

## Effect of Short Message Service Reminders on Adherence to Follow-up of National Annual Prostatic Digital Rectal Examination Campaign Participants: A Randomized Controlled Pilot Study

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**Introduction:** National annual prostatic digital rectal exam (DRE) campaign advocated by the Philippine Urological Association (PUA) started 2 decades ago in over 60 urological centers in the country. It is being used as a tool to educate Filipinos regarding benign and malignant prostate diseases. However, after each campaign, most patients were lost to follow-up leading to delay in diagnosis and low adherence to medications.

**Objective:** To evaluate the effect of short message service (SMS) in the adherence to follow-up of participants after a campaign.

**Methods:** The investigators enrolled 126 participants aged 40 years old and above with significant LUTS and/or a prostate cancer suspect, in a two-arm, parallel, randomized controlled pilot study at the Jose R. Reyes Memorial Medical Center (center with the most number of participants annually in the Philippines). Participants received daily SMS text messages for 3 days ( $n = 63$ ) or usual care ( $n = 63$ ). The primary outcome was follow-up at the outpatient clinic within 1 month after the campaign. The investigators used Epi Info version 7 to analyze the data.

**Results:** Among participants receiving SMS, 21/63 (33.3%) returned, compared to 5/63 (7.94%) in the control group. The relative risk [RR] = 4.2, odds ratio = 5.8 and uncorrected chi-square ( $X^2$ ) = 12.4, at 95% confidence interval;  $p = 0.000429$ .

**Conclusion:** This pilot study illustrated the feasibility of using SMS reminder among Filipino national prostatic DRE participants to improve adherence to follow-up. However, further research needs to be done to investigate the impact on adherence to medications and delay in diagnosis.

**Key words:** Short message service (SMS), digital rectal examination (DRE)

### Introduction

Short message service (SMS) is a text messaging service component of a web-based and/or mobile communication systems. SMS was the most widely used data application, with an estimated 3.5 billion active users, or about 80% of all mobile phone subscribers at the end of 2010. SMS is used for marketing, information campaign, and health education in different countries worldwide.<sup>1</sup> SMS could offer a convenient and cost-

effective way to support desirable health behaviors for preventive health care by addressing factors that lead to the onset of a disease, and by detecting latent conditions to reduce or halt their progression.<sup>2</sup> Low to moderate quality evidence also shows that SMS reminders increase attendance at healthcare appointments compared to no reminders, or postal reminders.<sup>3</sup> Hence, using this service would complement and further promote prostate health awareness even after the national DRE campaign.

National screening programs advocated by the Philippine Urological Association (PUA) were started 2 decades ago to catch the attention of a Filipino male individual by increasing their awareness about prostate diseases. It was held a day before Fathers' Day every June facilitated by urologists nationwide. In the Philippines, assessing men's health, particularly, prostate health condition has always been challenging due to the vast differences in the socioeconomic status, diverse culture and limited access to health care. Hence, newer approaches to complement and promote health care seeking behavior are the keys in improving men's health status.<sup>4</sup>

This research study determined the feasibility of measuring the effect of SMS in the adherence of participants with prostate diseases after a national prostatic DRE campaign. This was a pilot study in a urology training tertiary government hospital, which caters to the most number of participants perennially since the start of the National DRE screening in the country.

## **Materials and Methods**

This research was a two arm, parallel randomized controlled pilot study involving the participants of the National DRE Campaign 2015 with significant LUTS and/or a prostate cancer suspect screened at a urology training tertiary government hospital in the Philippines. The duration of the study was 16 weeks.

Participants were classified according to the following as previously defined by Chua, et al. 2014:

### **1) Target population for screening or not:**

Target population for screening was defined as Filipino males aged 40 years or older, who had no previous consultation for Lower Urinary Tract Symptoms (LUTS) or prostate cancer screening in the past 12 months.

### **2) Cases identified as significant LUTS or prostate cancer or not:**

Case of LUTS or prostate cancer was defined as Filipino males aged 40 years or older with IPSS

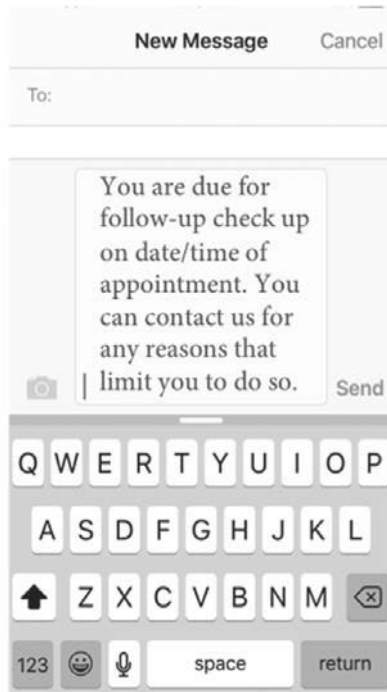
>7, or, has an abnormal DRE finding, which was defined as nodular, hard or tender prostate. However, a DRE finding of an enlarged prostate but non-nodular, doughy in character and non-tender was not considered as a case of LUTS or prostate cancer suspect.

One month prior to the actual event, all urology residents and consultants were reoriented for the proper completion of the National DRE Campaign data collection form prescribed by the Philippine Urological Association (PUA). The form included the participants' basic demographic data with cellphone numbers, questions on general medical history, and a locally validated and standardized Filipino version of the International Prostate Scoring System (IPSS) and DRE findings. On the same venue, the research forms such as a copy of the research protocol outline, consent forms and dummy tables were distributed.

On the National Digital Rectal Examination day, all participants were assisted to answer the Filipino version of IPSS followed by a general physical examination with DRE. The findings, prognosis and plans were discussed with the participants. The cellphone numbers of the participants were collected during the consultation. All participants meeting the inclusion criteria were asked to enroll in the study by signing a consent form. The demographics together with their DRE findings were collected.

The enrolled participants were randomly assigned after the collection of all the numbered consent forms to a control group (conventional follow-up without SMS reminder) and experimental group (follow-up with SMS reminder). The randomization was assigned using the Excel Randomization Tool. The experimental group received an SMS reminder in Filipino 2 days before the appointment date, one day before the appointment date and on the day of the appointment date for the participants to follow-up at the study site out-patient department for further intervention. The message content in Filipino was "Mayroon po kayong follow-up check up sa (date/time of appointment). Maaari po kayong magtext back kung hindi po kayo makakapunta sa inyong naka-schedule na appointment sa anumang kadahilanan na meron po kayo" (English version: You are due for follow-

up check up on date/time of appointment. You can contact us for any reasons that limit you to do so) (Figure 1). The date and time of participation in the study, follow-up schedule and actual follow-up were recorded.



**Figure 1.** Screenshot of the sample SMS reminder in English

## Results

The total number of participants (Table 1) recruited to join the pilot study was one hundred twenty six (126), which was 24% of the computed sample size. Among participants receiving SMS, 21/63 (33.3%) had their initial follow-up at the outpatient clinic, compared to 5/63 (7.94%) in the control group. The follow-up was within one month after the activity wherein the results of the PSA requested were retrieved and the initial medications prescribed were monitored for adherence and compliance. Patients with elevated PSA and/or DRE findings of nodular/hard prostate were advised transrectal ultrasound guided biopsy of the prostate. The patients in the experimental group expressed gratitude with the SMS reminder they received.

**Table 1.** Number of participants on the experimental and control group.

Variable With	Follow-up	No Follow-up	Total
With SMS (Experimental)	21 (33.33%)	42 (66.67%)	63
No SMS (Control)	5 (7.94%)	58 (92.06%)	63
Total	26	100	126

There was a 92% non-adherence to follow-up for the control group signifying the large number of participants that is annually lost and remain passive with regards to their prostate health. This same number would be the potential population that would benefit from the effect of an SMS reminder. The 66.67% non-adherence to follow-up despite the intervention of SMS reminder is found to be statistically significant using the Uncorrected chi-square ( $X^2$ ) = 12.4, at 95% ( $p < 0.05$ ) confidence interval with  $p = 0.000429$ .

The computed relative risk is 4.2 saying that there is a 420% probability that participant who received SMS reminder will follow-up after a National DRE campaign as compared to those who did not receive SMS. The odds ratio of 5.8 supports this claim signifying that participants exposed to the SMS reminder is 5.8 times more likely to follow-up as compared to the conventional practice.

## Discussion

Men's prostatic health was divided into malignant and benign diseases. Currently, the incidence rate of prostate cancer in the Philippines is continuously rising with estimated mortality rate of 5.3 per 100,000. Earlier estimates showed that 1 out of 100 males would have a likelihood of getting prostate cancer before age 75 with a reported median survival of 52 months and a 43% and 31%, 5-year and 10-year survival rates respectively.<sup>5,6</sup> On the other hand, benign prostatic hyperplasia (BPH) was considered a treatable condition through pharmacological therapy and/or surgery. However, adherence to

pharmacological therapy for BPH was low and could affect clinical outcomes. Long-term 5-alpha reductase inhibitors and combined therapy use was associated with an independent reduced risk of hospitalization for BPH surgery. Hence, there's a need for new strategies to increase patient adherence to prescribed treatment and more appropriate prescribing by physicians.<sup>7</sup>

Regular follow-up of patients can translate to improvement in adherence to prescribed treatment and ensure continuity of care especially for chronic prostatic disease. Short message system was effective in improving attendance rate in primary care and could be used as an alternative to conventional reminder system. It was also found to be as effective as telephone reminder in reducing non-attendance in patients who required long-term follow-up.<sup>8,9</sup> More so, it is cost-effective and showed promise in reducing non-attendance rates, as a result of texting appointment reminders to patients who persistently fail to attend their general practice appointments.<sup>10,11</sup>

There were no reports found regarding the use of SMS reminder system for the follow-up of patients with prostatic diseases using a MEDLINE search. However, its feasibility and acceptability for educational intervention had been already explored. It had served as 1) workshop reminders; 2) post-workshop message reinforcement; 3) spiritual / motivational messages; and 4) participant retention. In other studies, it was effective in encouraging exclusive breastfeeding practices in China improved medical adherence and clinic attendance of epileptic patients and improved follow-up adherence of pediatric cataract patients.<sup>12-14</sup>

Most studies indicated poor knowledge levels among men regarding prostate cancer with mild to moderate beliefs and intentions to screen for prostate cancer.<sup>15</sup> This was addressed by utilizing SMS and had been acceptable and feasible in educational healthcare interventions about prostate cancer among African American adult male population.<sup>16</sup> Its use in addressing reduced access and continuity of medical care for prostate disease positive individuals can also further reduce the gap between patient-provider communications.

The results of this research will significantly help the participants to remember their appointments in the future at the same time monitor their compliance to medications prescribed during the campaign. These results will be forwarded to the organizer of the event for a possible adaptation of practice and further conduct a multi-institutional study to determine the variables affecting the non-adherence to follow-up and impact on adherence to medications.

## Conclusion

This pilot study illustrated the feasibility of using SMS reminder among Filipino national prostatic DRE participants to improve adherence to follow-up. However, further research needs to be done to investigate the variables of non-adherence to follow-up, impact on adherence to medications and the delay in diagnosis.

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