cutoff of age 15 was used to identify an adult child (Strauss, Witoelar, and Sikoki 2016b). I exclude parents who had labor migration children in 2007 but had all of them return in 2014 from the pooled sample as the analysis is focused on the impacts of offspring's outmigration. From this eligible sample, I drop observations for older individuals who were not successfully reinterviewed

in 2014, and who did not have complete information on the variables of interest or sampling weights for either wave. Overall, 20 percent of observations were dropped from the eligible sample due to missing information, resulting in a final analytical sample of 3,760 pooled observations (i.e., 1,880 older parents). While individuals in the eligible and final sample differ in terms of some demographic characteristics, I find no statistical difference in baseline depression levels for dropped and retained cases before or after controlling for these factors (see Supplementary Information).

4. Measures and Methods

This study examines the consequences of adult daughter's migration for parental depression, measured using the Center for Epidemiological Studies 10-item roster. In the IFLS, respondents were asked to score how frequently, on a 4-category ordinal scale (1 = never, 2 = some days, 3 = occasionally, 4 = most of the time), they experienced ten emotional symptoms in the last week. This symptomology was consistently measured in the 2007 and 2014 waves. Validity tests have supported the use of CES-D scales to identify depressive symptoms among Indonesian elderly (Mackinnon et al. 1998). To construct a continuous outcome measure, I reverse-coded items of contentment, added parent's responses to the ten symptoms so that a higher total score reflects higher distress, and logged the total score to adjust for its skewed distribution.

I model this outcome as a function of adult children's (daughter's) labor migration using individual fixed effects linear regressions with controls for time-varying individual, household and meso-level confounders, survey year effects, and region-specific survey year effects. One

challenge with estimating the implications of migration for parental health is that unobservable factors (e.g. biological predispositions, personality traits, gender ideology) that cannot be controlled for may be correlated with the migration decision and the health of parents (McKenzie, Stillman, and Gibson 2010). The model used here addresses this concern with the inclusion of fixed effects for individual, period, and region-period; these account for all the unobserved, time-invariant characteristics of the individual and the time-varying characteristics of the national and regional (island or corridor) context that can confound the effect of adult child's migration on parental health.

Similarly, the inclusion of time-varying controls accounts for changes in individual factors, household factors, and meso factors that can impact or change with migration and/or influence depression (see Das et al., 2007; Tampubolon and Hanandita, 2014 for review on the correlates of mental health). At the individual level, I control for changes in demographic and health factors such as parent's age group (age \geq 65 years), union status, employment status (working for income), and physical health (measured using activity limitations). At the household level, I control for changes in household size/structure (number of adults ages 15-49, number of members ages 15 or less). I also control for changes in economic status (asset quartile, household expenditure per capita (logged)) so that I can capture the psychological impact on parents beyond economic changes that accompany children's outmigration. Finally, at the meso level, I control for rural versus urban residence. The coding structure for control variables is shown in Table 1, and further details on variable construction is provided in the Supplemental files.

Regression coefficients from this model can be interpreted as the percentage change in depression that temporally accompanies a one-unit change in the independent variables. I ensure

robust estimates by clustering standard errors at the household level (i.e., the level at which the ‘treatment’ is assigned). Regressions employ panel weights, unless stated otherwise.

The main independent variable for this analysis, adult children’s (daughter’s) labor migration, is measured using a three-category variable: [1] no labor migrant adult children; [2] only labor migrant sons; and [3] at least one labor migrant daughter. A labor migrant child is defined as a biological or adopted adult child who was living in a different district than his/her/their parents or was living abroad for a period of at least 6 months, and whose primary activity was described by parents as working for income. For most of this paper, I use individuals in the first category as the reference group. I examine how parents who transition to having only labor migrant sons, and individuals who transition to having at least one labor migrant daughter, compare with those who have no labor migrant child in either wave. Additionally, I perform analysis using individuals in the second category as my reference group. That is, I examine how individuals who transition from having only labor migrant sons to having at least one labor migrant daughter compare with those who have only labor migrant sons in both waves. By using two comparison groups, I gain a wider conceptualization of how daughter’s migration impacts parents at origin.

To identify possible reasons why daughter’s migration impacts parental depression, I extend the regression strategy outlined above in three ways. First, to test H1a, I interact the main independent variable with the indicator for a female adult in the household to identify if the impact of daughter’s migration varies by the presence of potential caregivers in the household. Second, to test H1b, I distinguish parents in category [3] based on migrant daughter’s marital status and examine if the depressive impact of migration is concentrated among those with at least one *unmarried* migrant daughter. As a placebo check for H1b, I examine if parents with unmarried

labor migrant sons and no unmarried labor migrant daughters experience a similar response to those with an unmarried labor migrant daughter (H1c). Finally, to examine H1d, I proxy migrant precarity using occupation and location information (for this study, precarious migrants are those who are self-employed, unpaid family workers, or casual workers in agricultural or non-agricultural businesses *OR* those who work in Malaysia or the Middle East) and expand the independent variable to see if depression is higher among parents with children in precarious occupations and/or locations.

5. Results

Sample Characteristics

Table 1 presents the characteristics of older parents in the final analytical sample. Between 2007 and 2014, roughly 20 percent of sampled parents transitioned from having no labor migrant children to having at least one labor migrant child. A little less than half of the parents who experienced this transition had a daughter move away for work in the interval. This period also saw a shift in the composition of migrant children; 41 percent of sampled parents had a migrant child in both waves, and one-fifth of parents in this group saw a shift in the gender composition of migrant children between waves (i.e., they transitioned from only migrant sons to at least one migrant daughter, or vice-versa).

Are these shifts in adult child's migration status associated with shifts in mental health outcomes for parents? At the cross-sectional level, parents with migrant daughters do not appear to have different depression scores than parents without migrant daughters. However, no

conclusions can be drawn from this simple comparison as there are confounding factors at play; parents with labor migrant daughters differ from parents with no migrant daughters in terms of other socioeconomic characteristics. For example, in 2007, parents who had a labor migrant daughter were more likely to be older, female, in union, in rural areas, have more adult children, not have (female) adults in the household, out of formal employment, and have an activity limitation than parents with no labor migrant children. Compared to parents with only labor migrant sons, parents with migrant daughters were more likely to be younger, in union, in urban areas, have more adult children, not have a female adult in the household, out of formal employment, and have an activity limitation. Panel regressions used in this study therefore consider how changes in children's migration status are associated with changes in parent's mental health, net of changes in correlates such as those described above.³

TABLE 1 HERE

Net Impact of Daughter's Migration

Table 2 estimates the association between daughter's labor migration and parent's emotional health using individual fixed effects regressions. Models 1 and 2 are the reduced models and they both show a positive association between the transition to having a labor migrant daughter (from no labor migrant children in Model 1, and from only labor migrant sons in Model 2) and change in parental depression. These reduced models also show a positive association between

³ Note that this individual fixed-effects regression strategy does not permit the inclusion 'fixed' individual factors, like gender, as a separate regressor.

transitioning from no labor migrant children to only labor migrant sons and change in parental depression.

TABLE 2 HERE

Models 3 and 4 examine if the associations observed in the reduced models hold net of time-varying controls. Model 3 shows that parents who transitioned from having no labor migrant children to having at least one labor migrant daughter saw a bigger increase in depression, compared to parents who had no labor migrant children in either wave. Notably, here, the disruptive influence of daughter's migration on parents' emotional health holds even after accounting for health-improving changes (e.g., shifts in asset quartile, consumption, working status, physical health) that her migration could have brought about. In contrast, parents who transitioned to having only labor migrant sons did not see a significantly different shift in depression compared to the parents in the reference group. The inclusion of time-varying controls wipes-out the positive association seen in the reduced model.

Model 4, which uses parents with only labor migrant sons as the reference group, provides further evidence of gendered health impacts. This model shows that compared to parents who had only labor migrant sons in both waves, parents who transitioned from having only labor migrant sons to having at least one labor migrant daughter saw a bigger net increase in depression. All these results are in the direction expected and support the hypotheses that daughter's migration can be a uniquely distressing event for non-migrant parents.

In terms of time-varying controls, I find that improvements in relative asset status were associated with fewer depressive symptoms, while developing activity limitations in the interval

was associated with more depressive symptoms. These associations are in the direction expected. Furthermore, the main takeaways from this table are robust to different outcome variable definitions and independent variable coding structures (see Supplemental Information).

Because the items comprising the depression index vary in terms of the specific emotion observed and in terms of severity of response, I analyze how daughter's labor migration influences each emotional response item for parents left behind. This provides a richer characterization of parent's mental health changes following daughter's migration. For this analysis, I recode the ten symptom items into dummy variables that indicate whether the individual experienced the specific symptom at all. I multiply these dummy variables by 100 and run linear probability models with individual fixed effects and time-varying controls from Table 2. These models capture the percentage point change in the probability of experiencing an emotional symptom if a daughter migrates for work, and if only sons migrate for work, compared to if no children migrate for work.

Figure 1 presents the results from this analysis. I find that compared to having no labor migrant children, having a labor migrant daughter was associated with an increased likelihood of being bothered by things that are not usually a concern, having trouble concentrating, feeling depressed, and experiencing difficulties going on with life. In contrast, having only labor migrant sons was associated with a higher likelihood of being bothered by things that were not usually a bother, but not with any other symptom. As in Table 2, these results show that a daughter's migration generates distinct anxieties and feelings of duress among parents left behind; only sons' migration does not invoke a similar response.

FIGURE 1 HERE

Possible Explanations

Having established that daughter's labor migration increases parental depression, I turn to possible reasons for this gendered impact. For this, I examine which subgroups of parents with migrant daughters experience an increase in depression compared to the reference groups.

I begin by examining if the lack of potential caregivers in the origin household is a significant reason for higher distress among parents of migrant daughters (H1a). In Table 3., I interact the main independent variable with an indicator for whether there was female adult in the household. Model 1 in Table 3 shows that compared to parents with no labor migrant children, parents with a labor migrant daughter saw an increase in depression, and this positive main effect was not offset by the main effect or interactive effect of having co-resident female adult. Similarly, Model 2 shows that compared to parents with only labor migrant sons, parents with a labor migrant daughter saw an increase in depression, and that this positive effect was not lessened by the presence of a female adult in the household. Taken together, these results suggest that the presence of a potential (female) caregiver does not change the impact of daughter's migration on older parents.

TABLE 3 HERE

Next, I turn to examining Hypothesis 1b. In Table 4, I expand the category of parents with labor migrant daughters and explore if parents with *unmarried* labor migrant daughters are more likely to experience an increase in depression compared to the reference groups. In accordance with the normative pressures argument in H1b, I find that when parents have only married migrant

daughters, they do not see a bigger increase in depression between waves than parents with no labor migrant children (Model 1), and parents with only labor migrant sons (Model 2). But when parents have at least one unmarried migrant daughter, they see a 6.8 percent increase in depression compared to parents with no migrant children, and a 6.2 percent increase in depression compared to parents with only labor migrant sons. This varied impact by migrant daughter's marital status suggests that non-migrant parent's depression is likely a function of the worries and social pressures from having *unmarried* daughter move away from home.

TABLE 4 HERE

To further substantiate the results from Models 1 and 2 in Table 4, I run a placebo test to see whether having an unmarried migrant son impacted parental depression in a similar manner. The idea here is that if observed parental depression is driven by gendered moral expectations for unmarried migrant daughters, then the departure of unmarried migrant sons for work should not have a similar impact on parental depression. Models 3 and 4 in Table 4 display the results for this check. They show that having an unmarried labor migrant daughter (and no unmarried labor migrant sons) is associated with an increase in depression compared to having no labor migrant children (Model 3) and compared to having labor migrant children who are all married (Model 4). In contrast, having an unmarried labor migrant son is not associated with a significant change in parental depression compared to having no labor migrant child, or compared to having only married labor migrant children.

As a final check for H1b, I run a test to see whether the emotional health implications of having an unmarried migrant daughter varies by transfer receipt from migrant daughters. The idea

here is that if parental depression observed is associated with normative pressures, then the receipt of transfers from daughters should not impact whether parents experience a significant increase in depression relative to the reference group. The results (shown in Table A5, Supplemental Information) are robust to this check as well. Irrespective of transfer patterns from migrant daughters, having an unmarried migrant daughter is associated with increased depression for parents at origin. I focus on variation by transfer receipt as remittances are seen as one of the biggest benefits of migration for families; this analysis suggests that there are limits to these benefits for sending families.

Lastly, in Table 5, I test H1d. This table examines whether the emotional impact of offspring's migration varies by the gender of the migrant and whether or not the migrant was in a precarious occupation and/or location. Here, I find that parents whose migrant daughters were in secure situations (group 4) and parents who had at least one migrant daughter in an insecure situation (group 6) both experienced an increase in depression compared to parents in the reference group. It is possible that some of the daughters classified as 'secure' here were also unmarried. Parental distress for that group is therefore likely driven by the composition of daughters in that group; small cell sizes prevent me from disentangling these effects.

The results for parents with migrant sons are less clear. Contrary to the hypothesis posed, parents whose labor migrant sons were in insecure occupations or locations did not see an increase in depression compared to parents with no labor migrant children.⁴ A possible reason for this is that the available information on occupation and location do not allow for accurate measurement

⁴ No significant depression impact was observed for group [3] even when group [2] was the ref group.

of precarity. More information on documentation status and/or more detailed breakdowns of occupation would allow for a more valid measure of precarity.

TABLE 5 HERE

6. Conclusion

The increasing feminization of labor migrant streams across the developing world warrants investigations of the distinct ways in which families at origin are affected by the departure of women for work. This study draws on individual panel data from the 2007 and 2014 Indonesia Family Life Survey to examine how an adult daughter's labor migration distinctly influences the mental health of older parents who remain at origin, beyond the economic channel. It is one of the first quantitative investigations to draw on nationally representative panel data to explore how the gender composition of labor migrant children measurably influence the mental health of non-migrant parents.

Results from individual fixed effects regressions reveal gendered health implications for non-migrant parents. Parents with a labor migrant daughter experienced a larger increase in depressive symptomology between the two waves compared to both parents with no labor migrant children and parents with only labor migrant sons. Further analysis reveals that this result is largely driven by having an *unmarried* daughter move away for work, suggesting that parental distress increases when it involves conditions that may threaten a daughters' sexual reputation and marital prospects. Sensitivity checks show no parallel depressive impact for parents with

unmarried migrant sons (and without unmarried migrant daughters), supporting the argument that parents' emotional responses are influenced by gendered moral expectations for young adults. This result, which quantifies the depressive impact of daughter's migration arising from normative pressures, is consistent with findings from the qualitative literature.

To be sure, the arguments and evidence presented here could be further substantiated, but lack of data for certain variables in the IFLS preclude such analysis. For example, information on whether a married daughter travelled with her spouse to destination and information on married migrant daughter's marital quality would provide more insight into heterogeneities in parent's responses to married daughter's migration. In the case of unmarried daughter's migration, information on whether unmarried daughters were working and living in female-only settings at destination would provide more insight into conditions that ameliorate/intensify non-migrant parents' distress. Similarly, information on community expectations regarding single women's and men's premarital behavior would further support arguments about how normative pressures shape parental depression when unmarried daughters move away for work.

Nevertheless, the findings presented highlight how female migration works as a uniquely disruptive process at the individual, family, and social level to quantifiably influence the emotional wellbeing of individuals in sending areas. As women are increasingly motivated, and even encouraged by the State to pursue migration for economic reasons, research and policy efforts need to consider the myriad ways in which the lives of individuals left behind are impacted. Existing studies have examined how the welfare of non-migrant children is affected when mothers move away for work (Cortes 2013; Bryant 2005; Arguillas and Williams 2010), but as these findings reveal, it is also important to consider the socioemotional experiences of older parents with migrant

daughters. Heightened depression following daughter's migration can translate into health risks across multiple domains for older individuals left behind (GBD Collaborators, 2018), making female migration particularly costly for sending families and communities. Social protection efforts, therefore, have to actively consider the unique health risks for elderly parents with migrant daughters, while improving work conditions and protections for female migrants working within Indonesia and abroad.

Tables & Figures

Table 1. Parent's Characteristics by Adult Children's Migration Status: Col % or Mean \pm SD.

	Full Sample	No migrant children	Only migrant sons	At least one migrant daughter
<i>Depression</i>				
Log depression score, 2007	2.5 \pm 0.2	2.5 \pm 0.2	2.6 \pm 0.2	2.5 \pm 0.2
Log depression score, 2014	2.7 \pm 0.3	2.7 \pm 0.3	2.7 \pm 0.3	2.7 \pm 0.3
<i>Change in adult child's migration status</i>				
No migrant children in both waves	39.4			
No migrant children \rightarrow Only migrant sons	11.5			
No migrant children \rightarrow At least one migrant daughter	8.0			
Only migrant sons in both waves	17.9			
Only migrant sons \rightarrow At least one migrant daughter	4.0			
At least one migrant daughter in both waves	14.9			
At least one migrant daughter \rightarrow Only migrant sons	4.5			
<i>Socioeconomic characteristics, 2007</i>				
Age \geq 65	18.0	14.7	23.2	22.1
Female	51.7	47.6	57.4	57.4
Not in union	20.5	20.3	22.3	18.9
Rural residence	62.5	60.9	66.1	63.3
# adult children	3.6 \pm 1.9	2.9 \pm 1.7	4.2 \pm 1.8	4.8 \pm 2.0
# co-resident adults, ages 15-49	1.6 \pm 1.3	1.8 \pm 1.3	1.4 \pm 1.3	1.3 \pm 1.3
# co-resident children, ages < 15	0.7 \pm 0.9	0.7 \pm 0.9	0.7 \pm 0.9	0.6 \pm 0.9
Female adult in HH	58.0	63.8	53.7	45.0
Log annual HH expenditure (IDR)	16.2 \pm 0.7	16.2 \pm 0.7	16.2 \pm 0.7	16.2 \pm 0.7
Asset quartile: Lowest	28.7	28.5	28.8	29.3
2 nd quartile	23.7	24.6	21.8	22.6
3 rd quartile	25.2	25.1	26.1	24.3
Highest quartile	22.4	21.7	23.2	23.7
Works for income	80.5	81.8	79.7	77.7
Has activity limitation	39.1	37.2	40.8	43.2
Obs.	1880	1093	420	367

Notes: IDR = Indonesian Rupees. Cross-sectional weights used.

Table 2. Individual fixed effects regression estimating the association between daughter's labor migration and parental depression, 2007-14

	(1)		(2)		(3)		(4)	
	b	S.E.	b	S.E.	b	S.E.	b	S.E.
No labor migrant children	ref.		-0.171***	0.020	ref.		-0.007	0.023
Only labor migrant sons	0.171***	0.021	ref.		0.007	0.023	ref.	
At least one labor migrant daughter	0.209***	0.025	0.038 ⁺	0.022	0.051*	0.026	0.044*	0.020
Age >= 65					0.007	0.018	0.007	0.018
Not in union					0.025	0.023	0.025	0.023
# adult children					-0.002	0.007	-0.002	0.007
# co-resident members age 15-49					-0.001	0.006	-0.001	0.006
# co-resident members age < 15					0.008	0.008	0.008	0.008
Rural residence					-0.005	0.031	-0.005	0.031
Log of annual HH expenditure					0.006	0.013	0.006	0.013
Lowest quartile					ref.		ref.	
2 nd quartile					-0.040*	0.018	-0.040*	0.018
3 rd quartile					-0.060**	0.018	-0.060**	0.018
Highest quartile					-0.021	0.022	-0.021	0.022
Works for income					-0.002	0.017	-0.002	0.017
Has activity limitation					0.066***	0.015	0.066***	0.015
Constant	2.539***	0.010	2.710***	0.013	2.445***	0.210	2.452***	0.210
Period dummies	Yes		Yes		Yes		Yes	
Region-period dummies	Yes		Yes		Yes		Yes	
Within r-squared	0.057		0.057		0.252		0.252	
Obs.	3760		3760		3760		3760	

Notes: S.E. robust clustered at HH level.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fig 1. Impact of child's labor migration on parent's probability of experiencing depressive symptoms

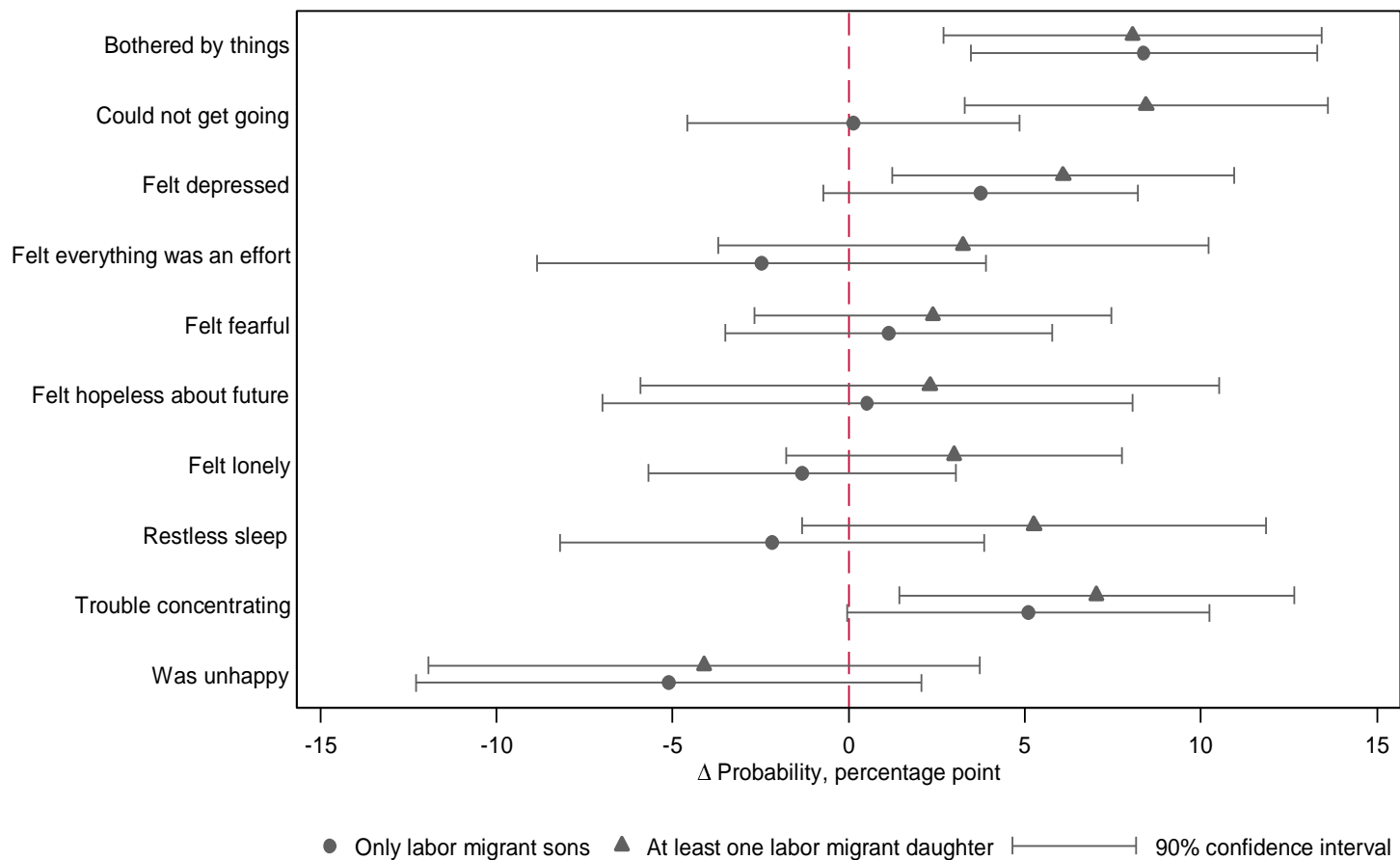


Fig 1. shows the percentage point change in parent's probability of experiencing the above symptoms when (1) only sons migrate for work, and (2) when at least one daughter migrates for work, compared to when no children migrate for work between waves. Probabilities and associated confidence intervals are from individual fixed effects linear probability models with full set of controls. Pooled N = 3,760

Table 3. Individual fixed effects regression estimating how the association between daughter's migration and parental depression varies by female coresident member status.

<i>Dep. Var: Log Depression</i>	(1)		(2)	
	b	S.E.	b	S.E.
<i>Main Effects</i>				
No labor migrant children	ref.		-0.011	0.024
Only male labor migrant sons	0.011	0.024	ref.	
At least one labor migrant daughter	0.054*	0.025	0.043 ⁺	0.024
Female adult(s) in HH	0.003	0.015	-0.001	0.018
<i>Interactions</i>				
No labor migrant children # Female adult(s) in HH			0.003	0.017
Only male labor migrant sons # Female adult(s) in HH	-0.003	0.017		
At least one labor migrant daughter # Female adult(s) in HH	-0.007	0.019	-0.004	0.021
Constant	2.374***	0.184	2.381***	0.186
Controls from Table 2	Yes		Yes	
Period and region-period dummies	Yes		Yes	
Within r-squared	0.252		0.252	
Obs.	3760		3760	

Notes: S.E. robust clustered at HH level. #: interaction

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Individual fixed effects regression estimating the association between offspring's migration, marital status, and parental depression.

<i>Dep. Var: Log Depression</i>	(1)		(2)		(3)		(4)	
	b	S.E.	b	S.E.	b	S.E.	b	S.E.
No labor migrant children	ref.		-0.007	0.023				
Only labor migrant sons	0.007	0.023	ref.					
All labor migrant daughters are married	0.040	0.028	0.033	0.022				
At least one labor migrant daughter is not married	0.068*	0.031	0.062*	0.028				
No labor migrant children					ref.		-0.018	0.023
All labor migrant children are married					0.018	0.023	ref.	
At least one unmarried labor migrant son; no unmarried labor migrant daughter					0.069*	0.030	0.051*	0.025
At least one unmarried labor migrant daughter; no unmarried labor migrant son					0.019	0.027	0.001	0.021
Unmarried labor migrant son and daughter					0.030	0.059	0.012	0.055
Constant	2.374***	0.213	2.381***	0.213	2.378***	0.213	2.396***	0.213
Controls from Table 2	Yes		Yes		Yes		Yes	
Period and region-period dummies	Yes		Yes		Yes		Yes	
Within r-squared	0.264		0.264		0.263		0.263	
Obs.	3760		3760		3760		3760	

Notes: S.E. robust clustered at HH level.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Individual fixed effects regression estimating the association between offspring's labor migration, workplace precarity, and parental depression.

<i>Dep. Var: Log Depression</i>	(1)	
	b	S.E.
1: No labor migrant children	ref.	
2: Only labor migrant sons; all sons in secure locations/occupations	0.013	0.022
3: Only labor migrant sons; at least one son in precarious location/occupation	-0.008	0.024
4: At least one labor migrant daughter; all children in secure locations/occupations	0.064*	0.025
5: All labor migrant daughters in secure occupations/locations but son in precarious occupation/location	0.053	0.042
6: Labor migrant daughter in precarious occupations/location; no labor migrant sons or all labor migrant sons in secure occupations/locations	0.048 ⁺	0.028
7: Labor migrant daughter and son in precarious occupations/locations	-0.000	0.037
Constant	2.421***	0.185
Controls from Table 2	Yes	
Period and region-period dummies	Yes	
Within r-squared	0.253	
Obs.	3760	

Notes: S.E. robust clustered at HH level.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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