Preparing Short Message Service Reminders to Improve Treatment Adherence among Tuberculosis Patients in Sleman District, Indonesia

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Abstract

Background: Modern tuberculosis (TB) treatment approaches require innovative adherence strategies. **Objectives:** This study aimed to explore the feasibility of using short message service (SMS) reminders through mobile phones to improve treatment adherence among TB patients. **Materials and Methods:** An exploratory sequential design was applied; initially, qualitative data collection was conducted among TB patients and TB program officers. A content analysis was done and messages were then developed. The messages were pretested using focus group discussions (FGDs), and a quantitative method using quasi-experiment on 120 TB patients. All the patients received a standard directly observed therapy short reminder, but only intervention group received daily SMS reminders (*n* = 60), the data were then analyzed using logistic regression. **Results:** Reminder messages can be sent directly to young TB patients or indirectly to the relatives of elderly patients. There are four phases of emotional states, which TB patients go through during treatment starting with disappointment and desperation after being diagnosed, grievance during the initiation of treatment, high and then low desire to follow treatment. Reminder messages aimed at improving treatment adherence should correspond to those conditions and motivate, inform, and facilitate TB patients to overcome all the obstacles during treatment. SMS reminders should also be short, informal, and easy to understand. Treatment adherence was significantly higher among the intervention group compared to the control group (odds ratio = 10.73) after controlling for demographics, accessibility, and adverse drug reaction. **Conclusions:** SMS through mobile phone is a feasible form of media to remind TB patients and to improve adherence to treatment in low-resource facilities.

Keywords: Mobile phone use, preparing messages, short message service reminder, treatment adherence, tuberculosis treatment

Introduction

Globally, tuberculosis (TB) is one of the leading causes of death which is responsible for 1.7 million deaths in 2017.[1] The long duration of TB treatment leads to a high level of nonadherence, especially during the first 2 months of the intensive treatment phase when patients should take anti-TB drugs daily.[2]

The nonadherence to treatment can increase transmission, drug resistance,[3] the need for more expensive treatment,[4] and mortality. A reminder system which uses innovative adherence strategies involving simple communication technology is important for managing nonadherence problems in low-resource facilities with limited numbers of health officers and incompetent direct observers.

The studies have shown that sending short message service (SMS) reminders through mobile phones could increase treatment adherence at a relatively low cost.[5] The percentage of people in Indonesia who own a mobile phone is high (84% in 2012).[6] Before a large-scale program is carried out, a pilot feasibility study must be done to ensure effectiveness.

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This study aimed to explore the feasibility of SMS reminders to improve treatment adherence among TB patients. We investigated the extent to which the SMS reminder was suitable and likely to be used by TB patients, developed appropriate messages and system to deliver the SMS reminder,[7] and to measure the effectiveness of the SMS reminder.

MATERIALS AND METHODS

This study uses an exploratory sequential design[8] using a qualitative study, followed by a quantitative study. Qualitative data were collected to explore the acceptability and demand of SMS reminders among TB patients and to identify suitable reminder messages. This was followed by a small-scale posttest only, quasi-experimental study to measure the effectiveness of the SMS reminder system on treatment adherence. This study was conducted in Government-Own Primary Health Cares, the Sleman District Hospital, and the Community Pulmonary Health Service Unit in Sleman District, the Northern part of Yogyakarta Special Province in Java Island, Indonesia.

Qualitative data were collected among informants who were selected purposively with maximum variation sampling according to sex and age. The informants were 32 TB patients (aged 18–61 years, consisting of 17 men and 15 women), 25 primary health center (PHC) staffs, 10 officers from public and private hospitals, and 1 staff from a community pulmonary health service unit. Overall, ten FGDs and five in-depth interviews were conducted.

After individual informed consent was granted, the FGD and interviews were conducted, recorded verbatim, then transcribed, and analyzed. From the transcript, meaning units were identified and open coded, then similar codes were put into categories.[9] With consideration to the results of the qualitative data analysis, the fourth author drafted the messages, all other authors were revised the language. The messages then were pretested in four FGDs with TB patients.

The researchers consisted of different backgrounds to enable triangulation: two physicians, two nurses, one social scientist, two undergraduate nursing students, and one postgraduate public health student who was also a district health officer in charge of TB program manager in Sleman.

SMS reminders were then pretested in a small-scale quasi-experimental study involving 60 TB patients in the intervention group receiving daily SMS plus standard directly observed therapy short (DOTS) reminders, and 60 patients in the reference group receiving only standard DOTS reminders. Source of 60 out of 120 participants from Sudiya S *et al*.[10] The sample size was determined based on the availability of resources. The samples were selected consecutively with the inclusion criteria of being newly diagnosed patients who started their treatment in a PHC in the Sleman District, were above 18 years of age, and agreed to participate in the study. The exclusion criteria were having complications. The selection of TB patients was done by systematic random sampling at the time of diagnosis in health services, while the allocation was done purposively. TB patients who were diagnosed from May 1, 2014, to June 30, 2014 were recruited as a control group, and the intervention group was recruited from November 1, 2014, to December 31, 2014 [Figure 1]. Researcher defined the random allocation of TB patients; the physician at the health facilities did the enrolment. The treatment adherence measurement was done by TB program officer in all health facilities who unaware of the random allocation of TB patient.

Treatment adherence was identified if the length of treatment was 56 days. To measure the effectiveness of SMS reminders on treatment adherence, some possible confounders were measured using questionnaire at the health-care facilities by health officer: demographic factors (age, sex, education, occupation, and income), accessibility (available mode of transportation and time to reach a health facility), and adverse drug reactions. A multivariate analysis with logistic regression was conducted using Stata version 14 (StataCorp LP, College station, Texas, USA) to test the relationships between the type of intervention and treatment adherence controlling for the possible confounders.

Ethical clearance was granted by the Ethical Committee, Faculty of Medicine, Public Health and Nursing, UGM number KE/FK/35/EC, and individual written informed consent was obtained from each recruited TB patients.
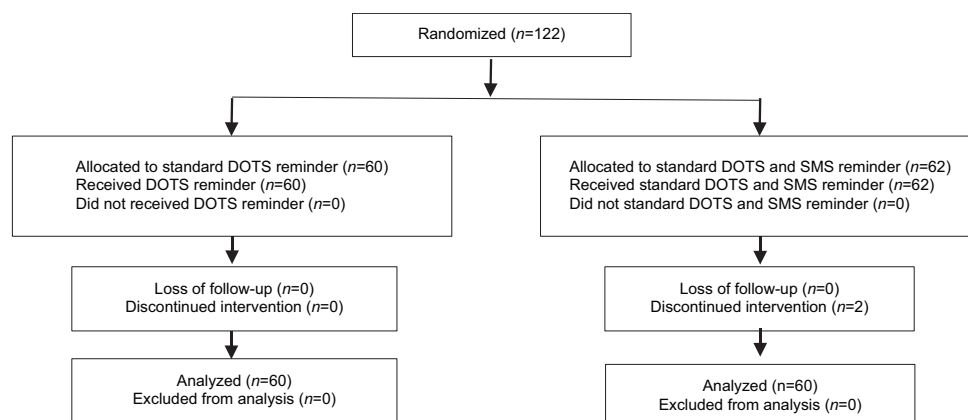

Figure 1: Participants flow of intervention and control groups

RESULTS

How do tuberculosis patients utilize mobile phones?

Four categories arose to describe how TB patients utilized their mobile phones: (1) purpose of using mobile phones, (2) perceived benefit of using mobile phones, (3) mobile phone dependency, and (4) ability to use mobile phones.[11]

All of the informants used mobile phones as a means of communication. Elderly informants confessed to difficulty in reading messages, that is, reading small text in close proximity. They also admitted difficulties making regular phone calls and preferring instant calls instead. On the other hand, young informants used mobile phones as a means of building or maintaining their social networks, either through SMS messages, phone calls, or the use of various social media and entertainment.

In general, informants admitted to the benefits of using mobile phones such as supporting their jobs and getting in touch with social networks, but occasionally informants felt disturbed by their mobile phones, i.e., when there were untimely, inappropriate, or unauthorized phone calls or messages.

Dependency toward mobile phones and the ability to use them varied according to age. The younger were more dependent and had more advanced abilities to operate them. Older informants shared their mobile phones with other family members and needed help from their younger relatives to operate them.

Tailoring reminder messages

In structuring the messages, three subcategories emerged from the codes on how to design the message. These were the nature of the messages (short, easy to understand, and informal), motivating characteristics (inviting and positive statement), and words showing respect (salutation, using Mr/Mrs/Miss, and avoid "TB patient").[12]

There were four emotional states, TB patients went through according to the treatment phase. After being diagnosed with TB, they felt disappointed and desperate, they were afraid of being labeled as TB victims. The feeling then changed into grievance during treatment initiation because of side effects from the anti-TB drugs. Once they managed their side effects well and believed that their illness was curable, TB patients had a high desire to follow the treatment regimen. Finally, a low desire to follow the treatment regimen as they experienced improved health.

This study found three different contents of messages that can be developed as reminders: motivational messages, regular reminders, and informational messages. The contents of these messages were mapped according to the TB patient's emotional state [Table 1]. For the first emotional stage of feeling disappointed and desperate, suitable messages should be motivating and convince the recipients that TB can be cured. The second phase, another pessimistic time. Therefore, informational messages about side effects and how to manage them was appropriate. The third phase of confidence is a time when information about regular treatment and prevention of transmission could be emphasized. Finally, the fourth phase of pessimism or low desire at the end of intensive phase treatment, which requires emphasis on information about long term and regular treatment.

We tailored and arranged 100 messages for daily delivery according to the emotional state of the patients. These messages were pretested among TB patients. Revisions were made. For example, the word "regular" was rewritten with capital letters as "REGULAR," and the word "6-month treatment," which may create a burden to the patient due to the long treatment duration, was paraphrased. After revision, 56 and one closing messages were ready to be sent daily to TB patients during the intensive phase [Table 2].[12]

Delivering short message service reminders

For the intervention group, a system was built by installing an SMS gateway application program in a PC, recording the mobile phone number of all TB patients, recording all messages, and scheduling messages to be delivered daily [Appendix]. Then, automatically reminder message was delivered daily to all TB patients' mobile phone.

Effectiveness of short message service reminders on improving treatment adherence

A comparison done between the intervention and control group in terms of predictors: demographic characteristics, health-care accessibility, and whether the patients experienced side effects [Table 3].[10] Logistic regression shows that the only significant difference between groups was in the proportion of patients

Table 1: Pattern of emotional states of tuberculosis patients and suitable message content

n	Content of message	Emotional states			
		Upset and desperate	Grave	High desire	Low desire
1	Motivating that the illness was curable	✓✓	✓		
2	Treatment suggestion	✓	✓✓		
3	Visit schedule and drug pickup schedule	✓	✓✓		
4	Manage problems		✓✓		
5	Side effect		✓✓	✓	
6	Physical activity		✓	✓✓	
7	Nutrition intake		✓	✓✓	
8	Transmission prevention			✓✓	✓✓

✓: Low intensity, ✓✓: High intensity

Table 2: Message topics for tuberculosis patient during their intensive phase

n	Topic	Sample of message
1	Motivating	Good morning (Mr/Mrs/Miss). Previous patient experience: "after taking medicine regularly, I am cured from TB" (health officer)
2	Treatment	Good morning (Mr/Mrs/Miss). Only by taking medicine regularly, will TB germs die (health officer)
3	Visit and pickup schedule	Good morning (Mr/Mrs/Miss). By taking the medicine in a primary health care or hospital as you are scheduled, you will have an easy and fast process (health officer)
4	Manage problem	Taking the medicine with an empty stomach, without taking any food will increase the action of the medicine. Have you taken your medicine this morning? (health officer)
5	Side effect	Good morning (Mr/Mrs/Miss). If you get reddish coloration of your urine, no need to worry. Let's continue the treatment (health officer)
6	Physical activity	Good morning (Mr/Mrs/Miss). Let's take medicine regularly, completely! The body will be healthy, will be active again and your family will be happy (health officer)
7	Nutrition intake	Good morning (Mr/Mrs/Miss). Consuming a lot of fruit and vegetables will improve your health and help you get cured (health officer)
8	Transmission prevention	Good morning (Mr/Mrs/Miss). To prevent transmission, sputum should be thrown in a jar containing sand submerged with bayclin and closed (health officer)

Full list of reminder messages available online https://drive.google.com/open?id=1q4nBGqpnhCvctoniwhdaxKRtl2p7PzeO. TB: Tuberculosis

Table 3: Comparisons of characteristics: demographics, health-care accessibility, and side effects among the intervention and control groups

Variable	Group	
	Intervention, *n* (%)	Control, *n* (%)
Age (year)		
18-55	47 (78.33)	51 (85.00)
>55	13 (21.67)	9 (15.00)
Sex		
Man	28 (46.67)	42 (70.00)
Woman	32 (53.33)	18 (30.00)
Education		
≥Senior high school	40 (66.67)	46 (76.67)
≤Junior high school	20 (33.33)	14 (23.33)
Occupation		
Employed	35 (58.33)	33 (55.00)
Unemployed	25 (41.67)	27 (45.00)
Household income		
≥1 million/month	14 (23.33)	20 (33.33)
<1 million/month	46 (76.67)	40 (66.67)
Distance to health facility		
Close	48 (80.00)	47 (78.33)
Far	12 (20.00)	13 (21.67)
Transportation equipment		
Motorbike and car	54 (90.00)	57 (95.00)
Bike and public transportation	6 (10.00)	3 (5.00)
Time to health facility (min)		
<30	51 (85.00)	50 (83.33)
≥30	9 (15.00)	10 (16.67)
Side effect		
No side effect	27 (45.00)	30 (50.00)
At least one	33 (55.00)	30 (50.00)

adhering to treatment (odds ratio [OR] = 7.88 ± 2.94–21.07). No significant differences were found in the other predictors. A greater likelihood of adhering to treatment among TB patients was found in the intervention group (OR 10.73 ± 3.64–31.66) compared to the control group after controlling for other predictors [Table 4].[10]

DISCUSSION

This study showed that TB patients had different emotional states requiring different type of messages. Desperation, fear, and grievance at the beginning of the treatment require motivational and informative messages about the treatment course and side effects. High motivation during the intensive phase treatment requires continuous information about taking medication regularly and how to prevent transmission. Finally, low motivation at the end of the intensive phase emphasizes the importance of taking drugs regularly and the long period of treatment. This finding is in line with the transtheoretical model by Prochaska who suggests to tailor a suitable intervention to certain psychological conditions of the client such as precontemplation, contemplation, preparation, action, and maintenance.[13]

Mittal and Gupta[14] emphasized that education should be given at the beginning of the treatment, describing the overall treatment, possible side effects, and other barriers that might hinder adherence during the long treatment period. This should be done periodically. This study also found that encouraging (positive) messages were more preferable for creating behavior adoption than discouraging (negative) messages, which create fear and might intensify the negative stigma of a TB patient. This finding is in line with the persuasive health message theory which underlines the importance of illustrating the possible health risks and treatment efficacy.[15] During the end of the intensive period, patients recognized that they felt better and usually considered the treatment to be sufficient. This misinterpretation was also identified by Cramm *et al.*, especially during the continuation phase.[15] Raguenaud *et al.*[16] demonstrated that communication with TB patients on a daily basis by health-care workers yielded high-TB treatment compliance. Mkopi *et al.*[17] emphasized the importance of health education to improve awareness to cure the disease and foster adherence over the long period of treatment. Farooqi *et al.* found that SMS reminders for TB patients were feasible and considered as care and support for TB patients.[5] Similar results were found in SMS reminders for HIV/AIDS patients in Mozambique, an illness with stronger stigma.[18]

Table 4: Crude and adjusted odds ratios of predictors for treatment adherence

Predictor	Crude OR (95% CI)	Adjusted OR (95% CI)
Intervention group		
Control	1.00	1.00
Intervention	7.88 (2.94-21.07)	10.73 (3.64-31.66)
Age		
>55 year	1.00	1.00
18-55 year	0.94 (0.33-2.64)	0.95 (0.24-3.79)
Sex		
Woman	1.00	1.00
Man	1.22 (0.54-2.75)	0.60 (0.21-1.74)
Education		
≤junior high school	1.00	1.00
≥senior high school	1.31 (0.55-3.10)	1.84 (0.55-6.16)
Occupation		
Unemployed	1.00	1.00
Employed	0.63 (0.28-1.43)	0 0.53 (0.18-1.57)
Household income		
<1 million/month	1.00	1.00
≥1 Million/month	0.76 (0.32-1.81)	0.90 (0.30-2.65)
Distance to health facility		
Far	1.00	1.00
Close	0.57 (0.19-1.66)	0 0.74 (0.19-2.94)
Transportation equipment		
Bike and public transportation	1.00	1.00
Motorbike and car	0.71 (0.14-3.58)	0 0.72 (0.09-6.00)
Time to health facility		
≥30 min	1.00	1.00
<30 min	0.63 (0.19-2.06)	0 0.72 (0.16-3.26)
Side effect		
At least one	1.00	1.00
No side effect	1.69 (0.75-3.81)	1.64 (0.62-4.30)

OR: Odds ratio, CI: Confidence Interval

Stigma toward TB patients remains present, as reflected by the statement to avoid the used of "TB patient" in the SMS. Stigma creates an additional psychological burden, especially when the patient is first diagnosed. Fear of becoming the subject of gossip is another reason for TB stigma, and only 3.7% of the population in South Africa disregard that fear.[15] Health education is critical in convincing TB patients that TB can be cured.

This study showed that the age of the patient is an important factor influencing the ability to receive the reminder.[11] This is in accordance with a study by Lei *et al.* which found age to be a factor in sending SMS reminders.[19] Age is related to the ability to operate a mobile phone, which in turn is related to the feasibility of sending SMS reminders.[20]

Due to the disruption caused by unwanted promotions or fraud through mobile phones, it is important to show the credibility of the sender and gain permission to send the SMS. Previous studies have found that 65%–91% of cell phone users decline to receive SMS reminders.[19-21] Approval to participate from the recipient is important, as Albino *et al.* found that a positive perception toward SMS reminder acceptance influences treatment adherence among TB patients.[22]

This study showed that SMS reminders significantly improved treatment adherence among TB patients during the intensive phase. Although reminders are acceptable for most TB patients, direct communication is preferred.[20] SMS reminders delivered through mobile phone is not intended to be a stand-alone intervention, but as an addition to the standard DOTS reminders given face to face.

This study is limited due to the few TB patient informants attending the FGDs, which might be related to the TB stigma. To overcome these challenges, further in-depth interviews were conducted. Another limitation is the measurement of treatment adherence based on the length of treatment due to limited resources. Electronic measurement devices or standardized measurement questionnaire such as Morisky Medication Adherence Scale-8[23] is recommended for the future study. We tried to identify any harm and unintended consequences of being uncomfortable with receiving SMS every day, but this was not found in this study.

CONCLUSIONS

SMS reminders on mobile phones are feasible to improve treatment adherence among TB patients, however, for use on older patients need help from a younger relative. The messages for the reminders should be short, easy to understand, informal, and developed according to fluctuations in emotional states of TB patients, starting from disappointment and desperation, grievance, high desire, and low desire to complete treatment. Although SMS reminders are not popular nowadays, the emotional states and corresponding messages found in this study can be applied when developing reminder messages through other platform in a smartphone.

Conflicts of interest

There are no conflicts of interest.

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Appendix: Reminder messages for tuberculosis patient during their intensive phase

n	Messages
1	Good morning (Mr/Mrs/miss) (name), during these 2 months we will remind you to take medicine. This medicine is taken once a day, 2 h before breakfast (health officer)
2	Good morning (Mr/Mrs/miss). If you get reddish coloration of your urine, no need to worry. Let's continue the treatment (health officer)
3	Good morning (Mr/Mrs/miss). Previous patient experience: "After taking medicine regularly, I am cured from TB" (health officer)
4	Good morning (Mr/Mrs/miss) data showed that: Most of TB patients are completely cured after taking medicine regularly for 6 months (health officer)
5	Good morning (Mr/Mrs/miss). To prevent transmission, sputum should be thrown in a jar containing sand submerged with bayclin and closed (health officer)
6	Good morning (Mr/Mrs/miss). If you are cured from TB, your family will be happy (health officer)
7	Good morning (Mr/Mrs/miss). Do not mind with the size of the medicine, but how useful the medicine is for your health (health officer)
8	Good morning (Mr/Mrs/miss). Previous patient experience: "I am happy after I know that TB can be cured" (health officer)

Appendix: Contd...

n	Messages
9	Good morning (Mr/Mrs/miss). Previous patient experience: "I am sure and believe, I will be cured from TB" (health officer)
10	Good morning (Mr/Mrs/miss). Only by taking medicine regularly, will TB germs die (health officer)
11	Good morning (Mr/Mrs/miss). Taking medicine regularly as schedule will prevent TB transmission to your family (health officer)
12	Good morning (Mr/Mrs/miss). (names) illness will not get worse if you take medicine regularly following your doctor's recommendation (health officer)
13	Good morning (Mr/Mrs/miss). Taking medicine regularly following the recommended dose by your doctor will reduce the risk of fatal condition (health officer)
14	Good morning (Mr/Mrs/miss). Common complaints after taking TB medicine are reddish coloration of urine, nausea, vomiting, and stiffness (health officer)
15	Good morning (Mr/Mrs/miss). Taking medicine regularly following the doctor's recommendation on the number and dose of medicine will make you cured (health officer)
16	Good morning (Mr/Mrs/miss). Taking the medicine in a primary health care or hospital as you are scheduled, you will have an easy and fast process (health officer)

Contd...

Appendix: Contd...

n	Messages
17	Good morning (Mr/Mrs/miss). If you plan to be away, contact your health officer to request extra medicine so that your treatment is not interrupted (health officer)
18	Good morning (Mr/Mrs/miss). If you take medicine regularly for 6 months, your health will be cured. Let's continue the treatment (health officer)
19	Good morning (Mr/Mrs/miss). Previous patient experience: "I do not regret to swallow medicine routinely, so I am healthy again" (health officer)
20	Good morning (Mr/Mrs/miss). Let's take medicine regularly for 6 months to get completely cure (health officer)
21	Good morning (Mr/Mrs/miss). Do not forget to take medicine regularly as scheduled by your doctor (health officer)
22	Taking the medicine with an empty stomach, without taking any food will increase the action of the medicine. Have you taken your medicine this morning? (health officer)
23	Good morning (Mr/Mrs/miss). To prevent transmission, sputum should be thrown in a jar containing sand submerged with bayclin and closed (health officer)
24	Good morning (Mr/Mrs/miss). Previous patient experience: "I always take medicine regularly because I put the medicine in an easy to see place" (health officer)
25	Good morning (Mr/Mrs/miss). Previous patient experience: "After taking medicine regularly for 6 months, I am happy because I am healthy again" (health officer)
26	Good morning (Mr/Mrs/miss). If you unable to get your medicine from your health provider on schedule, your family can get it for you (health officer)
27	Good morning (Mr/Mrs/miss). Do not forget to take medicine with an empty stomach. If you take medicine with food, the benefit of medicine will decrease (health officer)
28	Good morning (Mr/Mrs/miss). If it happens you could not get continuation of medicine on schedule, you can get your medicine the day before after calling health officer beforehand (health officer)
29	Good morning (Mr/Mrs/miss). Keeping pillow/mattress under the sunlight exposure and change the pillow/bed sheets once a week is one way to prevent TB transmission (health officer)
30	Good morning (Mr/Mrs/miss). The best time to take TB medicine is in the morning after waking up or 2 h before having breakfast (health officer)
31	Good morning (Mr/Mrs/miss). Using mask will protect your health and prevent TB transmission to your family (health officer)
32	Good morning (Mr/Mrs/miss). Let's take medicine regularly following the schedule! Your health is the happiness of the whole family (health officer)
33	Good morning (Mr/Mrs/miss). If you happen to move away, ask for a referral. Keep taking medicine until the doctor declares that you are cured (health officer)
34	Good morning (Mr/Mrs/miss). Direct sunlighting the room by installing glass tiles is one way to prevent TB transmission (health officer)
35	Good morning (Mr/Mrs/miss). Do not forget to take medicine on an empty stomach. If you take medicine with food, the benefit of medicine will decrease (health officer)
36	Good morning (Mr/Mrs/miss). If you cough or sneeze, close your mouth and nose with handkerchief to prevent TB transmission to others (health officer)

Appendix: Contd...

n	Messages
37	Good morning (Mr/Mrs/miss). If there is no handkerchief, close your mouth/nose with your inner arm when you cough or sneeze, is one way to prevent TB transmission (health officer)
38	Good morning (Mr/Mrs/miss). TB transmission can be prevented by opening windows and let sufficient direct sunlighting at home (health officer)
39	Good morning (Mr/Mrs/miss). Open the window every day and install glass tiles can kill TB germs (health officer)
40	Good morning (Mr/Mrs/miss). Your illness will be cured with regular medication. Obedience to take medicine is the key for your cured (health officer)
41	Good morning (Mr/Mrs/miss). To prevent TB transmission, expose your mattress/pillow in the sunlight, and change bed sheets/pillow sheet every week (health officer)
42	Good morning (Mr/Mrs/miss). Consuming a lot of fruits and vegetables will improve your health and help you be cured (health officer)
43	Good morning (Mr/Mrs/miss). Do not forget to visit your doctor routinely to know your illness progress. Have you taken your medicine this morning? (health officer)
44	Good morning (Mr/Mrs/miss). Let's take medicine regularly, completely! The body will be healthy, will be active again and your family will be happy (health officer)
45	Good morning (Mr/Mrs/miss). Do not forget to take medicine regularly. Your family is waiting for your health (health officer)
46	Good morning (Mr/Mrs/miss). Taking medicine following the doses and the time will prevent your illness from getting worse (health officer)
47	Good morning (Mr/Mrs/miss). Let's take medicine regularly! You will be cured and your family will not be exposed (health officer)
48	Good morning (Mr/Mrs/miss). We will check your sputum to know the progress of your illness. Ask the doctor to check the sputum (health officer)
49	Have you (Mr/Mrs/miss) checked the sputum? Sputum is taken twice: morning after wake up and afternoon when you visit your doctor (health officer)
50	Good morning (Mr/Mrs/miss). If you take medicine regularly, the length of medication will not be delayed. The result of your sputum checked will be known within a few days (health officer)
51	Good morning (Mr/Mrs/miss). If you want to get healthy again, take the medicine regularly. Now it is time to take medicine (health officer)
52	Good morning (Mr/Mrs/miss). You will be cured if you take medicine regularly following the recommended dose and schedule by your doctor for 6 months (health officer)
53	Good morning (Mr/Mrs/miss). Although you already feel healthy. Let's continue to take medicine until doctor declares that you are cured (health officer)
54	Good morning (Mr/Mrs/miss). Consuming a lot of fruits and vegetables will improve your health and help you cured (health officer)
55	Good morning (Mr/Mrs/miss). Do not forget to visit your doctor regularly to know your illness. Keep your passion to take medicine (health officer)
56	Good morning (Mr/Mrs/miss). Do not forget to take medicine even if you are busy so that the medication is not interrupted (health officer)
57	Good morning (Mr/Mrs/miss). How is your medication now? We want to ask your comment about the messages we sent every day. Thank you (health officer)