

A Study on the Role of Mobile Phone Communication in Tuberculosis DOTS Treatment

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ABSTRACT

Background: Every year, a lot of Tuberculosis (TB) patients undergo Directly Observed Treatment Short-course (DOTS) in Salem city, one of the high TB districts in South India. Mobile phone usage among these patients and health workers is common. Mobile phone communication has a great potential in TB treatment. **Objectives:** To analyze the mobile phone usage and its effectiveness in TB DOTS treatment. **Materials and Methods:** A cross-sectional survey with 150 TB patients was followed by a focus group discussion with treatment supervisors, DOTS providers, and health workers. **Results:** Majority of patients use mobile phones to make calls to health workers to clarify their doubts on side effects, food, and symptoms of the disease. TB treatment supervisors effectively use mobile phones to counsel patients to adhere to the treatment regimen. Patients see mobile phones as a useful communication tool in TB treatment though they prefer direct interpersonal communication with health workers. Though the mobile ownership is 68% among the TB patients, many of them are not able to send text messages or read messages in English. **Conclusion:** Mobile phone possession and usage is high among the patients. Patients need to be trained to use mobile phone features such as alarm, voice mail, and interactive voice response. Incentives like free talk time and short message service (SMS) will encourage patients to communicate frequently with health workers, thereby, increasing the chances of better adherence to DOTS. SMS could be made available in the regional languages.

Keywords: Adherence, DOTS, health communication, mobile phones

Introduction

The World Health Organization (WHO) and United Nations Program on Human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) (UNAIDS) have deemed that stepping up telecommunications technology in resource-constrained healthcare settings is a priority.⁽¹⁾ Many countries have started to use the telecommunications especially mobile communication in the healthcare sector. Now mobile communication is revolutionizing economic and social life in India.⁽²⁾ India has the world's second-largest mobile phone user base.⁽³⁾ Low-cost mobile handsets

and affordable airtime rates made it easy for anybody to possess mobile. It has created new opportunities to reach and improve healthcare services.⁽⁴⁾

Tuberculosis (TB) is an infectious disease requiring prolonged treatment. Poor treatment can increase the risk of mortality and spread of disease.⁽⁵⁾ Since the treatment course for this disease is of longer duration, patients have to stay motivated to complete the treatment period. Directly Observed Treatment Short Course (DOTS) providers are supposed to monitor them almost every day and it is unrealistic to supervise all the patients on a daily basis. Mobile phones can help overcome the barriers such as stigma, privacy loss, and transportation limitations associated with the traditional interventions.⁽⁶⁾ It is an easy and cost effective way to communicate and monitor patients in remote locations. Short message service (SMS) texts can be used as reminders to take their regular medications. Patients can be motivated to adhere to the treatment course and their doubts can be cleared.⁽⁷⁾

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South Africa's mobile initiative project-2006 has proved that the mobile phone communication is more effective and it also saves the patients' time and money.⁽⁸⁾ Compliance rate increased from 40% to 90% with SMS reminders.⁽⁹⁾

The Massachusetts Institute of Technology's (MIT) X Out TB program makes use of text messages in treatment monitoring.⁽⁷⁾ A similar mobile biometric technology was recently initiated in India to monitor 3,000 TB patients in New Delhi.⁽¹⁰⁾ Text messages are also helping some AIDS patients in Australia with medication adherence.⁽¹¹⁾

Mobile communication devices have a very good potential in India as the penetration is very high even in rural areas. In spite of the efforts to control TB by the government and non governmental agencies, the cases have not really come down. In this scenario, there is a need to study the effective use of a mobile in TB treatment.

This study was conducted at Salem city in south India among the patients and Revised National TB Control Program (RNTCP) health workers to find out the mobile phone usage during DOTS treatment. The objectives of the study are to understand the mobile phone usage pattern among the patients and to analyze its effectiveness in the DOTS treatment.

Materials and Methods

Number of patients registered for TB DOTS treatment was 3,085 during 2011-12 in the Salem district.⁽¹²⁾ Among them, 150 patients were randomly selected from five centers and surveyed. A questionnaire in Tamil language was used to gather data. Qualitative data was collected through a focus group discussion among RNTCP supervisors (12), DOTS (4) and health workers (4). The study was conducted in February 2012.

A total of 150 patients (85 men and 65 women) aged between 25 years and 62 years were surveyed. Most of them were illiterate and some have education up to secondary school level. Many patients were from the semi-urban and rural background. About 50% of the women were homemakers and the rest were daily wage workers. Most of the men respondents were laborers and semi-skilled workers.

Results and Discussion

Mobile phone ownership and patients

About two-thirds of the patients have their own mobile phones and use it regularly [Table 1]. Thirty-two percent of the patients do not have mobile phones, but they are using mobiles phones of family members and

Table 1: Mobile phone usage pattern among TB patients undergoing DOTS (N-150)

Variable	n (%)
Mobile phone ownership	102 (68)
Making a call on mobile	107 (71.3)
Understanding text messages	48 (32)
Sending text messages	18 (12)
Calls received from Health workers in a fortnight	
>5 calls	12 (8)
2-5 calls	70 (46.7)
<2 calls	50 (33.3)
Nil	18 (12)
Patients making calls to health workers/ DOTS providers in a fortnight	
>5 calls	12 (8)
2-5 calls	63 (42)
<2 calls	39 (26)
Nil	36 (24)
Communicating with fellow patients	28 (18.7)
Using mobile phone features*	
Alarm	36 (24)
Radio	39 (26)
Voicemail	2 (1.3)
Interactive Voice Response (IVR)	2 (1.3)

*Multi responses

friends. Mobile ownership is an important factor as it is related to making and receiving calls directly to/from the health workers. Family members and friends can also play a role in the treatment indirectly with their mobile phones.

Making calls on the mobile

Most of the patients (71%) can make calls on their own [Table 1]. About 29% have difficulty in dialing numbers and those can only receive calls from others. But most of these patients know how to make calls from a landline. The patient's inability to read English commands and instructions on the mobile seems to be one of the main reasons for this. But the visual icons are more easily understood by the users and with regular use they find it easier to make calls.

Understanding and sending Short Message Service

Only 32% of patients can read and understand English Short Message Service (SMS) and 12% can send [Table 1]. More patients can use this facility if the mobile phones and service providers offer Tamil language SMS facility. Pictorial messages could possibly obviate the problem of text messages if participants are trained to use the function.⁽⁶⁾

Patients and health workers communicating on mobile

Majority of the patients receive calls from the health workers and 8% of the patients get calls at least five times in a fortnight enquiring about their health and

medication. Twelve percent of the patients do not receive any calls. One-fourth of patients do not make any call to the health workers, 42% call them 2-5 times in a fortnight. About 26% call them once or twice, while 8% of the patients call the health workers five times in a fortnight. Few patients make calls to health workers from public call offices (PCO). Encouraging the patients to share their experiences through mobile phones can have a positive effect in the treatment.

Patients using alarm, Frequency Modulation (FM) radio, voicemail facilities

Only about one-fourth of the patients are familiar with setting alarm and listening to FM radio on the mobiles [Table 1]. Patients are not making use of the other features like voice mail and conference. Only few of them seem to be aware of any interactive voice response facility.

Patients receiving calls by the health workers through mobile phones

About 52% of the patients get calls from the health workers mostly regarding side effects like acidity and vomiting sensation due to medication [Table 2]. A study done in Agra identified side effects following medication was the most important reason for dropouts from treatment. Lack of awareness about the duration of the treatment and importance of full treatment were other important reasons.⁽¹³⁾ Twenty-two percent of the patients said they get advice about eating nutritious food and about the disease in general. Some patients (28%) get counseling through mobiles.

Patients seeking assistance from health workers

Many patients (62%) make calls to health workers regarding side effects [Table 3]. Around 20% clarify their doubts about food and the disease. As seen in Table 1, 24% of the patients do not make any calls to health workers. These patients need to be encouraged to call at least once in a week and seek counseling whenever necessary.

Mobile and interpersonal communication

About 71% of patients [Table 4] prefer direct, personal visits by the health workers. 18% prefer mobile communication while some patients (11%) are open to both interpersonal and mobile communication. Most of them feel they can clear their doubts in a better manner through direct, interpersonal communication. With the increase of mobile phone ownership, mobile communication is likely to increase among the patients.

Mobile phone as an effective tool in TB management

Almost three-fourths of the patients see mobile phones as a useful communication medium in the treatment [Table 5]. The patients who own mobile phones are

Table 2: Patients receiving calls/monitoring by the health workers through mobile phones* (N-150)

Variable	n (%)
Side effects of the drugs	78 (52)
Food	33 (22)
Medication and disease	33 (22)
Counseling	43 (28)

*Multi responses

Table 3: Patients seeking assistance from health workers* (N-150)

Variable	n (%)
Side effects of the drugs	93 (62)
Food	30 (20)
Medication and disease	33 (22)
Counseling	12 (8)

*Multi responses

Table 4: Mode of communication preferred by patients (N-150)

Variable	n (%)
Direct visit	106 (70.7)
Mobile Phone	27 (18)
Both	17 (11.3)

Table 5: Usefulness of mobile phone according to the patients (N-150)

Variable	n (%)
Very useful	63 (42)
Useful	46 (30.7)
Maybe	35 (23.3)
No	6 (4)

already using it to communicate with health workers. Around one-fourth thinks of it as a potential tool in TB treatment. Their attitude towards this new communication device will change positively with more ownership and usage.

Results from focus group discussion (FGD)

All the RNTCP Health workers use their mobile phones on a daily basis to interact with patients. They get daily updates about the patient's attendance and medication in the mornings from DOTS providers. Any unusual side effects notified from the patient's side are immediately reported to the health workers and they advise the concerned patients through mobile phones.

Health workers observe that many patients do not pick up their phones when they are working and some patients do not carry their phones with them. Many patients are not good at using mobile phones. They do not notice the missed calls. Most of the patients seem to have mobile phones and health workers have spoken to them at least once during the course of treatment.

All the participants opine that RNTCP should get mobile phones for all the patients free of cost. They also feel that other incentives like free talk time should be given to them. The health workers feel that they tend to talk longer on the phone when they are counseling the patients.

Most of the patients call the health workers regarding the side effects like vomiting sensation, acidity, allergy, and food-related questions. Health workers advice the patients and follow up on them through mobile phones. All of them feel that alarm function can be used as reminders to go to the DOTS centers to take their medications. An automated reminder service on the mobile can also facilitate the adherence.

There seems to be many queries from patients regarding the correct primary health centers where they are supposed to take their medication regularly. Health workers observed that they mostly get calls from patients whom they have visited personally at least a couple of times. They feel that 4-6 weeks after patients start the DOTS medication many tend to drop out of the treatment course. That is a crucial period when health workers should call and motivate them to complete the treatment. Mobile and other communication tools can be effective for the creation and consumption of persuasive and motivation content.⁽¹⁴⁾

Mobile phones are used to track the patients when they are on the move and when they give incorrect address. Sometimes health workers counsel the family members of the patients through the phone and educate the family about prevention and importance of the treatment.

All the health workers feel that there is a strong stigma attached to TB disease and patients do not want others to know about their health status, so they prefer talking on mobile phones to personal visits.

Health workers feel that their daily schedule is not as tough now because of mobile phones. It has really made it possible to stay in touch with all the patients. Health workers can track and communicate with patients living in remote places.

All health workers communicate with 15-20 patients through mobile phones in a day on an average. The patients really feel the need for a dedicated health worker who can clear their doubts, provide counseling to them round the clock.

Conclusion

The role of mobile phones in promoting adherence to TB DOTS medication is gaining importance in our country. India is particularly suited for a mobile phone-based

intervention given the widespread connectivity, low costs, and growing popularity. Health education and communication will reach a larger audience, if the SMS is made available in regional languages. If the patients are trained to use mobile phone functions such as voice mail, interactive voice response and conference facility without any difficulties then health communication can reach greater heights. TB patients feel the need to talk to health workers about their problems often and mobile phones can fulfill this function. Incentives like free talk time/SMS will also increase the effectiveness and reach of the treatment. Enlightening the family members along with patients through the mobile phones is also a good strategy to control the disease.

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