



Telepsychiatry- Based Care for the Treatment Follow-Up of Iranian War Veterans with Post-Traumatic Stress Disorder: A Randomized Controlled Trial

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What's Known

- In recent years, concerns about access to mental health services such as post-traumatic stress disorder (PTSD) treatment have been increased, especially for people living in remote areas and warfare victims. Telepsychiatry is an effective solution to allay these concerns in developing countries.

What's New

- Telepsychiatry in veterans with PTSD increased patient satisfaction insofar as they could express their mental problems more easily and they had less mental pressures caused by travelling. Most recipients of these services stated that telepsychiatry was as useful as face-to-face visits.

Abstract

Background: Physical limitations, distance, and time are major obstacles to access to mental health services for veterans and soldiers. This study was aimed at comparing the efficacy of telepsychiatry and face-to-face consultation as methods of treating post-traumatic stress disorder (PTSD). The comparison was based on treatment costs, access to health services, completion of therapy sessions, and patient satisfaction as variables.

Methods: This research was a double blinded clinical trial supported by Tabriz University of Medical Sciences and conducted in 2015 to 2016 in Tabriz, Iran. Totally, 60 patients were included in the study. Through simple randomization, the patients were divided into experimental and control groups, both of whom were treated through face-to-face consultations for the first 3 sessions. Six follow-up sessions were then held remotely with the experimental group and face to face with the control group. Data were collected using a self-designed and reliable questionnaire and entered in SPSS, version 16. Intergroup comparisons were performed using descriptive statistical measures. Finally, the results were tested using the *t* test method.

Results: A significant relationship was found between the use of information technology and increased patient satisfaction, completion of therapy sessions, and reduction in treatment costs; however, no significant difference was found between the groups in terms of reduction in waiting time and access to a psychiatrist.

Conclusion: Telepsychiatry is an effective means of delivering mental health services to psychiatric outpatients living in remote areas with limited resources. The results provide preliminary support for the use of telepsychiatry in treating PTSD and improving access to care.

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Introduction

Nowadays, the role of information and communication technologies in improving public health and medical care is undeniable.^{1, 2} Telemedicine is a new method in health care, diagnostics, and therapeutic service, which are supported in

telemedicine practice through electronic and communication processes. It renders health-care services available for people who have no access to such assistance, albeit the services are provided at reduced quantity and quality for various reasons.^{3, 4} The technology is also widely applied in clinical fields such as radiology, rehabilitation, mental health care, and skin disease treatment.⁵

One of the greatest challenges facing humanity in the 21st century is access to high-quality health-care facilities for all, consistent with the vision of the World Health Organization. Such access is especially important for people suffering from post-traumatic stress disorder (PTSD), which is a type of anxiety disorder that is characterized by psychiatric symptoms such as aggression, nightmares, reminders of trauma, and reduced trigger threshold after experience of a life-threatening accident.⁶ Concerns about access to mental health services have increased in recent years, especially among people living in remote areas.⁷ The prevalence, onset, and course of mental-behavioral disorders are affected by war.⁸ War veterans suffer from mental and behavioral problems that are more acute than those afflicting the general population. Research has shown that almost 1 in every 4 soldiers who return from war suffers from severe psychological problems.⁹

In Iran, the number of veterans suffering from psychiatric problems amounts to more than 200 000 individuals, as reported by the Mental Health Center of the Foundation of Martyrs and Veterans Affairs.^{10, 11} These veterans are burdened with inadequate health coverage, and in cases wherein they are provided health-care protection, their conditions are insufficiently examined. For many war veterans with PTSD, limited or lack of access to mental health-care services is sometimes a bitter reality given that such access is considerably impeded by mobility, distance, and time limitations.¹² Most studies on this issue have been conducted in the United States and developed European countries, whose conditions differ from those of developing nations. Such difference constrains the generalizability of research findings. Essential requirements, therefore, are to investigate the current situation of telemedicine in the Middle East and Iran and formulate strategies and suggestions that are specific to these regions. Accordingly, the present study evaluated the efficacy of telepsychiatry and face-to-face consultations as treatments for PTSD in terms of treatment costs, access to mental health services, completion of therapy sessions, and satisfaction rate.

The primary research question of the proposed study was whether telepsychiatry for PTSD in war veterans is as effective as face-to-face visits.

Patients and Methods

This research was a randomized clinical trial conducted from 2015 to 2016. The target population consisted of veterans injured in the so-called "8-year Imposed War" who suffered from PTSD, were aged between 45 and 60 years old, and were referred to Tabriz Fajr Psychiatric Hospital for treatment. In the hospital, follow-up therapy is offered only to outpatients. Since PTSD is normally coupled by high rates of comorbid psychiatric disorders, patients with comorbid depressive and anxiety disorders were included. In addition, veterans with personality disorders were also included because this status is commonly concurrent with PTSD in veterans.¹³ In all the cases included, PTSD was considered the primary disorder. Additionally, patients that required hospitalization and did not live in the province of East Azerbaijan were excluded from the survey. Participants were screened for eligibility. To be eligible for participation, participants had to meet the diagnostic criteria for PTSD. If in the psychiatrist's opinion the patient did not meet the eligibility criteria, the patient was excluded from the study. The selected patients were diagnosed according to the criteria of the International Classification of Diseases-10th Edition, after which necessary information regarding the research was provided to them and their relatives. They were assured that the study would not cause any physical harm to them. All the patients signed a detailed informed consent form, and the study was approved by an ethics committee (TBZMED.REC.1394.990).

Out of the 138 patients referred for study participation, 67 were excluded for failure to satisfy the inclusion criteria (16 patients), refusal to participate (47 patients), ineligibility (2 patients), and refusal to provide consent (2 patients). After matching for age and severity of illness with respect to psychiatric disorders was done, the 71 consenting participants were grouped under 2 types of treatment through simple randomization: 37 of the patients were administered telepsychiatry (experimental group) and 34 were provided with face-to-face consultations (control group). Five of the patients did not receive intervention. Figure 1 shows the flow of selection. As the study was conducted within a local hospital and a standard clinical practice, the patients received general treatment. The patients

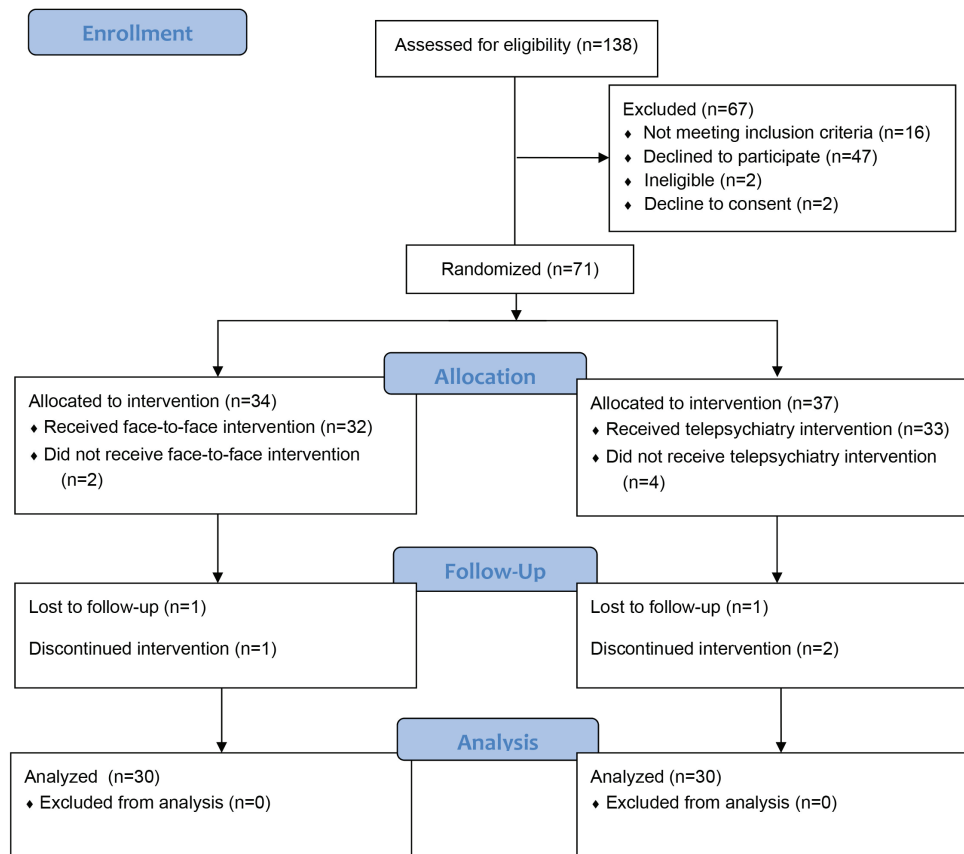


Figure 1: Consort flow diagram of the progress through the phases of a 2-group parallel randomized trial.

in the control group received standardized medical care. The intervention group patients all received a medical assessment followed by telepsychiatry. The participants and clinicians were not blinded to the intervention assignment, while the research assistants who managed the data collection were double blinded. The mean ages of the members of the face-to-face and telepsychiatry groups were 49 ± 3 and 51 ± 3 years, respectively. After review and intervention, 30 participants from each of the 2 groups were subjected to follow-up treatment, during which their conditions were further analyzed.

Both groups were treated through face-to-face consultations for the first 3 sessions, after which 6 follow-up sessions were held face to face with the control group using the lmo mobile application and Skype for the experimental group. The face-to-face sessions were carried out at the hospital, and the telepsychiatry sessions had no time limit except for 12 midnight to 8 am. The follow-up sessions, each lasting for 20 minutes, were carried out over the course of 3 months, with each session held approximately once each week during this period. The treatment sessions consisted of antidepressant medication management, psychoeducation, and brief supportive counseling. For both groups,

the information provided and the questions raised by the psychiatrist were clinically driven. The telepsychiatry sessions were scheduled on a regular weekly. In the telepsychiatry group, follow-up treatment was provided with the help of a multimedia application (lmo voice calls, text messaging, Telegram, and Skype). The patients or their family members (family members were allowed to participate with the patient's permission) were given basic guidelines for their telecommunication sessions. The war veterans reported or sent their histories and clinical outcomes to the psychiatrist. Immediately after the review of the patients' records, the psychiatrist communicated with the patients through the telecommunications methods with regard to instructions for changing medication dosage and the need for the patients' presence for the prescription of new medication and recording in the insurance booklet. After the follow-up sessions, a self-designed questionnaire was administered to the patients in both groups. An optional electronic version of the questionnaire was sent to the experimental group through the mobile application, and 10 of the patients in the group completed the questionnaire through this channel. The rest of the participants completed the questionnaires during the face-to-face

consultations. The questionnaire consisted of 2 parts: (a) demographic data section and (b) questions related to the mental health services delivered by physicians. The items related to requirements evaluation were rated using a Likert scale ranging from 1 ("very low") to 5 ("very high"). The content validity of the questionnaire was confirmed through the opinions of 5 specialist psychiatrists, and the reliability coefficient of Cronbach's alpha was 0.8 to 0.9. The collected data were entered in SPSS, version 16. Intergroup comparisons were performed using descriptive statistical measures such as mean values and inferential statistical measures such as independent *t*-distributions. The *t* test method was selected to assess the results.

Results

The demographic and clinical characteristics of the groups were obtained from outpatient records. All the participants were male (100%), at an average age of between 45 and 60 years. As is shown in table 1, many of the respondents (40%) completed primary education, but the treatment groups did not significantly differ in terms of educational background.

As is indicated in the results of the χ^2 test (table 1), no significant difference was found between the 2 groups.

Table 2 illustrates the relationship between the use of telepsychiatry and face-to-face consultation for the patients with PTSD. The means of patient satisfaction were compared using a *t* test.

The questionnaire choices of "very low" and "very high" were developed in such a way that they enabled the comparison of the face-to-face and telepsychiatry methods. Given that the average response was higher than 2.5, it can be quantitatively concluded that most of the participants completed the questionnaire and were willing to complete the therapy sessions. Compared with the face-to-face method, telepsychiatry increased access to a psychiatrist, reduced follow-up treatment costs and patients' waiting time, and elevated patient satisfaction. Because the superiority of telepsychiatry was determined only in quantitative terms, the significance of this result was subsequently measured and presented through statistical methods. Data distribution was considered normal after the implementation of the Kolmogorov–Smirnov test, and a *P* value larger

Table 1: Sample demographics and clinical characteristics

Variable	Face-to-face N (%)	Tele-psychiatry (N) N (%)	P value
literate	0 (0)	5 (16.7)	0.042
Primary education level	13 (43.3)	12 (40)	
Middle high school	8 (26.7)	8 (26.7)	
High school level	5 (16.7)	0 (0)	
Diploma	3 (10)	5 (16.7)	
Associate degree	1 (3.3)	0 (0)	
Employed	2 (7)	5 (17)	0.331
Retired	6 (20)	8 (27)	
Disabled	22 (73)	17 (56)	
Single	0 (0)	1 (3)	0.565
Married	26 (87)	26 (87)	
Separated	4 (13)	3 (10)	
45-50	1 (3)	0 (0)	0.325
51-55	11 (37)	9 (30)	
56-60	18 (60)	21 (70)	

Table 2: Relationship between face-to-face and telepsychiatry for the treatment of post-traumatic stress disorder

Variable	Face-to-Face (n=30) Mean±SD	Telepsychiatry (n=30) Mean±SD	<i>t</i>	df	P value
Completion of the therapy sessions	2.50±0.98	2.67±0.98	7.19	59	0.001
Access to psychiatrists	3.37±1.03	3.77±1.03	1.22	59	0.227
Follow-up treatment costs	3.10±0.843	3.27±0.843	5.966	59	0.001
Patients' waiting time	3.53±1.12	3.57±1.12	-1.2	59	0.231
Patient satisfaction	2.53±0.60	3.07±0.60	3.85	59	0.002

than 0.05 was obtained for all the variables.

According to the data presented in table 2, the P value of patient satisfaction was lower than 0.05, indicating a significant positive relationship between the use of telecommunications technology in follow-up treatments for PTSD and patient satisfaction. A positive and significant relationship was found between the use of telecommunications technology in the treatment of the PTSD veterans, the completion of follow-up sessions, and the patients' preference for telepsychiatry over the face-to-face approach. The hypothesis on the relationship between telepsychiatric treatment and access to a psychiatrist was rejected, and no comparison could be made between the 2 treatment methods in terms of test significance and the level of access to a psychiatrist. A significant positive relationship was found between reduction in treatment costs and telepsychiatric treatment. Such treatment was also viewed as significantly effective by the patients, as reflected by the Likert ratings; this treatment option considerably reduced the costs of travel from the patients' residences to the health center and the costs of food consumed during travel.

The Friedman test was conducted to rank the follow-up treatment variables. The results are shown in table 3. The P value generated by the Friedman test was lower than 0.05. The average column ranks show that the top-ranking variable was the completion of therapy sessions (average rating=3.65), whereas the least-ranked variable was patient satisfaction (average rating=2.41).

Discussion

Mobile phone-driven follow-up treatments are accessible to war veterans with PTSD and the general public and more accessible than other expensive telemedicine services. The patients participating in this work stated that greater access to mental health professionals, continuity of care, reduced waiting times, reduced treatment costs, and protection of privacy were among the advantages of telecommunications technology-based care.¹⁴ In this work, telepsychiatric services were provided using an ICT application. The results showed that the

use of such technology exerted a positive effect on the follow-up treatment of the veterans and increased the rate of the completion of follow-up sessions. We also found increased use of telecommunications technology in the follow-up treatment and increased access to psychiatrists in terms of frequency and convenience. Our findings are consistent with those of other works. A study conducted in 2016 for the United States Army, for example, showed that the patients could use health-care services offered by the best professionals through telemedicine services; this also held true for war veterans.¹⁵ Moreno et al.¹⁶ stated that the use of the Internet and video conferencing was highly effective in providing psychological care services; applying these technologies increased access to mental health care and improved the interaction between patients and service providers. Morland et al.¹⁷ (2010) found that providing PTSD care services through videoconferencing was an effective and practical way to increase access to mental health-care services and significantly reduced health-care costs and patients' waiting times. Specifically, the use of telecommunications technology for follow-up treatment significantly reduces follow-up treatment costs.

In the current work, the costs and difficulties of traveling, accommodation and food costs, and the costs of non-essential travel and other items associated with the face-to-face method significantly affected cost increase and patient satisfaction. These problems were minimized by the telepsychiatry approach. Similarly, Moreland et al.¹⁷ showed that mental health-care services offered via videoconferencing exerted a positive effect on the continuity of care and access to mental health-care services and significantly reduced related costs. Egede et al.^{18, 19} compared the effects of treatments provided through face-to-face sessions and videoconferencing and found that remote psychological programs usually reduced treatment costs, consistent with the findings obtained in the present study. The main problems encountered in follow-up treatments for people afflicted with PTSD are waiting time in receiving mental health services (i.e., psychiatric visits) and frequent follow-up sessions for consultation with a psychiatrist

Table 3: Friedman test for the ranking of the variables

Variable	Ranking-Mean	χ^2	df	P value	Ranking
Completion of the therapy sessions	3.65	28.708	4	P<0.001	1
Access to psychiatrists	2.41				5
Follow-up treatment costs	3.22				2
Follow-up treatment costs	3.18				3
Patient satisfaction	2.55				4
Completion of the therapy sessions	3.65				1

regarding the mental problems caused by drugs, dosage changes, and drug intake schedules. In the present research, telepsychiatry proved to be superior to the face-to-face method vis-à-vis the duration of waiting. Detweiler et al.²⁰ found that the remote delivery of mental health services led to at least 8 days of reduction in waiting time and significantly improved the follow-up and continuity of care services received by veterans. At the end of the study, 89% of the participating veterans joined the remote mental health programs because of satisfaction and quality of service delivery.

The use of telecommunications technology in the current work increased patient satisfaction, helping the veterans discuss their mental problems more easily (improved physician-patient communication) and reducing the mental pressures originating from travels to treatment centers. Needless to say, patients with PTSD are typically constrained by physical and social problems. The results of this work are consistent with those of other studies (e.g., 19–22). According to Row et al.,²¹ most recipients of telecommunications technology-based health-care services stated that the quality of such services was equal to that of face-to-face care services. The patients also indicated that continuity of care and their comfort levels during therapy sessions were improved. Vaitheswaran et al.²² showed that the use of telecommunications technology in treatment significantly reduced patient anxiety and increased patient satisfaction with therapy sessions. A study that compared the frequency of veteran referrals and hospitalization in mental health centers before and after the provision of remote psychiatric services revealed an 86% reduction in the number of patients and an 80% reduction in the number of hospital visits.²³ The patient satisfaction questionnaire administered in the research indicated a high level of satisfaction with the use of remote psychotherapy. Yellowlees et al.²⁴ stated that remote mental health services reduced symptoms and improve the treatment of veterans. The author also indicated that because the veterans were in familiar surroundings, they communicated with service providers more comfortably, were free from the anxiety of leaving their homes, and collaborated with care providers for more effective follow-up treatment plans. From the perspectives of patients, telepsychiatry generally poses a significant effect on reducing health-care costs, including transport fares, the costs of unnecessary commuting, and the costs of food and accommodation.²⁵ This treatment option also increases the level of patient satisfaction with respect to the security

of personal information.^{26, 27}

The present study also found that the use of telecommunications technology eased the discussion of physical and psychological problems and increased the speed and duration of information exchange and the completion of therapy sessions. These positive factors can reduce patient disabilities in various fields, eliminate stress and anxiety, and accelerate recovery.

The features of information technology serve the interests of users, ensure necessary data transmission, and guarantee contact with specialists, especially for people living in remote regions.²⁸ Despite the advantages of remote psychiatry, however, the use of such treatment method in Iran is hampered by obstacles. For example, most experts tend to live in large cities, giving rise to debates over how these specialists are to be paid and how insurance, cultural, and confidentiality and security issues are to be addressed. Given that a number of insurance organizations do not cover the costs of telecommunications technology and considering the increasing breadth with which this method is applied, resolving issues relating to payment is necessary. Although the implementation of remote psychiatry requires the construction of facilities that reduce the number of medical team members, the advantages of this method cannot be disregarded, particularly for areas located far from medical centers. Another important issue is inadequate Internet bandwidth, which causes problems given the geographical scope that needs to be covered to establish efficient audio-visual communication through telecommunications technology. This challenge highlights the importance of comprehensive needs assessment and feasibility studies on communication technologies as avenues for providing psychiatric services in Iran. Furthermore, information exchange between patients and physicians necessitates training for the former and their companions on how to use mobile applications.

The current study has 2 limitations. First, the small sample size may have constrained the statistical calculations. Second, the cost analysis was limited to governmental institutes and the chosen treatment procedures (i.e., telepsychiatry and face-to-face consultation). The results may differ when other procedures or psychiatric settings such as private institutions are evaluated.

Conclusion

The specific conditions of patients suffering from

PTSD with respect to in-person and physical access to mental health professionals and the necessity of receiving services in a timely manner prompted the introduction of telepsychiatry as an effective alternative in providing services to these patients. Telepsychiatry has been an effective means of delivering mental health services to psychiatric outpatients living in remote areas with limited resources. The results of the present work serve as preliminary support for the use of telepsychiatry in treating PTSD and improving access to care.

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Conflict of Interest: None declared.

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