Supplement

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Feasibility of Text Messaging to Improve Oral Anti-cancer Adherence in Older Cancer Patients

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ABSTRACT

BACKGROUND More than 50 oral chemotherapy agents in pill form are on the market, with projections that in 3 years, 25% of cancer treatment will be in pill form. For oral agents to achieve a therapeutically effective level for cancer treatment, patients must strictly adhere to the regimen. However, adherence is often less than 80%, which may be inadequate for treating the cancer. There are more than 285 million wireless subscribers in the US with an estimated 67.5% of adults owning cell phones and 98% of those phones having text messaging capability. A recent review of 12 trials on interventions for disease prevention or management found that text messaging improved health behaviors.

PURPOSE There are multiple mobile applications and smart phone products to prompt medication adherence, however, few have examined if these prompts improve medication adherence. Adherence is critical among cancer patients who are older and less likely to text message. The cancer medications can be costly, as much as $800 per pill, and only effective if taken as prescribed. Adherence is complicated by complexity of the dosing and the duration of the prescriptions. Therefore, the purpose of this study is to test the feasibility, usability, and satisfaction with text messages to improve symptoms from side effects of treatment and adherence to oral chemotherapy agents.

METHODS A 10-week, 2-group, prospective trial will enroll 76 patients from cancer centers to examine a 3-week text message intervention to promote oral agent adherence and management of symptoms from side effects of treatment. Descriptive statistics, generalized linear modeling, and generalized estimating equations will be used for analysis.

RESULTS Enrollment is underway and preliminary findings on characteristics, feasibility of text message intervention and its influence on adherence rates will be presented.

CONCLUSION Text messages can easily be tailored to a specific oral agent regimen, making this intervention usable for simple or more complex dosing. Further, delivering the text messages on cell phones makes this intervention readily accessible. Likewise, it is the first study to enroll a cohort of patients who are newly prescribed oral agents. Past research has demonstrated that adherence levels begin to decline 2 months after the initiation of therapy. Therefore, this research could inform initiation of care, where patterns of behavior could be established and carried out through the entire treatment regimen. This type of novel intervention also has the potential to transform and impact other ill populations that require adherence to a medication regimen.
ABSTRACT

Hospital-based studies suggest that late presentation at tertiary level is a driving factor for mortality from severe febrile illness in resource-poor contexts. Recent research into health seeking pathways in Malawi identified primary level barriers linked to service provision and misdiagnoses. In Malawi an Emergency Triage, Assessment and Treatment (ETAT) package, approved by the World Health Organisation (WHO) has been introduced at tertiary level and is being rolled out to district and primary clinics. mHealth technologies are likely to sustain quality in implementing clinical protocols, particularly when community-based health providers with limited formal training are increasingly working to offset primary level staff shortages.

We aimed to develop and evaluate feasibility and acceptability of a prototype primary care level intervention to improve triage, assessment and referral of children with severe illness in Blantyre and to investigate whether this facilitates systematic and timely recognition and response to severe illness.

All paediatric cases within five primary clinics in urban Blantyre were triaged and assigned Red for Emergency, Amber for Priority and Green for Queue using the mHealth triage algorithm. Phones were assigned to triage, to clinicians and the A&E department within the local tertiary, referral hospital (Queen Elizabeth Central Hospital (QECH)) for monitoring patient referrals.

We conducted a rigorous evaluation using a combination of quantitative and qualitative approaches, both pre-and post and, using the phone as a monitoring tool, in parallel to the intervention.

Seventy-four healthcare staff were trained across five urban primary clinics. A total of 41,358 patients were assessed using the mHealth triage algorithm from December 2012 to May 2013, of whom 1.56% were referred to QECH. Rates of concordance between triage and clinician assessment showed a good level of agreement above chance (Kappa value = 0.71). Pre- and post-Patient Journey Modelling tools identified positive changes in patient flows. Overall patient and health worker satisfaction was high with indirect impact on quality of
clinical assessment amongst health workers based at intervention clinics but not directly involved in the intervention.

This study has shown that mHealth technologies have the potential to improve primary level health services in resource-poor contexts with high patient numbers and overburdened health staff. Working in collaboration with the Ministry of Health the data we present will inform the development of a cluster-randomised trial to rigorously evaluate the role of mHealth in the implementation of ETAT. This will aid policy decisions around ETAT implementation at primary health level.
WELTEL LTBI: A RANDOMIZED CONTROLLED TRIAL PROTOCOL OF A TEXT-MESSAGING INTERVENTION TO IMPROVE PATIENT ADHERENCE TO TREATMENT FOR LATENT TUBERCULOSIS INFECTION

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ABSTRACT

Successful treatment of latent tuberculosis infection (LTBI) is critical to reduce the impact of TB; however, in North America, fewer than half of individuals starting LTBI treatment complete therapy. While existing TB treatment adherence interventions have not yet proven consistently successful, evidence has shown that weekly text messages can improve treatment adherence in HIV. One of these evidence-based interventions is WelTel, a service involving weekly text-message “check-ins” with patients. The aim of this study is to determine the effectiveness of the WelTel intervention on adherence to LTBI treatment.

The objectives of this study are to: 1) determine the effect of the WelTel intervention on completion of LTBI treatment; 2) determine the effect of the WelTel intervention on daily adherence to LTBI treatment; 3) measure patient satisfaction with the WelTel intervention; 4) evaluate the cost-effectiveness of the WelTel intervention.

A multi-site randomized controlled trial will be conducted at three TB control clinics in British Columbia, Canada. Over two years, we expect to enroll 486 individuals diagnosed with LTBI and initiating isoniazid (INH) (300mg daily for nine months). Participants will be randomly allocated to an intervention or control arm (standard care) at a 1:1 ratio. Intervention arm participants will receive a weekly SMS ‘check-in’, “Are you OK?”, to which they will be instructed to respond within 48 hours either “yes” or “no”. A TB clinician will follow-up and triage any problems that are identified. Participants will be followed for one year, with a primary endpoint of treatment completion, defined as having taken at least 80% of prescribed doses within 12 months. Follow-up questionnaires will be used to assess participant satisfaction with the intervention. Cost-effectiveness will be analyzed through decision-analytic modeling. Data will be analyzed according to intention to treat principles. Chi-squared tests will be used for categorical outcomes; and t-tests or Mann-Whitney U tests for continuous outcomes.

Ethical approval has been received from the University of British Columbia Clinical Research Ethics Board (H13-01450). The trial is registered with ClinicalTrials.gov (NCT01549457). Recruitment began in July 2012, and the study is currently enrolling participants.

The WelTel LTBI trial will contribute important information on the effectiveness of the WelTel text-messaging intervention to improve treatment adherence among patients with LTBI. Trial results and a cost-effectiveness evaluation will inform how WelTel might contribute to the long-term success of TB control and elimination efforts.
USE OF THE WelTel MOBILE HEALTH INTERVENTION AT A TUBERCULOSIS CLINIC IN BRITISH COLUMBIA: A PILOT STUDY

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Abstract

Successful treatment of latent tuberculosis infection (LTBI) is critical to reduce the impact of TB; however, treatment completion in North America is less than 50%. Evidence has shown that weekly text messages can improve treatment adherence in HIV. One of these evidence-based interventions is WelTel, a service involving weekly text-message “check-ins” with patients. The aim of this study was to determine the feasibility of adopting the WelTel intervention, originally developed and tested in Kenya, for use in the context of TB care in British Columbia (BC).

(1) Determine prevalence of mobile phone ownership, text-message use, and patient attitudes towards receiving text messages from the clinic. (2) Determine the technological feasibility of the WelTel mobile health intervention, and patient and healthcare provider acceptability of the service.

A descriptive cross-sectional survey was undertaken at a provincial TB control clinic in BC. A clinician administered a questionnaire focused on demographics, mobile phone ownership and use, and attitudes towards receiving text messages from the clinic. The WelTel intervention was then implemented in a small group of LTBI patients for 12 weeks. On Monday morning, an SMS gateway sent “How are you?” text messages to patients, to which they were to respond either “OK” or “Not OK” within 48 hours. A clinician phoned those who responded ‘Not OK’ and those who did not respond. Participants completed baseline and follow-up questionnaires, and semi-structured interviews.

Of 82 participants who completed the survey between September 2011 and December 2011, 68 owned a mobile phone and 58 used text messaging weekly. Participants were receptive to receiving treatment-related communication from the clinic via text messaging (n = 80) but preferred not to have language relating to TB in the message content. Of 16 patients who received the intervention, 14 completed the study. After overcoming initial difficulties, the technological platform was an efficient way to deliver the intervention. The greatest participant-perceived benefits were that it enabled them to report side effects quickly (n = 6), reminded them to take their medication (n = 4), and imparted a feeling that their healthcare providers cared (n = 2). Interview data supported these findings. Barriers included cost (n = 3) and network coverage (n = 2).

Patients have the means to communicate with their healthcare providers via text-messaging and were receptive to doing so. The intervention was well-received by participants and the healthcare provider; however, research on its effectiveness to improve TB treatment adherence is required.
WELTEL BC1: A QUALITATIVE INVESTIGATION ADAPTING THE WELTEL TEXT MESSAGING INTERVENTION TO IMPROVE HIV CARE IN BRITISH COLUMBIA, CANADA

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ABSTRACT

BACKGROUND Patient engagement in care and adherence to medication are critical to achieving the full benefits of antiretroviral therapy (ART) among people with HIV infection. A randomized controlled trial in Kenya, WelTelKenya1, showed that an interactive mobile phone text messaging intervention can improve adherence and viral load suppression. We conducted a pilot study among individuals taking HAART to assess the acceptability of the WelTel model in a Canadian setting.

PURPOSE (1) To adapt the WelTel intervention to a Canadian setting, and (2) Assess acceptability by health care providers (HCP) and HIV+ clients taking HAART at the Oak Tree Clinic, a women and family centred HIV clinic.

METHODS Between April and June 2012, we recruited five participants each from five patient groups: “Youth” (14–24 years), “Mature” (≥ 50 years), “ESL”, “Remote” (≥ 3 hours travel time to clinic) and “CD4 < 200”. Participants were sent weekly “How are you?” messages, to which they were required to respond within 48 hours either that they were well or had a problem. Nurses responded to negative and non-responses. Focus group discussion and semi-structured interviews were conducted with health care providers (HCP) (n = 5), and participants at baseline (n = 25) and study end (n = 20). Questionnaires were also administered at baseline (n = 25) and study end (n = 17). Analysis was guided by two theoretical frameworks: The Technology Acceptance Model and the Theory of Reasoned Action.

RESULTS Of 25 client participants, 80% (20/25) were female, the median age of participants was 46 (range 16–60) and the median time since HIV diagnosis was 13.7 years (range 2.6–20.6 years). 76% (19/25) of participants completed the study. Client participants and HCP indicated high acceptance and satisfaction with the program. Client participants reported the intervention to be a convenient and useful method to engage in communication with their HCP, thus increasing their ability to access support services, report side effects and attend appointments. HCP reported improved contact with clients and a faster response time to clients’ health
concerns. Challenges with the intervention included non-responses, cell phone functionality and lost/stolen phones. Recommendations to improve the intervention included varying message frequency, tailoring messages and sending clinical test results via text messages. At study end, all client participants asked (17/17) would recommend the intervention to a peer.

**Conclusions** Clients and HCP at a Canadian HIV care centre were enthusiastic about the WelTel intervention, believing that regular communication via text messaging was an acceptable and useful approach to maintaining engagement in HIV care.
TEXT TO MOVE – RANDOMIZED CONTROLLED TRIAL OF PERSONALIZED TEXT MESSAGING TO IMPROVE PHYSICAL ACTIVITY IN A DIVERSE PATIENT POPULATION WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Physical activity (PA) is one of the recommended self-care behaviors that have been shown to improve outcomes in the management of type 2 diabetes mellitus (T2DM), but it is difficult to initiate and sustain for patients with T2DM. Text messages (SMS) are rapidly becoming a means of reaching out to diverse patient populations because of the low cost and the ubiquitous nature of mobile phones.

This study examined the effect of personalized text messages on PA, as measured by a pedometer, and clinical outcomes (HbA1C) in patients with T2DM in a 2-arm randomized controlled trial. Following guidelines set by the American Diabetes Association, patients in the program were staged using the Trans-theoretical Model of behavior change, into one of the five stages of behavior change, from pre-contemplation to maintenance, and set personal PA goals. The control group received a pedometer too without personalized messages, in addition to standard diabetes care at Massachusetts General Hospital (MGH). The intervention group received a pedometer, interactive personalized messages twice a day and standard diabetes care. The messages consist of practical educational and motivational information tailored to a 4th grade reading level, their stage of behavior change, and language (English or Spanish). Both groups used a pedometer with wireless upload of data into a SMS engine, which then transmitted customized SMS based on a pre-set algorithm. The morning message delivered subjects’ activity data from the previous day, in context to their goal, while an evening message provided the other messages. The intervention was successfully tested for feasibility in a total of 20 subjects, for 3 weeks. Subjects tested whether the appropriate messages were sent based on the algorithm, whether they were sent on time, and whether the frequency of the messages was appropriate.

This intervention is ongoing at 4 MGH community health centers – Revere, Chelsea, Charlestown and Everett.

The low cost and design of the messages makes it possible for the program to be easily scaled across a diverse patient population regardless of age, educational, economic or ethnic background and sustained for a longer duration; thereby, facilitating sustained behavior change. Given the level of evidence of PA for improved outcomes in DM, personalized SMS could be a means to achieving and sustaining this necessary but difficult behavior to change in T2DM.
ABSTRACT

INTRODUCTION In South Africa a number of Millennium Development Goals relating to maternal health have been worsening while the use of mobile phones to support health services (mHealth) has been shown to improve health outcomes in the developing world. South Africa is one of the focus countries for the Mobile Alliance for Maternal Action (MAMA) which also includes Bangladesh and India. MAMA South Africa (MAMA-SA) uses a multi-channel mHealth approach to communicate healthy pregnancy and newborn child support behaviours, with a country specific focus on prevention of mother to child transmission (PMTCT) of HIV. This presentation provides an overview of MAMA-SA’s five mHealth communication channels and details the monitoring and evaluation (M&E) that is being conducted on each.

METHODS MAMA SA’s five ‘channels’ are SMS, USSD, Mobi, MXit (a South African mobile phone-based chat platform) and voice. With such a variety of communication methods on offer, a detailed M&E plan was necessary to gauge MAMA-SA’s impact on women within the country. To ensure similar levels of M&E across multiple countries, MAMA-Global (MAMA’s global coordination team) supported the initial M&E planning. This process established standardized indicators for all MAMA countries, while leaving room for adding additional indicators for country specific circumstances. Building on the standardized indicators, South Africa has added a number of additional indicators, some of which are based on national PMTCT indicators. Automated and manual data collection methods have been implemented, as well as focus group discussions and user feedback and testing.

RESULTS Since the launch, over 20,000 unique users have interacted with MAMA SA which translates into over 67,000 unique page views, hundreds of mobi-site comments, and more than 110,000 SMS’s and 8500 USSD messages being sent thus far. Most registered mobo-site users (73.01%) have already delivered and are looking for information to care for him/her, while the rest (26.99%) have yet to deliver. A large portion of SMS users (21.88%) opted to receive HIV-related messages, while this is lower than the national HIV rate which currently stands at 29.5%. Focus groups and user testing has shown that users of the service have found MAMA-SA valuable.

CONCLUSIONS Preliminary MAMA-SA data indicates high acceptability and satisfaction with the project. Detailed planning of M&E for such a diverse mHealth service offering has been essential. Service uptake has been satisfactory, but strategies for greater publicity are necessary. Further research is necessary (and planned) to ascertain health outcomes of HIV-positive women.
ABSTRACT

Learning Objectives:

1) Participants will identify the successes and challenges of developing and implementing a total mobile data management system in a level 1 trauma center.
2) Participants will demonstrate the value of integrated solutions combining mobile devices, electronic medical records, education and telemedicine/decision-support for when decisions are most critical.
3) Participants will appreciate the importance of the user experience and acceptance when selecting appropriate technology for their mobile health projects.

Mobile technologies harbor the potential to transform healthcare by improving clinician workflow and decision-making, which ultimately enhances quality of care and patient outcomes. The time sensitive nature inherent in trauma and critical care requires physicians to quickly access information to make correct decisions. In the past 5 years, we have been developing a mobile software platform and data management system that combines clinical documentation, education and telemedicine/decision-support. The goal is to provide clinicians with an integrated system of tools to facilitate the process of care. MobileCARE delivers a suite of integrated applications that completely supports a physician’s workflow. Clinicians are able to create documentation, view test results, medical notes and surgical documentation in real time. It also provides access to a mobile learning trauma and critical care curriculum and the ability to communicate through telemedicine with other team members. To better understand the use of mobile technologies in the clinical environment, we conduct usability and user acceptance testing as a guide to implementation. We also have conducted knowledge and skill acquisitions tests of the learning modules. The system are currently being evaluated in the trauma intensive care unit of a busy urban Level 1 trauma center. Physicians use it to document patient admissions and daily patient status with the information immediately available to all users across multiple platforms. Knowledge and skill acquisition tests have demonstrated that the mobile learning modules are equivalent to traditional classroom lectures (Figure 1), and that their use improved performance in the simulated environment (Figure 2). MobileCare is a complete software solution that provides significant functionality in the clinical environment. The impact on the safe and efficient delivery of care will continue to be realized. This technology is especially beneficial where continuity of care is required, as with patients with chronic disease or multiple acute conditions.
Figure 1

Figure 2
AIR AWARE: A SMARTPHONE APP TO INCREASE AWARENESS OF ENVIRONMENTAL FACTORS TRIGGERED FOR SYMPTOMS OF BREATHING-RELATED ILLNESSES

ABSTRACT

Breathing-related chronic illnesses such as asthma and chronic obstructive pulmonary disorder (COPD) affect millions of people. People with these conditions are especially impacted by environmental and weather-related factors that contribute to symptom exacerbation. This includes worsening dyspnea, anxiety, fatigue and depression. Self-monitoring of symptoms is becoming an increasingly popular tool in treatment for these illnesses. One such tool is being developed by the Department of Medical Social Sciences (MSS) at Northwestern University Feinberg School of Medicine. This tool is an iOS based mobile application that incorporates validated measures from the NIH PROMIS system with publicly available environmental and weather-related data through RSS and API interfaces. The application associates a person’s dyspnea, anxiety and fatigue symptoms with environmental variables such as pollution and pollen levels and weather related data such as temperature and humidity levels for a given GPS location. These variables are obtained by calling publicly available web services that take GPS data as inputs. The GPS readings are obtained through the GPS API available in the iOS devices. Since a person’s sensitivity to these external factors is highly individualized, the application first prompts users to complete a short battery of PROMIS computer adaptive tests (CAT) under a variety of environmental conditions and then calculates correlation coefficients. These prompts are enabled through the notification system available in the iOS platform. CATs reduce patient burden by administering highly targeted items to the user and stops when enough information is received. Once the application has collected enough data to determine if a correlation(s) exists, it will alert the user when environmental or weather conditions are at a level that would indicate a symptom is likely to occur. Since correlation does not equate causation, the application does not provide specific treatment recommendations for the symptoms; instead it aims to increase awareness of the existing conditions and how it may affect one’s immediate well-being. User acceptance and effectiveness will be evaluated in a future feasibility study. This will aid in the refinement of criteria for determining the alert mechanism based on historical stored data.
EXPERIENCE WITH MOBILE TECHNOLOGY AMONG PATIENTS WITH TUBERCULOSIS IN SAN DIEGO, CALIFORNIA AND TIJUANA, MEXICO

ABSTRACT

Each year, nearly 9 million cases of tuberculosis (TB) occur worldwide, resulting in 1.4 million deaths. While curable, long treatment regimens (6–24 month) negatively impact adherence for many patients, resulting in ongoing illness, continued transmission, and development of drug-resistant TB. Directly observed therapy (DOT) is recommended for improving adherence. DOT consists of TB providers watching their patients ingest each medication dose. However, DOT is costly, labor intensive and impractical in remote or resource-poor settings. To reduce these barriers, we developed the “Video DOT” (VDOT) system, whereby patients use mobile phones to record and send daily videos of themselves taking medications, which are then viewed remotely by DOT workers. To gauge feasibility of this technology-based approach, we assessed prior experience with mobile phones and willingness to adopt mHealth interventions in a sample of TB patients in the US/Mexico border region.

VDOT was pilot-tested in a single-arm trial among TB patients in San Diego, CA (n = 43) and Tijuana, Mexico (n = 9). Participants were interviewed before and after using VDOT for an average of 5.5 months (range 1–11 months). Ages ranged from 18–86 years old, 50% of patients were male and 50% were Hispanic. Education ranged from 24% completed primary education or less to 57% completing at least some college. Prior to study enrollment, 94% of participants owned a cell phone (55% were smartphones), of which most reported experience sending photos (72%) or videos (57%) from a cell phone, and 64% reported sending text messages daily. Age was the only factor significantly associated (p-values < .05) with owning a cell phone, owning a smart phone, sending pictures and videos, and daily text messaging. Experience with technology was similar between San Diego and Tijuana participants. Compared to baseline ranking on a 10-point scale, participants felt more comfortable using cell phones (+.77, p = 0.008), phone cameras (+1.43, p = 0.006), phone video cameras (+1.68, p = 0.009), internet (+.68, p = 0.100), email (+.72, p = 0.226) and text messaging (+.29, p = 0.299) at follow-up.

Cell phone use was very common among a demographically-diverse sample of TB patients. Younger patients had the most experience with smartphones prior to study enrollment, making this demographic especially prepared to adopt mHealth interventions. The experience of using smartphones for VDOT also led to an increase in comfort using mobile phone functions in both low and high-resource settings. These findings suggest that smartphones provide a feasible platform for TB treatment monitoring applications.
ENGAGING INDIVIDUALS TO PROMOTE DIABETES RISK AWARENESS WITH txt4health: A PROGRAM EVALUATION OF BEACON COMMUNITY txt4health PILOTS IN SOUTHEAST MICHIGAN AND GREATER CINCINNATI

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ABSTRACT

There are an estimated 25.8 million American children and adults, roughly 8.3% of the U.S. population, living with diabetes. Diabetes is particularly burdensome on minority populations where health disparities persist. Mobile technologies are an attractive method for reaching broad populations given the high penetration of cell phones across diverse groups, and may be a useful strategy for raising awareness of type 2 diabetes. To raise awareness of the risks associated with type 2 diabetes, pilots of txt4health, an automated 14-week text message program, were launched by the Southeast Michigan and Greater Cincinnati Beacon Communities. This investigation sought to evaluate the txt4health program pilot in Southeast Michigan and Greater Cincinnati through documenting participant usage of txt4health, as well as user perceptions of the program.

In this two part evaluation, we conducted a retrospective records analysis of individual-level txt4health system usage data from participants in Southeast Michigan and Greater Cincinnati to determine usage of the program. We also conducted a multimodal user survey with 161 txt4health users recruited through the program to understand participant perceptions of program satisfaction, participant use, and self-reported perceptions of behavior change. Preliminary results from the retrospective records analysis reveal that across both pilots, 5,570 participants initiated enrollment in txt4health, of which 33% completed the two-step enrollment process. Once enrolled, the majority of participants set a weight loss goal (74%), and tracked their weight (89%) and physical activity (65%) at least once during the program; however 56% dropped out before the end of the program, with 70% of dropouts occurring before the end of the fourth week. Among program completers, rates of weekly weight tracking were low with 22% of participants logging weekly weights at least five times, yet rates of weekly physical activity tracker were greater with 49% logging weekly physical activity at least five times. Despite high attrition across the pilots, surveyed txt4health users report high levels of program satisfaction, with 67% reporting satisfaction scores of eight or higher on a ten point scale (10 = most satisfied; M = 8.2, SD = 1.6). The majority of participants report that txt4health helped them make lifestyle and behavior changes related to diet and physical activity. While broadly focused public health text message interventions may have a great reach, individual engagement among participants widely varies, suggesting that this type of approach may not be appropriate for all, but is a feasible and acceptable delivery modality for a large subset of people.
USE OF AN AUTOMATED TELEPHONE RESPONSE SYSTEM FOR A WOMEN’S LIFESTYLE PHYSICAL ACTIVITY PROGRAM

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ABSTRACT

Physical inactivity is ranked fourth as a global risk factor for mortality. Internationally, physical inactivity disproportionately affects women (33.9%) as compared to men (27.9%). A need exists for innovative physical activity behavioral interventions for women using affordable, accessible technology. The 48-week, community-based Women’s Lifestyle Physical Activity Program for African American women strived to meet this need by creating an intervention that includes the use of 6 group visits and a personalized step goal. One of three study conditions also received 11 motivational tips to overcome barriers via an automated telephone response system (ATRS), while another received 11 motivational personal calls and a third received no calls. The purpose of this presentation is to present the development and then examine the use of phone technology in the ATRS condition. The research questions are: 1) What was the preferred means of receiving the automated calls (cell phone, home phone, work phone)? 2) Did the number of automated calls completed differ by the means of receiving the calls? 3) What were the challenges encountered with an ATRS?

A randomized cluster, Latin Squares, clinical trial design was used with the order of the conditions randomly assigned to six community sites. Over three years each of the study sites received each of the three study conditions. Five group visits occurred every five weeks in the first 24 weeks with a booster visit in the second 24 weeks. Women in the ATRS condition received one to two calls between group visits that delivered motivational tips. They could listen to more than one tip.

Ninety-seven women of the total 288 enrolled were in the ATRS condition. Of these women, 68% provided cell numbers, 69% provided home numbers, and 27% provided work numbers. The majority of women chose to have messages delivered to their cell phones (73%), followed by home phones (22%), or work phones (5%). The women listened to an average of 9.5 motivational tips. Specific challenges encountered were phone numbers that were not in service throughout the study, which was encountered with 10.8% of the phones at least one time during the study as well as unanswered calls (8.9%). Selected solutions designed to address challenges included closely tracking weekly call reports, using participants’ alternative contacts and email to reach them, and always updating participant phone numbers during data collections.

This study has demonstrated that automated telephone messages can be successfully delivered via cell phone technology.
A COMPARISON OF TWO TEXT MESSAGE-BASED INTERVENTION STUDIES FOR HEALTH PROMOTION IN CAPE TOWN, SOUTH AFRICA: THE LESSONS LEARNT

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ABSTRACT

According to the World Bank, there are 128 mobile subscriptions per 100 people in South Africa as of 2011. Cellphones are therefore viewed as having considerable potential for health promotion. However, evaluations of interventions and evidence of effectiveness are still limited in developing countries. Two separate trilingual (isiXhosa, Afrikaans and English) short-message-service (SMS) interventions that took place from 2012 to 2013 in Cape Town are evaluated.

The SMS campaigns aimed to increase health knowledge by disseminating health information via SMS. Specifically, each study involved sending SMSes to participants to provide them with information regarding how to control hypertension and how to be healthy during pregnancy, respectively. The hypertension campaign was conducted with hypertensive patients at a Community Health Centre, while the antenatal campaign was with pregnant women attending a Midwife Obstetric Unit. Facility staff guided the preparation and checked the health promotion content of both campaigns.

There were 223 and 206 participants at baseline in the hypertension and antenatal campaigns respectively. Both studies used mixed research methods of a randomised control trial followed by a focus group. Participants were randomised either to be sent SMSes (experiment group) or not (control group). Intervention in the hypertension campaign involved sending 5 SMSes per week for 16 weeks. The pattern of dissemination was different in the antenatal campaign: SMSes were staggered according to the week of pregnancy at the time of recruitment into the study. The total number of SMSes sent to all those in the experiment group was 101.

34.53% and 46.60% of the participants were lost to follow-up (LTFU) in the hypertension and antenatal campaigns respectively. There was no differential LTFU in either study. At the end of the antenatal campaign, there were no significant differences in the level of knowledge (assessed by nine questions) between the experiment and the control group (all p > 0.05). Similar results emerged in the hypertension campaign. Despite no significant improvements in knowledge, both campaigns’ participants (experiment group) reported high levels of behavioural change. Participants in both focus groups remarked that the SMSes acted as reminders or “light bulbs”.

SMSes appear to be more effective at improving motivation than increasing knowledge, although objective measures to verify behavioural change could not be obtained in either campaign. Further research is needed to investigate how health knowledge can be improved via mHealth interventions, particularly in populations of low socioeconomic status where high rates of LTFU are a reality.
ABSTRACT

Risky decisions (e.g., having unprotected sex; using methamphetamine) are often context dependent, automatic, and affectively based, but the contextual triggers that contribute to those risks may not be well understood by the individual him or herself. Virtual game simulations, designed to capture real-life situations, for example for PTSD sufferers, (Rizzo et al., 2009; McLay et al., 2011) are used by clinicians to diagnose then, personalize therapy. Because Read et al. (2006) have designed interactive virtual date environments (VE) to simulate the risk challenges MSM typically encounter in real life, could MSM’s virtual decisions be used to diagnose men’s risks in everyday life? However, to date, no tests of a simulation game’s virtual validity (link between game and real-world risk-taking) have been conducted: That was this project’s goal. We tested the hypothesis that decisions made within the VE would be correlated with real-life risky choices made in the past 3 months (e.g., unprotected sex, alcohol use, methamphetamine use). High-risk men who have sex with men of color (18-30yr old MSM of Latino & African-American descent) were recruited online via hook-up/social networking sites on both mobile apps and through the Internet. Participants reported past risky behaviors and then made a series of automatically recorded choices in an online VE. We found that those who drank alcohol in the past 90 days were likely to choose to drink alcohol in the VE, $p(116) = .332, P = .000$. Similarly, those who took methamphetamine in the last 90 days, were also likely to choose to take methamphetamine in the VE, $p(116) = .866, P = .000$. Those who were the insertive partner most in real-life (over 60% of the time), chose to be the insertive partner in the VE, and those who were the receptive partner most in real-life (over 60% of the time), chose to be the receptive partner in the VE, $Anal Sex Position p(90) = .747, P = .000$. Finally, those who chose to have unprotected anal intercourse (UAI) in the VE, were more likely to have engaged in risky anal sex in the past 90 days, $UAI (Time 1) p(116) = .612, P = .000$. These findings suggest the potential value of VE for unobtrusively diagnosing, predicting, and understanding the circumstances under which real-life risk-taking might take place. These findings suggest virtual simulation games could be used in apps and over the web to diagnose MSM’s real-life risky choices, potentially yielding more behavior change, even for those with contextual challenges they don’t understand.
Consistent high levels of adherence to antiretroviral drug therapy (ART) are needed to sustain undetectable viral loads (VL) in persons living with HIV/AIDS (PLWH). The result is improved health and prevention of HIV transmission. Rural dwelling PLWH encounter barriers such as low health care resources, transportation, poverty, stigma, and depression that contribute to adherence challenges. The goal of the Music for Health smartphone app is to use technology to improve adherence to ART. The app consists of a music program called the LIVE Network that includes animated music videos specially developed and tailored for PLWH, a manual with web links, and a pill count survey. The program is designed to educate, motivate, and increase self-confidence in rural PLWH to adhere to ART. We are conducting a randomized controlled clinical trial to study the efficacy of this app compared to an equivalent educational app in 240 rural PLWH in Georgia. Eligibility criteria include: HIV infected, initiating ART for the first time or changing a regimen due to side effects or ART drug resistance, ≥18 years of age, English speaking, and willing to complete study activities. Once randomized at baseline, each participant will receive a smartphone loaded with the appropriate app and will have a supervised listening/viewing session. They will receive regular text message reminders to use the app and for monthly unannounced pill counts. Pill counts will also be collected via smart phone. All participants will be followed up at 3, 6, 9 months using computerized interviews, hair samples for ART drug levels, and lab values extracted from medical records. The app was pre-tested in 3 focus groups conducted in 3 different rural counties. Nine men and 4 women participated; 10 (77%) were African American. All reviewed the app and provided feedback. Only one person did not own a mobile phone and 7 (54%) owned a smart phone. After coaching all were able to use the smart phone and app. All songs and videos were rated ≥ 7 on a scale of 0 to 10 and 5 songs had a median score of 10. Participants found the songs relevant and many thought songs addressed a situation they were currently experiencing: “This is my first year living with HIV, so songs like that I can relate to... dealing with issues and questions that I have in my own head... that I don’t talk to people about.” Videos were edited to incorporate changes requested by the participants. Study recruitment will begin in 2014. If successful this app could transform the delivery of HIV adherence self-management care by overcoming barriers in this vulnerable group.
ABSTRACT

BACKGROUND Breast cancer patients who founded in early stage have a good prognosis. Females who practice breast self-examination (BSE) are usually diagnosed at an earlier stage than those who do not.

AIMS The purpose of this study was to develop a smart-phone application to encourage BSE, and to evaluate the effects of mobile intervention in terms of improving breast self-examination behavior.

METHODS A developed smart-phone application had several functions including a BSE date alarm, a reminder to encourage mother and daughter to practice BSE together, BSE record, and educational video clips. Females aged 19 and over were enrolled and two series of questionnaires were carried out (before and after using the application) between July and September 2012.

RESULTS Forty five subjects (age 29.5 ± 5.9 years) were enrolled in the study. Of 45 participants, 28 (62.2%) had practiced BSE, and only one of these was carried out at the appropriate time, based on the results of the baseline survey. After using the application, the number of participants practicing BSE increased from 28 to 32 (62.2% to 71.1%; p = 0.503). In subgroup analysis (age <30 years), the number of participants using BSE increased from 8 to 18 (36.4% to 81.8%; p = 0.002), and the number of those using it at the appropriate time improved from 1 to 15 (2.2% to 33.3%, p <0.001).

CONCLUSIONS In female younger than 30 years, the developed smart-phone application increased BSE practice. To confirm the long-term effect of the mobile application and overcome difference in smart phone usage, further studies must be carried out.