Mobile Phone Text Messaging Intervention for Cervical Cancer Screening: Changes in Knowledge and Behavior Pre-Post Intervention

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ABSTRACT

Korean American women are reported to have one of the highest cervical cancer mortality rates in the United States. Despite their mortality risk, Korean American women have the lowest Pap test screening rates across US racial/ethnic groups, ranging from 39% to 64%. Earlier interventions to increase cervical cancer screening in this vulnerable population specifically targeted structural barriers to cancer screening (cost or language barriers) but did not address the many cultural barriers such as modesty, misconceptions, and reservations about screening. Moreover, previous intervention strategies also did not target specific individual concerns about screening. Personalized interventions may be needed to change screening behavior in this difficult-to-reach population. Mobile smartphones are rapidly becoming the most popular and widespread form of communication in the world. Most young adults already use smartphones (83%), and nearly all (98%) have a mobile phone. Mobile phone–based health intervention (mHealth) could be a cost-effective method to deliver health information and improve health outcomes among hard-to-reach, vulnerable populations.

To address the limitations present in prior interventions, the authors developed and tested a mobile phone text message–based cervical cancer screening (mScreening) intervention utilizing mHealth technology. The aim of this study was to assess the acceptability and feasibility of a 1-week mScreening intervention to increase knowledge about cervical cancer screening and intent to undergo screening and receive a Pap test. Guided by Fogg’s Behavior Model, the mScreening intervention identified individual barriers to screening, developed motivators specific to these barriers, and provided a trigger to the desired health behavior action (receipt of a Pap test). Messages individually tailored for each participant were delivered once daily over 7 days at each participant’s preferred time.

Thirty-four Korean American women were recruited, and 30 aged 21 to 29 years qualified as study participants. A quasi-experimental research design was used to collect information from participants through face-to-face interviews using a structured questionnaire administered at baseline) 1 week after completing the mScreening intervention and at a 3-month follow-up.

At the 1-week follow-up, significant improvements were observed in general knowledge about cervical cancer ($P < 0.001$), knowledge about the Pap test ($P < 0.001$), and cervical cancer risk factors and screening ($P < 0.001$), as well as beliefs about and attitudes toward the Pap test ($P = 0.006$). By the 3-month follow-up, 23% (7/30) of the participants reported having received a Pap test. There was a high degree of acceptability and satisfaction with the intervention. At the 1-week follow-up,
83% (25/30) of the participants were satisfied with the intervention, and 97% (29/30) would recommend the program to their friends.

These findings show that mobile technology is a promising tool to increase knowledge and receipt of cervical cancer screening in this population. The data provide evidence for the effectiveness, feasibility, acceptability, and satisfaction of this mHealth intervention.

**EDITORIAL COMMENT**

(The Pap smear has had a tremendous impact on women’s health. If utilized, the Pap smear decreases the incidence of cervical cancer by 75%. It has been exemplified as the ideal screening tool (inexpensive, easy to obtain, tests a disease that has a treatable precancer interval, etc). With the addition of human papillomavirus testing, clinical management of cytologic abnormalities has been further refined. While it is cheap and easy to perform, the number of women availing themselves of screening has been less than complete. The reasons for not undergoing screening include fear of pain, no access to a provider, lack of understanding of screening, fear of bad results, cultural and language issues, and not remembering to undergo screening. Women with low education or no insurance have been identified to undergo cytology screening less frequently.

In the current study, Dr Lee and colleagues offer a unique screening intervention, mScreening, which offers patients mobile education and reminders. The population studied is Korean American women. Data suggest that these patients are the least likely group to undergo cervical cancer screening. There were 30 patients in the study, and they were required to have health insurance and a provider. Approximately 20% of patients subsequently obtained a Pap smear, felt to be due to this intervention. Some study patients felt that the messages were too long, but overall many were receptive to this method of communication/intervention/education/medical reminders.

The American Medical Informatics Association states “all work in informatics is motivated by the need to create new solutions—often using information technology—that enhances biomedical science, the health of the population, and the quality and safety of the care that is provided to individuals when they are ill.” mScreening would be an example of screening assisted by information technology. In 2013, 65% of Americans owned a smartphone. It is estimated that there are 4 devices per person, and more than 30% will have a tablet. Mobile screening or mobile intervention would seem to be an appropriate approach given the current access to technology.

In the current study, the authors strive to improve screening compliance by use of an approach using the smartphone. Other screening efforts have been made using mScreening including weight loss management, smoking cessation, self-care behaviors, and asthma monitoring. One of the benefits of mHealth, defined by the authors as the “use of mobile and wireless devices as intervention tools,” is the ability to deliver instant, short, multiple messages. One of the limitations of mHealth then would be that patients 65 years or older, those who did not attend college, those with household earnings less than $30,000, and those living in rural areas would probably not have a smartphone, and this population would be neglected. Nonetheless, given the quickly emerging and plentiful technology available to all of us and that overall cellphone ownership is greater than 90% of the population, mHealth/mScreening presents a new approach to health issues and should be explored in the future.—LVL)