

## Female Sex Workers' Use of Mobile Phones in India: Lessons in Effective Engagement

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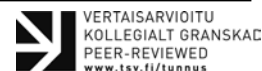
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**Abstract:** *Despite the widespread impact of mobile phone technology, research on female sex workers' (FSWs) access and use of this technology is sparse. This study aimed to document FSWs' subjective perceptions of the benefits of mobile phone technology as well as examine the potential for its use by nongovernmental organizations (NGOs). Employing a phenomenological study built on in-depth qualitative interviews and focus group discussions with 67 FSWs and 18 staff and leaders from local NGOs in Mumbai and various locations of the Karnataka State in India between January and May 2015. Findings revealed complex trajectories for FSWs regarding accessing, learning about, and using mobile phone technology. FSW participants highlighted enhanced social connectedness with clients and their communities while NGO personnel underscored the newer ways of engagement with FSWs with mobile phone technology. Study findings point to both opportunities and challenges posed by FSWs' extensive use of mobile phone technology.*

**Keywords:** *sex work, mobile phone technology, India, prostitution, female sex workers (FSWs), technology-based interventions.*

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## INTRODUCTION

Globally, information and communication technologies (ICTs) have profoundly changed the manner in which people communicate with one another and seek and share information and ideas (Lipset, 2013). A recent report by the International Telecommunications Union (ITU, 2017) highlighted the significant digital divides between developed and developing countries. And, despite their worldwide reach, researchers in the past have underscored the inherent inequities that ICTs present, ranging from access, autonomy, and skill to social support and purpose (Sinpeng, 2015), that continue to foster enormous stratification and negate the initial popular perceptions of equalizing diverse populations (Mendonça, Crespo, & Simoes, 2015). In recent years, mobile phones have emerged as a powerful communication tool and there is widespread acknowledgment of the power of mobile phones to transform people's lives, especially in places where resources are scarce (Donner, 2008). Further, mobile phones have presented a powerful opportunity for advancement to millions of women in developing nations.

While ample literature abounds on the perceived benefits of mobile phone technology for marginalized women in the developing world, empirical evidence—specifically on female sex workers' (FSWs) experiences with mobile phone technology—is only gradually emerging. In India, tele-density among sex workers in urban settings has been estimated at 97% (Sambasivan, Weber, & Cutrell, 2011). Researchers in the recent past have consistently documented a trend of mobile phone-based client solicitation among FSWs in India and have consistently pointed to the benefits of moving away from soliciting in public venues, thereby enhancing desired anonymity as well as reduced presence of intermediaries such as brothel owners, brokers, and other middlemen (Beattie, Bradley, Vanta, Lowndes, & Alary, 2013; Buzdugan et al., 2010; Buzdugan et al., 2012; Jain & Saggurti, 2012). Given the existing evidence of widespread use of mobile phone technology by FSWs in India, it is vital to examine specifically the trajectories of sex workers' intersections with technology. Additionally, NGOs (nongovernmental organizations) and other agencies must understand and recognize sex workers' abilities to engage with this technology, as this will have implications for designing holistic interventions and outreach programs for women in high-risk and vulnerable groups. This study thus aims to fill this gap in literature by shedding light on how FSWs' experiences with accessing and using mobile phone technology may be similar or different compared to other women from marginalized communities. The focus of this qualitative study was two-fold: (a) to document FSWs' subjective perceptions of the benefits of mobile phone technology, and (b) to examine the potential for the use of mobile phone technology by NGOs.

To understand the specific ways in which FSWs interact with mobile phone technology, it is crucial to examine the existing terrain and nuances of how marginalized women from various social and cultural contexts employ mobile phones to their advantage. Research evidence has underscored the ways in which ICT technologies such as MP3-type players have enabled rural women's increased engagement in important community dialogues (Sengupta, Long, Singhal & Shefner-Rogers, 2007) and emphasized that independent access to mobile phone technology has enabled women's entrepreneurial endeavors while reducing the gender divide (Jacobsen, 2011; Jennings & Gagliardi, 2013; Zainudeen, Iqbal, & Samarajiva, 2010). In addition, for low-income women, finding intermediaries such as family members, including children and spouses, ably sidesteps some formidable barriers posed by literacy-related issues (Lemish & Cohen, 2005; Sambasivan, Cutrell, Toyama, & Nardi, 2010). Mobile phone technology also has been touted as a key enabler in the deepening of social ties among women, thus facilitating both interpersonal and instrumental

gains through building of social capital. Research in the past has shown that women use mobile phones to initiate virtual relationships more frequently as compared to men (Pertierra, 2005). Several studies have acknowledged the widespread feminization of mobile phones and underscored women's use of the technology as being consistent with their caregiving roles. Some researchers have found that women use technology largely for intrinsic (relationship maintenance) rather than extrinsic purposes (business transactions; Lemish & Cohen, 2005; Zainudeen et al., 2010), while others noted that mobile phones symbolize safety and connection to family for women, enabling expressions of empathy (Livholts & Bryant, 2013). Research evidence also points to the role of mobile phone technology in strengthening of ties among household members, between members in a social circle, between employers and their employees, and more specifically between women employed overseas and their children (Handapangoda & Kumara, 2013; Murphy & Priebe, 2011; Pertierra, 2005; Tenhunen, 2008). Other studies have staunchly stressed mobile phone technology's indispensability for the expansion of women's social and business networks (Handapangoda & Kumara, 2013; Murphy & Priebe, 2011). In a recent global survey by GSMA (mWomen Programme, 2012a), the majority of women (80%) from impoverished communities reported greater familial connectedness because of mobile phones and highlighted the usefulness of mobile phones during emergencies. Other researchers have emphasized that these types of expanded access to others within communities serves to reduce significantly the women's sense of isolation (Maleka, 2012).

Findings from studies on the perceived impact of mobile phone technology on women's personal lives have been mixed. Some researchers have underscored the role of portable communication devices in fulfilling women's social needs in terms of extending their social networks and support structures, as well as fulfilling their entertainment needs by providing them access to movies and shows on topics of interest to them (Handapangoda & Kumara, 2013, Jouhki, 2013; Yoon, 2006). In Afghanistan, providing women access to culture-specific content related to civic education and development and rights-based frameworks via solar-powered digital audio players facilitated collective listening with family members, fueled vital discussions, defused potential male resistance, and promoted women's empowerment (Sengupta et al., 2007). Mobile phones also have been associated with increased safety and security for women, along with improved access to financial, health, and educational opportunities and women's increased autonomy and proactive decision making regarding their own and their families' health (GSMA Development Fund & Cherie Blair Foundation for Women, 2010).

One of the most important gains resulting from mobile phone technology has been in the public health sphere. Mobile phone technology has increasingly proved to be useful for increasing women's utilization of primary health care services (Oluwafemi & Wynn, 2014), implementing mental health interventions (Norris, Swartz & Tomlinson, 2013), and obtaining easy access to vital health-care information (Jennings & Gagliardi, 2013). Further, mobile phones have emerged as one of the most popular and low-cost technological devices used to disseminate health reminders and disease prevention messages in an unobtrusive manner, monitor treatment adherence, enable disease surveillance (including diagnosis and treatment of sexually transmitted infections), collect data regarding on-going health concerns, and provide immediate feedback to health-care practitioners (Bahadur & Murray, 2010; Patrick, Griswold, Raab, & Intille, 2008). Rapid advances in mobile phone technology are driving the increased prominence of mobile phones, allowing individuals to take more control over their health and helping health-care practitioners deliver timely and effective services. Innovations such as telephone broadcasting

systems have aided in relaying psycho-educational information to women living with or at risk for HIV/AIDS, such as FSWs (Sambasivan, Weber & Cutrell, 2011), while inventive mHealth approaches have been proven to have positive health outcomes for maternal and child health (Deshmukh & Mechael, 2013).

On the other hand, researchers in the past have cautioned against over emphasizing the positive impacts of mHealth interventions on gender relations and have called for a comprehensive understanding of women's abilities to navigate sociocultural, financial, and technical literacy barriers in terms of access to and use of technology (Jennings & Gagliardi, 2013; Natarajan & Parikh, 2013). And, while the gains of mobile phone technology are undeniable, research evidence suggests a gender inequality owing to the gendered use of ICTs in general and mobile phones in particular (Casado & Lasén, 2014; Goluboff, 2016; Jouhki, 2013; Svensson & Wamala Larsson, 2016). Past studies have pointed to technology-related vulnerabilities for women often because of male-controlled access and monitoring of mobile phones or a lack of privacy resulting from phone sharing for cost effectiveness (GSMA mWomen Programme, 2012a; Pertierra, 2005), while others have drawn attention to the gender disparity regarding mobile phones with exclusive access and use by men for communication and entertainment purposes contrasting with women's experiences of monitored phone use by extended family members and with limited privacy (Doron, 2012). Many studies have found that women's overdependence on men and fear of reprisals from male spouses/partners, combined with a lack of training in using technology, were significant barriers to women's success in using technology effectively and expanding social networks outside of existing boundaries (GSMA mWomen Programme, 2012b, Handapangoda & Kumara, 2013; Lemish & Cohen, 2005; Ojokoh, 2009; Sambasivan et al., 2010). Archambault's (2011) study revealed the significant impact of the information gathered on and through mobile phones on young couples in Southern Mozambique that resulted in conflicts and relationship disruption. Other research suggested that the perceived anonymity of texting may sometimes inspire uncharacteristically intimate conversations, leading to premature or inappropriate self-disclosure or even to harassment (Pertierra, 2005; Short & McMurray, 2009), an issue that has specific implications for sex workers in particular, given the high premium placed on preserving their anonymity.

Significant research evidence illustrates both benefits and challenges in using mobile phone technology for those engaged in the sex work industry. Mobile phones and the Internet have been underscored as important new pathways for soliciting new clients and enabling ongoing client–sex worker interactions in Estonia (Aral, St. Lawrence, & Uuskula, 2006) and Thailand (Veena, 2007) and for establishing and maintaining transactional sex practices in sub-Saharan Africa (Stark, 2013). Research evidence from India has stressed the association between mobile phone use by FSWs for client solicitation and risky sexual behaviors (Mahapatra, Saggurti, Halli, & Jain, 2012; Navani-Vazirani et al., 2015), especially in the case of FSWs belonging to the lower socioeconomic strata who solicited clients both over the phone and at traditional venues (Navani-Vazirani et al., 2017). In a recent study in India, Panchanadeswaran, Unnithan, Chacko, Brazda, and Kuruppu (2017) emphasized FSWs' heightened vulnerabilities, including risk for conflict and violence within intimate relationships resulting from mobile phone surveillance by their partners. Support also exists for the idea that mobile phone technology has aided users' connections to others in addition to saving time, increased mobility, and in the dissemination of vital information from governmental organizations and NGOs (Jouhki, 2013; Millanga, 2014; Ohme, 2014). In terms of service delivery to the most socially marginalized populations like

FSWs, NGOs often find it hard to reach them, and they struggle with the existing means to track and monitor the progress of well-being among these groups through traditional forms of engagement. Research on phone-based systems and technology provide outreach actors such as NGOs with comprehensive strategies for improving the implementation of technology-mediated interventions, and mobile phone technology as a means of psycho-education is becoming increasingly common. Studies in this area have explored the impact of transmitting information to engage better with marginalized populations (Smales, 2011; Sambasivan et al, 2010; Sambasivan et al., 2011). Sambasivan et al. (2011) studied the use of a phone broadcasting system among FSWs to improve NGO outreach efforts in India to communicate information on issues ranging from microfinance loans and HIV testing to computer training and community-based information, while Smales (2011) discussed a text messaging hotline system implemented in Kuwait for domestic workers to follow-up on reports regarding gender-based violence. Overall, a convergence in the literature has developed regarding the central role that NGOs play in enabling communities with human-computer interactions, especially in the developing world (Sambasivan et al., 2010).

While literature on women's access and use of mobile phone technology in developing countries is abundant, focus on the experiences of FSWs' use of mobile phone technology and the implications for NGOs that work with this marginalized population is still emerging. Researchers have pointed to the need to examine mobile phone technology's impact beyond traditional areas of development, including health care, education, and so forth (Archambault, 2011; Sariola, 2009). The current study addresses this gap by delving into how the use of mobile technology among FSWs is unique, owing to the nature of sex work and where sex workers value a high degree of anonymity. The aim of the study was to examine the myriad ways in which mobile phone technology impacts the lives of FSWs in India. This paper will focus on two specific questions: (a) What are FSWs' subjective perceptions of the benefits of mobile phone technology? and (b) What role does mobile phone technology play in the ways in which FSWs and NGOs engage with each other?

## METHODS

### Design, Sampling, and Data Collection

For this study, we used a phenomenological approach to investigate the experiences of FSWs in Mumbai and various locations in Karnataka state, including the city of Bengaluru and several semi-urban and rural areas around Bengaluru. FSWs were recruited into the study by the first author in partnership with local NGOs and local professionally trained social workers. The eligibility criteria for the participants of the study were women who (a) were 18 years or older, (b) self-identified as sex workers, and (c) currently owned a mobile phone. The FSWs who participated in our study solicited and provided sexual services in multiple venues, primarily (a) street, lodges, or hotels, (b) their own or their friends' homes, or (c) brothels. A total of 67 FSWs were recruited into the study through purposive and snowball sampling methods. The mean age of the FSWs was 33.05 years ( $SD = 7.02$  years); over a third (38%) had not attended school, and the majority (76%) reported being currently single with at least one child ( $M = 1.8$ ,  $SD = 0.98$ ). For most of the FSWs (85%), sex work was the primary source of income. The

FSWs reported owning mobiles for almost 9 years on average. A significant proportion (75%) of the FSWs owned one mobile phone, while 25% reported owning two mobiles. Eighteen individuals from local NGOs in Mumbai and Karnataka participated in our study, including front line staff (grassroots-level worker), supervisors, managers, and heads of organizations. Most (72.2%) were graduates in the fields of social work or related disciplines with experience in working with sex workers.

Data collection methods included in-depth interviews (44 FSWs) and several focus group discussions (23 FSWs), in addition to a short sociodemographic survey. The semistructured interview guides used for data collection were developed by the first author in consultation with local NGO partners and gatekeepers. The guides were piloted, revised, and subsequently finalized. Questions included initiation into mobile technology use, the range of mobile phone use, perceived benefits of mobile phone use on personal life and on sex work, and their experiences with using phones for engagement with NGOs as well as readiness to send/receive health promotion messages, other generic information, and so forth. In-depth interviews and focus group discussions were conducted by the first and the third author with the help of a research assistant (all female) in a private office of the participating NGOs. Interviews and discussions were conducted in a conversational style, generally after the interviewer and the respondent chatted informally over coffee/lunch for at least a half hour before commencing the data collection process. Data were collected in the local languages, that is, Hindi, Marathi, Kannada, or English (in which both the respondents and the researchers were fluent). NGO personnel provided their perspectives via in-depth interviews. All interviews and discussions were recorded after the interviewers administered detailed informed consent procedures. Based on local cultural norms, all FSW participants were compensated in kind (i.e., a meal, transportation costs to the data collection site, and a small gift). This study received approval from Adelphi University's Institutional Review Board.

## **Data Analysis**

Qualified multilingual transcribers translated and transcribed verbatim all non-English interviews into English for analysis and coding. Coding is the process of identifying themes in texts, then labeling the presence of these themes in the collected documents used for the research (Bernard, 2011). The authors developed a sample coding plan based on the recommendations of Miles and Huberman (1994). Code families containing primary and secondary codes were developed based on the goal of the study along with prior research input from NGO collaborators. The coding plan was used to team code four interviews as a pilot test. During this pilot process, the coded documents were discussed by the coders with specific attention paid to the code list and its ability to be used to document the target themes relating to the implications of mobile phone technology on sex workers lives (Miles & Huberman, 1994). The authors added, subtracted, and organized the code families and subcodes as necessary to clarify the data analysis process for use in the final coding of the transcripts (Miles & Huberman, 1994). The final step in the coding process was loading the transcripts into Atlas.ti 7 (Muhr, 2013) for analysis and coding.

Five code families were used in the analysis of the total dataset. Each family contained one to five primary codes and multiple secondary codes. In this paper, we focus on the analysis of the primary and secondary codes from two of the code families. These families are FSWs journeying into and benefits of mobile phone technology, and NGO engagement with sex workers using

mobile phone technology. The primary and secondary codes in the journeying into technology family identified themes about how and why FSWs started using mobile phones, the costs associated with and the learning process to use mobile phone technology, and the perceived benefits of using the technology. The NGO engagement family contained themes related outreach activities using phones and implications for service delivery to the sex worker community.

## FINDINGS

The main results from the study are presented below in two parts. The first part will focus on FSWs' pathways to accessing and learning about and use of mobile phone technology, as well as FSWs' views on the perceived benefits of mobile phone technology. The second part will highlight FSW respondents' and NGO personnel's opinions on the use of technology for optimal mutual engagement.

### Journeying into Mobile Phone Technology

#### Initiation into Technology and Learning

Results revealed varied scenarios regarding how FSWs were introduced to mobile phone technology. In some cases, this initiation was sudden; in other instances, it entailed a gradual process of learning and familiarization. A 43-year old street-based FSW described how she has been using one or another form of mobile phone technology for the past 20 years:

*It's been about 15 to 20 years since I first started using a mobile.... I first bought a pager, then a mobile with an antenna, then another one without a camera. And just recently, I bought this big mobile phone with a camera.*

For many respondents, mobile phone gifts from regular trusted partners and clients were a key gateway that facilitated access to the new technology and some of them recounted how they gained gradual comfort and familiarity using the same. As one 25-year old brothel-based FSW explained,

*One of my customers gifted me. He said, "You use it. Slowly, slowly you will know everything." Then slowly, slowly it was easy for me to operate, and now I know everything. If I cannot contact over call, then I can contact through WhatsApp also.*

For others, watching peers gain from the access to mobile phones motivated them to proactively acquire one for themselves. Another brothel-based 30-year old FSW described her experience as follows,

*I did not know the use of mobile phones initially. I used the landline and the coin booth for work. Later on, when I started seeing a lot of them (other FSWs) having it [mobile phone], I wanted one. But I couldn't buy one because I did not have money. When the rates came down, I bought.*

For a few FSWs who were employed with local NGOs on a part-time basis, these organizations became a key pathway for their induction into mobile phone technology. A 24-year old home-based FSW explained,

*I didn't know anything about mobile when I started working with the NGO. They had given me a crisis phone, and when any crisis happened, they used to call me. I didn't know how to use it at first. I worked for nearly 7 years with that NGO. Then I gave up the crisis phone [and] bought one for myself. Meanwhile, I had learned everything.*

Many brothel-based FSWs also recounted instances in which the brothel owners urged them to buy phones to facilitate their ability to stay in touch with their families. A 31-year old FSW in a Mumbai brothel clarified,

*No, I didn't purchase it immediately. When I was facing problem in contacting my children, then Mai [brothel owner] provided me a mobile phone with a SIM card. She said to me, "Keep this mobile phone now; later on I will provide you a Chinese Mobile and you repay me later on."*

Findings revealed that, over time, FSWs gained competencies in using mobile phone technology. For many, the phone seller was a key initiator and enabler who also provided technical support to help FSWs navigate the technology. Many FSWs described their experiences in ways similar to this respondent, who was a 35-year old brothel-based FSW:

*If I go to the mobile shop, he shows, "This is how it opens; this is how you need to fix it." He [phone seller] gave me that piece [headphones]. But now looking at other women, I've learned to use a headphone in my ears, listen to music, and use WhatsApp. Everyone uses all this, and I learned [by] watching them use these. Earlier, I couldn't understand all this.*

A 36-year old female NGO manager asserted her observations of FSWs' learning from multiple actors,

*[They learn] from each other. It is peer education. And some of these girls will learn from their customers. And there are many mobile shops around the red-light area. When they have some issues with the mobile phones, they will go and will check there and repair their phones and get some information from the shop owner as well.*

FSW respondents repeatedly identified their children and peers as key enablers of their learning to use mobile phone technology as did NGO personnel. A 48-year old female NGO manager stressed,

*They are now also learning from their children. Children are studying, going to school.... Small children learn all these apps and they are teaching their mothers. ... They learn from each other and they learn very quickly. All these touchscreen phones, the android phones now, they operate very well....Even though they [the FSWs] are barely literate, they can identify names, numbers....They have some kind of visual thing and they are able to do that.<sup>1</sup>*

For some FSWs, spouses and clients appeared to play a key role in helping them to get familiar with the various features of mobile phones, as evidenced by the following quotes:

*If I have to write something or I want to talk to my friend or I want to send my friend something, I tell my husband to show what has to be done. [38-year old street-based FSW]*



*Whatever knowledge he [client] had about mobiles, he taught me everything. [42-year old street-based FSW]*

*Switching on/off Bluetooth, how to use WhatsApp, how people speak on WhatsApp, my client taught me all this. I still remember his name. [smiles; 28-year old street-based FSW]*

### Perceived Benefits of Mobile Phone Technology

FSW participants reported that, regardless of the pathways through which they were initiated into mobile phone technology, mobile phones offered important uses in their lives, ranging from better connectedness with families, peers, and others in their communities to providing opportunities for their own enjoyment. Mobile phone technology was touted by many respondents as freeing them from the inconvenience of public phone booths. One home-based, 29-year old FSW narrated how she purchased mobile phones to escape from the tedium and disadvantages of using privately operated small phone shops (known as Subscriber Trunk Dialing or STD booths), especially at night:

*I used to contact my customers or my family members through the coin phone. If I wanted to get in touch with someone in the middle of the night, based on my status [as a sex worker], it was difficult. Suppose I wanted to send someone a message in the night, I had to go looking for a coin phone booth or wait for the person to open his shop in the morning. Based on all these circumstances, I felt, why not own one myself? Hence I purchased it.*

Mobile phones appeared to be a vital facilitator in sex workers' efforts to rekindle and deepen ties with their loved ones. A 40-year old street-based and a 30-year old brothel-based FSW, respectively, recounted their experiences as thus:

*A lot of changes have taken place. I am reunited with my family because of my mobile phone. I left my family about 9 years back. If I have good relationships with my family, then it is because of the mobile phone.*

*Earlier, I didn't have much information about what's happening at home, so I would just stop thinking about it. There was no phone. Now, I get calls. Someone or the other calls up. Twice a week my brother calls, then my sister calls. So the relationship has become stronger.*

Many FSWs also talked about their decisions to gift mobile phones to their family members, leading to an elevation in their status within their families. Our findings revealed the extensive use of mobile phone technology to build social networks and relationships with peers, neighbors, community leaders, as well as to seek help during times of crises.

Significantly, the FSW respondents' narrations also revealed extensive use of mobile phones as tools for self-directed entertainment and personal enjoyment, such as for listening to music, watching movies, playing games, and for taking pictures/videos of friends and family. One 27-year old home-based FSW said, "We play games, we listen to songs, we listen to FM [radio], and then we see photos. We speak over the phone, talk to our relatives, send messages, we read messages." A 24-year old brothel-based FSW stressed, "I get some songs saved for the kids. I pay about Rs.40 [US\$0.59] to get the songs downloaded. They watch movies too. I get them downloaded; they watch the movies and then they delete them." Although rare, a few FSWs also shared their experiences of shopping online with their phones, as one 35-year old street-based FSW described,

*It [mobile phone] is useful now to buy jewelry: what sort of jewelry and [from] which store to buy. A friend who works with me will send me the link on it [the phone]. I can see it clearly. They show me the latest trends that I can choose from. They [Web sites] also suggest options that will be good. My son has selected two of those.*

For many sex workers in this study, mobile phone technology appeared to provide immense gateways that facilitated learning and other creative forms of self-expression. As one 30-year old brothel-based FSW asserted,

*Mobile has changed my life. I may be in the wrong line [of work], but I've learned to read and write using a mobile. I've learned a lot through the mobile. Like, I didn't know how to sign. I didn't know what A looked like and didn't know any spellings. I didn't go to school at all. Slowly I learned this is A, B, C, D, etcetera. [Writes her name.] I've learned this because of the mobile.*

NGO personnel observed that sex workers' enhanced self-worth has resulted from mobile phone technology. This perspective is apparent in many of their narrations, as evidenced in the quotes below:

*When someone has access to a phone, it is so empowering. ... A few words of English is empowering; ... they can negotiate. [33-year old female front line worker]*

*Many can't read or write, so even the way they save a person's number through different ringtones, different visual symbols, etcetera., sort of makes them [sex workers] feel a sense of accomplishment and pride—that you don't have to be literate to be smart and intelligent. [28-year old female supervisor]*

*Around 92-95% of the women in the red-light area are illiterate. But they know how to use the smart phone! Sending video clips, photographs through Bluetooth using Internet, and downloading songs & movies. Now they know to do that very easily. [49-year old female NGO manager]*

Another real advantage of mobile phone technology that FSWs spoke about at length was related to their experiences within the realm of sex work. Respondents repeatedly underscored the newer opportunities presented by mobile phone technology in soliciting customers. As one 29-year old male NGO manager said,

*Especially with young girls, it's [mobile phone technology] a craze! They find it very necessary to have a smart phone. There are a few girls who have pornographic video clips on their cell phones. It becomes a very interesting way to solicit customers.*

Further, mobile phones appeared to provide FSWs a real chance to actively vet potential clients before engaging with them. A 45-year old street-based FSW elaborated on this process:

*We call and find out who he is, and then ask him what color clothes is he wearing. On reaching the spot, we observe him for a long time and then give him a missed call and check if it is him. If we feel that the person is inappropriate then we don't go. That is what we do. We switch off the phone for a while.*

Our study data were replete with instances of FSWs using mobile phone technology also to stay safe, vigilant, and seek support to get out of potentially dangerous situations. Mobile phones

were cited as critical for FSWs in building mutually supportive networks, as is evidenced from the following quotes from a 48-year old street and a 35-year old home-based FSW, respectively,

*Once it so happened, a girl, who went to a lodge to serve a client, found there were four inside the room. She sent me blank messages. It was a code, I had told her that if there is an emergency and if she is unable to call, she should send me blank messages, and I will call her back or do something.*

*We are a group of 4 to 5 women.... We usually inform at least one of them that I am going to this place with this person, so she will know. So, when I don't come back even after half an hour or one hour, she will start calling me. If I don't answer or if my mobile is switched off, she will start getting scared. Either they come searching for us or call the client and ask: "Why are you keeping her so long? Send her back." And they try to save us. We have done this many times.*

Despite the many advantages of mobile phones that FSWs cited, they also highlighted significant challenges. One of the key issues that FSW participants consistently pointed out was the cost of maintaining a mobile phone. Respondent narrations highlighted FSWs' elaborate strategies to keep the costs low. A 25-year old street and 20-year old brothel-based FSWs described their efforts as such:

*I always keep a track on the costs per call and other offers. Based on the various mobile phone offers [and] opportunities, I choose the plan. There are offers for 3 months, 6 months, and 9 months. I know a person who owns a mobile recharge and SIM-providing shop. I go to him and ask him, which is the best recharge offer; if in case I need a SIM, I tell him that I need a good number. It should be an easy number for the others to keep note and for me to keep it by heart. If there is such a number, please keep it aside. I will purchase it. He calls me when there is good recharge plan or if there is such a SIM. I purchase it.*

*Internet – when I feel I don't require it or it doesn't work, [then] I don't recharge. Even if I have recharge, I switch off [the] Internet on the phone.*

Another common strategy that all FSW respondents reported adopting was placing the onus of expensive talk-time on clients. A 41-year old street and a 30-year old home-based FSW strongly underscored their strategy:

*Even if they recharge my phone, I give them a missed call only... I don't call them... They call back.*

*Yes, customers normally call us only when required. So, if I give them a missed call, they could note down my number and call me when required.*

An aspect of mobile phone technology that posed significant hurdles for FSWs was the persistent fear of stealth photography and video recording by strangers and clients, and thus the resultant violation of their privacy. As a 34-year old brothel-based FSW explained,

*There is a building nearby.... from where photos have been clicked and have been printed in the newspaper as well. If they hide in the building and click, nobody will get to know. This has happened a lot.*

These kinds of incidents pushed FSWs to stay vigilant at all times, especially during activities associated with their work, meaning during solicitation and encounters with clients. A brothel-based FSW, aged 28 years, shared her experience as follows:

*One day an incident happened. A customer [client] was trying to click a video when I and my friend was [sic] talking. Later on, I asked that person, "What video have you clicked?" He said, "I have not clicked any video." Then I said, "Show me your mobile." He replied: "No, no, why should I show my mobile to you?" Then our manager checked his mobile and got some videos.*

For many FSWs, incessant interrogations and monitoring of their use of mobile phones by their intimate partners/spouses presented additional challenges. A 36-year old street-based FSW described her experiences with her husband:

*Sometimes I think if we didn't have a phone, it would've been better. [There would be] no fights at home, no tension about the village. There would be nothing. Whenever I call [people, they ask me to] give money. Whenever I call, there's this problem [or] that problem. If someone calls [me], then there are questions [from my husband]: "Who called? Why?" Rather than answer these questions, we should not have a phone at all.*

NGO personnel who interacted with FSWs on a regular basis commented on the gradual rise in partner violence arising from sex workers' use of mobile phones. A 45-year old female NGO supervisor said,

*Every day when they [FSWs] go back home, they [partners] will check the numbers on their phones. They will check how many calls, who has called. So it is a constant struggle for them [FSWs] to have those incoming and outgoing calls. They have to delete [that information] every day."*

A 51-year old female NGO manager pointed out additional disadvantages for brothel-based FSWs. The mobile phones allow for added surveillance and tracking of their activities and movements that, at times, results in a severe clamping down on their freedoms and privacy.

### **Mutual Engagement Using Mobile Phone Technology: Perspectives of FSWs and NGO Personnel**

Our study findings highlighted the changes brought about by the advent of mobile phone technology with respect to the potential implication regarding engagement with the sex worker community, outreach, and service delivery. The NGO personnel who participated in our study touted the vital role played by the technology in their ability to respond to FSWs' calls for help in times of emergency in real time.

NGO respondents also underscored the ease of ongoing contact and outreach with the sex worker community because of extensive mobile phone usage by FSWs. A 44-year old female NGO supervisor noted,

*It has become useful for us because keeping in touch is easier. Earlier, we had to go and hunt for them in brothels. Then we lost track of them. Now it has become easier: We have the mobile number. So, one call and you know where they are.*

In addition to these benefits, NGO personnel described the ease with which they could mobilize sex workers for protests and rallies through mobile phones, touting the technology's vital role as tools for grassroots activism. The same NGO manager continued,

*The other thing [mobile phones] have helped is sex worker rights and activism. If there is a rape, to mobilize the community is infinitely easier...if you are doing a protest or a rally the way other people use it. Sex workers also have multiple identities. So it is not just work, not just leisure, and not just activism.*

Data from FSW participants underscored these points, with some strongly citing the role of mobile phone technology essential in reaching out to their peers and allies for events. One 43-year old street-based FSW claimed,

*Of course it is useful! I can contact so many people over the phone for programs. I can mobilize people, both women sex workers and sexual minorities. My mobile phone is my best friend; it is like my full-time partner, helps me with everything. I can mobilize more than 100 people over the phone: My tongue has such a value and power; I have built a rapport in such a way with both the communities. I make sure that the people who are dependent on me, nothing bad should happen to them.*

Respondent narrations also shed light on mobile phone technology's ability to build bridges between NGOs, sex workers, and service providers, especially from the public sector, criminal justice system, and social services. A 31-year old male NGO head asserted,

*We have a very strong outreach program. Recently, we had a health check-up camp. Three days before that, our staff went out to remind them [FSWs]. Several women told our outreach workers: "In this heat, why do you come to tell us? You have our cell phones. Why don't you just call us? Even on the day of the camp, the minute you call us we will come." So you see now how our outreach perhaps has become outreach through telephone.*

At the same time, some NGO leaders lamented how mobile phone technology had significantly altered the nature of engagement with the sex worker community, with fewer in-person visits and personal connections. A 42-year old female manager stated,

*Over the phone, a lot of things can be sorted out. But in social work, [in] the one-to-one relationship that is required, the technology blocks [that interpersonal connection]. Seeing the facial expressions, hearing her [FSW's] struggles [and] troubles and what she is going [through] is important. Over the phone, I am only hearing her voice and am very technical in my approach. Yes, getting in touch with the woman [FSW] has become easier for the staff. For me, to an extent [there is] a little negative component because the field visits have become less [frequent and the] link to the community may break at times. But at other times, it makes the work much more easier because, with a limited number of field staff, that you can deal with more number of women [FSWs].*

A significant number of FSWs also considered mobile phone technology, especially phone calls, to be a more efficient and effective way for NGO personnel to communicate with them. This is well depicted in the following quote by a 32-year old street-based FSW, who described the newer interactions with local NGOs,

*More than sending an SMS [Short Messaging Service], they [the NGO staff] give us a call and inform us about the program. With SMS, there is a possibility that people see it or don't see it. That is why they inform us over the phone. They explain the date, day, and venue, and give us the program details. They know that we don't see SMS. It is better to let us know over the phone.*

Many FSW respondents also acknowledged their literacy challenges and expressed their preference for voice calls. One 40-year old street-based FSW elaborated, “*Yes, voice message would be the best. One can just listen to it, one doesn’t need to read. We know how to listen to voice messages.*” Yet, despite obvious disadvantages, many FSWs expressed their strong affinity to learning technology. As one 28-year old brothel-based FSW said, “*If we have to learn something new, why wouldn’t we learn it? It is required.*”

Our findings revealed NGOs used mobile phone technology in varied ways to work with the sex worker community, ranging from initiating mobile technology-based health promotion interventions, and crisis messaging to information dissemination on important events. A few NGO staff underscored the importance of working with brothel owners actively to support the FSWs during times of crises. A number of NGO respondents underscored the vital challenge in enabling FSWs’ independence during times of emergency through mobile apps because of linguistic barriers. As one 34-year old male supervisor pointed out, the apps useful for safety “*are all in English, so it is very difficult [for FSWs] to write [and] type. So it is not easy to make them [FSWs] use all these apps...because they [are] not available in any of the regional languages.*”

Importantly, a few NGO personnel respondents also reflected on the slow uptake of mobile phone technology among the NGO community, highlighting a distinct divide in the sex workers’ and NGO staff’s readiness to use and adopt technology for interventions. Another 45-year old NGO leader expressed candidly,

*We are not advanced in technology, so we can’t expect the women to be. We need to develop our own knowledge and get equipment [phones] to be able to deal with this type of situation. The older generation [of staff] tend to have technology phobia.*

Another significant aspect that especially NGO managers highlighted was the real gap between technology used by some FSWs and by NGO staff. This issue was highlighted by a senior female NGO manager, who said,

*Ours is an absolutely local grassroots organization, so we have also staff from lower middle-class families...So, in terms of technology—their phones—we are limited.... The organization has to make arrangements for high-end phones if need to have it for the staff. You can’t do it for one person; you need to do it for the entire [staff]. So, that poses a lot of difficulties in the process.*

Finally, a few of the NGO personnel expressed reservations about omnipresent availability necessitated by mobile phone technology. Their concern focused on the expectation that they would be available to respond to FSWs at all hours during the day and night.

## DISCUSSION

Findings from the current study revealed the ubiquitous presence and salience of mobile phone technology in the lives of FSWs in India. Results revealed how FSWs in India appeared to have acquired, adopted and adapted the mobile phone to suit their own personal, social, and professional practices, as has been found in earlier research among low-income populations (Lipset, 2013; Tenhunen, 2008). As in the previous literature that pointed to low-income women with low levels of literacy finding intermediaries such as family members, including children and

spouses, to help them to master mobile phone technology (Lemish & Cohen, 2005; Sambasivan et al., 2010), this study also shed light on some of the key actors responsible for the initiation of mobile phone technology among sex workers. These actors include their trusted partners/clients, peers, children, husbands, NGOs, phone sellers, and brothel owners.

Results highlighted some of the perceived benefits that FSWs attributed to mobile phone technology and the manner in which this marginalized group deftly adopted and adapted the technology to their advantage. The process of gradual familiarization with the new technology among FSWs revealed the role of mobile phone technology in enabling FSWs' sense of self-efficacy through mastering the use of mobile phones for self-directed enjoyment and skill building, including clicking pictures, consuming music, watching movies, shopping online, and learning English. Moreover, the FSWs' sense of deep appreciation for the device is similar to findings in earlier studies in India among nonFSW populations (Doron, 2012; Jouhki, 2013; Mehta & Mehta, 2014) and echoed Sengupta et al.'s (2007) study that showed the benefits obtained by poor women from owning electronic devices, such as MP3 players. FSWs' experiences in this study mirrored the experiences of lower-class women who worked as domestic workers—that is, their ability to connect with others for their businesses and so forth—but sharply contrasted with upper-class married women's supervised and limited use of the same within traditional households, as found in earlier research in India (Doron, 2012; Jouhki, 2013).

Most FSW respondents in our study were primarily self-employed and were able to exercise significant agency and choice in initiating ownership of new technology, thus maintaining control and proactively using their mobile phones to further their personal goals to a large extent. Further, the results from the narratives of FSWs in our study indicated a sense of pride and achievement owing to their adoption and use of mobile phone technology with ease, despite the lack of formal education, which is in line with the overall findings from past literature that have underscored exposure to technology and women's confidence (GSMA mWomen Programme, 2010; Lemish & Cohen, 2005; Sambasivan et al., 2010; Sengupta et al., 2007). Researchers have demonstrated technology's role in furthering women's access to productive employment and the resulting financial well-being (Boateng, Hinson, Galadima & Olumide, 2014; GSMA mWomen Programme, 2012a; Jennings & Gagliardi, 2013). Our results echoed those from past research, demonstrating that the poor FSWs' novel ways of using mobile phone technology to solicit clients aided in their efforts to achieve financial stability. Past studies have focused on women's use of mobile phone technology to expand their social networks and to maintain their connections with family members (GSMA mWomen Programme, 2010; Jouhki, 2013; Livholts & Bryant, 2013; Pertierra, 2005; Sengupta et al., 2007; Tenhunen, 2008; Zainudeen et al., 2010), which was a recurrent theme in the our study as well. Our FSW respondents used mobile phones to forge deeper and more meaningful ties within peer networks, community members, and their families, and were especially useful in seeking help during crises.

Despite the real gains of mobile technology for FSWs, findings from our study underscore the need for cautious optimism regarding the perceived impact of mobile phone technology for FSWs. Mobile phones appear to both liberate and constrain FSWs by fostering independence but yet somewhat isolate and perpetuate increased control of the FSWs by diverse actors in their lives. This study's findings clearly indicate mobile phone technology's capacity to challenge sex workers' need for privacy and anonymity because of nonconsensual photography and videography by clients and strangers. This finding was similar to earlier research in India among nonsex worker populations, which found that women were concerned about the "abuse of

photography by men,” referring to men secretly clicking pictures of women (Jouhki, 2013, p. 47). Although FSWs in our study appeared to exercise agency and autonomy in procuring and using mobile phones, their ability to feel empowered was significantly diminished within gender-bound intimate relationships, where surveillance stemming from their partner’s sexual jealousy, and culture-specific gender norms in India was commonplace, as found in prior studies (Archambault, 2011, Doron, 2012; Jouhki, 2013; Panchanadeswaran et al., 2017).

Another striking finding from our study was the NGO personnel’s recognition of the possibilities of creating technology-based interventions for the sex worker community, given FSWs’ extensive adoption and adaptations of mobile phone technology, while acknowledging their own limited current use of the technology. Given that the technologies underlying mobile phones are becoming more powerful, cheaper, and increasingly accessible to all segments of populations globally (Patrick et al., 2008), mobile phones present an important opportunity to develop mobile phone-based mechanisms for greater outreach and service delivery to vulnerable groups such as sex workers. As prior studies show, the lack of local and community-related content can be a major barrier in women’s use of IT for economic empowerment (Hafkin & Taggard, 2001; Jorge, 2002; Ojokoh, 2009).

## CONCLUSIONS

A few limitations of the study bear mentioning. Given that all the data were based on self-reports, the disadvantages posed by recall bias and social desirability are real. Further, findings are based on an examination of the experiences and views of a group of purposively sampled FSWs and NGO personnel. As a result, it is not possible to generalize the conclusions drawn from this study to the larger population of FSWs in India. However, these limitations notwithstanding, this study fills an important gap in existing literature by highlighting the complex socio-cultural-economic considerations that govern the optimal level of FSWs’ access to, adaptation of, and use of mobile phone technology.

This study adds to the existing literature in understanding the unique and nuanced ways in which FSWs acquire, adopt, and adapt mobile phone technology and how this is different from and similar to the use of mobile phones by marginalized women from distinct sociocultural contexts around the world. Thus, evidence from this study points to some important implications.

First, FSWs’ extensive use of and ease with mobile phone technology in India presents an important opportunity for the development of phone-based interventions that address not only crises interventions but also help strategize and deepen social connectedness beyond their immediate communities. Mobile phones also may be a vital tool in helping sex workers to organize, mobilize, and advocate for change, as well as participate actively in local and regional political forums. Seamlessly integrating mobile phone-based tools into existing services for sex workers may be an urgent priority for NGOs (Navani-Vazirani et al., 2017). Most importantly, as underscored in prior research (e.g., Thomas et al., 2017), mobile phone-based interventions with FSWs need to outgrow merely addressing issues around HIV prevention and encompass domains such as digital literacy and building competencies around safety and privacy. As this phenomenological exploration suggests, while mobile phone technology has the potential to be a transformative social change agent in terms of providing FSWs with a sense of agency, it may



not be necessarily empowering given its abilities to deepen gender divides and hierarchies. Thus, future research will need to focus on the manner in which ICTs, specifically mobile phone technology, impact gender relations for FSWs within various sexual partnerships.

More research that clearly delineates the barriers to optimal access and use of ICTs by women in general and FSWs in particular is critical in addition to recognition of women's agency in overcoming constraints (Chib & Chen, 2011). Designers of technologies for poor women in developing nations like India will need to account for the challenges faced by marginalized and stigmatized groups like FSWs around issues of privacy, literacy, and cost. Importantly, listening to women's voices and acknowledging their ideas in the quest to make ICTs accessible and ensuring their equitable use would be an essential prerequisite in developing newer interventions (Ojokoh, 2009) while remaining cognizant of the fact that significant social changes cannot be directly attributed to any technology (Mehta & Mehta, 2014). Further, understanding FSWs' intersections with mobile phone technology in the context of the similarities and the differences with other at-risk vulnerable populations is critical when developing and using technology-based interventions to affect change. It is critical to bear in mind that FSWs' access and use of mobile phone technologies are besieged with complex sociocultural and economic considerations. Given that FSWs greatly value privacy, trust, and anonymity, it is critical that mobile phone-based interventions recognize the inherent challenges to potential violation of privacy and respect sex workers' need for strict boundaries (Sambasivan et al., 2011) while balancing the need for personal connection. A thorough evaluation of the challenges posed by mobile phone technology, including linguistic and literacy barriers in applications that prevent the optimal use of technology by sex workers, would be critical in the development of mobile phone technology-based interventions.

## IMPLICATIONS FOR APPLICATION

Technology is a multifaceted tool and has significant implications for sex workers' personal and professional lives. In addition to enabling increased agency for furthering their financial stability, mobile phone technology also plays a critical role in cementing FSWs' social ties with their family, friends, professional networks, and the larger community. Exploiting the ubiquity of mobile phone technology among the FSW community should be an important priority for policy-makers, NGOs, and other stakeholders for timely outreach, crisis intervention, and service delivery. Demystifying technology through ongoing training and updating technical skills would also go a long way in empowering marginalized FSWs to ensure that women gain control technology to maximize the benefits and reduce vulnerabilities inherent in the use of mobile phone technology.

## ENDNOTE

1. In all the quotes, the use of ellipses indicates pauses in the speech of the participants.

## REFERENCES

- Aral, S. O., St Lawrence, J. S., & Uuskula, A. (2006). Sex work in Tallinn, Estonia: The sociospatial penetration of sex work into society. *Sexually Transmitted Infections*, 82, 348–353.  
<https://doi.org/10.1136/sti.2006.020677>
- Archambault, J. S. (2011). Breaking up “because of the phone” and the transformative potential of information in Southern Mozambique. *New Media & Society*, 13(3), 444–456.
- Bahadur, M. K. C., & Murray, P. J. (2010). Cell phone short messaging service (SMS) for HIV/AIDS in South Africa: A literature review. *Studies in Health Technology and Informatics*, 160, 530–534.  
<https://doi.org/10.3233/978-1-60750-588-4-530>
- Beattie, T. S. H., Bradley, J. E., Vanta, U. D., Lowndes, C. M., & Alary, M. (2013). Vulnerability reassessed: The changing face of sex work in Guntur district, Andhra Pradesh. *AIDS Care*, 25, 378–384.  
<https://doi.org/10.1080/09540121.2012.701726>
- Bernard, H. R. (2011). Qualitative data analysis I: Text analysis. In N. E. Roberts & M. Manzano (Eds.), *Research methods in anthropology: Qualitative and quantitative approaches* (5th ed.). Lanham, MD, USA: Rowman & Littlefield.
- Boateng, R., Hinson, R., Galadima, R., & Olumide, L. (2014). Preliminary insights into the influence of mobile phones in micro-trading activities of market women in Nigeria. *Information Development*, 30(1), 32–50.  
<https://doi.org/10.1177/0266666912473765>
- Buzdugan, R., Copas, A., Moses, S., Blanchard, J., Isac, S., Ramesh, B. M., Washington, R., Halli, S. S., & Cowan, F. M. (2010). Devising a female sex work typology using data from Karnataka, India. *International Journal of Epidemiology*, 39(2), 439–448.
- Buzdugan, R., Halli, S. S., Hiremath, J. M., Jayanna, K., Raghavendra, T., Moses, S., Blanchard, J., Scambler, G., & Cowan, F. (2012). The female sex work industry in a district of India in the context of HIV prevention. *AIDS Research and Treatment*, Article ID 371482, 1–10.  
<http://dx.doi.org/10.1155/2012/371482>
- Casado, E., & Lasén, A. (2014). What is disturbing and why not to disturb: On mobile phones, gender, and privacy within heterosexual intimacy. *Mobile Media & Communication*, 2(3), 249–264.
- Chib, A., & Chen, V. H. H. (2011). Midwives with mobiles: A dialectical perspective on gender arising from technology introduction in rural Indonesia. *New Media & Society*, 13(3), 486–450.
- Deshmukh, M., & Mechael, P. (2013). *Addressing gender and women’s empowerment in mHealth for MNCH: An analytical framework*. Washington, DC, USA: mHealth Alliance. Retrieved on June 2, 2017, from [http://www.villagereach.org/wp-content/uploads/2013/07/gender\\_analytical\\_framework\\_report.pdf](http://www.villagereach.org/wp-content/uploads/2013/07/gender_analytical_framework_report.pdf)
- Donner, J. (2008). Research approaches to mobile use in the developing world: A review of the literature. *The Information Society: An International Journal*, 24(3), 140–159.
- Doron, A. (2012). Mobile persons: Cell phones, gender and the self in North India. *The Asia Pacific Journal of Anthropology*, 13(5), 414–433.
- Goluboff, S. L. (2016). Text to sex: The impact of cell phones on hooking up and sexuality on campus. *Mobile Media & Communication*, 4(1), 102–120.
- GSMA Development Fund & Cherie Blair Foundation for Women (2010). *Women & mobile: A global opportunity—A study on the mobile phone gender gap in low and middle-income countries*. Retrieved August 22, 2017, from [http://www.cherieblairfoundation.org/wp-content/uploads/2012/07/women\\_and\\_mobile\\_a\\_global\\_opportunity.pdf](http://www.cherieblairfoundation.org/wp-content/uploads/2012/07/women_and_mobile_a_global_opportunity.pdf)
- GSMA mWomen Programme (2012a). *Realising the mWomen Opportunity: A framework for designing the mWomen business case*. Retrieved September 1, 2017, from [https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA\\_mWomen\\_Business\\_Case\\_Framework\\_Full\\_Report\\_FINAL.pdf](https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_mWomen_Business_Case_Framework_Full_Report_FINAL.pdf)

- GSMA mWomen Programme (2012b). *Striving and surviving: Exploring the lives of women at the base of the pyramid*. Retrieved on September 1, 2017, from [https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA\\_mWomen\\_Business\\_Case\\_Framework\\_Full\\_Report\\_-FINAL.pdf](https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_mWomen_Business_Case_Framework_Full_Report_-FINAL.pdf)
- Hafkin, N., & Taggart, N. (2001, June). Gender, information technology, and developing countries: An analytic study. Retrieved on September 22, 2017, from [http://www.mujiresenred.net/zonaTIC/IMG/pdf/Gender\\_Book\\_NoPhotos.pdf](http://www.mujiresenred.net/zonaTIC/IMG/pdf/Gender_Book_NoPhotos.pdf)
- Handapangoda, W. S., & Kumara, A. S. (2013). The world at her fingertips? Examining the empowerment potential of mobile phones among poor housewives in Sri Lanka. *Gender, Technology and Development*, 17(3), 361–385. <https://doi.org/10.1177/0971852413498742>
- Smales, P. (2011). The power to organise and engage: The use of ICT by women migrant domestic workers' organisations—Hong Kong and Taiwan (Research Program Report 2011). Retrieved on August 23, 2017, from [https://www.gender-is-citizenship.net/sites/default/files/citigen/uploads/DraftTT\\_cover.pdf](https://www.gender-is-citizenship.net/sites/default/files/citigen/uploads/DraftTT_cover.pdf)
- International Telecommunications Union (ITU), Telecommunication Development Bureau. (2017). ICT facts and figures 2017. Retrieved on September 30, 2017, from <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf>
- Jacobsen, J. P. (2011). The role of technological change in increasing gender equity with a focus on information and communications technology. *ACSPL Working Paper Series, 1, Article 2*. Available at <https://wescholar.wesleyan.edu/wps/vol1/iss1/2>
- Jain, A. K., & Saggurti, N. (2012). The extent and nature of fluidity in typologies of female sex work in southern India: Implications for HIV prevention programs. *Journal of HIV/AIDS & Social Services*, 11, 169–191. <https://doi.org/10.1080/15381501.2012.678136>
- Jennings, L., & Gagliardi, L. (2013). Influence of mHealth interventions on gender relations in developing countries: A systematic literature review. *International Journal for Equity in Health*, 12(1), 85–95. <https://doi.org/10.1186/1475-9276-12-85>
- Jorge, S. N. (November, 2002). *The economics of ICT: Challenges and practical strategies of ICT use for women's economic empowerment*. Paper presented at the United Nations Division for the Advancement and Empowerment of Women (DAW) Expert Group Meeting on Information and Communication Technologies and their Impact on and Use as an Instrument for the Advancement and Empowerment of Women. Seoul, Republic of Korea.
- Jouhki, J. (2013). A phone of one's own? Social value, cultural meaning and gendered use of the mobile phone in South India. *Journal of the Finnish Anthropological Society*, 38(1), 37–58.
- Lemish, D., & Cohen, A. A. (2005). On the gendered nature of mobile phone culture in Israel. *Sex Roles*, 52(7-8), 511–521. <https://doi.org/10.1007/s11199-005-3717-7>
- Lipset, D. (2013). Mobail: Moral ambivalence and the domestication of mobile telephones in Peri-Urban Papua New Guinea. *Culture, Theory and Critique*, 54(3), 335–354. <https://doi.org/10.1080/14735784.2013.826501>
- Livholts, M., & Bryant, L. (2013). Gender and the telephone: Voice and emotions shaping and gendering space. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, 9(2), 157–170.
- Mahapatra, B., Saggurti, N., Halli, S. S., & Jain, A. K. (2012). HIV risk behaviors among female sex workers: Using cell phone for client solicitation in India. *Journal of AIDS and Clinical Research. S1:014*, 1–6 <https://doi.org/10.4172/2155-6113.S1-014>
- Maleka, M. B. M. (2012). *A gender-based analysis of ICT adoption and usage in South Africa*. Master's Thesis, University of Witwatersrand, Johannesburg, South Africa. Retrieved October 2, 2017 from <https://core.ac.uk/download/pdf/39670837.pdf>
- Mehta, B. S., & Mehta, N. (2014). ICT and socio-economic empowerment of rural women: Case of mobile phone in India. *Knowledge Horizons—Economics*, 6(4), 103–112.
- Mendonça, S., Crespo, N., & Simões, N. (2015). Inequality in the network society: An integrated approach to ICT access, basic skills, and complex capabilities. *Telecommunications Policy*, 39(3-4), 192–207.

- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2<sup>nd</sup> ed.). Thousand Oaks, CA, USA: Sage Publications.
- Millanga, A. K. (2014). Mobile phones and participatory communication for poverty eradication on public service broadcasting: The case of Tanzania Broadcasting Corporation (TBC). *Mobile Media & Communication*, 2(3), 281–297.
- Muhr, T. (2013). *ATLAS.ti 7.0 user's manual and reference* (Vol. 7). Berlin, Germany: Scientific Software Development GmbH.
- Murphy, L. L., & Priebe, A. E. (2011). “My co-wife can borrow my mobile phone!” Gendered geographies of cell phone usage and significance for rural Kenyans. *Gender, Technology and Development*, 15(1), 1–23. <https://doi.org/10.1177/097185241101500101>
- Natarajan, M., & Parikh, T. (2013, December). Understanding barriers to information access and disclosure for HIV+ women. In *Proceedings of the Sixth International Conference on Information and Communication Technologies and Development: Full Papers* (Volume 1; pp. 143–152). <https://doi.org/10.1145/2516604.2516627>
- Navani-Vazirani, S., Heylen, E., Deardorff, J., Srikrishnan, A. K., Vasudevan, C. K., Solomon, D., & Ekstrand, M. L. (2017). The role of sex work pay in moderating the effect of mobile phone solicitation on condom practices: An analysis of female sex workers in India. *HSOA Journal of AIDS Clinical Research & STDs*, 4(1), 1–8. <https://doi.org/10.24966/ACRS-7370/100008>
- Navani-Vazirani, S., Solomon, D., Gopalakrishnan, Heylen, E., Srikrishnan, A. K., Vasudevan, C. K., & Ekstrand, M. L. (2015). Mobile phones and sex work in South India: The emerging role of mobile phones in condom use by female sex workers in two Indian states. *Culture, Health & Sexuality*, 17(2), 252–265.
- Norris, L., Swartz, L., & Tomlinson, M. (2013). Mobile phone technology for improved mental health care in South Africa: Possibilities and challenges. *South African Journal of Psychology*, 43(3), 379–388. <https://doi.org/10.1177/0081246313493376>
- Ohme, J. (2014). The acceptance of mobile government from a citizens' perspective: Identifying perceived risks and perceived benefits. *Mobile Media & Communication*, 2(3), 298–317.
- Ojokoh, B. A. (2009). Empowering Nigerian women using information technology: Practical strategies. *EAF Journal*, 20(1), 58–78.
- Oluwafemi, S. O., & Wynn, R. (2014). Giving cell phones to pregnant women and improving services may increase primary health facility utilization: A case–control study of a Nigerian project. *Reproductive Health*, 11(1), 8–16.
- Patrick, K., Griswold, W. G., Raab, F., & Intille, S. S. (2008). Health and the mobile phone. *American Journal of Preventive Medicine*, 35(2), 177–181. <https://doi.org/10.1016/j.amepre.2008.05.001>
- Panchanadeswaran, S., Unnithan, A. M., Chacko, S., Brazda, M., & Kuruppu, S. (2017). What's technology got to do with it? Exploring the impact of mobile phones on female sex workers' lives and livelihood in India. *Gender, Technology and Development*, 21(1–2), 152–167. <https://doi.org/10.1080/09718524.2017.1385318>
- Pertierra, R. (2005). Mobile phones, identity and discursive intimacy. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, 1(1), 23–44.
- Sambasivan, N., Cutrell, E., Toyama, K., & Nardi, B. (2010). Intermediated technology use in developing communities. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 2583–2592). Retrieved on August 31, 2017, from <https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/p2583-sambasivan-intermediated.pdf>
- Sambasivan, N., Weber, J., & Cutrell, E. (2011). Designing a phone broadcasting system for urban sex workers in India. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 267–276). Retrieved on July 1, 2016, from <https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/CHI201120Sambasivan20et20al.pdf>
- Sariola, S. (2009). *Gender and sexuality in India: Selling sex in Chennai*. Abingdon, UK: Routledge.

- Sengupta, A., Long, E. G., Singhal, A., & Shefner-Rogers, C. L. (2007). The Sada says “We women have our rights”: A gender analysis of an ICT initiative in Afghanistan. *International Communication Gazette*, 69(4), 335–353. <https://doi.org/10.1177/1748048507079006>
- Short, E., & McMurray, I. (2009). Mobile phone harassment: An exploration of student's perceptions of intrusive texting behavior. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, 5(2), 163–180.
- Sinpeng, A. (2015, October 21). More technology doesn't mean less inequality [Web log post]. Retrieved on July 18, 2017, from <https://theconversation.com/more-technology-doesnt-mean-less-inequality-48180>
- Stark, L. (2013). Transactional sex and mobile phones in a Tanzanian slum. *Suomen Antropologi: Journal of the Finnish Anthropological Society*, 38(1), 12–36.
- Svensson, J., & Wamala Larsson, C. (2016). Situated empowerment: Mobile phones practices among market women in Kampala. *Mobile Media & Communication*, 4(2), 205–220.
- Tenhunen, S. (2008). Mobile technology in the village: ICTs, culture, and social logistics in India. *Journal of the Royal Anthropological Institute*, 14(3), 515–534.
- Thomas, B., Closson, E. F., Biello, K., Menon, S., Navakodi, P., Dhanalakshmi, A., Mayer, K. H., Safren, S. A., & Mimiaga, M. J. (2017). Development and open pilot trial of an HIV-prevention intervention integrating mobile-phone technology for male sex workers in Chennai, India. *Archives of Sexual Behavior*, 46(4), 1035–1046.
- Veena, N. (2007). Revisiting the prostitution debate in the technology age: Women who use the Internet for sex work in Bangkok. *Gender, Technology and Development*, 11, 97–107. <https://doi.org/10.1177/097185240601100105>
- Yoon, K. (2006). The making of neo-Confucian cyberkids: Representations of young mobile phone users in South Korea. *New Media & Society*, 8(5), 753–771.
- Zainudeen, A., Iqbal, T., & Samarajiva, R. (2010). Who's got the phone? Gender and the use of the telephone at the bottom of the pyramid. *New Media & Society*, 12(4), 549–566. <https://doi.org/10.1177/1461444809346721>

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