

DVARA RESEARCH

What Do We Know About Women's Mobile Phone Access & Use? A review of evidence

*Dr. Lina Sonne*¹

Abstract

While phone access and ownership has been rising rapidly in India in recent years, women lag behind on access, usage and ownership of mobile phones across the world but especially in South Asia, including India. This paper provides an analytical review of extant literature on how low-income women in India and in other countries in the Global South access and use mobile phones, including for financial activity; what the barriers to access and usage are; and what dimensions lead to exclusion. We find that there is limited published research on women's access and use of mobile phones in India, and significant research gaps. Overall, the review shows that women have less access to phones, generally have access to a shared phone or a phone with less features. Women use fewer features on the phone as compared to men. Women's use of mobile phones is more constrained in the geographic location they may use the phone, for how long and for what purpose. Women also suffer from barriers to using mobile phones including socio-cultural notions of women not needing a phone, or women potentially compromising family honour, due to which women both self-censor and are frequently monitored in their phone usage. Significant research gaps remain with respect to how women in India access and use phones, and what barriers affect access and use.

Dvara Research Working Paper Series No. WP-2020-03

August 2020

Version 2.0

¹The author works with Inblick Innovation Advisory, India. The author thanks Malavika Raghavan, Srikara Prasad and the Future of Finance Initiative Team at Dvara Research for their detailed comments, engagement and feedback. All errors and omissions remain those of the author. Comments and feedback are welcomed at ffi@dvara.com.

This paper presents independent research commissioned by the Future of Finance Initiative at Dvara Research in furtherance of the Initiative's research agenda. The Initiative's work focusses on the impacts of digitisation and technological innovation in Indian finance, leading from the low-income consumer perspective on these issues.

Contents

1. Introduction	1
2. Methodology	3
3. Review of Existing Knowledge	5
3.1. Impact of the Introduction of Mobile Phones in India	5
3.2. Women's Access to, and Use of, Mobile Phones	6
Mobile Phone Access	6
Mobile Phone Use	6
3.3. Sector-Based Interventions: M-Health and Digital Financial Inclusion	8
M-Health and Women	8
Digital Financial Inclusion and Gender	8
3.4. Barriers to Access and Use	9
4. Methods Used	11
5. Conclusion	13
References	15

1 Introduction

India has seen a rapid increase of mobile phone access in the last few years. This is clearly evidenced today with the mobile phone seemingly omnipresent during the Covid-19 crisis. It is how we communicate when we can no longer meet, it is how we find out about news, it is how we seek out entertainment and learn new skills, it is how we increasingly order goods and groceries, it is how women can report domestic abuse, and it is how we track Covid-19.

At the time of economic liberalization in 1991, teledensity² stood at 1% of the population. The reforms that were part of economic liberalization in the early 1990's together with two major policy instruments, the National Telecom Policy of 1994 and the New Telecom Policy of 1999, resulted in an increasingly open sector, and better access to telephony (Prasad, 2008). In particular, growth in telephone density is linked to the spread of mobile phones (Abraham, 2007). By the first quarter of 2019 teledensity stood at 90% (TRAI, 2019). While this figure masks disparities between rural and urban teledensity (43% and 160% of total, respectively) or the tendency by some to own multiple phones while others have none, it is a remarkable rise in phone access.

Globally, the subscription rate for landlines has been declining at the same time as mobile phone subscriptions have been rising rapidly (ITU, 2018). India is no different. It has in fact leapfrogged to a large extent from no phone ownership straight to mobile phone ownership. This leapfrogging has taken place due to the availability of cheap mobile phone handsets, and in recent years, access to cheap data. Phone access and ownership has been rising steadily since cheap mobile phones became more readily available in the 2000's. The most significant recent trigger for increased phone access and usage, and in particular usage of data, has been the launch of *Jio* mobile phone operator in September 2016.

However, while availability and access to phones have increased overall, women lag behind on access, usage and ownership of mobile phones in India. According to GSMA (2019), the Indian gender gap in mobile phone ownership was 26% while the gender gap in use of mobile internet use was a staggering 56% in 2018.

Clearly, with such a difference in access and usage of mobile phones, there is a need to better understand how women access and use phones, as well as the barriers they face in phone access and usage.

The objective of this paper is to provide an analytical review of literature on how low-income women primarily in India but also in other developing countries access and use mobile phones, including for financial activity; what the barriers to access and usage are; and what dimensions lead to exclusion.

This review of evidence is part of a project that looks at women's access to and use of mobile phones in India for the Future Finance Initiative at Dvara Research. The underlying interest of Dvara Research in this project is understanding digital financial inclusion for women, which in India, primarily entails access to finance via mobiles.

²Teledensity refers to the number of telephone connections for every hundred individuals in an area.

In multiple recent research projects, Dvara Research has found, while undertaking field-work, that women appear to have more limited access to mobiles, use mobiles less, and have less access to digital financial services through mobile phones. However, there appeared to be limited literature available on this *prima facie*. This scoping-study was therefore commissioned to understand what existing evidence is available and what it says. However, the scope of this review of evidence was broadened to access to and use of mobile phones by women given the limited literature on digital financial inclusion via mobile phones for women in India.

By understanding how women access and use mobiles, we expect to be better able to understand what this means for enabling digital financial inclusion for women as well as having a better understanding of barriers and exclusions with respect to digital financial inclusion. While this review was undertaken prior to the COVID-19 pandemic, we expect that the crisis will exacerbate the inequalities in access and use evident in this review. At the same time we expect that this crisis will spur further expansion of digital services, including in digital finance. The themes in this review therefore remain relevant today and following the pandemic.

This paper contributes to a significant gap in the literature on women's access to, and use of, mobile phones in India, highlighting the need for further research to ensure that women do not fall further behind in digitisation, in turn further excluding women from services that are going online, and reducing their agency.

The next section details the methodology, followed by key insights from the literature in section 3. Section 4 provides an overview of methods used different studies. Finally the conclusion summarises and offers suggestions for future research.

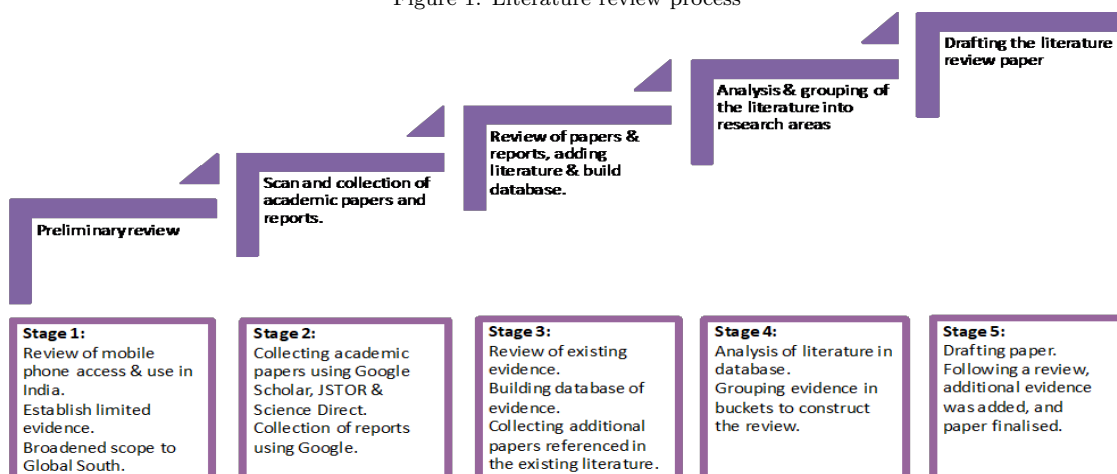
2 Methodology

This analytical review of literature scopes out extant evidence on low-income women's mobile access and use, as well as barriers to access and use. The review borrows from systematic reviews. This includes a comprehensive search for literature, screening process with parameters for including the literature, and analysis and synthesis. The study initially set out to review evidence on women's mobile phone access and use in India with a particular interest in mobile phone use to access digital financial services by women. A preliminary review quickly established that there were few papers and reports available. We therefore widened the scope to include evidence on women's mobile phone access and use across the global South, with relevance for women's access and use in India.

To systematically collect papers, we undertook JSTOR, Science Direct and Google Scholar searches for terms such as “mobile phone gender”; “mobile phone women”, “mobile money women”, “digitalization and gender”. The search kept to papers from 2016 onwards from India and the rest of the global South. The cut-off date was used to coincide with the introduction of Jio in India which has significantly altered access and usage patterns in India. Given the rapidly changing dynamics of digitisation, the review wanted to look primarily at recent evidence that would remain relevant today. It was also assumed that papers from 2016 and after would mention any earlier seminal papers (for example, Jensen, 2007) and papers specifically studying mobile phone and gender in India (e.g. Potnis, 2015a,b). These were subsequently included. Close to 120 or so papers and reports were reviewed, of which the most relevant have been featured in this paper. These papers were then reviewed and papers referenced within these papers that appeared particularly relevant and important were then added to the list. Papers that appeared to be published in predatory journals and other low-quality journals were excluded.

Given the rapidly evolving nature of mobile phone ownership and usage, academic papers were unlikely to provide up-to-date information. Therefore, papers were supplemented with recent reports from renowned organisations primarily on women's mobile phone access and use in India. Using the same cut-off date, Google searches provided a set of reports from 2016 onwards that were reviewed. The references of the most relevant reports were reviewed and cross-checked with existing papers, and relevant papers not already downloaded, were added.

Figure 1: Literature review process



A database of existing papers and reports was created which provided an overview of the different themes, geographies, methods and insights of the papers. Using the database as a short-hand for the 120 or so papers, we constructed the review of literature by grouping evidence in research buckets including–

- i the impact of the introduction of mobile phones in India;
- ii women's access and use of mobile phones in India and in the global South;
- iii barriers to access and use; and
- iv women's mobile phone use with respect to digital financial inclusion and m-health.

Having grouped and analysed the literature and evidence, we drafted the review of literature, with the aim to provide a coherent overview of the different strands of literature that exist, what it tells us about women's mobile phone access and use, and what else we need to know.

3 Review of Existing Knowledge

This review of literature sets out to do two things. Firstly, to provide an overview of what we know about mobile phone access to, usage by and related barriers for women from extant literature. We take a special interest in digital financial inclusion, but review evidence on mobile phones and gender across sectors and issue areas. Secondly, to understand what research methods have been used and whether there are any best practices.³

There are few papers that engage specifically with women's access to, and use of, mobile phones in India – whether in relation to financial inclusion or not, in any meaningful way. This review of literature therefore covers evidence from across the Global South.

The reviewed literature can be broadly categorized into the following strands:

- Impact of the introduction of mobile phones in India (Jensen, 2007; Abraham, 2007).
- Access to, and use of, mobile phones for women generally, and specifically for
 - M-Health interventions
 - Digital financial inclusion
- Barriers to use for women including socio-cultural constraints, privacy concerns, and security concerns including online harassment.

The next sections are structured as follows: First we discuss the impact of the introduction of mobile phones in India. Then we look at literature on women's access and use of mobile phones, followed by a review on digital financial inclusion. We then consider barriers to access and use. Finally, we detail the varied methods used in some of the most pertinent studies in this review.

3.1 Impact of the Introduction of Mobile Phones in India

The role and impact of the introduction of the mobile phone to low-income individuals have been studied since the mid-2000's when the technology slowly began to diffuse through Indian society to low-income households. For example, two important papers on fishing communities (specifically fishermen) in Kerala study the role of mobile phones in reducing information asymmetries and market inefficiencies and in term improving livelihoods (Jensen, 2007; Abraham, 2007). However, women and gender aspects did not feature in this strand of literature.

More recently, Tenhunen (2018), studied the West Bengal village, Janta, over several decades and observes the impact of the introduction of the mobile phone in the village.

³A broader discussion of evidence on women and ICT, including feminist perspectives on women and technology (van der Spuy & Aavriti, 2018; van der Spuy & Souter, 2018; Gustafsson, 2018; Tsetsi & Rains, 2017; LIRNE Asia, 2019); as well as digital dividend and women (World Bank, 2016), and gender perspectives on specific digital policy initiatives such as Digital India (Gurumurthy, 2018) is outside the scope of this paper.

Tenhunen (2018) finds that while micro entrepreneurs and drivers were the first to buy phones because they helped in business (in accordance with Abraham, 2007 & Jensen, 2007), there has been limited impact of the mobile phone on earning powers for the majority of villagers. Nevertheless, young men are able to use the mobile phone to search for employment opportunities. Additionally, Tenhunen (2018) emphasized that the uptake or diffusion of mobile phones has happened along generational lines, apart from gender, with young men and women most keen to have a phone.

Kamath (2018) studied the use and impact of the mobile phone on Dalit communities in Bangalore. The author finds that those that were already doing relatively well financially, were those that advanced the most from having access to a mobile phone. Likewise, there was a concern that those that did not speak English (a majority of the respondents) had only limited access to apps and internet search functions, and were therefore excluded from most benefits (such as searching for work opportunities online).

3.2 Women's Access to, and Use of, Mobile Phones

There are broadly two types of studies that have looked at women's access to, and use of mobile phones, including multi-country surveys and single-country, location specific interview-based studies. While India featured in the multi-country surveys, there are few studies specifically on India.

Mobile Phone Access

Large surveys on mobile phone access were global in nature (GSMA, 2018;2019; ITU, 2018) while covering India. Women have a much lower access to phones than men in general, but especially in South Asia (GSMA, 2018,2019, LIRNE Asia, 2019). In fact, South Asia is the region with the lowest access to phones for women (GSMA, 2018)

In India, when women have access to phones, it is often somebody else's phone (husband / father / brother /son). If there is a 'household phone', it is the men in the family that have primary use and ownership of that phone (Kovacs & Ranganathan, 2017; Barboni et al., 2018; GSMA, 2018). Tenhunen (2018) too finds that women were less likely to own their own phone in India, and instead rely on a shared phone.

However, a study by Wyche & Olson (2018), Wyche, et al. (2018) and Wyche, et al. (2016) in Kenya found that most women had their own phones even though these were often older handsets or secondhand handsets. Women's phones were also frequently cheaper, with fewer features (Wyche, et al., 2016). Furthermore, in accordance with the observation by Tenhunen (2018) of ownership along generational lines, a study in Kenya found that younger women were more likely to have a phone than older women in the same communities (Wyche, Simiyu & Othieno, 2016; Riley, 2019).

Additionally, GSMA (2018, 2019) and LIRNE-Asia (2019) found that mobile internet is the primary way through which women access internet in India.

Mobile Phone Use

When women have phones, they tend to use a smaller range of services than men partly because of limited access or limited ability to use more advanced functions (GSMA, 2019). This is echoed by Barboni et al. (2018) who interviewed 125 women across India and found that while women lag behind men in all types of phone access, ownership and use, the gap widens with the sophistication of the task. For example, the gender gap is much wider for internet use than for making phone calls.

Wyche & Olson (2018), Wyche, et al. (2018) and Wyche, et al. (2016) in a study of rural women in Kenya, too found that the easy-to-use M-Pesa app was commonly used by the women. However, internet was less commonly accessed, and many phones did not have that capability. When the phones did have the internet feature, the women did not perceive themselves as having the available time to learn how to access it. Women also struggled with understanding different add-on services and features on the phone, like turning off automatic paid-for services.

This then puts into question women's ability to use more advanced mobile phone-based services and interventions without training on the part of the women, and a focus on developing easy-to-use interfaces by the phone, app and handset companies. Wyche, Nightingale and Othieno (2018) considered particular features of mobile phones and their relevance to women. They found that mobile phones sold to women in Africa do not appear to be designed with women's usability in mind.

Kapinga et al. (2016) interviewed women market vendors in Tanzania on their use of mobile phones and found that the women faced many issues with their phones which hindered usage, like managing costly calls and data, ability to charge the battery and limited phone network. Women frequently lacked the skills to handle a smartphone, and generally did not use the phone to gather information for their business or to promote it.

In India, the purpose and place of phone use is gendered with women expected to use the phone considerably less and primarily at home to not arouse suspicion (Kovacs & Ranganathan, 2017; Barboni, 2018). This gendered geography of phone use is closely linked with perceived notions of honour. It is perceived that women's mobile phone use will lead to reputational harm for women and their families because rumours may spread about women's activities.

Therefore, women's phone use tends to be supervised or monitored (Kovacs & Ranganathan, 2017; Barboni, 2018; CGAP, Dalberg & Dvara, 2017), which in turn significantly limits the agency and freedom that mobile phones could give women.

For these reasons, Tenhunen (2018) explains that women in her study use phones at home, and preferably when they are home alone.

Nevertheless, in terms of socio-cultural changes, Tenhunen (2018) found that in one significant change women were better able to stay in touch with their own family with the use of mobile phones. It allowed women to widen the day-to-day domestic sphere within which they move, and made it less likely for them to be isolated in a new home after marriage. However, they remained constrained and there were clear gendered user patterns that the introduction of the mobile phone did not impact. For example, while men tended

to call friends and business associates the most, women primarily called their husband or other close family members.

In China, Wallis (2013) studied the role of and use of mobile phones among young female migrant domestic workers. Wallis (2013) too found that young rural women who have migrated to urban China to work as domestic servants, use the mobile phone extensively to communicate with each other and with family back home. The author found however that there is limited connection between social mobility and bargaining power with respect to employers, and the use of mobile phones.

3.3 Sector-Based Interventions: M-Health and Digital Financial Inclusion

M-Health and Women

Several studies looked at the use of mobile phones for healthcare services, especially for expectant and new mothers. For example, Dasuki & Zamani (2019) studied the use of mobile phones to access maternal health in Nigeria and found that using the mobile phone improved women's access to emergency healthcare services, empowered women to seek better quality care and improved their knowledge of how to stay healthy. Being part of the m-health intervention also improved their sense of social connectedness, echoing Tenhunen (2018) and Barboni's (2018) studies on women's use of mobile phones to stay connected with friends and family in ways that was not possible before.

In Bangladesh, Bishwajit, Hoque & Yaya (2017) used urban household health survey data to study the use of mobile phones to request childbirth services in urban areas. They found that women living in informal settlements were less likely to request assistance with childbirth, and also less likely to receive post-natal care than women living in other parts of the city.

Kazi et al. (2017) undertook a survey of women in local healthcare centres in Kenya to assess mobile phone use for healthcare provision. They found that 82% of women had a phone. The women preferred calls over text messages, likely because many were illiterate, and text messages from health officials would have to be read out by somebody else, compromising privacy.

Digital Financial Inclusion and Gender

We do not find academic papers on women **and** digital financial inclusion for women in India. While the literature on women and financial inclusion in India is expansive - academics have studied the role of women and gender aspects in Indian microfinance including women entrepreneurialism (Radhakrishnan, 2015); gender, security and microfinance (Kar, 2018); social work aspects of women's work in communities in relation to microlending (Radhakrishnan, 2018a); and women empowerment and microfinance (Radhakrishnan, 2018b), including relationships between women (Guerin, 2013). None of these papers discuss the role of mobile phones or digitisation of financial inclusion.

Instead, the digital financial inclusion and gender literature comprises primarily evidence review studies (Gammage, 2017; Rea, 2017; Kim, 2018; UN-Women, 2019) as well as

studies collecting primary data on the use of mobile money, primarily M-Pesa related interventions, in specific locations in Africa (e.g. Riley, 2019; Suri & Jack, 2016; Natile, 2020 & 2019).

Turning to studies on micro-entrepreneurs, Gichukia, & Mulu-Mutukub (2018) researched mobile use and savings among women micro entrepreneurs that form part of savings groups in Kenya. The authors found that while the savings groups improved women's awareness and subsequent adoption of mobile payment services, financial exclusion remained a serious concern. Women's control over their enterprise and its finances has a significant impact on their knowledge and use of mobile money. Likewise, there is evidence that a higher level of education correlates with increased awareness and adoption of mobile money (Gichukia, & Mulu-Mutukub, 2018).

Riley (2019) undertook an RCT comparing disbursements of loans to female micro-entrepreneurs in cash versus on a mobile money app in Uganda. Riley found that women who received the loan digitally had 15% larger profit after eight months than those who received the loan in cash. The profit was 25% higher for women who had indicated that they would be under pressure by family members to share their loans.

Natile (2020 & 2019) studied women's use of mobile phones in Kenya with respect to use of mobile money through M-Pesa. The author found that women in Kenya remain at a disadvantage with respect to financial inclusion despite using M-Pesa. The lack of elements of redistribution within M-Pesa's digital financial inclusion policy continues to put women at a disadvantage. Rea (2017) echoed this sentiment with respect to gender relations noting that there was no evidence that mobile money has had an impact on gender discrepancies.

Along the same lines, Rea & Nelms (2017) in a review of evidence note that M-Pesa, while a driver of digital financial inclusion, has a history of excluding women with the exception of women micro-entrepreneurs. For example in the Ivory Coast, where mobile money has been driven by remittances from neighbouring countries, women are on the most part excluded from mobile money (Morvant-Roux et al. 2017 in Rea & Nelms, 2017). This continued gender skewedness is in large part due to these new digital money technologies being embedded in existing socio-cultural practices (Archambault, 2017 in Rea, 2017). Barboni et al. (2018) and Tenhunen (2018) have highlighted similar concerns in India with respect to the ownership and use of mobile phones by women and the constraints that prevailing gender norms impose.

On the other hand, in a study using panel survey data from 2008-2014 in Kenya, Suri & Jack (2016) find that women accessing mobile money has, over time, led to a reduction in poverty. Women's use of mobile money helped households improved how they spent their money, allocated consumption and labour. Likewise, in a study from Pakistan, women in rural areas who received mobile remittances from family members in cities were able to avoid having to borrow locally— a practice which would have brought both shame and potentially weakened their positions (Baig, 2017 in Rea & Nelms, 2017).

Lastly, in terms of access, Wyche & Olson (2018), Wyche, et al. (2018) and Wyche, et al. (2016) studied the use of M-Pesa as part of broader research on access and use. They

found that women accessed M-Pesa with relative ease. However, in terms of operating M-Pesa, women found that the interface was confusing and not intuitively designed. Many women forgot their PIN and struggled to access or withdraw funds from their mobile accounts.

3.4 Barriers to Access and Use

A number of studies discuss barriers to women's access to mobile phones both in global review studies of evidence (Gammage, 2017; Kim, 2018; UN-Women, 2019); and in studies specifically on India (Potnis (2015a+b), Kovacs & Ranganathan, 2017, Barboni et al. (2018) and Tenhunen (2019)).

The main barriers to access and use of mobile phones can be divided into physical barriers and socio-cultural barriers. Physical barriers include the cost of the phone (and credit), access to funds to buy the handset and top up credit, ability to recharge the handset and access a facility to top up credit, ability to operate the handset, and lastly both literacy and digital literacy.

Social barriers include the belief that women do not need a phone (especially if home-based), concerns over women's safety and security owning a mobile and going online, patriarchal notions of women with a phone being led astray and bringing shame to the family; and the patriarchal urge to control women.

Gammage (2017) reviewed literature on both financial inclusion and digital financial inclusion. The author found that women's barriers to digital financial inclusion were the same as to financial inclusion, including awareness of financial products, financial literacy and numeracy, social norms with respect to women's asset ownership and ability to earn and control income.

The barriers to women's mobile phone access and use in India were the same as reported in global review literature. Though in India normative barriers (based on honour, purity, and 'bad' behavior) were particularly important (Kovacs & Ranganathan, 2017; Barboni et al., 2018).

Women often self-censor their presence online due to risk of online harassment as well reputational harm, from online visibility or activity (Barboni et al., 2018; CGAP, Dalberg & Dvara, 2017). In a study on Pakistan, Hassan, Unwin & Gardezi (2018) found that women suffered harassment through mobile phones. The preoccupation with women's presence online and potential reputational harm to the woman and her family led women to be monitored (Kovacs & Ranganathan, 2017; Barboni et al., 2018), which in turn constitutes a barrier to privacy and agency over mobile phone use for women.

Due to the risks posed by women being visible online, women prefer 'closed-circuit' apps like WhatsApp as opposed to social media apps such as Facebook (GSMA, 2019) because of the security concerns and the risk of gossip from using Facebook (which in turn can have a negative impact on young women's ability to marry well) (Barboni et al., 2018).

4 Methods Used

There are a range of approaches to studying mobile phone use and access. The methodologies of the reviewed studies varied widely and included –

- i in-depth ethnographic studies of individuals or locations (Lipset, 2018; Tenhunen, 2018);
- ii qualitative studies with interviews and focus groups with sample sizes varying from 20 to 200 (Barboni et al., 2018; Wyche, Simiyu, & Othieno, 2018; Dasuki & Zumani, 2019; Potnis, 2015; Kamath, 2018);
- iii large quantitative surveys (GSMA, 2018; Suri & Jack, 2016; LRINE Asia, 2019), and
- iv use of existing databases and secondary data (Greenfield et al., 2019; Sey & Hafkin, 2019).

Barboni et al. (2018), Wyche, Simiyu, & Othieno (2018), and Potnis (2015 a+b) all studied use, and primarily used structured, semi-structured or in-depth interviews and focus groups to do so. Kusimba, Yang & Chawla (2016) instead mapped family networks through structured interviews in order to undertake social network analysis. Papers that reviewed literature tended to have a broader focus than women specifically but included sections on gender (Rea & Nelms, 2017; Gammage 2017).

In terms of larger surveys, LIRNE-Asia surveyed 5000 households and individuals across 19 states in India using 2011 household census data for sampling. GSMA surveyed 2000 individuals in India (sampling unclear). However, they asked similar sets of questions covering: mobile phone and sim card ownership, type of phone (basic handset / feature phone / smart phone), number of years since owning phone, knowledge and use of internet and social media, limitations to using internet / social media, app use, type of information shared on social media, trust in news from social media, mobile phone expenditure, online harassment, mobile money use, use platform to buy services, method of paying for online purchases, use platforms for selling goods and money spent on mobile phone and data.

Wyche & Olson (2018), Wyche, et al. (2018) and Wyche, et al. (2016) collected data through eight group interviews with a total of 64 women mobile phone owners in rural Kenya during three visits in 2014-2016. Photos of the phones were taken in addition to interviews.

Kamath (2018) undertook a mixed methods approach. Kamath included 74 home-based household interviews with a total of 214 individuals for group one; 11 open-ended interviews and a focus group with business owners for group two; and 13 open-ended interviews with social activists for group three. The interviews sought to bring out 'micro'(oral) life histories of about 15 years since the introduction of mobile phones. They focused on the role that mobile phones played in accessing livelihood opportunities like better access to contacts and networks.

Tenhunen (2018), studied the West Bengal village, Janta, over several decades and observed the impact of the introduction of the mobile phone in the village through in-depth ethnographic research methods like in-depth interviews and filming or recording of mobile phone conversations. Wallis (2013) used similar ethnographic methods following young women working as maids in urban China.

Barboni et al (2018) is the only recent interview-based study on women's mobile phone use in India with publicly available output. In the study, 125 women were interviewed through individual interviews and focus groups across five locations: National Capital Region, Tamil Nadu, Maharashtra, Madhya Pradesh, West Bengal. These locations were chosen based on a prior randomized controlled trial (RCT) study that had been undertaken in the same locations.

Gichukia, & Mulu-Mutukub (2018) collected data through a survey of 392 women that was conducted over a few months in 2016. They sampled women that formed part of table banking groups— similar to self-help or kitty-based groups.

5 Conclusion

This paper has provided an analytical review of extant literature on how low-income women in India and in other countries in the Global South access and use mobile phones, including for financial activity; what the barriers to access and usage are; and what dimensions lead to exclusion.

We found that there is limited published research on women's access and use of mobile phones in India, and related barriers. However, overall, the review shows that women in India –

- i have less access to phones;
- ii generally have access to a shared phone or a phone with less features;
- iii use fewer features on the phone as compared to men;
- iv are more constrained in the geographic location they may use the phone, for how long and for what purpose; and
- v suffer from barriers to usage including socio-cultural notions of women not needing a phone, or women potentially compromising family honour through phone usage, due to which women both self-censor, and are frequently monitored in their phone usage.

There was no published evidence on women's use of digital financial services through mobile phones in India. However, evidence from Africa (primarily using M-Pesa) suggest that women often struggle to access all features on the phone, and some of the mobile phone-based digital financial services. Phones are not designed intuitively for women, and womens' lower level of literacy makes it harder for women than men to negotiate digital finance through the mobile

By understanding how women access and use mobile phones, we expect to be better able to understand what this means for enabling digital financial inclusion for women, as well as having a better understanding of barriers and exclusions with respect to digital financial inclusion. While this review was undertaken prior to the COVID- 19 pandemic, we expect that the crisis will exacerbate the inequalities in access and use evident in this review, while at the same time spurring further expansion of digital services, including financial inclusion, to enable social distancing. The themes in this review therefore remain relevant today and following the pandemic.

This paper contributes to a significant gap in the literature on women's access to, and use of, mobile phones in India, highlighting the need for further research to ensure that women do not fall further behind in digitisation, in turn further excluding women from services that are going online, and reducing their agency.

Given the lack of evidence on women's access and use of mobile phones in India – both for digital financial inclusion, and more generally, there are a lot of opportunities for researchers in India to build on. Three important research areas are provided here.

First, we need to better understand how women in different contexts access and use their phones, including the kind of features they most use, how their use is determined based on constraints in every-day life, and the barriers they face as well as how women negotiate those barriers.

Second, we require more insight into what good phone and app features look like for low-income women in India. How can phones and apps be made user-friendly, especially in contexts where literacy may be limited?

Third, with respect to the digital financial inclusion, the research space is vast. There is a push towards digital financial inclusion in India, at a time when we have no published research on low-income women's use of mobile phones for digital finance. We require more and better data on how women use digital finance and what constraints, physical and socio-cultural, they will face.

Without more research and consideration for how women's access and use of mobile phones can influence their ability to access and use services, we risk further excluding women from financial inclusion as well as the digitisation drive in general, increasing the gendered digital divide.

References

- 1 Abraham, Reuben. (2007). Mobile Phones and Economic Development: Evidence from the Fishing Industry in India. *Information Technologies and International Development*. 4. 5-17. 10.1162/itid.2007.4.1.5.
- 2 Archambault, J. (2017). *Mobile Secrets: Youth, Intimacy, and the Politics of Pretense in Mozambique*. Chicago: University of Chicago Press.
- 3 Baig, N. (2017). *Branchless Banking: Integrating Pakistan's Poor into the Global Financial Circuit*. IMTFI Final Report.
- 4 Barboni G., Field, E., Pande, R., Rigol, N., Schaner, S., Troyer Moore, C. (2018). *A Tough Call: Understanding barriers to and impacts of women's mobile phone adoption in India*. Cambridge, MA: Evidence for Policy Design, Harvard Kennedy School.
- 5 Bishwajit, G. Hoque, M.R. & Yaya, S. (2017). Disparities in the use of mobile phone for seeking childbirth services among women in the urban areas: Bangladesh Urban Health Survey. *BMC Medical Informatics and Decision Making*, No. 17: 182.
- 6 Caribou Digital (2017). *ID Identities: New practices in a connected age*, Caribou Digital Report.
- 7 CGAP, Dalberg & Dvara (2017). *Privacy on the Line: What people in India think about their data protection and privacy*. Dvara Report.
- 8 Dasuki, S.I. & Zamani, E.D. (2019). Assessing mobile phone use by pregnant women in Nigeria: A capability perspective. *The Electronic Journal of Information Systems in Developing Countries*, 85:5.
- 9 Gammage, S., Kes, A., Winograd, L., Sultana, N., Hiller, S. & Bourgault S. (2017). *Gender and digital financial inclusion: What do we know and what do we need to know?* International Center for Research on Women Working Paper.
- 10 Gichukia, C.N. & Mulu-Mutukub, M. (2018). Determinants of awareness and adoption of mobile money technologies: Evidence from women micro entrepreneurs in Kenya. *Women's Studies International Forum*, 67.
- 11 Greenleaf, A., Ahmed, S., Moreau, C., Guiella, G. & Choi, Y. (2019). Cell phone ownership and modern contraceptive use in Burkina Faso implications for research and interventions using mobile technology. *Contraception*, No. 99, pp. 170-174.
- 12 GSMA (2019). *Connected Women: The Mobile Gender Gap Report 2019*. GSMA Report.
- 13 GSMA (2018). *Connected Women: The Mobile Gender Gap Report 2018*. GSMA Report.

- 14 Guérin, I., Kumar, S., Agier, I. (2013) Women's Empowerment: power to act or power over other women? Lessons from Indian microfinance. *Oxford Development Studies*, Taylor & Francis (Routledge), 41 (1), pp.S76-S94.
- 15 Gurumurthy, A. & Chami, N. (2018) Digital India through a Gender Lens. Report for Heinrich-Boll Stiftung.
- 16 Gustafsson, J. (2018) Domestic Connectivity: Media, Gender and the Domestic Sphere in Kenya. *Media and Communication*, Cogitatio Press, vol. 6(2), pages 188-198.
- 17 Hassan, B., Unwin, T., & Gardezi, A. (2018). Understanding the darker side of ICTs: Gender, sexual harassment, and mobile devices in Pakistan. *Information Technologies & International Development (Special Section)*, 14, 1–17.
- 18 ITU (2018) Measuring the Information Society Report. Geneva: International Telecommunication Union.
- 19 Jensen, R. (2007) The Digital Divide: Information (Technology), Market Performance, and Welfare in the South Indian Fisheries Sector. *The Quarterly Journal of Economics*, 122(3), 879-924
- 20 Kamath, A. (2018) “Untouchable” cellphones? Old caste exclusions and new digital divides in peri-urban Bangalore, *Critical Asian Studies*. DOI:10.1080/14672715.2018.1479192.
- 21 Kapinga, A., Montero, C. & Mbise, E. (2016) Investigating women entrepreneurs' usage of mobile technology for accessing market information in Iringa, Tanzania. *International Conference on Interactive Mobile Communication, Technologies and Learning (IMCL)*, San Diego, CA, 2016, pp. 73-77.
- 22 Kar, S. (2018) Securitizing women: gender, precaution, and risk in Indian finance. *Signs*, 43 (2). pp. 301-325.
- 23 Kazi, A., Carmichael, J., Hapanna, G., Wangoo, P., Karanja, S., Wanyama, D., Muhula, S., Kyomuhangi, L., Loolpait, M., Wangalwa, G., Kinagwi, K. & Lester, R. (2017). Assessing Mobile Phone Access and Perceptions for Texting-Based mHealth Interventions Among Expectant Mothers and Child Caregivers in Remote Regions of Northern Kenya: A Survey-Based Descriptive Study. *JMIR Public Health and Surveillance*.
- 24 Kim, M., Zoo, H., Lee, H. & Kang, J. (2018) Mobile financial services, financial inclusion, and development: A systematic review of academic literature. *E J Info Sys Dev Countries*.
- 25 Kovacs, A. Ranganathan, N. (2017) Chupke, chupke: going behind the mobile phone bans in North India. https://genderingsurveillance.internetdemocracy.in/phone_ban/
- 26 Kusimba, S. Yang, Y., & Chawla, N. (2016) Heartholds of mobile money in Western Kenya. *Economic Anthropology*. Vol. 3, No. 2.

- 27 Lipset, D. (2018) A Handset Dangling in a Doorway: Mobile Phone Sharing in a Rural Sepik Village (Papua New Guinea). In Foster, R and Horst, H. (2018) *The Moral Economy of Mobile Phones: Pacific Islands Perspectives*. Australia. Australian National University Press.
- 28 LIRNE Asia (2019) *AfterAccess: ICT access and use in Asia and the Global South*. Colombo, LIRNE Asia.
- 29 Morvant-Roux, S., Barussaud, S.; Reuse, S., Compaoré, C. & Diedonné, I. (2017). IMTFI Research Project on Mobile Banking in the Context of Cross-Border Transfers between Ivory Coast and Burkina Faso. IMTFI Report.
- 30 Natile, S. (2020). *The Exclusionary Politics of Digital Financial Inclusion: Mobile Money, Gendered Walls*. London: Taylor & Francis. 10.4324/9780367179618.
- 31 Natile, S. (2019). Regulating exclusions? Gender, development and the limits of inclusionary financial platforms. *International Journal of Law in Context*, 15(4), 461-478.
- 32 Osabuohien, E. & Karakara, A. A. (2018). ICT Usage, Mobile Money and Financial Access of Women in Ghana. *Africagrowth Agenda Journal*, 15(1), 14-18.
- 33 Potnis, D. (2015a) Inequalities creating economic barriers to owning mobile phones in India: Factors responsible for the gender digital divide. *Information Development*, No. 1-11.
- 34 Potnis, D. (2015b) Culture's consequences: Economic barriers to owning mobile phones experienced by women in India. *Telematics and Informatics* 33:356-369.
- 35 Prasad, R. (2008) *The Impact of Policy and Regulatory Decisions on Telecom Growth in India*. Stanford University Center for International Development Working Paper no. 361.
- 36 Radhakrishnan, S. (2015). "Low Profile" or Entrepreneurial? Gender, Class, and Cultural Adaptation in the Global Microfinance Industry. *World Development*. 74.
- 37 Radhakrishnan, S. (2018a). Of loans and livelihoods: Gendered "social work" in urban India: Gendered "Social Work" in Urban India. *Economic Anthropology*. 5. 10.1002/sea2.12120.
- 38 Radhakrishnan, S. (2018b). Empowerment, Declined: Paradoxes of Microfinance and Gendered Subjectivity in Urban India. *Signs*. 44. 83-105. 10.1086/698278.
- 39 Rea, S. & Nelms, T. (2017) *Mobile Money: the first decade*. Institute for Money, Technology & financial Inclusion Working Paper 20017-1.
- 40 Riley, E. (2019), *Hiding loans in the household using mobile money: Experimental evidence on microenterprise investment in Uganda*. Oxford University Working Paper.
- 41 Segers, I., & Arora, P. (2016). *Smashing patriarchy with cell phones? – Critique of dominant technofeminist perspectives on mobile phone-enabled women's*

- empowerment programmes in Bangladesh, Feminist Studies Division, International Communication Association, Fukuoka Japan.
- 42 Sey, A. & Hafkin, N. (2019). Taking stock: Data and evidence on gender equality in digital access, skills and leadership. United Nations University Institute on Computing and Society/International Telecommunications Union: Macau.
 - 43 van der Spuy, A., Aavriti, N.. (2018) Mapping research in gender and digital technology. Association for Progressive Communication.
 - 44 van der Spuy, A. & Souter, D. (2018) Women's digital inclusion: Background paper for G20. Association for Progressive Communication.
 - 45 Srinivasan, J., Bailur, S., Seshagiri,S., (2018), The Poverty of Privacy: Understanding Privacy Trade-Offs From Identity Infrastructure Users in India. *International Journal of Communication* 12(2018), 1228–1247.
 - 46 Suri, T. & Jack, W. (2016) The long-run poverty and gender impacts of mobile money. *Science* 354:1288-1292.
 - 47 Telecom Regulatory Authority of India (2019). The Indian Telecom Services Performance Indicators, January – March, 2019.
 - 48 Tenhunen, S. (2018) *A Village Goes Mobile: Telephony, Mediation, and Social Change in Rural India*. Oxford: Oxford University Press.
 - 49 Tsetsi, E., Rains, S.A. (2017) Smartphone Internet access and use: Extending the digital divide and usage gap. *Mobile Media and Communication*. Vol: 5, NO. 3, pp. 239-255.
 - 50 UN Women (2019) *Leveraging Digital Finance for Gender Equality and Women's Empowerment*. UN Women Working Paper.
 - 51 Wallis, C. (2013) *Technomobility in China: Young Migrant Women and Mobile Phones*, New York, NY: New York University Press.
 - 52 World Bank. 2016. *World Development Report 2016: Digital Dividends*. Washington, DC: The World Bank.
 - 53 Wyche, S., & Olson, J. (2018). Kenyan women's rural realities, mobile Internet access, and “Africa Rising.” *Information Technologies & International Development (Special Section)*, 14, 33–47.
 - 54 Wyche, S., Simiyu, N. & Othieno (2018) Understanding women's mobile phone use in rural Kenya: An affordance-based approach. *Mobile Media & Communication*, Vol 7, No. 1, Pp. 94-110.
 - 55 Wyche, S., Simiyu, N. & Othieno (2016), Mobile phones as amplifiers of social inequality among rural Kenyan women. *ACM Transactions on Computer-Human Interaction* Vol. 23, No.3, pp.1-19.