# The Impact of Parental Migration on the Mental Health of Children Left Behind

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## Abstract

*This study aims to examine the impact of parental international migration on the mental health of children left behind. Data for this paper were taken from the "Child Health and Migrant Parents in South-East Asia (CHAMPSEA), 2008" project. A total of 1030 children (519 from emigrant parents and 511 from non-migrant parents) were covered. Data were collected from the caregivers of children using the extended versions of Strength and Difficulties Questionnaire (SDQ). Multivariate analyses were performed to determine the association between parental migration and the mental health status of children left behind. Several factors were significantly associated with children's mental health. After controlling for other variables, our study suggests that mothers' past migration experience was a risk factor for mental health problems among children. This implies that mothers' past migration experience can actually have long-lasting impacts on children's lives. Therefore, effective strategies to prevent such mental health problems among children are warranted.*


## Background

The relationship between migration and health is complex and dynamic. Migration affects the physical, mental, emotional health and well-being of migrants themselves, of the people at the place of origin (left behind), and of the people at the place of destination (Carballo et al., 1998).The literature shows that parental migration has both positive and negative impacts on both migrants and families left behind. On the one hand, migration can enhance the well-being of migrants as well as that of their families (Chant & Radcliffe, 1992; Stark & Taylor, 1991; Kahn et al., 2003). For example, migration leads to better health among the population left behind (Gulati, 1993; Hadi, 1999; Kuhn, 2003). Children of migrant parents are heavier and taller than the children of non-migrants. Similarly, children of migrant parents are less anxious and less lonely compared to the children of non-migrants (SMC, 2005). Most existing research focuses on the importance of remittances and found that remittances received from migration could support the family left behind by minimizing economic risk and overcoming capital constraints (Massey et al., 1993; Stark & Taylor, 1991). Another study shows that remittances increase access to healthcare services among both left-behind older parents (Adhikari et al., 2011) and children, especially those in poor households, where remittances represent a primary source of income for the family (Cortes, 2007; Salah, 2008). Bryant reviewed many studies and found that children of migrant households had better health than did children in non-migrant households due to the use of remittances for children's education and health needs (Bryant, 2005). With additional money coming from remittances, left-behind families can eat more nutritious food and buy expensive medicine, if needed (Salah, 2008). A study conducted in the Philippines measured social anxiety and loneliness and found better outcomes for children of migrants, i.e., they tend to be less anxious and less lonely compared with their counterparts in non-migrant families (Asis, 2006).

On the other hand, other studies find negative impacts of parental transnational migration on left-behind children's mental health. For example, children of absent parents do not receive needed care and medicine on time and the food to which they have access is of poor quality (Salah,

2008). Research has also found a higher incidence of mental disorders and impeded social and psychological development among children left behind (Hugo, 2002; Aguilera-Guzman et al., 2004; Save the Children, Sri Lanka, 2006). A study which explore the impact of internal parental migration also found that left-behind girls were more likely to be unhappy, to contemplate suicide, and to consider leaving home (Gao et al., 2010). Similarly, children left behind are more vulnerable to psychological problems such as depression (Pottinger, 2005; Jones et al., 2004).

Migration of one or both parents and their gender may affect their children's social behavior and health status in different ways. Battistella and Conaco (1998) have suggested that migration need not necessarily be disruptive for the children left behind if it is not the mother who migrates. Children of migrant mothers have been found to feel lonely, angry, unloved, afraid, and worried compared with children of non-migrants (SMC, 2005). Furthermore, a mother's out migration has been positively associated with child morbidity (Phuc et al., 2009) and mortality (Konseiga et al., 2009).

Recently a few studies have examined the impact of parental migration on children left behind in Thailand. Among these are studies by Jampaklay (2006), Jones & Kittisuksathit (2003) and Nanthamongkolchai et al., (2006). These studies give a mixed picture of the consequences for children, having found both positive and negative results (Jampaklay, 2011). Yet the impact of parental migration on the mental health of children left behind is an almost unexplored topic in Thailand.

It can be assumed that in the coming years Thailand is likely to experience a larger number of left behind children due to increasing number of internal and cross-border migrants. In this situation, the country needs effective policies that can maximize the positive effects of migration and minimize its negative effects on migrants, their families, and communities of origin and destination. Concrete evidence is needed for policy formulation and program design. Our study contributes to the literature by comparing children with migrant parents and children living with parents, thus offering a more complete picture about the issues related to migration and health. The findings can be useful for policy makers and program planners to improve health and health services for Thai people, especially among the young population. Our findings will also be beneficial for governmental or non-governmental organizations and children's rights activists for designing and advocating appropriate interventions related to migration in Thailand.

**Data and study population**

Data for this paper were taken from the "Child Health and Migrant Parents in South-East Asia (CHAMPSEA), 2008" project. The CHAMPSEA project was launched to investigate the impacts of parental migration on children left behind in four Southeast Asian countries (Indonesia, the Philippines, Thailand, and Vietnam). It was led by researchers at National University of Singapore (NUS) and St. Andrews, UK in collaboration with researchers in academic institutes in the above-mentioned countries. For CHAMPSEA Thailand, the study was conducted by the Institute for Population and Social Research (IPSR), Mahidol University. The project used a cross-sectional design to collect information. A flexible-quota sampling design was used to recruit households with a child aged 3, 4, or 5 years and/or 9, 10, or 11 years. The survey

covered about 1000 households in each of four study countries. However, this paper uses data from Thailand only. This research is approved by Institutional Review Board (IRB) of Institute for Population and Social Research, Mahidol University, Thailand.

Eligible households were those in which there was a child/children in the specified age ranges at the time of survey and in which either one or both parents were transnational migrants (transnational households) or in which both parents were present in the households ("usually resident" households). If one or both parents of the household had been absent for working abroad for a continuous period of at least the six months prior to the survey, then that household qualified as a transnational household. Similarly, "usually resident" households were those in which both parents had been living at the same address as the child on most nights over the past six months.

**Instruments**

Data were collected from children's primary caregivers using the extended versions of the Strength and Difficulties Questionnaire (SDQ) to assess children's mental health status. The SDQ measures 25 emotional and behavioral symptoms. Each item is scored from 0 to 2 (not true, somewhat true, and certainly true). The SDQ is a validated instrument to screen children's and adolescents' emotional and behavioral problems developed by Goodman (Goodman, 1997; Goodman, 1999) and has been used extensively in Great Britain (Goodman, 1997; Goodman, 1999; Goodman et al., 2000; Goodman, 2001) and in many other countries (Achenbach et al., 2008; Bourdon et al., 2005; Heiervang et al., 2008; Woerner et al., 2011). The SDQ includes five factors: emotional symptoms (e.g., has many worries, is often unhappy, etc.), hyperactivity (e.g., gets restless, cannot sit for long, etc.), conduct problems (e.g., fights a lot, often has a hot temper, etc.), peer problems (e.g.,is bullied by others, tends to play alone, etc.), and pro-social behaviors (e.g., often volunteers to help others, shares readily with other children, etc.). A total difficulties score is calculated as the sum of scores of the conduct, hyperactivity, emotional, and peer problems scales (Goodman, 1997; Goodman et al., 2000). Another subscale assesses the positive aspects of pro-social behavior.

**Methods of analysis**

Initially, univariate or descriptive analysis was performed to describe the percentage, mean and number of sampled respondents according to individual, household, and caregiver characteristics. Both bivariate and multivariate analyses were performed to examine the association between parental migration and the mental health status of children left behind.

Total difficulties score were classified according to the Thai version of the SDQ as "normal," "borderline," or "abnormal". Estimates of frequency of possible mental disorders based on normative data for Thailand cut offs developed by Woerner and others was used to describe the mental health status of the children in Thai context (Woerner et al., 2011). For the bivariate and multivariate analysis, total difficulties score was used as a categorical scale data (coded as 1=abnormal; 0=else) and treated as dependent variable. In this study, poor mental health or mental health problem was interpreted as the presence of certain symptoms and behaviors

(having abnormal scores) indicative of a mental disorder and thus of psychological distress. Chi-square test was used to examine the association between mental health status of children and other independent variables. In addition, multivariate model was fitted to examine the net effect of parental migration on mental health of children after simultaneously controlling for other children, household and caregiver characteristics. Before using multivariate analysis, the correlation matrix was applied to discover the degree, and direction of the relationship between each pair of independent variable and dependent variable. Highly correlated ($r>0.65$) independent variables were removed from the multivariate analysis.

## Results

### *Background characteristics of children*

Out of 1030 children, 519 (50.3%) had migrant parent(s). Survey was designed to collect equal number of younger (3-5 years) and older children (9-11 years), and equal number of male and female children. About half the children had primary or below education. Physical health was measured by the symptoms of colds, cough, fever, flu, headache, stomachache, diarrhea, or eye problems within the previous two weeks. Notably, more than half of children had poor physical health status, i.e., they experienced at least one of the above-mentioned symptoms within the two weeks before the survey.

More than two-thirds of the children had at least one sibling (sister/brother). Similarly, more than two-fifths of parents (both father and mother) had at least 6 years of education. An overwhelming majority of fathers (70%) while about a tenth (12%) of mother had migration experience since the target child was born.

Regarding characteristics of caregivers, almost all children were cared for by parental caregivers i.e. by mother. The mean age of caregivers was 36 years, with about a fifth aged less than 30 years. About two-fifths of caregivers spent less than 6 hours a day caring for their children. Mental health status of primary caregivers was measured by using the self reporting questionnaire 20 (SRQ-20) developed by WHO. Nearly four out of five caregivers were mentally healthy (less than 8 symptoms) (Table 1).

### *Mental health status*

This study, which used the Thai version of the SDQ, as mentioned above, found that more than a tenth of children had mental health problems (i.e., 12.7% scored abnormal in total difficulties score). Abnormality varied with different subscales. For instance, one in five children (20%) had hyperactivity problems, about one in six (16%) had conduct problems, one in twenty had emotional (5%) and peer problems (5%), and more than a tenth exhibited pro-social behavior (13%). No significant differences were found in emotional symptoms, peer problems, conduct problems, and prosocial behavior scores among children irrespective of their parents' migration status. However, a significantly higher proportion of children left behind had an abnormal hyperactivity score (24%) than did non-left-behind children (17%). With regard to total difficulties score, a higher proportion of children left behind had mental health problems (14%)

than did non-left-behind children (11%). However, the association was not statistically significant (Table 2).

***Bivariate analysis***

Based on total difficulties score of SDQ, more than one in ten children have poor mental health symptoms; i.e. abnormal situation in mental health (12.7%). Percentage of abnormal score varied according to different characteristics. For instance, children whose mothers had migration history after the child was born, had significantly higher abnormal score than did children whose mothers had not migrated and left children behind (11% vs. 23%).

Children who were older, and whose physical health was good had significantly better mental health than did their counterparts. Similarly, children who have at least one sibling had significantly better mental health than did children who did not have sibling. Caregiver characteristics such as age, and mental health status had a significant association with children's mental health. For instance, children who had caregivers aged 40 years or over had better mental health than did children with caregivers aged less than 30. Interestingly, children who were cared for by mentally healthy caregivers had better mental health than did children who were cared for by mentally unhealthy caregivers (Table 3).

***Multivariate analysis***

The multivariate analysis found that several factors, such as mother's migration history, age of children (younger vs. older), physical health status of children, age of caregivers, and caregivers' mental health status, were significantly associated with the mental health of children. The odds ratio shown in Table 4 represents the effect of each independent variable on the dependent variable. Mother's migration history had resulted significantly poorer mental health of children at 0.01 significance levels. To be more precise, after controlling for other variables, children whose mothers had migrated after they were born showed a higher risk of having mental health problems (OR=2.59) as compared with those whose mothers did not migrate (Table 4).

We further explore whether or not parental migration has same impact on health of children across the sex and age of children. Our study found that current parental international migration and migration history of father did not have significant impact on mental health of children. However, our study found negative impact of mother migration experiences on mental health of both younger and older children, and female children. Negative impact of mothers' migration history remained significant for both age groups of children (table 5) and female children (table 6) even after controlled by other variables such as children, household, and caregivers characteristics.

Our analysis found that some of the control variables such as age, physical health of children, age of caregivers, and mental health of caregivers, have a significant association with children's illness. The odds ratio of older children reflected a significantly (OR=0.39; $p<0.05$) lower occurrence of mental health problems compared with that of younger children. Regarding the physical health of children, poor physical health is positively associated with the poor mental health. For instance, those children who had poor physical health were more likely to have mental health problems (OR=2.08; $p<0.001$). Similarly, those children who had older caregivers

(aged 30-39 and 40 or above) were likely to have fewer mental health problems (OR=0.49 for caregivers aged 30-39, and OR =0.41 for caregivers aged 40 or more) than were children who had younger caregivers (aged less than 30 years). Furthermore, those children who were cared for by mentally healthy caregivers were likely (OR=0.35; $p<0.001$) to have fewer mental health problems than were those who were cared for by mentally unhealthy caregivers (Table 4).

**Discussion and conclusion**

This study, in using the Strength and Difficulties Questionnaire, opens a new frontier in the study of the impact of parental migration in Thailand on the mental health of children left behind. It was found that mental health problems among Thai children are not uncommon and that more than a tenth of Thai children experienced mental health problems.

Our study did not find any association between current parental migration status and mental health status of children left behind. This could be because almost all the parents (94%) who migrated were the fathers, not the mothers. The other reason could be that the two provinces studied have among the highest prevalence of overseas migration. It is possible that in this setting, overseas migration is perceived as common, and thus negative impacts might not be recognized as much as in settings where overseas migration is less common. Interestingly, this study found that mother's migration history had a significant, independent association with mental health problems of children left behind. Those children whose mothers had history of migration experience and had left child behind, had more mental health problems than did children whose mothers did not have migration history after child was born. The reason of negative impact on psychological health of children with previous migration experience of the mother may be due to the possibility that these children had problem with their previous caregiver. These children might not have received better care in the absence of their mother. This finding indicates that absence of parents may leave a long-term psychological consequence for left behind children. Previous research also suggests that the migration need not necessarily be disruptive for the children left behind if it is not the mother who migrates (Battistella & Conaco, 1998). On the other hand, the children of migrant mothers were found to feel lonely, angry, unloved, afraid, and anxious compared with children of non-migrants (SMC, 2005). The other reason could be that a mother's love is often irreplaceable (Jampaklay, 2006). The reason for more negative impact of mother's migration experience on mental health of female children could be that female children are more attached with mother than their fathers.

This study also found that control variables such as age, physical health of children, age of caregivers, and mental health of caregivers, have a significant association with children's illness. Older children were less likely to have mental health problems than were younger children, which could be due to decrease in dependency of older children. The other reason could be older children may have developed a better support network with their peers (Fan et al., 2010) that may help to reduce the risky healthy behavior. It could be as Asis (2006) suggested that children play a role in improving their own well-being by taking charge of their lives. Children who live separately by their migrants parents provide them space to grow independently upon the removal of restrictive parental control and may learn many important skills (Asis, 2006).

As expected, physical health and mental health are associated. Those children who had physical health problems were also more likely to have mental health problems. Other studies support the

finding that physical illness of children increased the risk of emotional and behavioral problems (Aarons et al., 2008; Hysing et al., 2007).

The present study also found that caregiver characteristics had a significant impact on children's mental health. Those children who were cared for by older caregivers were less likely to have mental health problems than were those who were cared for by younger caregivers. This could be because younger caregivers tend to be busy with their work and lack sufficient time to provide adequate support and nurturance for children under their care (Fan et al., 2005). Furthermore, children who were cared for by mentally healthy caregivers were less likely to have mental health problems than were children cared for by mentally unhealthy caregivers. One reason could be that mentally healthy caregivers provide better care and support. The other reason could be mentally unhealthy caregivers may contribute to a stressful environment for children, which has in turn been associated with negative psychological consequences for these children. As in other Asian societies, children are usually cared by their mothers. Research has found that depression and emotional problems among mothers were positively associated with children's anxiety-depression symptoms (Champion et al., 2010).

This study has several strengths, such as its large sample size, large number of variables that tap into several domains and employs the first comprehensive data set on impacts of international migration, but its limitations should be recognized. First of all, it is a cross-sectional study; all the factors analyzed in the study were measured at a single point in time. Therefore, the analysis can only provide evidence of statistical association between those variables and the mental health status of the children. Secondly, all of the information was gathered from the caregivers, which may have resulted in reporting bias, such as under-reporting of stigmatizing behaviors or over-reporting healthy behavior. However, to minimize reporting bias, questions were asked of the primary caregivers in private settings, away from other people in the household. Furthermore, recall error about migration history could be another limitation. We also need to be cautious to interpret the result because information about health was perceived or self rated response. The use of self-reported data may introduce some reporting bias whereby some groups (for example, older people or less educated people) may be less likely to accurately recall health condition of their children.

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**References**


Aarons, G. A., Monn, A. R., Leslie, L. K., Garland, A. F., Lugo, L., Hough, R. L., et al. (2008). Association Between Mental and Physical Health Problems in High-Risk Adolescents: A Longitudinal Study. *Journal of Adolescent Health, 43*(3), 260-267.

Achenbach, T. M., Becker, A., Döpfner, M., Heiervang, E., Roessner, V., Steinhausen, H.-C., et al. (2008). Multicultural assessment of child and adolescent psychopathology with ASEBA and SDQ instruments: research findings, applications, and future directions. *Journal of child psychology and psychiatry, 49*(3), 251-275.

Adhikari, R., Jampaklay, A., & Chamratrithirong, A. (2011). Impact of Children's Migration on Health and Health Care-seeking Behavior of Elderly Left Behind. *BMC Public Health, 11*, 143.

Aguilera-Guzman, R. M., de Snyder, V. N., Romero, M., & Medina-Mora, M. E. (2004). Paternal Absence and International Migration: Stressors and Compensators Associated with the Mental Health of Mexican Teenagers of Rural Origin. *Adolescence, 39*(156), 711-723.

Asis, M. M. B. (2006). Living with Migration: Experiences of Children Left Behind in the Philippines. *Asian Population Studies, 2*(1), 45-67.

Battistella, G., & Conaco, C. G. (1998). The Impact of Labour Migration on the Children Left Behind: A Study of Elementary School Children in the Phillipines. *Sojourn, 13*(2), 1-22.

Bourdon, K. H., Goodman, R., Rae, D. S., Simpson, G., & Koretz, D. S. (2005). The Strengths and Difficulties Questionnaire: U.S. Normative Data and Psychometric Properties. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*(6), 557-564.

Carballo, M., Divino, J. J., & Zeric, D. (1998). Migration and health in the European Union. *Tropical Medicine & International Health, 3*(12), 936-944.

Champion, J. E., Jaser, S. S., Reeslund, K. L., Simmons, L., Potts, J. E., Shears, A. R., et al. (2009). Caretaking Behaviors by Adolescent Children of Mothers With and Without A History of Depression. *Journal of Family Psychology, 23*(2), 156-166.

Chant, S., & Radcliffe, S. (1992). Migration and development: The importance of gender. In S. Chant (Ed.), *Gender and Migration in Developing Countries* (pp. 1-29). New York Belhaven Press.

Cortes, R. (2007). *Remittances and Children's Rights: An Overview of Academic and Policy Literature*: UNICEF.

Fan, F., & Sang, B. (2005). Absence of Parental Upbringing and Liushou Children's Personality, Academic Achievements As Well As Behavior Problems. *Psychological Science, 28*(156), 855-859.

Fan, F., Su, L., Gill, M. K., & Birmaher, B. (2010). Emotional and Behavioral Problems of Chinese Left-Behind Children: A Preliminary Study. *Social Psychiatry and Psychiatric Epidemiology, 45*(6), 655-664.

Gao, Y., Li, L. P., Kim, J. H., Congdon, N., Lau, J., & Griffiths, S. (2010). The impact of parental migration on health status and health behaviours among left behind adolescent school children in China. *BMC Public Health, 10*, 56.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *The Journal of Child Psychology and Psychiatry 38*(5), 581-586.

Goodman, R. (1999). The Extended Version of the Strengths and Difficulties Questionnaire as a Guide to Child Psychiatric Caseness and Consequent Burden. *Journal of Child Psychology and Psychiatry, 40*, 791-799.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *J Am Acad Child Adolesc Psychiatry, 40*(11), 1337-1345.

Goodman, R., Ford T, Simmons H, Gatward R, & H, M. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to Screen for Child Psychiatric Disorders in a Community Sample. *The British Journal of Psychiatry, 177*, 534-539.

Gulati, L. (1993). *In the absence of their men: The impact of male migration on women*. London: Sage publications.

Hadi, A. (1999). Overseas migration and the well-being of those left behind in rural communities of Bangladesh. *Asia Pacific Population Journal, 14*, 43-58.

Heiervang, E., Goodman, A., & Goodman, R. (2008). The Nordic advantage in child mental health: separating health differences from reporting style in a cross-cultural comparison of psychopathology. *Journal of child psychology and psychiatry, 49*(6), 678-685.

Hugo, G. (2002). Effects of International Migration on the Family in Indonesia. *Asian and Pacific Migration Journal,, 11*(1), 13-46.

Hysing, M., Elgen, I., Gillberg, C., Lie, S. A., & Lundervold, A. J. (2007). Chronic Physical Illness and Mental Health in Children. Results from a Large-Scale Population Study. *The Journal of Child Psychology and Psychiatry 48*(8), 785-792.

Jampaklay, A. (2006). Parental Absence and Children's School Environment: Evidence from A Longitudinal Study in Kanchanaburi, Thailand. *Asian Population Studies, 2*(1), 93-110.

Jampaklay, A. (2011). Migration and children In J. W. Huguet & A. Chamratrithirong (Eds.), *Thailand migration report 2011- Migration for development in Thailand: Overview and tools for policymakers*. Bangkok, Thailand: International Organization for Migration, Thailand Office.

Jones, A., Sharpe, J., & Sogren, M. (2004). Children's experiences of separation from parents as a consequence of migration. *Caribbean Journal of Social Work, 3*, 89-109.

Jones, H., & Kittisuksathit, S. (2003). International Labour Migration and Quality of Life: Findings from Rural Thailand. *International Journal of Population Geography, 9*(6), 517-530.

Kahn, K., Collinson, M., Tollman, S., Wolff, B., Garenne, M., & Clark, S. (2003). *Health consequences of migration: Evidence from south Africa's rural Northeast*. Paper presented at the African Migration in Comparative Perspective.

Konseiga, A., Zulu, M. E., Bocquier, P., Muindi, K., Beguy, D., & Ye, Y. (2009). Assessing the effect of mother's migration on childhood mortality in the informal settlements of Nairobi. In Collinson M, Adazu K, W. M & F. S (Eds.), *The dynamics of migration, health and livelihoods: INDEPTH network perspectives* (pp. 123-138). England.

Kuhn, R. (2003). *A longitudinal analysis of health and mortality in a migrant sending region of Bangladesh*: Institute of Behavioral Science, Population Aging Center

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). An evaluation of international migration theory: The north American case. *Population and Development Review, 20*(4), 699-751.

Nanthamongkolchai, S., Ladda, M., Nichara, R., & Sirikul, I. (2006). Family migration and IQ of school age children and adolescents in Thailand. *Journal of Demography, 22*(1), 33-45.

Phuc, D. H., Thanh, X. N., & Chuc, K. T. N. (2009). Migration and Under Five Morbidity in Bavi, Vietnam. In M. Collinson, K. Adazu, M. White & S. Findley (Eds.), *The Dynamics of Migration, Health and Livelihoods: INDEPTH Network Perspectives* (pp. 169-184). England.

Pottinger, A. M. (2005). Children's experience of loss by parental migration in inner-city Jamaica. *American Journal of Orthopsychiatry, 75*(4), 485-496.

Salah, M. A. (2008). *The impact of migration on children in Moldova*: UNICEF.

Save the Children Sri Lanka. (2006). *Left behind, left out: The impact on children and families of mother migrating for work abroad: Summary report*. Colombo: Save the Children Sri Lanka.

SMC. (2005). *Hearts apart: Migration in the eyes of filipino children*: Episcopal Commission for the Pastoral Care of Migrant and Itinerant People-CBCP/Apostleship of the Sea-Manila, Scalabrini Migration Center (SMC), and Overseas Workers Welfare Administration.

Stark, O., & Taylor, J. E. (1991). Migration incentives, migration types: The role of relative deprivation. *The Economic Journal 101*(408), 1163-1178.

Woerner, W., S, N., Becker, A., Wongpiromsarn, Y., & A, M. (2011). Normative Data and Psychometric Properties of the Thai Version of the Strengths and Difficulties Questionnaire. *Journal of Mental Health of Thailand, 19*(1).

**Tables**

**Table 1 Selected characteristics of sample population**

| Characteristics | % of Children |
|---|---|
| **Parental migration status** | |
| At least one parents currently migrant | 50.3 |
| Father's have migration history | 70.4 |
| Mother's has migration history | 12.3 |
| **Individual characteristics** | |
| Older child | 50.6 |
| Male | 50.2 |
| Having no schooling (younger aged 3-5) | 49.8 |
| Having poor physical health (at least one symptom) | 53.0 |
| **Household characteristics** | |
| Have at least 1 sister/brother | 66.7 |
| Father has at least 6 years of education | 41.7 |
| Mother has at least 6 years of education | 43.2 |
| Poor household (2 bottom quintiles) | 40.0 |
| **Characteristics of caregivers** | |
| Caregiver aged 30-39 years | 55.6 |
| Female caregivers | 97.6 |
| Parental caregivers | 95.4 |
| Caregiver spend 6 or more hours for child careering | 38.7 |
| Caregiver is mentally healthy | 78.9 |
| **Total N** | **1030** |

**Table 2 Comparison of emotional and behavioral problems by parental migration status**

| | Parental migration | | Total |
|---|---|---|---|
| | Non-migrant | Migrant | |
| **Emotional symptoms score** | | | |
| Normal (0-4) | 88.5 | 87.5 | 88.0 |
| Borderline (5) | 5.9 | 7.9 | 6.9 |
| Abnormal (6-10) | 5.7 | 4.6 | 5.1 |
| **Conduct problem score** | | | |
| Normal (0-3) | 74.4 | 68.8 | 71.6 |
| Borderline (4) | 12.5 | 13.1 | 12.8 |
| Abnormal (5-10) | 13.1 | 18.1 | 15.6 |
| **Hyperactivity score **** | | | |
| Normal (0-5) | 68.9 | 59.9 | 64.4 |
| Borderline (6) | 14.3 | 16.4 | 15.3 |
| Abnormal (7 or above) | 16.8 | 23.7 | 20.3 |
| **Peer problem score** | | | |
| Normal (0-4) | 84.7 | 86.3 | 85.5 |
| Borderline (5) | 10.4 | 9.8 | 10.1 |
| Abnormal (6-10) | 4.9 | 3.9 | 4.4 |
| **Prosocial behavior score** | | | |
| Normal (5-10) | 87.5 | 86.1 | 86.8 |
| Abnormal (0-4) | 12.5 | 13.9 | 13.2 |
| **Total difficulties score** | | | |
| Normal (0-15) | 75.7 | 71.5 | 73.6 |
| Borderline (16-18) | 13.3 | 13.9 | 13.6 |
| Abnormal (19-40) | 11.0 | 14.6 | 12.8 |
| **Total** | 100.0 | 100.0 | 100.0 |
| N | 511 | 519 | 1030 |

*Note **Significant at Chi-square test P<0.01*

**Table 3 Percentage of abnormal scores on total difficulties by parental migration status and other characteristics (N=1030)**

| | | % | n |
|---|---|---|---|
| **Parental migration status** | | | |
| **Parents currently migrant** | Non-migrant | 11.0 | 511 |
| | Migrant | 14.6 | 519 |
| **Father's migration history** | No | 11.5 | 305 |
| | Yes | 13.4 | 725 |
| **Mother's migration history ***** | No | 11.4 | 903 |
| | Yes | 22.8 | 127 |
| **Individual characteristics** | | | |
| **Age of children ***** | Younger child | 18.3 | 509 |
| | Older child | 7.5 | 521 |
| **Sex of child** | Female | 12.3 | 513 |
| | Male | 13.3 | 517 |
| **Physical health status ***** | Good health (no symptom) | 6.4 | 296 |
| | Poor health (at least one symptom) | 15.4 | 734 |
| **Household characteristics** | | | |
| **Have at least 1 sister/brother **** | No | 16.9 | 343 |
| | Yes | 10.8 | 687 |
| **Father has at least 6 years of education** | Upto 6 years education | 12.0 | 601 |
| | More than 6 years education | 14.0 | 429 |
| **Mother has at least 6 years of education** | Upto 6 years education | 12.3 | 585 |
| | More than 6 years education | 13.5 | 445 |
| **Household wealth status** | Poor (2 bottom quintiles) | 13.8 | 412 |
| | Average (2 medium quintile) | 12.4 | 411 |
| | Rich (5th quintile) | 11.6 | 207 |
| **Characteristics of caregivers** | | | |
| **Age ***** | Less than 30 years | 24.3 | 173 |
| | 30-39 years | 11.0 | 573 |
| | 40 or more | 9.5 | 284 |
| **Types** | Non-parental caregivers | 19.1 | 47 |
| | Parental caregivers | 12.5 | 983 |
| **Hours spend in caring for children** | Less than 6 hours | 11.3 | 631 |
| | 6 or more hours | 15.3 | 399 |
| **Mental health status ***** | Not healthy | 23.0 | 217 |
| | Mentally healthy | 10.0 | 812 |
| | **Total** | **12.7** | **1030** |

*Note *** Significant at Chi-square test P<0.001, and **=p<0.01*

**Table 4 Multivariate model predicting poor mental health**

| Predictors | Model I | Model II | Model III | Model IV |
|---|---|---|---|---|
| | $e\beta$ | $e\beta$ | $e\beta$ | $e\beta$ |
| **Parental migration status** | | | | |
| **Parent currently migrant** Non-migrant (Ref.) | | | | |
| Migrant | 1.56 | 1.48 | 1.46 | 1.43 |
| **Father's migration history** No (Ref.) | | | | |
| Yes | 0.74 | 0.81 | 0.84 | 0.81 |
| **Mother's migration history** No (Ref.) | | | | |
| Yes | 2.33** | 2.68*** | 2.49*** | 2.59** |
| **Individual characteristics** | | | | |
| **Age of children** Younger child (Ref.) | | | | |
| Older child | | 0.38** | 0.37*** | 0.39*** |
| **Sex of child** Female (Ref.) | | | | |
| Male | | 1.08 | 1.09 | 1.11 |
| **Physical health status** Good health (Ref.) | | | | |
| Poor health (at least one symptoms) | | 2.54*** | 2.44*** | 2.08*** |
| **Household characteristics** | | | | |
| **Have at least 1 sister/brother** No (Ref.) | | | | |
| Yes | | | 0.63 | 0.67 |
| **Father's education** Upto 6 years education (Ref.) | | | | |
| More than 6 years education | | | 1.11 | 1.16 |
| **Mother's education** Upto 6 years education (Ref.) | | | | |
| More than 6 years education | | | 0.84 | 0.75 |
| **Household wealth status** Poor (Ref.) | | | | |
| Average (2 medium quintile) | | | 0.81 | 0.86 |
| Rich (5th quintile) | | | 0.73 | 0.91 |
| **Characteristics of caregivers** | | | | |
| **Age** Less than 30 years (Ref.) | | | | |
| 30-39 years | | | | 0.49** |
| 40 or more | | | | 0.41** |
| **Types** Non-parental caregivers (Ref.) | | | | |
| Parental caregivers | | | | 1.08 |
| **Hours spend in caring for child**<6 hours (Ref.) | | | | |
| 6 or more hours | | | | 1.05 |
| **Mental health status** Not healthy (Ref.) | | | | |
| Mentally healthy | | | | 0.35*** |
| **Constant** | **0.126*** ** | **0.082*** ** | **0.135*** ** | **0.487** |
| **-2 Log likelihood** | **774.4** | **730.9** | **724.3** | **686.8** |
| **Cox & Snell R Square** | **0.014** | **0.055** | **0.061** | **0.091** |

*Note *** Significant at P<0.001; **=p<0.01 and *=p<0.05*

**Table 5 Multivariate model predicting poor mental health among children by age**

| Predictors | Younger | | Older | |
|---|---|---|---|---|
| | Model I | Model II | Model I | Model II |
| | $_{e}\beta$ | $_{e}\beta$ | $_{e}\beta$ | $_{e}\beta$ |
| **Parental migration status** | | | | |
| **Parent currently migrant** Non-migrant (Ref.) | | | | |
| Migrant | 1.44 | 1.44 | 1.39 | 1.25 |
| **Father's migration history** No (Ref.) | | | | |
| Yes | 0.95 | 0.92 | 0.69 | 0.77 |
| **Mother's migration history** No (Ref.) | | | | |
| Yes | 2.05* | 1.85* | 3.35** | 4.65** |
| **Constant** | **0.173*** ** | **0.62** | **0.069*** ** | **0.174** |
| **-2 Log likelihood** | **476.5** | **438.1** | **268.0** | **236.1** |
| **Cox & Snell R Square** | **0.015** | **0.086** | **0.017** | **0.067** |

*Note *** Significant at P<0.001; **=p<0.01 and *=p<0.05*

*Model I fitted without controlling any variable; Model II was fitted after controlling children characteristics (sex and physical health status of child), household characteristics (sibling, father's education, mother's education and household wealth status, and characteristics of caregivers (age of caregiver, types, hours spend in caring for child and mental health status of caregiver).*

**Table 6 Multivariate model predicting poor mental health among children by sex**

| Predictors | Male | | Female | |
|---|---|---|---|---|
| | Model I | Model II | Model I | Model II |
| | $_{e}\beta$ | $_{e}\beta$ | $_{e}\beta$ | $_{e}\beta$ |
| **Parental migration status** | | | | |
| **Parent currently migrant** Non-migrant (Ref.) | | | | |
| Migrant | 1.48 | 1.24 | 1.63 | 1.54 |
| **Father's migration history** No (Ref.) | | | | |
| Yes | 0.81 | 0.79 | 0.69 | 0.89 |
| **Mother's migration history** No (Ref.) | | | | |
| Yes | 2.26* | 2.0 | 2.39* | 3.59** |
| **Constant** | **0.128*** ** | **3.23** | **0.124*** ** | **0.71** |
| **-2 Log likelihood** | **399.5** | **346.6** | **374.6** | **323.8** |
| **Cox & Snell R Square** | **0.013** | **0.102** | **0.015** | **0.108** |

*Note *** Significant at P<0.001; **=p<0.01 and *=p<0.05*

*Model I fitted without controlling any variable; Model II was fitted after controlling children characteristics (age and physical health status of child), household characteristics (sibling, father's education, mother's education and household wealth status, and characteristics of caregivers (age of caregiver, types, hours spend in caring for child and mental health status of caregiver).*