

## Original Article

**The effect of supportive text message on the adherence to medication in depression: An experimental study**Aeen Mohammadi<sup>1,2</sup>, Mitra Zolfaghari<sup>1,2,3</sup>, Masoud Nikfarjam<sup>4</sup>, Neda Parvin<sup>4</sup>, Najme Shahin Fard<sup>1,4\*</sup><sup>1</sup> Department of E-learning in Medical Education, Virtual School, Tehran University of Medical Sciences, Tehran, Iran<sup>2</sup> Center of Excellence for E-learning in Medical Education, Tehran University of Medical Sciences, Tehran, Iran<sup>3</sup> Nursing & Midwifery Care Research Center, Tehran University of Medical Sciences, Tehran, Iran<sup>4</sup> Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

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## ABSTRACT

**Background & Aim:** Lack of adherence to prescribed medication is a main concern in medicine especially in chronic diseases. The aim of present study was to determine the effect of supportive text message on the adherence to treatment of depression.

**Methods & Materials:** This quasi-experimental study was conducted on sixty eligible patients with diagnosis of depression who referred to a psychiatry clinic in Shahrekord. The patients were allocated to supportive text message and control groups. The patients in both groups were treated with the same antidepressants; however, the patients in supportive text message group additionally received daily text messages for six weeks. The adherence to medication was assessed by a researcher-made questionnaire and the severity of depression was assessed by Beck depression inventory.

**Results:** Immediately after intervention, average score of depression showed a significant improvement in both groups ( $P < 0.001$ ). Moreover, the average score of depression and medication adherence, in two groups (supportive short message and control group) had no significant differences ( $16.76 \pm 4.70$  and  $63.3\%$  Vs  $19.83 \pm 7.39$  and  $53.3\%$ ) ( $P = 0.06$  and  $0.31$ ).

**Conclusion:** Daily supportive text message in this study could not improve antidepressant adherence and depressive symptoms in patients with major depression.

**Introduction**

Major depressive disorder (MDD) is a chronic psychiatric disorder associated with morbidity, mortality, loss of productiveness, and decreased quality of life (1). Nowadays, treatment of major depressive disorder is accompanied with some difficulties for patients and physicians and approximately 30% of patients are non-responsive to conventional antidepressant medication (2, 3).

An essential element of MDD treatment is psychotherapy and antidepressant. On the other hand, lack of adherence to treatment is

one of the crucial parts in the course of treatment and several studies have conducted in this regard (4). Non-adherence with antidepressants has defined as: premature termination of drug (or so called drop-out) or the lack of consistency with the prescribed regimen in the context of ongoing use (medication non-compliance) which means patients may not conform to the recommendations made by the prescriber in terms of timing, dosage and frequency of medication taking (5). Non adherence to treatment in major depressive disorder has estimated to be 10%-60% (median: 40%)

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(5).The prevalence of recurrence or relapse of MDD is lower among patients with better adherence to treatment (6, 7).

Nowadays, there is a growing interest in using mobile phone text messages as an intervention (8) in treatment of depression (9), long-term illnesses (10) and adherence to medication (11, 12). However, the role of cultural diversities should be considered in a supportive mobile based intervention (13).

Improving medication adherence has proved to be a challenging task. There are new aspect of intervention which has shown to be effective in patients' adherence; such as short messaging system (SMS) usage in patients with valvular heart disease (14) or improving dyslipidemia and blood sugar control in diabetic patients (15). However there are few studies in favor of effectiveness of SMS in patient's adherence in MDD. Montes et al. have investigated MDD patient's adherence to psychotropic medication by SMS during three months follow up. Daily SMSs were send to patients to remind them about taking the medications. The result showed the effectiveness of SMS in patient's adherence, quality of life improvement and decline in severity of disorder (16). There is emerging evidence that SMS can play an important role in reducing forgetfulness of pre-set clinical sessions in MDD patients (17-20). The reason to conduct this study was that despite established effectiveness of SMS in enhancing patient's adherence in other medical conditions; there are a few researches which examine SMS effectiveness on MDD patient's adherence. On the other hand it should be considered that using SMS depends on variety of cultural and social factors, and we were not able to find a study about the effect of SMS on MDD patient's adherence in Iran.

The present study was conducted with the aim of determining the effect of a supportive text message therapy program on the

adherence to medication in Iranian patients with depression.

## **Methods**

This quasi-experimental study was conducted in a psychiatry clinic in Shahrekord (A city in Southwest of Iran) from March to September, 2015. The study population was out-patients with diagnosis of major depression. Inclusion criteria were diagnosis of major depression according to DSM-IV-TR criteria; being literate; ability to work with mobile phone and reading and writing a text message.

When comparing two independent groups, for detecting the difference at 5% of type of 1 error with the power of 80%, and considering standard deviation based on previous studies, the sample size would be about 30 participants in each group.

Out of 120 patients who had referred to the clinic, sixty seven eligible patients were allocated to supportive SMS or control groups. Patients who refused to participate in the study were excluded.

After confirming diagnosis of major depression by a psychiatrist, the participants in two groups were underwent a standard depression treatment with the same antidepressant medication, however, the patients in the supportive SMS group, received two text messages automatically every day except holidays, for six weeks. The first message was associated to the patients' medication (medication reminder, preventing drugs side effects, and what they must do when encounter with a problem through the study) and the second consist of some supportive advises. Meanwhile, each participant received a booklet consist of schedule of taking medication, medication side effects, and what he or she must do when encounter with a problem during the study period.

Some of the sent messages were: “Walking in the good weather was generally give you energy”, “Do not stop your medication without consulting your doctor”; “Do not forget to take the medication with breakfast and drink plenty of water”, and etc.

The Beck depression inventory II (BDI-II-Persian) with 21 items was used for measurement the patients’ depression severity at the beginning and the end of the study (six weeks later). This inventory is one of the most used screening instruments for depression and the reliability and concurrent validity of the BDI-II-Persian as a measure of depressive symptoms in nonclinical samples were previously confirmed (21). Cronbach’s alpha for the BDI-II-Persian was 0.87. The BDI-II-Persian also revealed acceptable consistency across time (Pearson correlation coefficient = 0.73) (22).

In addition, demographic characteristics such as age, gender, education level, income, job, location, duration of illness, and frequency of hospitalization were documented.

To evaluate patient's adherence to medication, a researcher-made questionnaire with 12 multiple choice questions was used. Based on the first question of this tool a patient who stops drug consumption would be considered as nonadherence to medication. But if the patient follows the recommendations for prescribed treatments continuously or after one time interruption, considered as adherence to medication. Beside that this tool covered the constructs of drug consumption, the type of prescribed antidepressant, reasons for drop out and side effects, as well as interruption of consumption. In addition, the possible etiology beyond discontinuing each antidepressant was determined. Ten faculty members of Tehran University of Medical sciences assessed and confirmed the questionnaire's content validity. The test-

retest reliability of the instrument for two weeks interval was 0.87.

The data were analyzed by SPSS software Ver. 16 (USA, Chicago, IL) and P-value less than 0.05 was considered as significant.

Considering Kolmogorov-Smirnov test ( $p=0.765$ ,  $P=0.445$  in SMS and control groups respectively), Q-Q and histogram plots, distributions of depression scores were normal; therefore, independent T test and paired T test were used for data analyzing.

The ethics committee of Tehran University of Medical Sciences, reviewed and approved the study (No. 9214658003) In addition, the study was registered in Iranian registry of clinical trials (IRCT) by IRCT2015091323998N1. An integrated explanation about the study was given to the participants then written informed consent form was taken.

## **Results**

From sixty-seven eligible patients three participants dropped out prior to week 6 in the SMS group and four in the control group. Finally, sixty patients were analyzed. (Figure 1).

Findings of the study showed non-significant differences between participants in two study groups in terms of age, gender, education level, job, location, marriage status, duration of illness, and frequency of hospitalization (Table 1). In addition, the majority of participants in both study groups had moderate income level (29 patients in the SMS and 28 in the control group).

Using T test, two study groups had no significant difference in scores of depression at the beginning of the study ( $27.90 \pm 5.57$  and  $26.13 \pm 4.93$ ,  $P=0.199$ ). Paired t-test showed significant changes in depression score in both groups ( $P<0.001$ ) in post-test (Table 2).

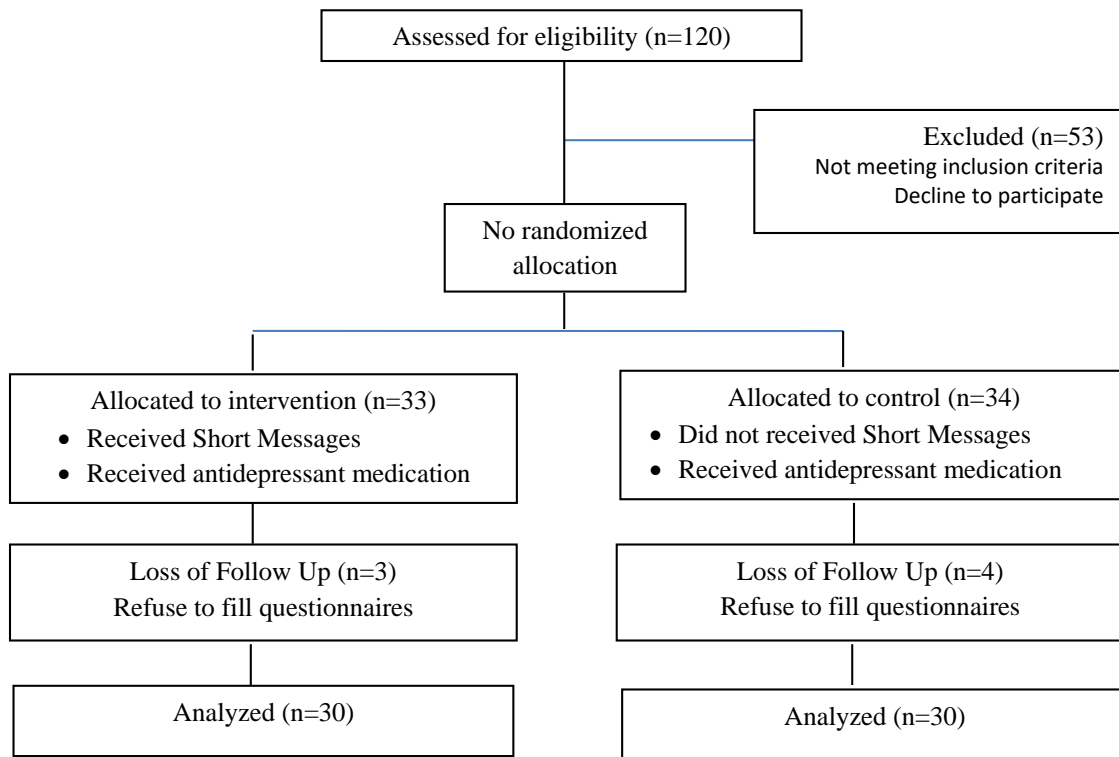


Figure 1. Flow Chart of Study Participants

Table 1. Demographic characteristics of participants in two study groups

Variable	SMS Group	Control Group	P- value
Age (year: M ± SD)	33.60±10.70	32.56±10.35	0.705
Duration of Illness (month: M ± SD)	31.80±49.73	34.90±45.03	0.801
Frequency of Hospitalization: (M ± SD)	0.83±1.39	0.46±1.85	0.390
Gender (N%)	Female	20 (66.7%)	0.596
	Male	10 (33.3%)	
Marriage Status (N%)	Single	15 (50%)	0.604
	Married	12 (40%)	
Location (N%)	Urban	23 (76.7%)	0.771
	Rural	7 (23.3%)	
Education Status (N%)	Primary school	8 (26.7%)	0.834
	Diploma	10 (33.3%)	
	University	12 (40%)	
	Housewife	11 (36.7%)	
Job (N%)	Labour	8 (26.7%)	0.351
	Government Job	7 (23.3%)	
	Unemployed	4 (13.3%)	

**Table 2.** Depression score in SMS and control groups before and after intervention

Groups	Before M (SD)	After M (SD)	P- value
SMS	27.90 (5.57)	16.76 (4.70)	< 0.001
Control	26.13 (4.93)	19.83 (7.39)	< 0.001
P- value	0.199	0.060	

**Table 3.** Adherence to medication in study groups before and after intervention

Groups	Time	No. (%)	P- value
SMS	Interrupted	11(36.7)	0.310
	Continuo on Medication	19 (63.3)	
Control	Interrupted	14 (46.7)	
	Continuo on Medication	16 (53.3)	

Although the average score of depression in SMS group was better than control group after intervention, this difference was not statistically significant ( $16.76 \pm 4.70$  and  $19.83 \pm 7.39$  respectively,  $P=0.060$ ) (Table 2). On the other hand the medication adherence rate in the SMS group and control group had no significant difference too (63.3% and 53.3%,  $P=0.31$ ) (Table 3).

The main reasons for poor compliance declared by patients in both groups were: denial of illness (11 patients, 44%), adverse side effects (6 patients, 24%), lack of knowledge about the treatment duration (3 patients, 12%), lack of knowledge about the regular drug consumption (1 patients, 4%) and other reasons (4 patients, 16%).

## Discussion

This study was conducted with the aim of determining the effect of a supportive text message therapy method on the adherence to medication. Findings of the study demonstrated that both treatment with antidepressant alone or adjuvant supportive SMS could improve the depression score; however, average score of depression and adherence to medication in the supportive

SMS group was not significantly better than the control group.

In this study, patients in the supportive SMS group received daily SMS about medication and some supportive advices and hopeful statements (8). Agyapong et al. found that supportive SMS improved patients' depression score compared with standard care (21). Furthermore, in the study of Shapiro et al. depression score was decreased significantly by using text-messaging in the patients with bulimia nervosa and depression symptoms (10).

Hope has a therapeutic effect on subjective well-being and mental disorders by enhancing the recovery process of patients with serious mental illness (11). Studies suggest that hope is associated with enhancing adherence to medication among adult populations (23, 24).

On the other hand, the patients who affected by major depression feel loneliness; therefore, receiving therapist's respect using SMS could decrease these feeling. Rajabi et al. highlighted the effectiveness of consulting by SMS on the aggressive behavior of the participants (12). De Jongh et al. in a review study concluded that in certain cases mobile phone messaging interventions may be

effective in supporting the self-management of long-term illnesses (25). Sahm et al. in a study mentioned that electronic reminders such as text messages, were acceptable to approximately 60% of depressed patients who reported being unintentionally non-adherent (13). Kannisto et al. in a study demonstrated that SMS reminders could encourage adherence among patients taking antipsychotic medication (26). Moreover, Fenerty et al. in a review study confirmed that reminder-based interventions may improve adherence to daily medications (27).

Although above mentioned studies show that daily supportive text message could improve medication adherence and symptoms in patients, in our study we couldn't show any statistically significant differences in term of antidepressant adherence among patients with major depression. It should be considered that despite of most previous studies in which the participants were moderate depression cases, all participants in our study were major depressed ones and it may alter the effect of SMS on the adherence to medication.

On the other hand these results may be due to small power of the study. If there are any differences between the treatment groups, this study with the current sample size, is underpowered to detect all. On the other hand patients with severe depression may be affected less with interventions other than medication (like SMS) and a new design with the patients with moderate depression may results to significant improvement in SMS group.

Other limitations of this study were non randomized allocation of the participants; short term intervention and lack of long term follow up. The researchers suggest the need for true experimental studies to compare SMS with other instructional methods and long term follow up.

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## **Conflict of Interest**

The authors declare that they have no conflicts of interest

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