



HHS Public Access

Author manuscript

J Telemed Telecare. Author manuscript; available in PMC 2016 May 09.

Published in final edited form as:

J Telemed Telecare. 2015 March ; 21(2): 104–107. doi:10.1177/1357633X14566569.

High mobile phone ownership, but low internet and email usage among pregnant, HIV-infected women attending antenatal care in Johannesburg

Kate Clouse, Ph.D., M.P.H.^{1,2,*}, Sheree R. Schwartz, Ph.D., M.P.H.³, Annelies Van Rie, M.D., Ph.D.³, Jean Bassett, MB.BCh.⁴, Sten H. Vermund, M.D., Ph.D.^{1,5}, and Audrey E. Pettifor, Ph.D., M.P.H.³

¹Vanderbilt Institute for Global Health, Vanderbilt University, Nashville, TN, USA

²Division of Infectious Diseases, Department of Medicine, Vanderbilt University School of Medicine, Nashville, TN, USA

³Department of Epidemiology, University of North Carolina Gillings School of Global Public Health, Chapel Hill, NC, USA

⁴Witkoppen Health and Welfare Centre, Johannesburg, South Africa

⁵Department of Pediatrics, Vanderbilt University School of Medicine, Nashville, TN, USA

Summary

We investigated mobile phone usage amongst HIV-positive pregnant women attending antenatal services in a primary care clinic in Johannesburg (n=50). We conducted a semi-structured interview and asked them about their mobile phone, Internet and email use. The median age of the women was 28 years, 36% had moved one or more times in the past year, and most were employed or recently employed, albeit earning low wages. Nearly all women (94%) reported that they did not share their phone and 76% of the SIM cards were registered to the woman herself. The median time with the current phone was one year (range 1 month–6 years) and the median time with the current phone number was three years (range 1 month–13 years). Even though 42% of the participants were from outside South Africa, they all had mobile phone numbers local to South Africa. About one-third of respondents reported Internet use (30%) and about one-fifth reported using email (18%). Overall, 20% accessed the Internet and 10% accessed email on their mobile phone. Mobile phone interventions are feasible amongst HIV-positive pregnant women and may be useful in prevention of mother-to-child transmission of HIV (PMTCT). Email and Internet-based interventions may not yet be appropriate.

Introduction

Mobile health (m-health) refers to the use of mobile communication devices such as mobile phones, smart phones or tablet computers in medicine or public health. A promising avenue for m-health applications in Africa is their use in prevention of mother-to-child transmission

*Corresponding author: Dr. Kate Clouse, Vanderbilt Institute for Global Health, Vanderbilt University, 2525 West End Avenue, Suite 750, Nashville, TN 37203 USA, Phone: (615) 875-9814, kate.clouse@vanderbilt.edu.

of HIV (PMTCT).^{1–3} However, there has been little research on mobile phone ownership and Internet use among HIV-infected pregnant women. Mobile device use in South Africa is widespread, with more mobile connections than people.⁴ However, there is extreme wealth inequality in South Africa, and mobile phone and Internet usage among poorer members of the population, including people who attend primary care clinics, probably differs from the wealthy minority. A study using data from 2010–2011 found 84% mobile phone ownership among HIV-infected, pregnant women receiving care in eight clinics in rural and urban areas of KwaZulu-Natal Province, South Africa.² Better understanding of how people who may be targeted for m-health interventions use mobile communication devices is important for improving the design of these interventions.

A major concern about using mobile phones for HIV prevention and care interventions involves the potential loss of confidentiality that may arise if phone sharing is common practice. Mobile phone usage among poor people in South Africa is said to be characterized by phone sharing and SIM card swapping. However, a study exploring mobile usage amongst very poor households earning less than R432 (US\$43.20) per month found that nearly 80% of respondents in South Africa did not share their phone.⁵ Since 2011, all SIM cards in South Africa must be registered in compliance with the Regulation of Interception of Communications Act (RICA). This new regulation may reduce the frequency of number switching by minimizing SIM card swapping.

The aim of the present study was to describe mobile phone ownership, SIM card registration, and email and Internet use among pregnant, HIV-infected women receiving routine PMTCT services at a primary care clinic in Johannesburg.

Methods

We collected data from May–July 2013 as part of a pilot study assessing a text message intervention to improve postpartum care in HIV-infected women at the Witkoppen Health and Welfare Centre, a primary healthcare clinic in Johannesburg. Full details of the study have been published elsewhere.⁶ Eligibility criteria included being HIV-seropositive, at least 36 weeks pregnant at the time of enrollment, in possession of a working mobile phone, able to demonstrate basic literacy by reading a simple text message, willing to accept text messages and phone calls, and willing to provide written informed consent for study participation. HIV-infected women of at least 36 weeks gestation attending the antenatal clinic were approached consecutively until the sample size (n=50) was met. All of the first 51 women approached met the eligibility criteria, including possession of a working mobile phone, but one woman declined study participation. To ensure that the phone number provided was correct, we sent a text message to test the number in the presence of the participant and confirmed receipt.

Women were asked about their mobile phone and Internet usage during one semi-structured interview at their enrollment visit. Participants chose the language for the interview (seSotho, isiZulu or English), which was conducted in a private space at the clinic by a local research assistant. Participant responses were recorded on paper questionnaires, then entered into an electronic database (REDCap, Vanderbilt University, Nashville, TN) and analysed

using a standard package (SAS version 9.4, SAS Institute Inc., Cary, NC). The study was approved by the appropriate ethics committees.

Results

The median age of the 50 women enrolled was 28 years (interquartile range, IQR: 26–33), 42% were born outside South Africa, 36% had moved one or more times in the past year, and most were formally or informally employed (62%) or recently employed (18%). The most common occupation was domestic worker. The median number of hours worked was 40 per week (IQR: 25–40) and median income was R2500 per month (IQR: 1900–3500). The majority of women (88%) were currently in a relationship and 82% lived in a household with other adults; 48% of women lived with their partner.

Mobile phone ownership characteristics, and email and Internet usage are summarised in Table 1. Nearly all women (94%) reported that they did not share their mobile phone with anyone. Three-quarters (76%) of SIM cards were registered directly to the woman, with the remainder registered to family or friends. The median length of time that they had owned their current mobile phone was one year (range 1 month–6 years) and the median time with the current mobile phone number was three years (range 1 month–13 years). Most women (84%) reported that they had held the same number for one year or more. Within the previous two years, most participants (58%) reported only one mobile phone number.

Only 18% of respondents had an email account. Among those who did report using email, device preference was mixed: 10% of all respondents accessed email via their mobile phone and 12% via a computer, with one participant (2%) reporting both. The overall frequency of using email to send and receive messages ranged from many times a day (8%) to less than once a day (8%).

Internet use was low (30%). More respondents reported Internet access on mobile phones (20%) than via computer (12%), and only one respondent (2%) reported the use of both devices. Nearly one-quarter (24%) of the sample reported frequent daily Internet use. When we asked participants to name the websites they visited most often, responses provided more than once included Facebook (18%), WhatsApp (8%) and Google (6%). Eleven other sites were each reported once: Apostolic church website, BlackBerry Messenger, food recipes, Gmail, Gumtree, job websites, Junk Mail, UNISA (university), Zonkewap. Two other sites which were reported could not be identified: “body care” and “domestic”.

Overall, 18% of participants reported using both Internet and email. All who reported email use also reported Internet use, while 12% of participants reported Internet use but no email. There was no difference in Internet or email use according to participant age.

Discussion

We found high rates of stable personal mobile phone and phone number ownership, but low Internet use and very low use of email services among 50 pregnant, HIV-positive women receiving antenatal care in South Africa. These results may be useful for researchers designing PMTCT m-health interventions in South Africa.

Mobile phone usage in South Africa has been said to involve sharing of devices and frequent number switching. We did not find this to be true in our sample. All the women in the study possessed a working mobile phone, few shared their phone with others and number switching was uncommon, with a median of three years with the current number. This is consistent with a median phone ownership of 3.3 years among pregnant, HIV-positive women in South Africa found prior to the RICA legislation.² Most of the phone SIM cards in our study (76%) were registered to the woman herself. Even though 42% of the participants were from outside South Africa, they all had mobile phone numbers local to South Africa. These results suggest that mobile phones could be a reliable means of connecting women with health facilities, and that text message interventions may be appropriate for this population. The continuity of mobile phone possession confirms that mobile phone interventions can be designed for patients' existing phones, i.e., it is not necessary to provide phones for use during interventions. The limited phone sharing also reduces concerns about violations of privacy or confidentiality if the wrong person reads a private text message from the clinic. Mobile phone interventions only work if the number provided is correct. We tested each mobile phone number as soon as it was provided to us, and recommend this for future interventions.

While mobile phone ownership was high, email and Internet use were surprisingly low among the women sampled. Only 30% of our sample reported using the Internet, and email use was even lower (18%). Facebook, a widely used social networking website, was the most commonly reported website: nine participants (18%) reported visiting the site. Two of the other "websites" that participants reported visiting – WhatsApp and BlackBerry Messenger – are actually instant messaging platforms, not websites. This indicates some familiarity with accessing social networking tools via mobile phones but possibly also a limited understanding of the Internet in general. These results suggest that social networking sites are starting to become popular in this population, but the lack of Internet access is hampering their use. Researchers should be aware of the lack of email and Internet use when considering social media and other online health interventions for this population. In our results, the few participants who reported email use were just as likely to use email on a mobile phone as on a computer. However, mobile phones were the most popular method for accessing the Internet. It is likely that email and Internet usage will increase rapidly over the next few years as Internet enabled phones become more affordable, and thus more prevalent, in this population.

The present study had several limitations. It was based on a small sample of HIV-positive pregnant women in a single primary health care clinic in Johannesburg and therefore may not be generalizable to populations in other settings. Most of the respondents worked formally or informally, but their wages were low; it is possible that unemployed people were unable to attend the clinic, and were thus under-represented in our sample. However, the results reflect the population of pregnant, HIV-positive clinic attendees who may be targeted by future m-health interventions. Finally, we did not record information about the types of phones being used, which would be useful information in future research.

In summary, young, HIV-infected women accessing antenatal care in an urban South African setting generally own their own mobile phones without sharing them, but are much less

accustomed to Internet and email use. Mobile phone interventions are therefore feasible in this group, but other m-health interventions using more advanced forms of technology may not yet be appropriate.

Acknowledgments

We are grateful to the staff and clients of Witkoppen Health and Welfare Centre. We also thank Nompumelelo Yende, Ntombenhle Shipalana, Nokuthula Mcunu, Mantombi Ntuli, Thembisile Makhomboti and the antenatal clinic team at Witkoppen Health and Welfare Centre, and Clarence Potter at the North Carolina Translational and Clinical Sciences Institute. The study was funded through the US Agency for International Development, cooperative agreement (AID-674-A-12-00033). Software assistance was supported by the National Center for Advancing Translational Sciences, NIH (grant 1UL1TR001111).

References

1. Rotheram-Borus MJ, Tomlinson M, Swendeman D, Lee A, Jones E. Standardized functions for smartphone applications: examples from maternal and child health. *Int J Telemed Appl*. 2012; 2012:973237. [PubMed: 23304136]
2. van Heerden A, Norris S, Tollman S, Richter L, Rotheram-Borus MJ. Collecting maternal health information from HIV-positive pregnant women using mobile phone-assisted face-to-face interviews in Southern Africa. *J Med Internet Res*. 2013; 15:e116. [PubMed: 23748182]
3. Dean AL, Makin JD, Kydd AS, Biriotti M, Forsyth BW. A pilot study using interactive SMS support groups to prevent mother-to-child HIV transmission in South Africa. *J Telemed Telecare*. 2012; 18:399–403. [PubMed: 23034933]
4. GSMA Intelligence. Sub-Saharan Africa Mobile Economy. 2013. See http://www.gsmamobileeconomyafrica.com/Sub-Saharan%20Africa_ME_Report_English_2013.pdf (last checked 19 September 2014)
5. Pena, R. Mobile usage at the base of the pyramid in South Africa. See <http://www.infodev.org/articles/mobile-usagebase-pyramid-south-africa> (last checked 8 August 2014)
6. Clouse K, Schwartz S, Van Rie A, Bassett J, Yende N, Pettifor A. “What they wanted was to give birth; nothing else”: barriers to retention in Option B+ HIV care among postpartum women in South Africa. *J Acquir Immune Defic Syndr*. 2014; 67:e12–8. [PubMed: 24977376]

Table 1

Characteristics of mobile phone ownership and Internet and email use among pregnant, South African HIV-infected women participating in the study (N=50).

Share mobile phone, n (%)	
No	47 (94)
Yes	3 (6)
Shares mobile phone with (n=3)	
Husband/boyfriend	2 (67)
Sister	1 (33)
Median time owning current mobile phone, months (range)	12 (1–72)
Median time owning current mobile phone number, months (range)	36 (1–156)
SIM card registered (RICA) to: n (%)	
Participant	38 (76)
Participant's husband or boyfriend	6 (12)
Participant's mother or father	4 (8)
A friend who is not participant's boyfriend or family	2 (4)
Mobile phone numbers in the past 2 years, n (%)	
One	29 (58)
Two	18 (36)
Three	3 (6)
Email account, n (%)	
No	41 (82)
Yes	9 (18)
Device for accessing email ^{*†}	
Mobile phone	5 (10)
Computer	6 (12)
Email frequency [†]	
Use email many times a day	4 (8)
Use email not every day	4 (8)
Use Internet, n (%)	
No	35 (70)
Yes	15 (30)
Device for accessing Internet [*]	
Mobile phone	10 (20)
Computer	6 (12)
Internet frequency	
Use Internet many times a day	12 (24)
Use Internet once a day or not every day	3 (6)
Websites visited ^{*‡}	
Facebook	9 (18)
WhatsApp	4 (8)
Google	3 (6)

Other (see text)

11 (22)

* Multiple responses allowed for this question so sum may exceed 100%.

[†] One participant reported that she had an email account but it had not been activated, so she did not respond to the questions about email device and frequency (n=8).

[‡] One participant reported Internet use but did not specify websites (n=14).

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript