Mobile Fotonovelas Within a Text Message Outreach: An Innovative Tool to Build Health Literacy and Influence Behaviors in Response to the COVID-19 Pandemic

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Submitted to: JMIR mHealth and uHealth
on: April 21, 2020

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Abstract

With all 50 states in the U.S. reporting cases of COVID-19, people around the country are adapting and stepping up to the challenge, but they are also scared, anxious and confused about what they can do to avoid exposure to the pandemic. Usual habits have been interrupted as a result of the crisis, and consumers are open to suggestions and strategies to help them change longstanding attitudes and behaviors. In response, a novel and innovative mobile communication capability was developed to present health messages in English and Spanish with links to fotonovelas (or visual stories) that are accessible, easy to understand across literacy levels, and compelling to a diverse audience. While text message outreach has been used to build health literacy and provide social support, few studies have explored the benefits of text messaging combined with visual stories to influence health behaviors and build knowledge and self-efficacy. In particular, this approach could be used to provide vital information, resources, empathy and support to the most vulnerable populations. This also allows providers and health plans to quickly outreach to their patients and members without any additional resource demands at a time when the healthcare system is severely overburdened.

(JMIR Preprints 21/04/2020:19529)
DOI: https://doi.org/10.2196/preprints.19529

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Mobile Fotonovelas Within a Text Message Outreach: An Innovative Tool to Build Health Literacy and Influence Behaviors in Response to the COVID-19 Pandemic

Rena Brar Prayaga, JD, MA & Ram Prayaga, MS

Abstract
With all 50 states in the U.S. reporting cases of COVID-19, people around the country are adapting and stepping up to the challenge, but they are also scared, anxious and confused about what they can do to avoid exposure to the pandemic. Usual habits have been interrupted as a result of the crisis, and consumers are open to suggestions and strategies to help them change longstanding attitudes and behaviors. In response, a novel and innovative mobile communication capability was developed to present health messages in English and Spanish with links to *fotonovelas* (or visual stories) that are accessible, easy to understand across literacy levels, and compelling to a diverse audience. While text message outreach has been used to build health literacy and provide social support, few studies have explored the benefits of text messaging combined with visual stories to influence health behaviors and build knowledge and self-efficacy. In particular, this approach could be used to provide vital information, resources, empathy and support to the most vulnerable populations. This also allows providers and health plans to quickly outreach to their patients and members without any additional resource demands at a time when the healthcare system is severely overburdened.

Background
The Coronavirus COVID-19 has profoundly changed our experience of everyday life and interpersonal connections. Both the CDC and WHO have recommended precautions to prevent and slow down transmission that include washing hands frequently with soap and water for 20 seconds, covering coughs and sneezes, and avoiding shaking hands. [1,2] At the same time, social distancing and stay at home orders require that people stay home and leave only for essential activities, and this can lead to increasing social isolation and loneliness, especially for the 35.7 million Americans (28% of households) who live alone [3].

Health Literacy and Fotonovelas
Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [4]. Approximately 80 million Americans have low health literacy, and this has been associated with disparities in health care access, lower utilization of health care services and poorer health outcomes [5]. Limited or insufficient health literacy has also been associated with a lower adoption of protective behaviors such as vaccinations, hand hygiene and other self-care measures [6]. The urgent need to avoid exposure to the COVID-19 virus would require a change in habits and behaviors, such as washing hands more frequently and maintaining a safe physical distance from others outside the home. It has been suggested that SMS campaigns for public health are the “most effective medium for mass dissemination due to their reach, immediacy, opportunity for data collection and personalization, ability to tailor and adapt information, and opportunity to link to other sources." [7] The goal here was to use SMS as a rapid deployment tool, but to also build health literacy by including a visual story within the text message and showing people modeling healthy behaviors to

prevent against the virus. While several innovative technologies have been developed to improve health literacy, a review of the literature revealed a lack of visual tools or mobile fotonovelas within text messages as a strategy to build health literacy and influence health behaviors.

There is substantial evidence that text messaging can be used for health outreach and to influence health behaviors [8]. At the same time, fotonovelas (a traditional print medium originally developed for Latin American audiences) have been used with great success with participants from other (e.g., Dutch) cultures, particularly among low literacy or underserved populations [9-11]. Similar to a comic book in format, they typically tell a story using a dramatic or soap opera style plot with illustrations or photographs and dialogue bubbles to capture the user's attention and share an important lesson. They have been used to help patients understand the value of preventive care and screenings and to improve self-management of chronic conditions. They are also more likely to be passed on to family or friends through social networks and can increase the reach beyond the targeted individual.

In this case, we wanted to adapt the traditional print format by creating a series of mobile (digital) fotonovelas or illustrated comic strips that could be used to improve health literacy around COVID-19, to fill knowledge gaps around perceived severity and susceptibility, and to help health plan members build new healthy habits to avoid exposure to the virus. We started with two mobile fotonovelas (in English and Spanish) to (1) build health literacy and awareness about simple changes in daily habits that could make a big difference in keeping safe, and (2) provide support to address the challenges of staying at home and social isolation as communities attempt to lower the risk of infection and “flatten the curve.” These fotonovelas were delivered to health plan members and patients as a link within SMS text messages. SMS is an obvious and well-accepted channel for rapid deployment, has a high rate of adoption, and seemed particularly appropriate for the urgent need to communicate health risks about the virus. The text messages with links to fotonovelas were designed to be educational with lighthearted content, and to reduce cultural and linguistic barriers. Readability for all content was at or below the 6th grade reading level.

Fotonovela 1*:* Promoting Healthy Behaviors to Prevent Spread of COVID-19

The messages in Fotonovela 1 were created as an early response to the COVID-19 threat and were informed, in part, by the Health Belief Model (HBM) [12-14], which was originally developed to study patient screening behavior for tuberculosis and is commonly used to drive behaviors relating to health promotion and disease prevention. In this case, recipients received a text message telling them that their health plan had put together COVID-19 simple steps to help them stay safe and healthy and they were asked to click on a link to see more. Upon clicking, they viewed the mobile fotonovela, which consisted of 8 frames in story format showing different settings and how to stay safe around people in those settings. The various scenes in the story discuss high risk individuals, washing hands, elbow bumps, elbow sneezes, using only trusted information sources online, and avoiding crowds (see Figures 1 and 2 below).

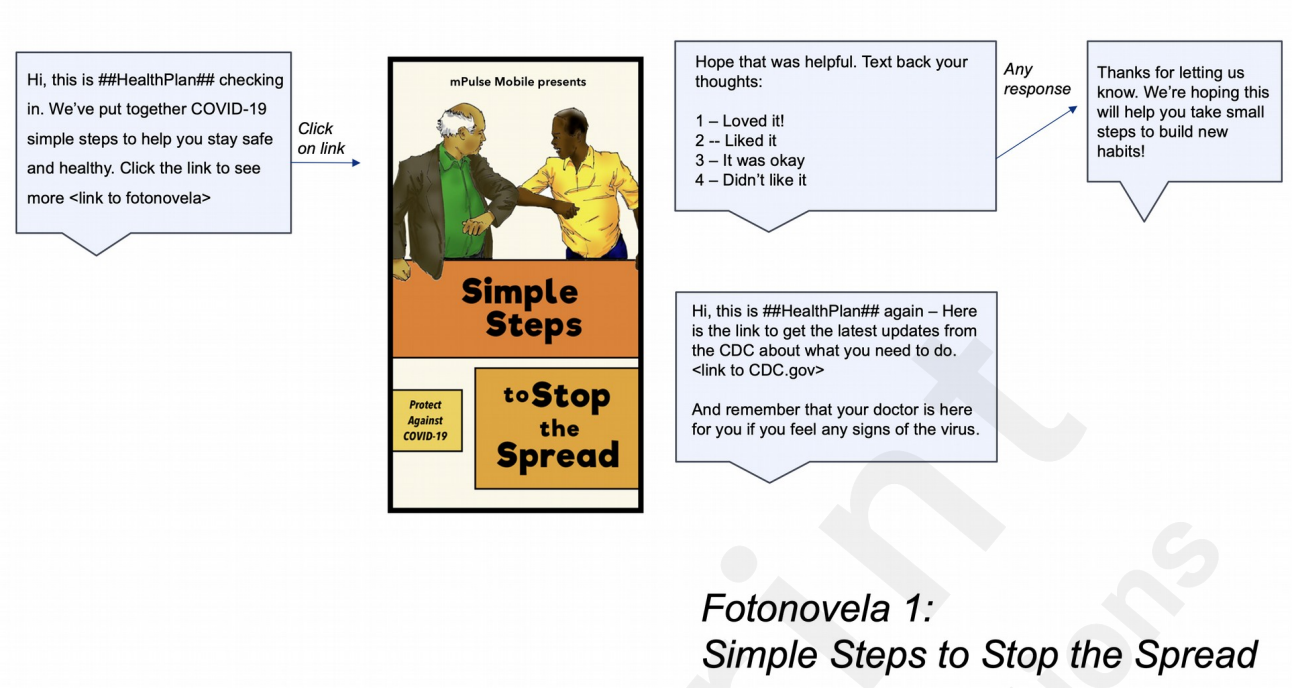

Figure 1: Text workflow introducing Fotonovela 1

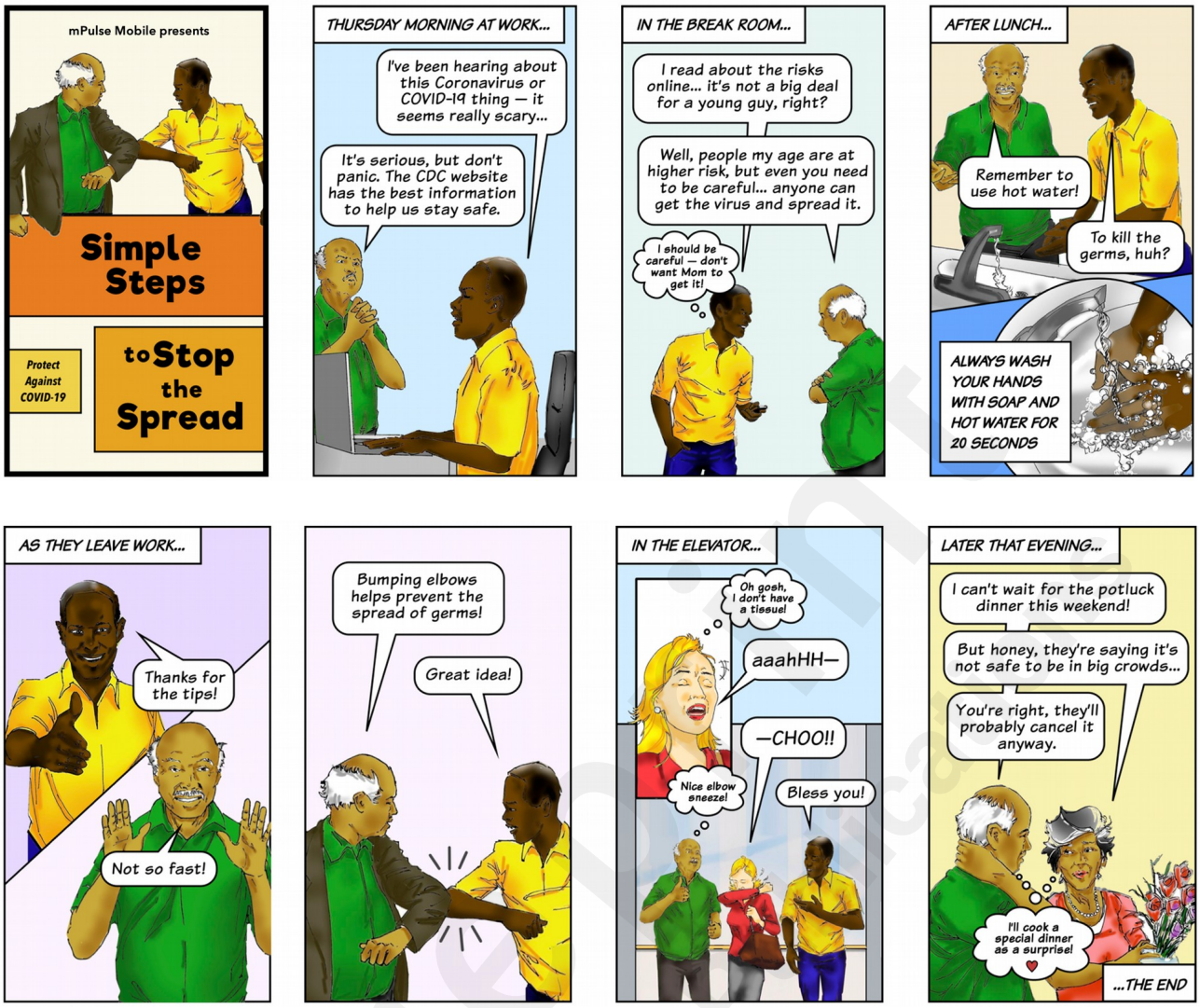

Figure 2: Fotonovela 1: Simple Steps to Stop the Spread

We were addressing the various determinants of behavior or constructs that are outlined in the HBM and which are likely to influence preventive behaviors: perceived severity (scene 1 – how bad is the virus), perceived susceptibility (scene 2 – does it really apply to me and how do my actions impact others I care about), perceived benefits (scene 3 – washing hands will help keep me safe), perceived barriers to action (scene 4/5 – but I have to change my behavior and stop shaking hands, be more careful about sneezing and engage in social distancing), exposure to factors that prompt action (scene 6 – influencing each other to avoid crowds and stay home). The goal of this type of mobile fotonovela is to build self-efficacy (the efficacy to influence events in one's life) [15] so that recipients feel empowered to pursue strategies and develop new habits that are likely to be successful in addressing the perceived threat or challenge posed by COVID-19. We also rely on social cognitive theory [16] which posits that understanding health risks and benefits will influence changes in health habits and behaviors if an individual believes that these new health behaviors can positively impact their health. As part of this process, there is an evaluation of possible benefits and losses and social approval or disapproval associated with new behaviors. By using a story format, we were able to (indirectly) share important messages, build empathy and understanding, and avoid making the recipient feel defensive or detached. The focus on simple steps made the changes feel easier and these small successes could build self-efficacy and confidence over time.

Fotonovela 2: Emphasizing Importance of Staying Home to Save Lives

As the situation evolved, it became clear that we would need to provide support for extended periods of physical distancing (also called “social distancing”) to slow the spread of the virus. There was the additional challenge of social isolation as a result of restricted movement outside the home due to self-imposed or mandatory precautionary measures. There is much evidence that social isolation (or a lack of social interaction) can have adverse health effects and even reduce life expectancy when it is experienced as loneliness. It increases risk of cardiovascular disease, cognitive decline and even weakens the immune system. A recent study compared the health effects of social isolation to be as damaging as smoking 15 cigarettes a day and this effect is particularly noticeable among seniors [17]. Social isolation in the era of COVID-19 adds an additional level of uncertainty, anxiety and fear that can quickly influence quality of life and well-being and start to impact mental and physical health. In response, we created Fotonovela 2, focusing on staying home whenever possible, keeping healthy physical separation from others outside the home, developing strategies to remain balanced and positive despite limited social contact, and finding ways to remain emotionally connected with friends and family using technology. The messages in Fotonovela 2 address the effects of limited social contact over several weeks and the impact of these restrictions on personal well-being and perceived loneliness.

There is strong evidence from psychology and behavioral economics [18] that people tend to engage in cognitive biases as part of the decision-making process in which we assess the probability of uncertain events using heuristic principles that might contain severe errors. One such cognitive bias or illogical heuristic is the *optimism bias* [19] where we underestimate risks when considering potential harm in the form of disease or catastrophe and also (erroneously) tend to believe that others are more likely to be impacted than ourselves. This is coupled with the *present bias* [20], which tends to over-value immediate rewards in the present (seeing friends at a get-together in two days) at the expense of long-term benefits (putting off the get-together so that everyone reduces chances of getting the virus). We believe that the prolonged nature and uncertain term of the stay at home requirements will only exacerbate these biases. In order to address both the *present bias* and the *optimism bias*, the consequences of not engaging in physical distancing are made particularly salient through the “Stay home, save lives” caption and mirror the messaging being promoted by the Centers for Disease Control (CDC).

Fotonovela 2 (see Figure 2 below) shows us four houses in a neighborhood and introduces us to the people in these homes. As the user scrolls down, a story unfolds behind closed doors and shares how people in a neighborhood are staying at home, coping with change, and finding ways to stay emotionally connected and positive. At the end of each story there are specific suggestions to

encourage users to explore new ways to stay actively engaged and develop a sense of routine even while being confined within one's home. By infusing the scenes with everyday examples of people making changes, expressing empathy and staying positive, a secondary goal is to build resilience and hope at a time of deep uncertainty. The primary goal is to overcome these biases, tap into prospect theory and loss aversion [21] and update risk assessment calculations so that individual decision-making and behavior more closely follow normative guidelines.

Figure 3: Text workflow introducing Fotonovela 2

Figure 4: Fotonovela 2: Stay Home, Save Lives

For Fotonovela 2, we used photographs instead of illustrations, presenting images of real people against simple backgrounds with thought and speech bubbles. This visual presentation is more

similar to the traditional printed (or paper-based) fotonovelas and presented the stories (within each vignette) with an element of humor and light-heartedness (having a dog speak, or the toddler having a design plan). The expectation is that the audience can relate to the situation presented in the first frame (the problem) but also can gain from the strategy offered in the subsequent frames (the solution). While each vignette ends with core points of the solution and related action suggestions, we rely on the visual story to carry the communication objectives: to convey a sense of togetherness, address doubts and apprehensions and provide concrete and positive ways to cope and build a sense of agency.

In addition to the fotonovelas, we created a series of check-ins via text messages with advice, suggestions and support on a range of topics including cooking ideas, exercising at home, importance of a daily routine, following a regular sleep schedule, suggestions to manage stress and increase mindfulness, and avoiding monitoring news reports throughout the day. The messages include links to helpful resources and were crafted to provide a lighter and more positive tone -- to help people reshape or reframe their day-to-day routines, even as they feel more cut off from social interactions and experience high levels of uncertainty about the future.

While Fotonovela 2 and the related text messages do not explicitly discuss COVID-19, and focus instead on supportive and empathetic content, we built extensive natural language understanding (NLU) to be able to recognize and address member questions and concerns relating to COVID-19. For example, if a member asked: “how do I know if I have coronavirus?” the NLU system would understand the question as “symptom related” and automatically respond with a message pointing them to the appropriate authoritative sources (e.g., CDC, health plan website, state website). This feedback system also allows us to add new content based on topics that were not included in the original program.

Early Feedback and Future Considerations

The mPulse Mobile platform delivers text messages to patients and members on behalf of health care companies. The platform consists of several components that together enable companies to interactively engage with their end-users about appointments, refills, gaps in care, or other health-related topics [22]. This was our first use of a mobile fotonovela to share important health information in order to address health beliefs, build self-efficacy and influence health behaviors. The characters in the visuals are culturally diverse, vary in age and gender, and communicate in English or Spanish. We are excited to find that this approach was effective in reaching over 100,000 health plan members across the age spectrum (as old as 97 years old) and in providing value to Spanish speakers and those who are negatively impacted by social determinants of health (who might also be encountering health disparities in outcomes and health access issues relating to COVID-19). We are unable to present detailed results due to clients’ confidentiality restrictions. Broadly, we measured number of views of the content, the satisfaction survey responses and opt-out rates. These metrics suggest a robust engagement across audience groups with this material.

Beyond COVID-19, our next step is to explore the ongoing use of these types of visual stories to build health literacy and awareness in other contexts. For example, is it necessary to get preventive screenings like mammograms when you feel healthy and nobody in your family has a history of breast cancer? Similarly, how do you decide whether to use a nurse line, urgent care or the emergency room when you feel sick after hours? We also want to consider tailoring the fotonovelas based on member demographics (age, gender, language, social determinants of health, health literacy) and psychographics (self-efficacy, health beliefs, stage of change) in order to build variations within story scenes based on these attributes, beliefs and preferences. We expect that this type of data-driven and artificial intelligence (AI) enabled segmentation will increase the relevance

of the fotonovelas and deepen engagement further. Finally, we expect to build our dataset of member responses so that we can rely more heavily on machine learning–based natural language processing to improve recognition accuracy and response handling.

We were able to quickly develop and deploy a text messaging and fotonovela outreach in English and Spanish to address concerns and influence behavior relating to the COVID-19 crisis. This program is a cost-effective and convenient solution for building health literacy and engaging with underserved, under-resourced and hard to reach populations. Member responses and engagement insights can be used to improve the design of future text and mobile friendly visual story-based solutions.

Acknowledgements
We would like to thank the following individual for their contributions to this project: Phil Louridas for technical support, program build and program monitoring; Jaimmie Gan and Erinn Macaulay for project support; Christian Elder for illustrations and concept development; Jeev Prayaga for graphic design support; and Leticia Cortes for Spanish translation.

Abbreviations
CDC: Centers for Disease Control
COVID-19: Coronavirus disease of 2019
HBM: Health Belief Model
NLU: Natural Language Understanding
SMS: short message service
WHO: World Health Organization

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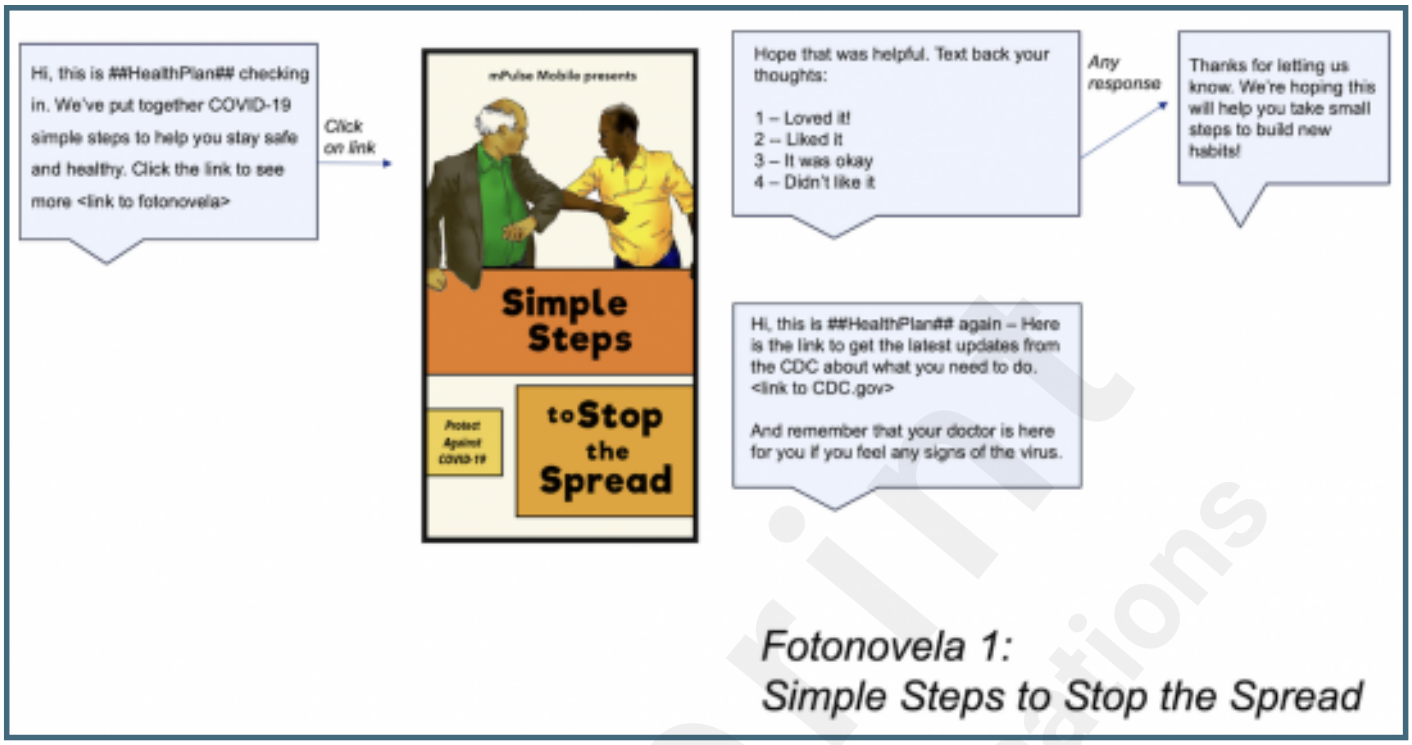
JMIR Mhealth Uhealth 2019;7(11):e15771

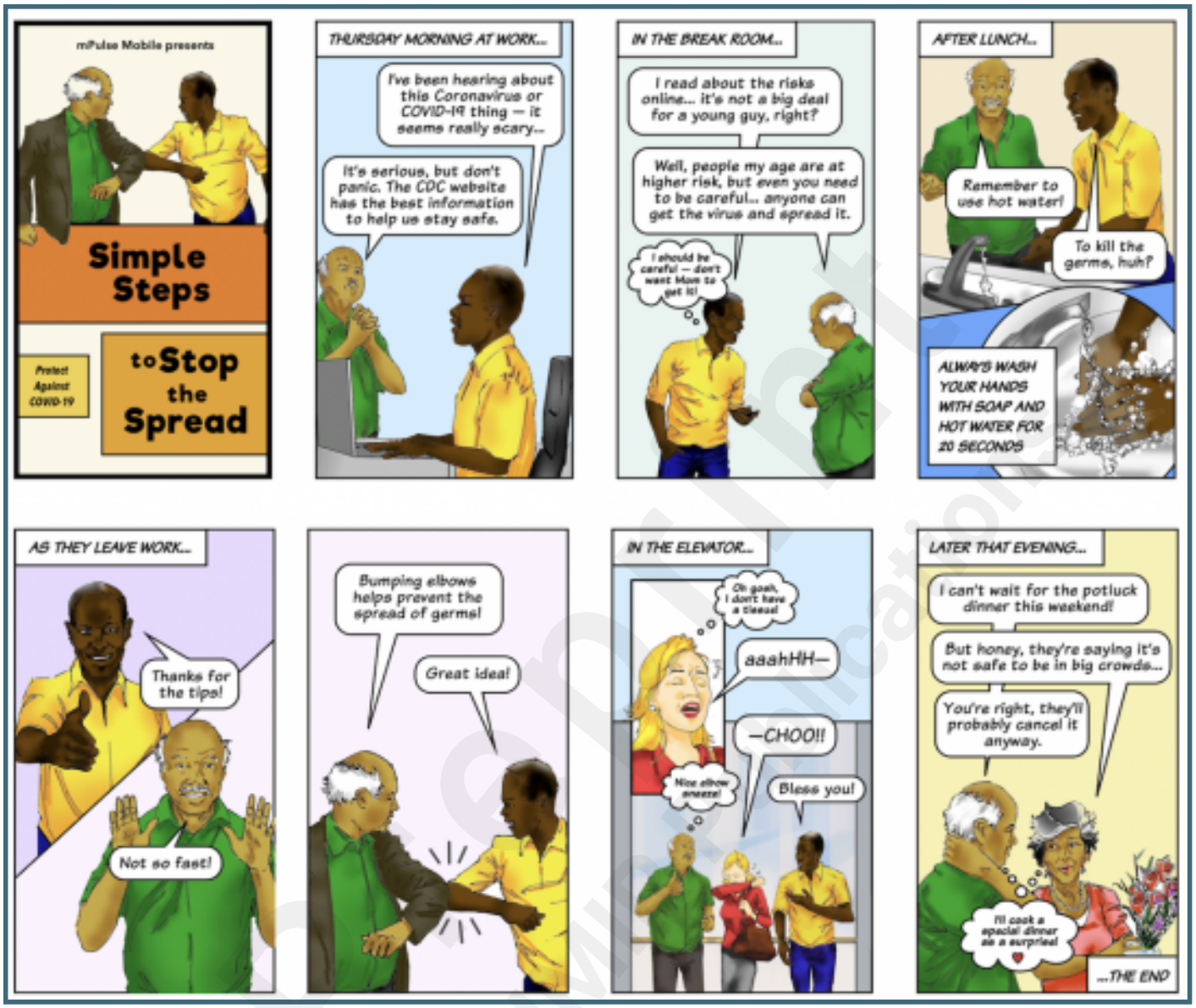
Supplementary Files

Figures

Text workflow introducing Fotonovela 1.



Fotonovela 1 - Simple Steps to Stop the Spread.



Text workflow introducing Fotonovela 2.

Fotonovela 2 - Stay Home, Save Lives.