

# Mobile phone use among female entertainment workers in Cambodia: an observation study

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**Background:** Text or voice messages containing health behavior change content may be an inexpensive, discreet, sustainable and scalable way to reach populations at high risk for HIV. In Cambodia, one of the important high-risk populations is female entertainment workers (FEWs). This ethnographic study aims to explore typical phone use, examining patterns and behaviors that may influence the design of future mHealth interventions.

**Methods:** The study consisted of one 8-hour non-participant observation session for 15 randomly sampled FEWs. Observations focused on capturing normal daily use of mobile devices. Observation checklists were populated by observers during the observations and a post-observation survey was conducted. Findings were discussed with Cambodian HIV outreach workers and HIV research fellows and their interpretations are summarized below.

**Results:** In this ethnographic study, all 15 participants made calls, checked the time and received research-related texts. More than half (n=8) of the participants engaged in texting to a non-research recipient. About half (n=7) went on Facebook (FB) and some (n=5) listened to music and looked at their FB newsfeed. Fewer played a mobile game, posted a photo to FB, went on YouTube, used FB chat/messenger, watched a video on FB, played a game on FB, used FB call/voice chat, looked at their phone's background or used the LINE app. Fewer still shared their phones, left them unattended, added airtime or changed their SIM cards. When participants received a research text message, most did not share the text message with anyone, did not ask for help deciphering the message and did not receive help composing a response. Notable themes from observer notes, HIV outreach workers and researchers include reasons why phone calls were the most frequent mode of communication, examples of how cell phone company text messages are used as a form of behavior change, literacy as a persistent barrier for some FEWs, and FEWs' high interest in receiving health-related messages and less concern about privacy and phone-sharing issues than expected.

**Conclusions:** This study suggests texting is a part of normal phone use although not as frequently used as voice calls or Facebook. Despite the less frequent use, FEWs were able to send and receive messages, were interested in health messages and were not overly concerned about privacy issues. Texting and voice messaging may be useful tools for health behavior change within the FEW population in Cambodia.

**Keywords:** Cambodia; sex workers; mHealth; cell phone; ethnography; observational study; sexual health

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## Introduction

Cambodia was one of the first countries in the world in which mobile phone subscribers surpassed fixed-line subscribers (1). The number of mobile subscribers in Cambodia reached 20,850,543 in 2015, exceeding the country's population by almost 6 million and doubling the 2010 figure (2). In Asian-Pacific countries, the number of mobile social media users was set to reach 1 billion by the fourth quarter of 2015; and in Cambodia, it increased 108% from the previous year (3). Over 98% of Internet subscriptions are from mobile devices (4). The number of people in the region accessing social media from mobile devices jumped an impressive 32 percent in the past year, to reach 900 million (3).

The United Nations Development Program report analyzed the demographics and phone use of 2,597 nationally representative youth aged 15–24 drawn from all 24 provinces in Cambodia. Of the 2,597 youth, 96% declared that they had access to a phone, with 68% reporting that they owned a personal mobile phone and 72% had a mobile in their home (5). There are six mobile phone operators who continue to lower price, causing mobile phone use to become more affordable and market penetration to increase (6). The percentage of Cambodians who own at least one smartphone was 40% in 2015, almost doubling the 2013 figure (7).

mHealth, or mobile health, projects have shown to be increasingly successful in developing countries. Collecting health data (8-10), increasing access to health knowledge (11-14), promoting provider quality (15-17), and increasing medication/appointment adherence (18-20) are a few ways in which mobile phones have successfully been used in developing countries to support health. In addition, rigorous evaluations have demonstrated mobile phone messages to be successful in supporting preventative healthcare (8,14,18,21,22) such as chronic disease prevention in Seychelles (23). Findings also support the transfer of face-to-face health behavior change technologies unto mobile phones in developed countries (24). There is evidence that self-report of risk behaviors through a mobile phone is as reliable and valid a method of data collection as in-person surveys (25). Especially for migrant or hidden populations in developing countries, mobile phones may become an important tool for linking people to health services (26-28).

In Cambodia, several successful mHealth health programs have been introduced in the areas of post-abortion

contraceptive use (29), pharmacovigilance (30), diabetes self-management (31), case detection/notification (32), and HIV education (33). This current evidence base for using mobile phones to make health assessments and encourage uptake of services in hard-to-reach populations that face stigma and discrimination in developing countries is promising, but stronger impact evaluations are needed to understand the full benefits of such interventions. Results from recent studies show that mHealth tools can be successfully implemented in Cambodia in an urban setting (29,32), for HIV prevention (33), and with young people using participatory approaches (29-33).

While mHealth research has confirmed its success as a public health tool, it remains an emerging field globally. Novel trials, particularly those in developing nations, encounter several challenges. In Cambodia, technical limitations include mobile users' ownership of multiple Subscriber Identity Module (SIM) cards from the six networks in Cambodia who may offer special deals for a limited period of time encouraging people to switch SIM cards temporarily (34,35). Sharing phones with family or friends, privacy concerns, and level of literacy may prove to be additional obstacles (34). In Cambodia, specifically, Khmer script is not universally available on all phones. However, many in the younger generation use a Romanized Khmer language for texting and social media.

mHealth may be an important tool to serve populations at high risk for HIV infection in Cambodia. Although great strides have been made to reduce the prevalence of HIV in Cambodia, eradicating new HIV infections has proven to be difficult. New infections primarily occur in those who engage in high-risk behaviors, including female entertainment workers (FEWs). Entertainment workers are women who work at entertainment venues such as karaoke bars, beer gardens, cafes and restaurants and who may or may not engage in high-risk behaviors such as direct or indirect sex work (36). Factors associated with sex work include limited schooling, the death of a parent, or drinking alcohol (37). Because of the dangers associated with their work, FEWs are at an increased risk for seeking an abortion (38), contracting HIV, experiencing psychological stress, and other health problems (39). Behavior change interventions may provide a way to support the health of FEWs by linking them to high quality HIV prevention and other health services. Voice or text messages containing health behavior change content have the potential to be inexpensive, discreet, adaptable, sustainable and scalable ways to reach vulnerable

populations. Mobile phone use by entertainment workers has increased at high rates and is now widespread among this population (34).

A recent cross sectional study of FEWs in Cambodia found that of the 96 respondents, 51% reported sending text messages daily; of them, 47% used Khmer script and 45% used Romanized Khmer (34). Most FEWs (98%) in this study reported feeling comfortable receiving private health messages despite the fact that 39% were sharing their phone with others (34). Younger FEWs were more likely to report daily texting ( $P<0.001$ ) and less likely to share their phone with others ( $P=0.02$ ) (34).

This study aims to further explore the phone use patterns of FEWs in Cambodia in order to inform testable mHealth intervention using text or voice message, and to identify potential challenges.

## Methods

### *Questionnaire development*

Cambodian research staff members who regularly work with FEWs developed an observation tool for note-taking and a structured interview questionnaire in English and then translated it into Khmer, the national language of Cambodia. The Khmer questionnaire was back-translated and reviewed by experts working on HIV with key population in Cambodia. The questionnaire was finalized based on their feedback.

Demographic information was restricted to phone use metrics including type of phone, number of SIM cards, provider, and ways in which the phone is most commonly used. In addition, information on perception of privacy, security, phone sharing, comfort in receiving health information through SMS/VM and comfort during the study were collected.

### *Data collection training*

All research team members including observers were trained for 3 days on ethnographic observation study methods, particularly non-participant observation, interview techniques, privacy assurance, and confidentiality. The training also addressed quality control strategies, such as rechecking and reviewing the questionnaires after administration and resolving issues that might arise during the fieldwork. An emergency protocol was given to all training participants in case a medical emergency or crime

occurred during the observation period. Data collection team leaders were encouraged to perform regular reviews on the progress of the fieldwork and communicate any issues that might have occurred during the data collection.

### *Study sites, sampling, and training*

Participants were recruited from a list of all FEWs in contact with KHANA's implementing partners in the capital city of Phnom Penh. A random sampling method was used to select FEW participants from the Phnom Penh area that have ever interacted with KHANA or their partners such as clinics or community-based organizations. From the list of FEWs kept by KHANA, 15 participants were randomly selected using the Microsoft Excel random number generator function and were called using the most recent phone number given.

On the phone, outreach workers followed a recruitment script which asked them to describe the study including time commitment, study location and compensation of potential participants and asked if they were interested in participating.

If they were, they were screened for eligibility. Inclusion criteria for the study participants included: being biologically female; being between the age of 18 and 30 years of age; identifying as a FEW; living in Phnom Penh for at least 1 year; being in the industry for at least 3 months; having ever used the text messaging function on a mobile phone; being able to commit to an 8-hour observation and additional 1-hour interview between December 1–30, 2015; and being able to provide verbal consent to participate in the study.

Peer observers for the study were recruited from "Save Incapacity Teenagers (SIT)", an implementing partner of KHANA, which focuses on improving the sexual and reproductive health (SRH) of the FEW community. The five peer observers were all outreach workers who are FEWs themselves and who receive an additional salary as outreach workers for providing their FEW coworkers with SRH knowledge and connecting them with services. Inclusion criteria for the peer observers included: being biologically female; being between the age of 18 and 30 years of age; identifying as a FEW; living in Phnom Penh for at least 1 year; being in the entertainment industry for at least 3 months; being able to commit to a 3-day training, three 8-hour observations and three additional 1-hour interviews between 12/1/2015 and 12/30/2015; and being able to provide consent to participate in the study.

Once five eligible observers were recruited, the team underwent observer training. Peer observers were taught the basic principles of ethnography and observation as an ethnographic tool was especially emphasized. Trainers impressed upon the observers the significance of the detached nature through which they were to observe as a totally objective observer. Observers were trained to remain at a comfortable distance away from participants (at least 5 meters) and not engage in communication, verbal or non-verbal, with the participant.

### ***Observation protocol***

To measure phone use, participants were observed for 8 hours and all phone use activities were recorded. This included type of use, who they contacted, the duration, time of day and notes on the use. A supplemental interview the following morning was used to clarify information collected and further explore themes.

Each of the five outreach workers observed three FEWs each for an 8-hour period. Observations were conducted in a non-participatory style. During the training, the field materials were comprehensively examined and demonstrated to be the backbone of the data collection for the non-participant observation period. Observers were asked to write everything down so as not to forget anything, or only remember selectively (40). Observers were instructed to record what the participant said, their tone, body language, location, sights, sounds, smells, dispositions, and any other details that may provide a more comprehensive picture. They were asked to put detail into their field notes.

During the observation, two text messages were sent to the participants by KHANA and the observers were instructed to record their observations of receiving and responding to the text message. The first text message consisted of general health information. The health message read: *“Having a trusted doctor that you see once a year can improve your health.”* The second text message was a health question. The question read: *“In the past year, have you met with a medical doctor at a hospital or clinic?”*

Additional observations were made on such behaviors as phone sharing, leaving phone unattended, and “topping up” airtime. In Cambodia, phone users regularly “top up” their phones with a small \$1–\$10 purchase of minutes and data. Because there are high levels of competition between cellphone companies, phone companies strive to maintain a positive relationship with their consumers by frequently offering deals and incentives.

### ***Follow-up interviews***

Follow-up interviews were conducted to supplement the observation and identify specific themes and behaviors. Observers met participants the morning after the observation usually at the home of the FEW to go over the findings of the observation and conduct a semi-structured interview for 1 hour. The topics covered in the interview include texting language, predominant contacts and types of phone use, number of SIM cards, phone/information sharing, security/confidentiality and thoughts or concerns.

### ***Data analysis***

Observation records and survey responses were entered into an Excel spreadsheet. Quantitative analysis consisted of descriptive statistical analysis including means and percentages. Responses were then discussed with HIV research fellows and peer outreach workers who are either FEWs themselves or interact with them on a daily basis. These discussions are summarized in the “Interpretation” section below.

### ***Ethical statement***

The KHANA Center for Population Health Research and the Touro University California Institutional Review Board reviewed and approved this study (IRB Application # PH-1015). A written informed consent was obtained from each participant after they were made clear that participation in this study was voluntary, and that they could refuse or discontinue their participation at any time. The research team protected privacy of the respondents by discreetly conducting the observation and conducting the interviews at a private place, and no personal identifiers were collected in the questionnaires or field notes. The records of this study were kept confidential. The co-investigators did not include the name of any participants involved in the research in any report. The interview recordings obtained from the participants were safely locked away in a digital file with a passcode. Electronic transcripts were stored on a password protected laptop. Informed consent forms with signatures and demographic questionnaires with identifiable information such as from the screening questions were stored in a locked bag during transportation to and from the study site. These forms were kept in a separate locked file away from digital recordings and transcripts. The co-investigators are the only people who will have access to these records.

## Results

### Demographics

Fifteen participants completed the study. Descriptive statistics of demographic characteristics are presented in *Table 1*. The most common texting language was Khmer, the national language of Cambodia (n=12), followed by Romanized Khmer, a version of the language written in Roman letter instead of characters (n=3) and English (n=2).

During the interview, participants' perception of their behavior during the observation was characterized as unchanged (n=12), the day as typical (n=13) and their phone use as typical (n=14). The number of SIM cards owned by participants varied from one to three with eight participants owning one, five owning two and two owning three. No participants owned more than three. Most women did not share their phone (n=9), but shared information on their phone (n=9). They shared information with their friends (n=7), doctor (n=1), family (n=1) and husband (n=1). Participants were somewhat likely (n=8), likely (n=1), not likely (n=4) and would never (n=2) let others use their phone.

Six participants reported that other people used their phone less than 3 times a day, five never let others use their phone, three let others use their phone 3–6 times a day and one participant let others use their phone 7–10 times each day. While most participants did not have a passcode or lock (n=10), most report being somewhat comfortable to very comfortable with receiving health information in text messages on their phone (n=14). To message, many participants reported using their phone's text messaging (n=6), but a few used voice messages (n=2) and one participant used an app to text message. When ranking their preference, all preferred voice call, followed by Facebook messenger (n=11), text message (n=9) and voice message (n=9). Phone type was evenly split between basic (n=8) and smartphones (n=7). Phone carriers varied between Smart (n=13), Cellcard (n=4) and Metfone (n=2). Few participants reported past privacy issues (n=3) or future privacy concerns (n=2).

### Observation data

Observation statistics of phone use characteristics are presented in *Table 2*. During the observation period, all participants called someone, checked the time and checked the text message from KHANA. More than half of the participants engaged in texting to a non-KHANA recipient. Around half went on Facebook (n=7) and texted a non-

KHANA recipient (n=8). Fewer listened to music, played a mobile game, posted a photo to Facebook, checked their Facebook newsfeed/news, went on YouTube, took a photo, used Facebook chat/messenger, watched a video on FB, used FB call/voice chat, looked at their phone's background or used LINE app. Significant frequencies included 116 observations of phone calls, 32 of checking the time, 34 of going on Facebook, 29 of checking the KHANA text and 15 of non-KHANA related texting.

The mean duration of each phone use activity include checking the Facebook newsfeed (21.8 min, SD =18.0), playing a mobile game (15.6 min, SD =9.5), listening to music on their mobile (12.6 min, SD =4.4), going on FB (12.0 min, SD =11.4) and going on YouTube (7.3 min, SD =7.5). Phone call recipients were clients, friends, boyfriends, family and mother. The three non-KHANA texting recipients were Smart Phone Company, boyfriend and friend.

### Literacy data

Literacy data are presented in *Table 3*. For reading, participants received the same scores when being assessed reading a complex sentence and a simple sentence with most having high reading comprehension (n=12). For writing, most were able to fully write the statement (n=8), while a few could write more than half, but not all of it (n=4), one could write half and two were unable to write any of the sentence.

### Observer notes

The observer's observations are catalogued in *Table 4*. Most participants did not share their phone (n=12), but did leave their phone unattended inside their home for an average time of 36.5 minutes (n=11). Few added data to their phone during the observation (n=4) or changed their SIM card (n=1). The average time until the KHANA text messages were read was 16.8 minutes (SD =32.5) and 24.8 minutes (SD =40.3) and it took an average of 30.1 minutes (SD =46.0) to finish composing a response to the second message. Most did not share the text message (n=12), ask for help deciphering the message (n=12) or receive help with composing a response (n=13).

### Key informant interpretation

Observation findings and discussion with outreach workers and KHANA research fellows, both of whom have daily

**Table 1** Reported data (n=15)

Data category	Number of participants
In what language do you text? Circle all that apply (n=15)	
Khmer	10
English	2
Romanized Khmer	3
Do you think you changed any of your behavior yesterday because there was someone observing you? (n=15)	
Yes	3
No	12
Was this a typical day for you? (n=15)	
Yes	13
No	2
Did this day represent typical phone use for you? (n=15)	
Yes	14
No	1
How many SIM cards do you own/use? (n=13)	
1	9
2	2
3	2
More than 3	0
Do you share your phone with others? (n=15)	
Yes	6
No	9
Do you show information on your phone to others (family, friends, etc.)? (n=14)	
Yes	9
No	5
How likely are you to let others use your phone? (n=15)	
Very likely	0
Likely	1
Somewhat likely	8
Not likely	4
Never	2
How often do other(s) use your phone? (n=15)	
>10 times a day	0
7–10 times a day	1
3–6 times a day	3
<3 times a day	6
Never	5

**Table 1** (continued)**Table 1** (continued)

Data category	Number of participants
Is there a lock/passcode for your phone? (n=15)	
Yes	5
No	10
How comfortable are you with receiving text messages with confidential or sensitive health information? i.e., HIV status, STI testing, SRH services, etc. (n=15)	
Very comfortable	7
Comfortable	4
Somewhat comfortable	3
Somewhat uncomfortable	1
Very uncomfortable	0
How do you message people most often? (n=13)	
Phone's text message	6
Does not message	4
App to voice message	2
App to text message	1
What is your preference out of the following choices for reviving health information on your phone? (n=15)	
Voice call	15
Facebook messenger	11
Text message	9
Voice message	9
Type of mobile phone (n=15)	
Standard	8
Smart	7
Type of SIM card (phone carrier) (n=19)	
Smart	13
Cellcard	2
Metfone	4
In the past, have you had any privacy issues with your phone? (n=15)	
Yes	3
No	12
Do you have any privacy concerns for the future? i.e., confidential information (n=15)	
No concerns for the future	13
Concerns for the future	2

**Table 2** Observation data

Type of phone use	Number of participants who performed phone use type at least once (n=15)	Total number of phone use actions during observation (n=245)	Proportion of phone use type per total actions during observation (%)	Average duration of action (min)
Total Facebook (FB) actions	7	34	14.0	48.8
Go on FB (unspecified action)	5	14	6.0	12.0
FB post/look at photos	3	6	2.0	–
FB newsfeed	5	5	2.0	21.8
FB chat/messenger	3	3	1.0	5.0
FB video	2	3	1.0	4.0
FB game	2	2	1.0	–
FB call/voice chat	1	1	0.4	6.0
Phone call	15	116	47.0	6.6
Check the time	15	32	13.0	–
Check the text message from KHANA	15	29	12.0	–
Non-KHANA texting	8	15	6.0	–
Listen to music on mobile	5	7	3.0	12.6
Play a mobile game	4	4	2.0	15.6
Go on YouTube	3	4	2.0	7.3
Take a photo	1	2	1.0	–
Look at phone’s background	1	1	0.4	–
Use LINE app	1	1	0.4	–

**Table 3** Short literacy test of participants

Test item	Ability scale (n=15)				
	0 (low)	1	2	3	4 (high)
Reading ability for complex sentence: <i>“Having a trusted doctor that you see once a year can improve your health.”</i>	3	0	0	0	12
Reading ability for simple sentence: <i>“Exercise is good for health.”</i>	3	0	0	0	12
Writing ability for complex sentence: <i>“In the past year, have you met with a medical doctor at a hospital or clinic?”</i>	2	0	1	4	8

0, cannot read any of this message; 1, can read less than half of this message; 2, can read half of this message; 3, can read more than half of this message; 4, can read all of this message.

**Table 4** Observers' observations

Activities observed (n=15)	Number of participants
During the observation, did the participant share her phone with anyone?	
Yes	3
No	12
Did the participant leave her phone?	
Yes	11
No	4
If yes, where did the participant leave her phone unattended? (n=11)	
On mattress	4
On bedroom table	4
On TV	3
During the observation, did the participant add data to her phone plan (top up)?	
Yes	4
No	11
Did the participant change her SIM card?	
Yes	1
No	14
Did the participant share the research text message with anyone?	
Yes	3
No	12
Did the participant ask for help deciphering the research text?	
Yes	3
No	12
Did the participant receive help to compose a response to the research text?	
Yes	2
No	13
For how much time did the participant leave her phone?	Average =36.5 min
Time from text arrival until participant read first KHANA text message	Average =16.8 min
Time from text arrival until participant read second KHANA text message	Average =24.8 min
Time from text arrival until participant composed a response to second KHANA text message	Average =30.1 min

interaction with FEWs, yielded several notable themes. Here is a summary of the points highlighted in the discussion.

### What mode of communication do FEWs use most?

Voice calling was the most common way that participants were observed using their phones. Outreach workers remarked that a quick call can be less expensive than multiple text messages. The low literacy rates in this population promote voice calling over written communication. In addition, calling doesn't require their vision or hands, so they can do it during times of transport including walking or using a moto or tuk tuk.

Facebook was used regularly to both update their status and have one-on-one check-ins with friends. All the FEWs with Facebook-capable phones went on Facebook during the observation. Outreach workers said that while texting usually solely uses words to communicate, Facebook allows a FEW to communicate using many types of media including pictures and videos. It is considered more of an entertainment. Additionally, it is a popular fad that came from overseas, and is therefore used frequently.

On the other hand, text messaging is also used, especially for brief communication. Text messages received during the observation came mostly from a phone provider that sends airtime discounts and alerts, however boyfriends and friends also used text messaging to communicate with participants.

### Can text messaging promote behavior change?

While the observation showed that participants use SMS and VM to reach each other, this observational study was not designed to determine if SMS and VM promote behavior change. However, outreach workers said that several of the most common phone service providers in Phnom Penh were found to use behavior change promotion techniques in their SMS messaging to consumers. Examples of these messages from SMART phone and Cellcard, two of the companies most commonly used by FEW in the observation, are below:

- ❖ *"Happy Water Festival!!! Top up during 24.-26.10.15 to enjoy 300% additional BONUS for on-net calls, SMS and data. ENJOY! #BeSmart"*
- ❖ *"Call I CAN (988) to have a chance to win an iPhone 6s, \$1,500 cash (1 prize), \$1,000 cash (1 prize) or \$100 cash (21 prizes)! Only 5 c/min & 10 c/week. Good Luck!"*
- ❖ *100% on-net bonus today just for you! One time only with \$0.50 top up or more.*

Participants in this study responded to these messages by purchasing airtime during discount windows or



entering raffles for prizes. In a similar way, we could expect consumers to respond to health-related behavior change messages sent via SMS/VM especially if there were added incentives. These technologies could effectively be used to improve health and promote positive behavior change within target communities.

### **Are FEWs literate enough to communicate through texts?**

There is a gap in the evidence around literacy rates among FEWs in Cambodia. In order to best inform the research team on current literacy rates, outreach workers conducted a short evaluation in which FEWs were categorized based on their ability to read a simple and complex health-related statement and write a response to a health-related question. The literacy test data demonstrated that of the 15 FEWs in the observational study, almost all were literate.

However, although the literacy test results indicated a high level of literacy for reading and writing within this population, outreach workers and the KHANA research team felt that there were many other FEWs who are illiterate. They justified the low response rate to the KHANA text sent during the observation with the problem of illiteracy. In addition, there may be a difference between overall literacy and texting literacy or digital literacy.

Cultural biases against women may also play into the lower literacy rate of this population.

Males and females may not be treated equally, especially among poorer families. If there is ever a choice of who had the opportunity to attend school as children, the males are sent, over the females.

While outreach workers and KHANA fellows agree that literacy rates among the FEW community are lower than in the average Cambodian community, “texting literacy” and phone literacy in general must be further explored to make an educated conclusion about using SMS messages to improve the health of this community.

### **Are FEWs interested in receiving health-related text messages?**

Most of the participants had positive remarks about potential health message interventions saying that the idea was “good”, “efficient”, “enjoyable” and “easy”. Nearly all felt very comfortable to somewhat comfortable with receiving text messages with health information (n=14).

It took the FEWs observed, an average of 20 min to open and read the KHANA text and 30 min to respond. Outreach workers felt that busy schedules, poor reading/

writing comprehension, distraction or hesitation may have increased the length of time it took to respond. However, the messages sent did not require immediate response, nor were they of an urgent nature. Response rates to the second KHANA text that asked a question were low. While this may have been caused by the cost of sending a text or the inability to comprehend the question due to literacy issues, it suggests that SMS may not meet the needs of all the participants. These barriers may continue to inhibit optimal linkage.

### **Are there privacy and phone-sharing issues when it comes to receiving health-related text messages?**

Most FEWs do not have a passcode or lock on their phone. All FEWs had their own phone. Outreach workers discussed that phones are considered personal property, just like a wallet. FEWs are not worried about someone gaining access to it, but overall safety and protection is still a concern. In general, they do not share their phone on a regular basis, but may share information on their phone. If they are willing to share their phone, then, they are agreeing to share the information that is stored in their phone. By handing their phone to another person, they are aware its information is no longer confidential, or they trust that person enough, where sharing personal health information is not an issue for them.

## **Discussion**

Owning a phone was universal in the FEW population surveyed in our study. Out of a nationally representative sample of 2,597 youth aged 15–24 in 2013, 96% reported access to a mobile phone, with 68% possessing a personal phone and 72% having a phone in their home (5). In another study of 2,064 of 15–65-year-old Cambodians in 2015, 94.5% said they owned their own phone, with 96% coverage in urban areas and 93% among women (41). As in our study, smartphone ownership in Cambodia is around 40%, increasing to 52% for urban residents (41).

Second, we found that 40% of FEWs use more than one SIM card. This was corroborated by a USAID study in 2013 where 35% of urban participant used multiple SIM cards (41). The USAID study states that Metfone, Cellcard and Smart Mobile are the three main mobile phone companies that operate at the national level (5). Coverage correlates with location and wealth: poorer, rural youth use Metfone, and wealthy, urban youth use Smart (5). This mirrors our findings as 13 FEWs living in urban Phnom

Penh used Smart while only 2 used Metfone.

Third, phone use trends differ by location and sub-population. While all FEWs in our study used their phones many times throughout the observation, only 66% of respondents in a 2015 BBC study reported using their mobile phone at least once a day (5). However, this number increased to 74% in the 20–24 age group, and up to 76% in urban areas (5). In addition, only 32% of urban mobile phone users used their phone for more than 30 minutes a day, which contrasted with the data from our study (5).

Similar to our findings, youth in the USAID study reported they used their phones mostly for making and receiving calls (98%) and sending and receiving messages (32%) (5). Also, 27% played games and 22% took photos (5). As in our study, the BBC report cited game playing (15%), music listening (13%) picture taking (11%) and radio listening (11%) (41). While 43% were found to listen to the radio in the USAID study, no observers in our study noted radio usage (5).

Use of both the Internet, and Facebook more specifically, were noted in our study at the two other recent studies. Cambodians reported the three most important reasons for seeking access to the internet on their phone to be for entertainment, news and education (41). Although the overall phone-based Facebook usage for the BBC report put the statistic at 34% of Cambodians, it put urban residents at 49%, near our rate of 40% (41). When asked what activities they engaged in most often when using Facebook, participants of the BBC study said look at pictures (24%), share posts (17%), chat (14%) and read articles (14%) (41). Our study found all of these activities observed multiple times. The USAID study found 79% of young people with internet access visited Facebook at least once a month, followed by YouTube (63%) (5). Our study reports similar Facebook usage with 86% of participants with smartphones using Facebook during the observation.

Fourth, the language used for texting varies among different demographics. In the BBC study, 63% of Cambodians had a Khmer-script enabled phone, but only 32% of those under 25 used Khmer to text daily or weekly (41). Similarly, 14% of users claimed to write in Khmer rendered in Latin script (Romanized Khmer), with 25% of those under 25 doing so daily or weekly (41). In the BBC study, the majority of youth using SMS used English (81%), compared to a third (32%) who use Khmer and 28% who use SMS templates (5). Of all respondents, 84% of all youth and 88% of urban youth used English.

Finally, this data is consistent with previously published

research looking at the phone use of FEW in Cambodia. In our recent study of 96 FEWs, we also noted that about half of the participants owned a smartphone, half texted daily and virtually all respondents felt comfortable receiving private health messages despite the fact that around 40% were sharing their phone with others (34).

## Conclusions

This study suggests that texting is a part of normal phone use although not as frequently used as voice calls or Facebook. Despite the less frequent use, FEWs were able to send and receive messages, were interested in receiving health messages and were not overly concerned about privacy issues. Texting, communicating through Facebook and sending voice messages may be useful tools for health behavior change within the FEW population in Cambodia.

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

*Ethical Statement:* The KHANA Center for Population Health Research and the Touro University California Institutional Review Board reviewed and approved this study (IRB Application # PH-1015). A written informed consent was obtained from each participant after they were made clear that participation in this study was voluntary, and that they could refuse or discontinue their participation at any time.

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