

Research Article

International Migrant Workers' Use of Mobile Phones to Seek Social Support in Singapore

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Abstract

International migrants often need social support to deal with an unfamiliar environment and reduce stress caused by prevailing attitudes in their host country, as well as that induced by distance and separation from their family. This study investigates whether mobile phones facilitate or inhibit migrants' ability to seek the social support needed to reduce the stress they experience in their host country. Further, gender differences are examined and discussed. A quantitative survey of men (n = 56), primarily Bangladeshis working in blue-collar occupations, and women (n = 60), primarily Filipina domestics, was conducted in Singapore. For women, mobile use alleviated stress by increasing social support; emotional support had the greatest impact on their psychological well-being. Male migrant workers were more likely to experience stress the more they used their mobile phones and when receiving increased emotional support. This finding is in contrast to traditionally held assumptions about the beneficial impacts of mobile phones. We caution against treating immigrants as a homogeneous group, and recommend inclusion of variables such as gender to understand the role of technology-mediated social support in alleviating migrant stress. We further propose that policies and programs facilitating transnational communication for low-income migrants need to be examined carefully in terms of their unintended impacts.

Introduction

Globalization has profoundly impacted financial capital and social organization, as well as the mobility of people, products, occupations, and information (Castells, 2000). For global labor, the opportunities have been immense, with increasingly complex transportation networks allowing migration to locations that offer better job prospects. The estimated number of international migrants increased to 214 million in 2010, with 60% residing in more developed regions, constituting 10.3% of the host country populations (UN, 2011). However, adapting to a new host culture and job situation, while simultaneously being cut off from one's traditional social networks, fosters a sense of isolation and leads to stress for international migrants (Berry, 2005; Bhugra & Jones, 2001).

Migrants have been observed to gain social support with increased access to communication networks through information and communica-

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tion technologies (ICTs). The technological ecology of migrants is complex, consisting of a variety of ICTs. Although some migration studies document technology-mediated social support (Chen & Choi, 2011; Mehra & Papajohn, 2007) and the relationship with acculturation stress (Ye, 2006), this research has been limited to computers and the Internet. We extend this academic research by evaluating mobile phone use among migrants in accessing social support. Further, we advance earlier work (e.g., Wong & Leung, 2008) on the relationship between key variables in the migration and ICT context—social support and migrant stress—by examining international migrant workers.

Finally, we investigate gender differences related to the questions posed in the literature on migration stress and social support; e.g., the importance and availability of social support for women (Kessler & McLeod, 2002; Laireiter & Baumann, 1992). We seek to contribute to the knowledge about ICTs' potential to reduce stress in, and provide social support for, low-income migrant communities within the global context. This article examines whether mobile phone use by international migrants facilitates access to social support and reduces stress. The study was conducted among male, primarily Bangladeshi, blue-collar workers, and female, primarily Filipina, domestic workers in Singapore. We begin by presenting the literature on migrant workers in Singapore, then examine the literature on migration-related stress, social support, and mobile phone use, ranging from the broader international perspective to the more specific Singaporean context.

Migrant Workers in Singapore

With increasing job opportunities associated with a growing economy, Singapore has recently experienced a rapid influx of migrant workers (Xinhua, 2007), predominantly from the South and Southeast Asian countries of India, Bangladesh, Indonesia, Thailand, and the Philippines (Yeoh, 2007). Low-wage migrant workers constituted almost 36% of Singapore's total workforce (Tan, 2011). Male migrant workers were employed in low-skilled jobs, primarily in the construction and craftsman sectors, landscaping and grass-cutting services, and the marine sector (Low, 2002; Rahman & Lian, 2005), while nearly all the women were engaged as

domestic workers (Human Rights Watch, 2008). As of 2012, approximately one in every five Singaporean households (Transient Workers Count Too, 2011) employed the 209,600 female migrant domestic workers, and 293,000 work permits were awarded in the construction sector (Ministry of Manpower, 2013).

Most unskilled laborers in Singapore have found work in blue-collar occupations (Abbugao, 2010). Migrant workers fall outside the jurisdictions of local labor laws with regard to minimum wage, job stability, employment mobility, and occupational rights, such as rest days or vacations (HOME, 2008). The low skill levels required and minimal legal protections have led to rapid hiring and firing strategies being used in response to broader macroeconomic trends, leading to a transient and mobile workforce with few permanent rights. Meanwhile, local Singaporeans, who feel that low-cost foreign labor has contributed to a suppression of wages among local low-income workers, are wary of existing immigration policies. These issues found heightened public discussion in political forums, such as the parliamentary general elections of May 2011 and the debates generated by the Population White Paper of 2012 (Ministry of Trade and Industry, 2012). The resulting volatility has led to anger toward, and mistrust of, foreign workers, particularly by Singaporeans in the lower socioeconomic brackets who suffer the greatest competition for low-wage employment. Thus, migrant communities in Singapore face multiple sources of stress, arising not only from job insecurity, but also from discrimination by locals.

Migration Stress

Migrants often need to deal with homesickness (Swagler & Ellis, 2003; Ying, 1996), loneliness (Ben-Sira, 1997; Ryan & Twibell, 2000), financial difficulties (Yeh & Inose, 2003), job-related challenges (Ben-Sira, 1997), language barriers (Vedder & Virta, 2005), and the social discrimination (Pedersen, 1995; Qiu, 2009) that comes with living in an unfamiliar environment. Migration stress, typically a result of exposure to difficulties and the constant need to adjust to a host country (Chen, 2007), is related to poor mental health (Wong & Leung, 2008) that manifests through such symptoms as anxiety, depression, apathy, and feelings of isolation

(Dion, Dion, & Pak, 1992; Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006; Swagler & Ellis, 2003).

Jibeen and Khalid (2009) identified the domains of social and functional stressors that migrants may encounter. Along with homesickness and loneliness (Ying, Lee, & Tsai, 2000), social stressors include discrimination in the workplace and in society (Rustenbach, 2010), financial constraints on social and self-improvement activities (See, Goh, Ng, Cheang, Jiang, & Chib, 2012), and interpersonal relationship issues. Functional stressors refer to language barriers arising from an inadequate command of the local language and the occupational and financial difficulties relevant to the migrant's day-to-day activities (Thompson, Hartel, Manderson, Woelz-Stirling, & Kelaher, 2002).

The literature points to conflicting accounts of the mental health conditions of migrant workers. Some research studies identify gender disparities in the susceptibility to migration stress (Broidy & Agnew, 1997), indicating that female migrant workers experience higher levels of psychological pressure than male workers in response to stress (Mirowsky & Ross, 1995). This is likely true in the Singaporean context as well, because research has shown that Filipina domestic workers are a key source of both financial (Rodriguez & Tionsgen, 2001; Tigno, 1998) and emotional support (Ueno, 2009) for their families. However, male migrants working in the manual labor sector in Shanghai were found to have more stressors that led to mental health issues (e.g., marriage issues and financial and work-related problems) than female migrants, whose stress was mainly attributed to interpersonal issues (Wong, He, Leung, Lau, & Chang, 2008).

Migrants' lack of acceptance by the host culture, their unstable legal status, and the challenging economic conditions they face are all contributing factors in their adjustment to migration (Bhugra & Ayonrinde, 2004). However, these conditions are dependent on the migrant's level of education and ethnic, cultural, and linguistic proximity to the host society (Evans & Kelley, 1991), making the integration process more difficult for migrant workers from lower socioeconomic brackets. Filipina domestic workers generally have a better command of the English language than male Bangladeshi construction workers, which may help to facilitate their integration into Singaporean society. Furthermore, domestic workers from the Philippines have higher

education levels and are generally considered to be more skilled than construction workers from Bangladesh, who are commonly known as "unskilled" manual laborers (Thompson, 2009). Hence, the former's adaptation to the host society may be smoother and less laden with obstacles.

Social Support

A growing body of research suggests that migrants' adaptation processes can be made less stressful and more manageable with ample social support (Kamya, 1997; Meadows, Kaslow, Thompson, & Jurkovic, 2005; Sherraden & Martin, 1994; Tran, 1994). A substantial literature also documents the positive influence of social support on the mental health and psychological well-being of migrants (Elias & Zeltser-Shorer, 2006; Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006; Uy-Tioco, 2007). Social support theory emphasizes that the interactive communication processes within a social network benefit the psychological well-being of individuals. Defined as a coping resource to buffer the negative effects of migration stress, social support can be provided in tangible or intangible forms. According to the theory, social support can come in the form of emotional, instrumental, or informational aid.

Emotional support provides encouragement, comfort, affinity, and acceptance to distressed migrants, especially when it is offered by individuals regarded with a degree of closeness and affection (Lyons, 2002). This is essential at a time when migrants' existing relationships have been destabilized by relocation (Siantz, 1997; Waters, 1997). Tangible assistance, in the form of instrumental support, involves the economic and physical aid that migrants receive when adjusting to life in their host country (House, Umberson, & Landis, 1988). The knowledge component of support is fulfilled through the advice and instructions conveyed to help reduce uncertainties while coping with challenges. Hence, informational support entails more direct assistive measures, such as the sharing of resources to facilitate job-seeking activities and navigate housing-related issues in an unfamiliar environment.

A consistent finding in the social support literature has been that informal networks (family, relatives, friends) play a significant role in providing

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emotional, informational, and instrumental support to migrant workers (Aroian, 1992; Hernández, Pozo, & Alonso-Morillejo, 2004; Leslie, 1992; Lynam, 1985). Essential for the progressive delivery of social support are the perceptions of support recipients on the availability of help, their readiness to seek out and accept aid, and their assessment of the usefulness of help offered (Coyne & Downey, 1991; Kawachi & Berkman, 2001; Leung, Chen, Lue, & Hsu, 2007). However, despite the presence of social support centers and nongovernmental organizations such as the Migrant Workers Centre, the Humanitarian Organisation for Migration Economics (HOME), and Transient Workers Count Too, many migrant workers in Singapore are unable to access these services due to restrictions enforced by their employers or a general lack of awareness.

Research on gender differences in social support networks indicates that women tend to have more intimate relationships and more extensive social networks than men (Laireiter & Baumann, 1992). Receiving social support and being included in social networks are important for mental well-being, especially for women (Kessler & McLeod, 2002). Wong and Leung (2008) found that social support acted as a moderator for migration stress in women, leading to improved mental health. In turn, women both provide more emotional support and receive more support (Kessler, McLeod, & Wethington, 1985). However, live-in domestic workers in Singapore often find it difficult to form networks of social support, especially if holidays and regular breaks—when they are allowed to leave the house—are strictly regulated (Hsia & Smales, 2010).

Mobile Phone Use

Mobile phones—via both text messages and voice calls—provide migrants with a way to build and maintain social support networks within the host country (Law & Chu, 2008; Law & Peng, 2006; Strom, 2002) while maintaining ties to the home country (Ryan, Sales, Tilki, & Siara, 2008; Thompson, 2009). Migrant workers typically use mobile phones to maintain a sense of closeness and communication with their geographically distant social network (Elias & Zeltser-Shorer, 2006; Uy-Tioco, 2007), adapt socially and culturally to the host society (Elias & Lemish, 2008), form networks with other migrants (Law & Peng, 2006), and obtain help in times of

emergency (Yang, 2008). With the greater affordability of telecommunications, both for hardware (Yang, 2008) and air time (Vertovec, 2004), mobile devices seem to be increasingly used by migrant workers in adapting to new environments (Roldan, 2009).

The use of mobile phones for social support depends partially on the relative expense of using mobiles in both the host and home countries (for accessing support from people there). A mobile phone is an expensive possession for migrant workers, as Thompson notes: "On salaries that range from about 250 to 500 Singapore dollars [~US\$200–400] per month for domestic workers and only slightly more for construction workers, a hand phone is often a foreign worker's most expensive budget item" (2009, p. 368). Nonetheless, a combination of economically competitive subscription plans and low-cost handsets led to a multifold subscription increase in the decade from 2000 to 2010 in both Bangladesh (from 0.22% to 46.17%) and the Philippines (from 8.35% to 85.67%; ITU, 2011). These economic trends make communicating with family and friends back home much easier.

Research shows that Bangladeshi construction workers communicate less frequently with families in their home countries than Filipina domestic workers do, but maintaining family ties is still considered very important by both groups (Thompson, 2009). When communicating with their families, Bangladeshi males must distribute their time with everyone equally, especially if they talk with both their parents and their wives (Rahman, 2004). If more time is spent talking to one or the other, resulting jealousy could lead to serious ramifications. Among Filipina domestic workers in Hong Kong, McKay (2007) observed that mobile phones facilitated mediated forms of intimacy that were inaccessible before; for instance, workers might find it easier to express certain feelings through text messages than in face-to-face contexts. Moreover, mobile phones allowed women domestic workers with children to parent them from a distance (Chib, Malik, Aricat, & Kadir, in press; Madianou & Miller, 2011), thus potentially reducing the distress of physical separation from the workers' children.

Although the mobile phone can function as a technology for liberation, it can also reinforce power relations embedded within social structures. A number of studies report that the mobile phone is used

as a tool to conduct surveillance on employees (Au Yong, 2005; Peng & Choi, 2013; Wallis, 2010). Employers in blue-collar industries use the mobile phone as a tool for issuing orders and maintaining control of male migrant workers. Similarly, live-in female domestic workers fall under the close and constant scrutiny of their employers, are always on call, and have little privacy or private space (Hsia & Smales, 2010).

Sending text messages silently allows migrant workers to keep and use their mobile phones away from their employers' hearing (Thompson, 2009). Moreover, the small size of mobile phones, compared to computers, enables workers to hide them (Yang, 2008). We also determined it important to recognize the two-fold nature of mobile phone use, because seeking emotional support from loved ones or regular contact with employers via mobile communications may, itself, also be sources of stress.

Research Questions/Hypotheses

- RQ1: Are there differences between male and female migrant workers in Singapore with regard to the workers' levels of stress, amounts of social support (informational, instrumental, and emotional) received, and patterns of ICT (mobile phone and computer) use?
- H1: The level of stress among migrant workers is inversely related to the amount of social support (informational, instrumental, and emotional) received.
- H2: The level of stress among migrant workers is inversely related to the frequency of ICT (mobile phone and computer) use.
- RQ2: Does social support mediate the relationship between ICT use and migrant stress?

Methodology

The 116 respondents included were selected through snowball sampling, comprising male ($n = 56$) and female ($n = 60$) migrant workers based in Singapore. The self-administered survey data was collected from January to March 2010. All questions were closed-ended, using Likert-type scales. The survey questions were developed in English, then translated into Bengali for the male Bangladeshi workers, and pre-tested with five Bengali-speaking males in Kolkata, India. Reverse Bengali-to-

English language translations were generated to check for errors. The Filipina questionnaire was pre-tested on 10 respondents to gauge the level of comprehension. While most of the female domestic workers understood English well enough to complete the survey unaided, a Filipino and an Indonesian interpreter were employed for respondents who needed translation to Tagalog (a language of the Philippines) or Bahasa (the official language of Indonesia).

The Bangladeshi interviews were conducted via street intercepts in the Little India district, where male migrant workers congregate on the weekends. The Filipina participants were contacted via local NGOs, such as *aidha*, a not-for-profit organization dedicated to enriching the lives of female migrant workers through financial education, and HOME, a charity that looks into the welfare and rights of migrant workers in Singapore.

Throughout the study, specific ethical procedures were followed, such as informing respondents that participation was voluntary and they could withdraw from the study at any time. The purpose of the research, protections from possible risks, and concerns were all explained. Individual names have been withheld from this article for reasons of confidentiality. At the end of the study, all participants were given a financial token of appreciation.

Dependent Variable

Migration Stress. Jibeen and Khalid's (2009) multidimensional acculturative stress scale was adapted to the Singaporean context, and the subscales measuring discrimination, homesickness, language barriers, and lack of opportunities for occupational and financial mobility were included in the survey. Factor analyses and reliability analyses were performed to determine which items should be included in the Singaporean analysis. Thirteen items (see Table 1) were used in the final migrant stress scale ($M = 3.67$, $SD = 0.83$), which was reliable ($\alpha = 0.78$).

Independent Variables

Informational support, instrumental support, and emotional support were measured using an adapted version of Sherbourne and Stewart's (1991) MOS social support survey. The items used a Likert scale measuring how easy it was to get these types of support from Singapore and back home, with 1 being *very difficult* and 5 being *very easy*.

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Table 1. Migrant Stress Subscale Items Using a 5-Point Likert Scale from Disagree (1) to Agree (5).

Discrimination ($\alpha = 0.651$)
1. Some Singaporeans treat me differently because of my race, nationality, or skin color.
2. I am constantly reminded of my minority status.
3. I think that many opportunities are denied to me because I am a foreigner.
4. I think that some Singaporeans discriminate against me just because I am a foreigner.
5. I feel that some Singaporeans do not treat me with respect.
Lack of opportunity for financial and occupational mobility ($\alpha = 0.725$)
6. I worry about losing my job.
7. I have few opportunities to earn more income.
8. I worry about not having enough money to support myself and my family.
9. I am disappointed that my standard of living is below what I expected.
Homesickness ($\alpha = 0.829$)
10. I miss my country and my people.
11. I miss my family members, relatives, and friends.
Language barriers ($\alpha = 0.512$)
12. I have difficulty understanding English in some situations.
13. I feel that some Singaporeans do not understand the way I speak.

Informational support. Six items from the original measure were included in the survey. They were the following: 1) I have someone to give me information to help me understand a situation; 2) I have someone to give me good advice about a crisis, i.e., if I had a dispute with my employer; 3) I have someone to confide in or talk to about myself or my problems; 4) I have someone whose advice I really want; 5) I have someone to share my most private worries and fears with; and 6) I have someone to turn to for suggestions about how to deal with a personal problem. The measure ($M = 3.77$, $SD = 1.19$) was highly reliable ($\alpha = 0.93$).

Instrumental support was measured by averaging responses to seven items. They were the following: 1) I have someone to help me make decisions; 2) I have someone to help me if I needed temporary shelter/accommodation; 3) I have someone to take me to the police if my employer abused or assaulted me; 4) I have someone to help me find employment if I was unemployed; 5) I have someone to help me seek legal advice on my rights as a foreign worker; 6) I have someone to help keep my travel documents and passport safe; and 7) I have someone to help me file a claim for unpaid or delayed wages.

The measure ($M = 3.28$, $SD = 1.13$) was reliable ($\alpha = 0.88$).

Emotional support was measured by averaging responses to five items. They were the following: 1) I have someone I can count on to listen to me when I need to talk; 2) I have someone who understands my problems; 3) I have someone I can get together with for relaxation; 4) I have someone I can have a good time with; and 5) I have someone who cares about my feelings. The measure ($M = 3.78$, $SD = 1.18$) was highly reliable ($\alpha = 0.92$).

Mobile phone usage was measured by averaging responses to six items exploring how often (from 1 = *never* to 5 = *every day*) participants used mobile phones to 1) make or receive calls; 2) send or receive text messages; 3) connect to the Internet; 4) use the camera/video function; 5) play games; and 6) listen to the radio/music. The measure ($M = 2.66$, $SD = 0.85$) was reliable ($\alpha = 0.64$).

Computer usage was measured by averaging responses to four items exploring how often (from 1 = *never* to 5 = *every day*) participants used computers for 1) chatting (i.e., MSN, Skype, Facebook, Friendster, Chikka); 2) entertainment (i.e., downloading movies, music, games); 3) surfing websites;

and 4) Microsoft Office applications (i.e., Word, Excel). The measure ($M = 1.27$, $SD = 0.82$) was reliable ($\alpha = 0.80$).

Data Analysis

Independent sample t tests were used to determine whether there were significant differences between male and female migrant workers with regard to stress level, amount of social support received, and ICT usage. Pearson's correlations were used to determine whether the dependent variables were related to migrant stress in the directions predicted. Multiple regressions were used to determine which social support and ICT variables accounted for the most variance in migrant stress for both female and male migrant workers, and to test the mediation models.

Results

Sample Description

The specific work domains of migrants were heavily biased by nationality, with the sample's blue-collar males hailing from South Asian countries such as Bangladesh and India, while the sample's female domestic workers were largely from the Philippines and Indonesia. Most of the females were Filipina (90%). They all worked as domestic helpers, and more than half (57%) reported making between 300 and 399 Singapore dollars (~US\$240–320) per month. Most of the males were Bangladeshi (96%), working as construction workers (80%) and making about 500 Singapore dollars (~US\$400) per month (82%). Slightly more than half (52%) of the female respondents were married, while 66% of the male respondents reported being single. Table 2 summarizes the sample characteristics.

Comparisons of Males and Females

The first research question asked whether differences existed between male and female migrant workers in Singapore with regard to their levels of stress, the amount of social support (informational, instrumental, and emotional) they received, and their patterns of ICT (mobile phones and computers) use. Independent sample t tests were used to determine whether male and female migrant workers differed in the amount of stress experienced, the amount of social support received, and the frequency of ICT use. There were no significant differences between male ($M = 3.66$, $SD = 0.88$) and female ($M = 3.67$, $SD = 0.79$) migrants' levels of stress, $t(114) = 0.06$, $P = 0.96$. Females reported

significantly more informational social support ($M = 4.6$, $SD = 0.73$) than males ($M = 2.88$, $SD = 0.91$), $t(105.34) = 11.19$, $P = 0.00$; more instrumental social support ($M = 3.93$, $SD = 0.92$) than males ($M = 2.59$, $SD = 0.90$), $t(114) = 7.91$, $P = 0.00$; and more emotional support ($M = 4.60$, $SD = 0.87$) than males ($M = 2.90$, $SD = 0.76$), $t(114) = 11.17$, $P = 0.00$. There were no significant differences between male ($M = 2.57$, $SD = 0.85$) and female ($M = 2.74$, $SD = 0.85$) migrant workers' mobile phone use, $t(114) = 1.11$, $P = 0.27$. There were also no significant differences between male ($M = 1.47$, $SD = 0.91$) and female ($M = 1.47$, $SD = 0.74$) migrant workers' computer use, $t(114) = 0.01$, $P = 0.99$.

Migrant Stress and Social Support

The first hypothesis predicted that the level of stress among migrant workers would be inversely related to the amount of social support (informational, instrumental, and emotional) received. Migrant stress was not significantly related to informational support ($r = -0.10$, $P = 0.30$), instrumental support ($r = -0.05$, $P = 0.62$), or emotional support ($r = -0.04$, $P = 0.65$) for the entire sample. When analyzed by gender, however, significant correlations emerged. For females, as predicted, significant negative relationships existed between stress and informational support ($r = -0.35$, $P = 0.01$), instrumental support ($r = -0.37$, $P = 0.00$), and emotional support ($r = -0.49$, $P = 0.00$). However, stress was not related to social support in the way that was predicted for males. For males, migrant stress was not related to informational support ($r = 0.01$, $P = 0.94$) or instrumental support ($r = 0.24$, $P = 0.08$), but it was significantly positively related to emotional support ($r = 0.40$, $P = 0.00$).

Multiple regressions were used to determine which types of social support accounted for the most variance in migrant stress (see Table 3). For female migrants, emotional support was the only significant predictor of migrant stress when all three types of support were included in the model. For male migrants, both informational support and emotional support were significant predictors of migrant stress.

Migrant Stress and ICT Usage

The second hypothesis predicted that the level of stress among migrant workers would be inversely related to the frequency of ICT usage. Migrant stress

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Table 2. Sample Description.

	Females (n = 60)	Males (n = 56)
Age (median)	33	28
Nationality		
Bangladeshi		96%
Burmese	2%	
Filipina	90%	
Indonesian	8%	
Sri Lankan		4%
Job Type		
Domestic helper	100%	
Construction worker		80%
Shipyards worker		5%
Other		14%
Monthly salary (median)	S\$350	S\$500
Education		
Secondary/high school diploma or less	55%	40%
College degree	7%	18%
Marital Status		
Single	43%	66%
Married	52%	37%
Separated/divorced	5%	7%
Time in Singapore		
Less than 6 months	22%	5%
More than 2 years	57%	39%

was not significantly related to mobile phone use ($r = -0.07$, $P = 0.47$) or computer use ($r = -0.02$, $P = 0.85$) for the entire sample. When analyzed by gender, significant correlations emerged. For females, as predicted, significant negative relationships existed between migrant stress and mobile phone use ($r = -0.27$, $P = 0.04$), but not for computer use ($r = -0.09$, $P = 0.48$). Migrant stress was not related to ICT use in the way that was predicted for male migrant workers. For males, migrant stress was positively related to mobile use ($r = 0.39$, $P = 0.00$), but it was not significantly related to computer use ($r = 0.04$, $P = 0.76$).

Social Support Mediating Between ICT Use and Migrant Stress

The second research question inquired as to whether social support mediated the relationship

between ICT use and migrant stress. Consistent with global telecommunication diffusion trends in developing countries—where mobile penetration has reached 89%, but Internet use via any device is only 31% (ITU, 2013)—mobile use among migrants far exceeds computer use. In our sample, computer use was not a significant predictor of migrant stress, so social support was only tested as a potential mediator between mobile use and migrant stress. Thus, this study focused on the role of mobile phones—as a mechanism for increasing or decreasing access to social support—in alleviating or exacerbating stress.

A series of multiple regressions was used to test this model: Mobile use → social support → migrant stress for both male and female migrant workers. First, regression analyses were used to confirm that mobile use predicted each of the social support vari-

Table 3. Multiple Regressions with Types of Social Support Predicting Migrant Stress.

	Males (β)	Females (β)
Informational support	-0.39*	0.28
Instrumental support	0.21	-0.21
Emotional support	0.48**	-0.63**
Adjusted R^2	0.20**	0.25***

* $P < 0.05$. ** $P < 0.01$. *** $P < 0.001$.

ables. When these failed to yield significant relationships (as was the case for males receiving informational support), mediation was not possible. Then, regression analyses were used to determine whether each social support type was related to migrant stress. For males, it was confirmed that we could not check for mediation related to informational support or instrumental support, because neither of those factors predicted migrant stress. Next, we confirmed that mobile use predicted migrant stress as our initial analysis suggested. Finally, for each mediation model being tested, mobile use and the type of social support being tested were entered into regression equations as independent variables, always with migrant stress as the dependent variable.

For females, each type of social support mediated the relationship between mobile use and migrant stress. For males, emotional support was shown to mediate the relationship between mobile use and migrant stress, but the relationships were the opposite of what we had predicted. Table 4 shows the final regression models demonstrating mediation.

Discussion

This study explored the potential of ICT use (mobile phones and computers) to reduce stress among and provide social support for migrant workers in Singapore. Our sample consisted of male, primarily Bangladeshi, blue-collar workers, and female, primarily Filipina, domestic workers. While we recognize that the findings might be influenced by any of these demographic distinctions, we discuss the findings as related to gender. The analysis shows that, while females benefit from transnational mobile communication, males experienced greater stress with more mobile phone usage. Furthermore, gender differences related to social support emerged. Computer use among migrants in our

sample was low and not significantly related to either social support or stress.

We found significant differences between the male and the female migrant workers with regard to social support received. Females reported receiving more informational, instrumental, and emotional support than males. These distinctions seemed to make a difference when it came to the extent to which social support and mobile use reduced migrant stress. However, due to the characteristics of our sample respondents and the snowball sampling method employed, we caution restraint in generalizing these findings to the entire migrant population. However, these findings are consistent with prior research on gender differences in social support networks, which has indicated that females tend to have more extensive social networks than males (Laireiter & Baumann, 1992), and that females both provide and receive more emotional support than males (Kessler et al., 1985). Receiving social support and being included in social networks are important for mental well-being, especially for females (Kessler & McLeod, 2002).

In terms of migrant stress, we found that, for female workers, mobile phones alleviated stress, particularly providing emotional social support. Those females who received more informational, instrumental, and emotional support experienced less stress. In addition, social support (all forms) mediated the relationship between mobile use and migrant stress. When all types of social support were included in the analyses, emotional support had the largest impact on reducing migrant stress. This was consistent with our predictions.

In contrast, male workers in our sample experienced higher levels of stress with increased mobile phone use and increased emotional support received, particularly through mobile phones. Since we only have cross-sectional data, it is difficult to determine conclusively at this point why this might be the case. Are males using their mobile phones

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Table 4. Mediation Models.

	Male migrants' emotional support (β)	Female migrants' informational support (β)	Female migrants' instrumental support (β)	Female migrants' emotional support (β)
Mobile use	0.258	-0.191	-0.168	-0.096
Social support (type in column)	0.282*	-0.304*	-0.314*	-0.456**
Adjusted R^2	0.185**	0.128**	0.131**	0.223***

* $P < 0.05$. ** $P < 0.01$. *** $P < 0.001$.

more because they already have higher levels of stress, but are not receiving relief from stress levels as a result of mobile use? Or are their stress levels increasing as a result of mobile phone use? It is possible that interacting with family at home reminds them of their obligations, and therefore they feel more stress. Alternatively, male migrant workers might be using the phones more for work purposes, yielding stress directly related to interaction with their bosses. Further research is needed to explore these possibilities.

Additionally, the relationship between stress and social support was complex for males in our sample. The correlation analysis revealed no relationship between stress and either informational or instrumental support. However, when entered into a regression model with emotional support, informational support became significant. Some sort of interaction between the informational and emotional support measures probably causes this. These two measures are sometimes combined in Sherbourne and Stewart's (1991) work. Other studies have found that certain individuals hesitate to allow social and professional contexts to overlap (Donner, 2009). For example, some South Asian male migrants in Singapore reported hesitation in carrying personal mobile phones to work, lest a stressful call from home should interfere with their workday (Chib & Aricat, 2012). Rather than blur the line between their personal lives and their livelihoods, male migrants waited to return to their dormitories before commencing personal communication. It is likely, as we found in this study, that migrants are willing to forgo the informational support rendered by mobile phones to mitigate the stress induced by mediated emotional support.

The more important finding to discuss is that, consistent across all analyses, there was a positive relationship between stress and obtaining emotional

support for males in our sample. Emotional support also mediated the relationship between mobile phone use and migrant stress. It is possible that, when males receive emotional support from family or loved ones in their home country, it increases their homesickness or reminds them of their lack of opportunities for financial mobility (and their related desire to provide more for their family), thus increasing their stress instead of alleviating it. More thorough investigation is needed to determine whether this is the case.

Future research could further investigate the gender differences that arise when seeking to establish the relationships among migration stress, social support, and mobile use, while including other variables in the analysis. For example, Hanna (1998) found community involvement to be a particular cause of stress for female migrants from Samoa. Wong and Leung (2008) found that social companionship support moderated the migration stress felt by female migrants.

Possible confounding variables exist in the present study, since gender, nationality, and occupation are conflated—most of the female respondents were from the Philippines, while most of the male respondents were Bangladeshi. Further, the differing work assignments of the two genders may have played a role in the results. The role of nationality and the parsing of work and life domains, beyond gender, in determining social support via ICTs are potential areas for future research. This study does confirm that examining migrant workers of different genders, nationalities, or work environments as a homogeneous group is inadequate.

Given current policies and migration trends in Singapore, it is difficult to develop a research design with a significant number of males and females from the same countries who are also working in the construction and domestic industries to unpack

the gender-culture-occupation relationship. Because migration is an increasingly global phenomenon, these research restrictions may be addressed in countries with similar migrant populations, as seen in the work of Johnson (2013), who uncovers gendered uses of mobile phones within a single migrant community.

The quantitative nature of the study limited in-depth exploration, yet it also opened spaces for further inquiry. The present research is confined to measures of use, and it reveals little about the content or appropriation aspects of mobile communication (Wirth, Von Pape, & Karnowski, 2008). Focusing on migrant stress also precludes investigating the role of mobile phones in fostering acculturation into the host society (Aricat & Chib, 2013; See, Goh, Ng, Cheang, Jiang, & Chib, 2012). Finally, the influence of mobile communications on migrants' familial ties (Paragas, 2009) and transnational mothering (within a gendered context; see Madianou & Miller, 2011) can provide fertile areas for deeper qualitative inquiry.

Conclusion

This study found that mobile phones can either increase migrant stress, as was the case with the male Bangladeshi blue-collar workers in Singapore, or decrease migrant stress, as was the case for female Filipina domestic workers in Singapore. The relationship between mobile phone usage and stress was mediated by emotional support received (in both a positive and negative way). The findings of this study present various challenges and offer opportunities for the government and voluntary welfare organizations to reach out to large migrant communities. We provide evidence to counter existing policy proposals (Jin, Wen, Fan, & Wang, 2012; Thomas & Lim, 2011), which suggest facilitation of the transnational communication of all migrants with their home communities, via mobile phones. Although we point to the importance of mobile transnational communication, we caution against treating the immigrants as a homogeneous group. Mobile communication, while beneficial to some, might be detrimental to the well-being of others. We will need to create alternative coping strategies for those, such as the males in our sample, for whom mobile communication creates greater stress.

From a policy perspective, this study suggests that mobile phones have an important role to play

in the emotional and psychological well-being of migrant workers as they adapt to the foreign circumstances of their host country. Often, domestic and blue-collar workers are restricted from or denied communication via mobile phones, either by recruitment agencies or employers who confiscate workers' phones in supposed attempts to prevent work interference or disruption. As a consequence, many migrant workers are unable to seek help in emergencies, let alone as a routine affair, or even to inform their families of their degrading work conditions (Human Rights Watch, 2008). Whether individual attitudes coalesce prior to government intervention is debatable, particularly when anti-immigration attitudes are on the rise, playing a major role in recent political forums.

While we urge further scholarly investigation, mobilizing and informing public opinion and transforming national policy are avenues that may simultaneously address the issue. From a broader perspective, as globalization creates ever more links with and opportunities in distant lands, subaltern communities, such as those made up of migrant workers, are bound to increase. This phenomenon will have to be managed not only at the international level, but also at the national level, as rural dwellers migrate to cities in search of better lives. Designing effective coping and support strategies using increasingly ubiquitous technologies, such as mobile phones, may contribute to alleviating the attendant migration stress. ■

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