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Original Article

Scaling up the Health System at Provincial Level to Conduct Telephone Follow - Up Program for Suicide Reattempters in West Azerbaijan, Iran, 2017-2018

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Abstract

Background and Objectives: *History of suicide attempt is the most important predictor of subsequent suicides. Therefore, implementation of aftercare prevention programs for those who have previously attempted suicide can help to reduce suicide reattempt. The present study was conducted to scale up the health system along with intersectoral collaboration approach for preventing suicide reattempt by provision of brief consultation and telephone follow-up in services.*

Materials and Methods: *Health system included the health and treatment departments in collaboration with Welfare Organization were scaled up in order to register the attempters and implement the telephone follow-up interventions at provincial level between May 2017 and April 2018 in 17 districts of West Azerbaijan Province with 3.5 million people. Each referred patient received 3 sessions of brief intervention of Attempted Suicide Short Intervention Program (ASSIP). Follow-ups were made for 12 months after discharge. Paired t-test was used to analyze the mean of suicide and suicide attempt before and after intervention.*

Results: *Fifteen districts with a population of 3139603 people entered the final analysis. Of those who referred to CHC, 1631 (36.6%) attached to program for 12 months. At the end of the intervention, 68 (1.5%) individuals had reattempted suicide. The number of suicide reduced to 1.8 per 100000 population among 15 districts (p=0.07). The rate of attempted suicide had increased to 1.4 per 100000 population after intervention.*

Conclusion: *The aftercare services have the capacity to decrease suicide reattempt. Although in our study interventions generally reduced suicide, suicide attempt showed a slight increase at the end of follow-up, this increase could be considered as an improvement in the potency of health system to identify and register the suicidal cases.*

Key words
Attempted suicide, Telephone follow-up, Brief intervention, Reattempt, Aftercare, Suicide prevention

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Introduction

Suicide is a complex and currently preventable health problem resulting from interaction between psychological, social, biological, and environmental factors [1]. Globally, 800000 people die due to suicide every year, estimated to be equal to one person every 40 seconds [2]. According to the World Health Organization (WHO), by 2020, 1.53 million people will die by suicide and suicide attempts will increase 10-20 times [3]. Previous studies [4, 5] showed that rates of annual suicide ideation, plan and attempt are equal to 5.7, 2.9 and 1% respectively and in Iran, despite a discrepancy between different sources [6, 8], suicide rate is between 5-6.7 per 100,000 population and it has been rising during the last ten years [9].

History of previous suicide attempt is one of the most important risk factors for subsequent attempts, such that risk is higher during the first year after the attempt [10]. 30-60% of people who died by suicide have had a history of previous suicide attempts and 10-40% of people who attempt suicide will go on to complete and die by suicide [11]. Psychological autopsy studies [12, 16] have shown that previous suicide attempt is one of the strong predictors of suicide (OR=2-39). As a result, preventive interventions are effective and necessary in preventing suicide after the first attempt [17, 18].

In this regard, some studies have been conducted in line with national suicide prevention program involving integration of suicide prevention program into PHC and implementation of telephone follow-up for suicide attempters. SUPPRE-MISS study conducted by WHO in low and middle income countries including Iran showed that Brief Intervention Counseling (BIC) significantly reduced suicide deaths about 18 months after hospital discharge, indicating that BIC could be an effective strategy for suicide prevention program in LMIC [19]. Also, preventive studies in Iran on the effects of telephone and email follow-up and BIC after suicide attempts showed that these interventions significantly reduced risk of suicidal behaviors [18, 20, and 21]. One study in Tehran, capital of Iran [22], showed that after conduction of telephone follow-up program, in experimental group, 11% of individuals attempted suicide only one time up to end of the study, however it was 25% in control group (10.5, 7.9 and 3.3% of individuals attempted suicide once, twice and three times, respectively).

Death rate due to suicide is higher in western provinces of Iran [8], largely explained by low socio-economic status and cultural issues [23, 24]. In Iran, strategies based on training general practitioners to identify the people at risk of suicide and depressed cases have been found to have promising effect on scaling up the health system and reducing the suicide rate [25]. Moreover, telephone follow-up program conducted as a research activity with limited sample worldwide and also in Iran [18] or at most covered population of one city [19] showed positive effect on reducing suicidal behaviors. Thus, the current study was implemented at provincial level including 15 districts by integrating telephone follow-up program into PHC and national suicide prevention program. In this study, modified version of Attempted Suicide Short Intervention Program (ASSIP) [26] was used and also “Prevention of suicide by brief consultation and telephone follow-up” program was developed and implemented in context of improving and enabling PHC system, as one of the strategies recommended by WHO to manage suicide reattempts and completion of suicide [27].

Method

Study area

West Azerbaijan is one of the 30 provinces of Iran and the capital city of the province is Urmia. It is located in North West of the country bordering with Turkey, Iraq and Nakhchivan, and the provinces of

East Azerbaijan, Zanjan and Kurdistan. Azerbaijan is about 40,000 square miles (100,000 square km) in area and also in 2011 the province had a population of 3,080,576. Figure 1 shows the map of West Azerbaijan province.

Fig 1. Map of West Azerbaijan province

Study Design

The present study was conducted using open-label, single–arm, and field quasi-experimental design of study with 1 year follow-up between May 2017 and April 2018. A group of patients with a history of suicide attempt without being compared with the control group were received 3 sessions of ASSIP and were followed up for 12 months by telephone calls. In the present study, rate of reattempted suicide and complete suicide was considered as primary outcome.

Required Services

To implement telephone follow-up suicide prevention program in each district, the following services were required.

1. Presence of Hospital and Emergency Department.
2. Presence of Comprehensive Health Centers (CHC) in Health network.
3. Since 2017, by implementing Health Transform Program across the country, Comprehensive Health Centers (CHC) were designed and established. Each center covers a population of 20 to 50 thousand people in which at least one psychologist with master degree of psychology provides mental health services such as suicide prevention, parenting, management of aggressive behavior, and addiction prevention.
4. Across the province, 191 CHC with 77 psychologists in 17 districts were providing mental health service to the people in need that 182 of them belonged to 15 districts.

Establishment of Capacity

To implement the program, the following capacities were established

1. Establishment of Steering Committee
   a. Deputy of health of WA province
   b. Head of health system of each district
2. Emergency Departments

a. Establishing training workshops for nurses of EDs
b. Providing and distributing 7 educational brochures about suicide and depression for patients and their families involving subjects such as educating about depression, suicidal behaviors, and aggressive behaviors.
c. Introducing hotline (1480 telephone lines and social emergency services named under the telephone number of 123 of Welfare Organization)
d. Organizing referral pathways from ED to mental health department of the district and then toward final destination of CHC and working of psychologist on daily bases.

3. Mental Health Office
   a. Establishing training workshops for mental health experts of each district
   b. Establishing referral system from EDs to Mental Health Office and then toward each CHC based on proximity of residence

c. Establishing training workshops for psychologists of each CHC based on cascade method to provide brief counseling for patients and their families according to ASSIP manual
d. Improving web-based system of registration for suicide registration in each mental health office of each district
e. Providing training manual for brief counseling of ASSIP provided by the psychologists for suicide attempters
f. Training them to make phone call periodically in order to get information from the patient and provide very brief counseling in each phone call and motivating them to use available mental health services at emergency or non-emergency conditions

Study Subjects

Participants in this study included suicide attempters referred to each ED of hospitals in 15 districts of West Azerbaijan province. After receiving emergency medical intervention and being physically stable, at the same day or the days after being invited to participate in the study. Participants and their families were explained that after discharge from hospital, they would be contacted by mental health psychologists to receive further support and counseling if they agree.

Interventional Procedures

1. Service Provided in Each ED
   a. Emergency medical services
   b. Bedside short educational session and introducing CHC services.
   c. Providing address of governmental and private mental health centers and obtaining signed consent form.
2. Provided Services by the Psychologists Working in CHC

a. Making phone calls to invite the patients to attend CHC. In case of lack of responding, they will be called three times.
b. Providing three-session brief counseling according to ASSIP program without television procedure
c. Obtaining singed consent form to make follow-up phone calls for 12 months. Time intervals for follow-ups were performed 1, 2, and 4 weeks after discharge from the hospital, and then in a monthly basis. Follow-up forms were completed on each call. Preferably, follow-up calls were performed by a same sex caller each time.

Statistical Analysis

Data was analyzed using SPSS software version 23. Based on type of results and variation, descriptive statistics (mean & standard deviation and percentages) and paired samples t-test were used to describe characteristics of primary information and compare outcomes across before and after intervention.

Modified Version of Attempted Suicide Short Intervention Program (ASSIP)

After referral of the patients to Comprehensive Health Centre (CHC), 3 sessions (60-90 min) of ASSIP were implemented by trained psychologists. In these sessions, the psychologists focused on patient's narrative of history of suicidal crisis, and interviews were recorded with patient's consent. ASSIP [26] as one of interventions in this field, is a brief intervention for those who have recently attempted suicide and have a structured treatment protocol. Effectiveness of this intervention for the first time has been evaluated in a RCT study [28], in which 60 patients were followed up after receiving 3 sessions of ASSIP for 24 months by regular letter writing. Results showed that the group who received ASSIP showed reduction of suicide attempts 18.4% more than control group.

Results

All districts of West Azerbaijan province (17 districts) with a total population of 3265219 people (an urban population of 2136203 people and rural population of 1129016 people) were included in the intervention and follow-up care. Due to disruptive and missing data, the data of 15 districts (excluding Takab

and Chaldoran districts) with a population of 3139603 people entered the final analysis. The population and health characteristics were shown in Table 1.

The number of individuals referred to EDs and other stations of referrals is shown in Fig 2. Of those who referred to CHC, 1631 (36.6%) attached to program for 12 months. At the end of the intervention, 68 (1.5%) individuals had reattempted suicide.

Table 1. The population and health characteristics of the West Azerbaijan province

District	Total population	General hospital	Number of physician	Number of CHC	Number of psychologists
Urmia	1040565	12	17	61	34
Khoy	348662	3	4	23	12
Miandoab	273949	0	13	17	5
Boukan	251409	3	3	8	6
Mahabad	236849	2	4	7	7
Salmas	196546	1	2	13	4
Piranshahr	138864	1	5	8	3
Naghadeh	127671	0	1	8	3
Sardasht	118849	1	3	11	6
Maku	94751	0	1	4	5
Shahin Dezh	92456	1	-	8	4
Oshnavye	73886	1	6	5	3
Shot	55682	0	2	6	3
Chaipare	47292	0	4	2	2
Poldasht	42170	1	-	1	3
Total	3139603	26	65	182	100

Fig 2. Patient Selection and Flow Diagram

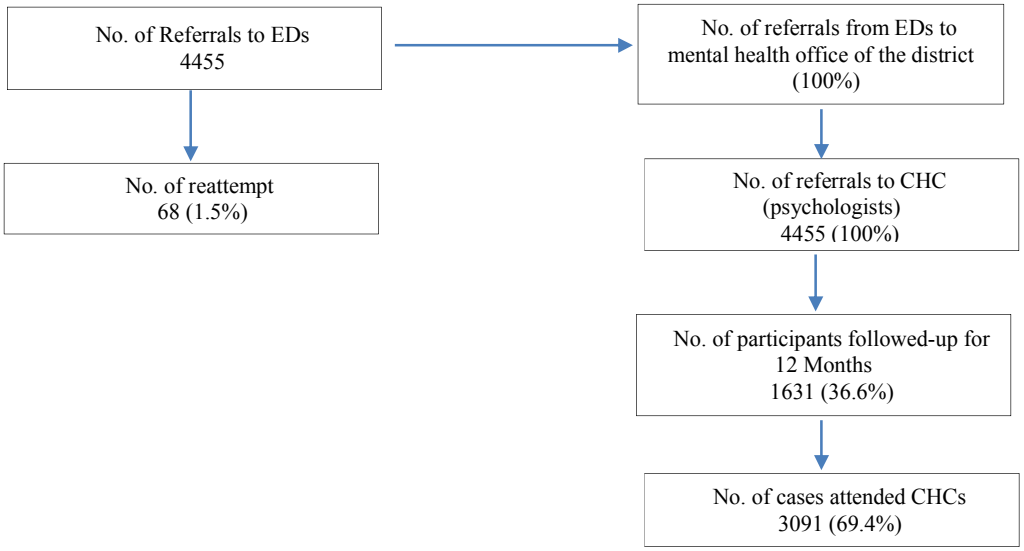

Table 2. Socio-demographic characteristics of the study of sample of suicide attempt and suicide groups in 15 districts of West Azerbaijan province in 2018

Variables	Suicide attempt	Suicide
	N (%)	N (%)
Gender		
Male	2668 (42.3)	123 (68.5)
Female	3651 (57.7)	29 (31.5)
Age		
10-24	3137 (49.7)	59 (33)
25-44	2652 (41.9)	84 (44.7)
> 44	530 (8.4)	39 (22.3)
Education		
Primary school	1771 (28.3)	61 (35)
High school	4241 (66.8)	83 (44.7)
Diplomas up	223 (4.3)	11 (6.6)
Other	39 (0.6)	27 (13.7)
Occupational status		
Unemployed	215 (3.6)	17 (10)
Housewife	2920 (46.4)	43(23.4)
Employee	97(1.6)	9(5.6)
Self-employment	1875 (29.3)	58 (32.5)
Student	639(10.1)	15 (7.6)
Other	573 (9)	40 (20.9)
Marital status		
Single	3000(47.4)	61 (34.5)
Married	3180 (50.4)	84 (46.7)
Divorced	72(1.2)	2 (1)
Other	67 (1)	35 (17.8)
Suicide method		
Hanging	120 (2)	91 (51.3)
Burning	28 (0.5)	18 (10.2)
Jumping from a height	5 (0.1)	2 (1)
Drug poisoning	5536 (89.5)	31 (16.3)
Pesticide	340 (5.5)	20 (10.6)
Drowning	2 (0.3)	-
Firearms	11 (0.2)	8 (4.6)
Cold weapon	90 (1.5)	4 (2)
Drug-Intoxication	106 (1.7)	3 (1.5)
Other	81 (1.3)	5 (2.5)
Region		
Urban	4834 (76.4)	110 (58.4)
Rural	1485 (23.6)	72 (41.6)

Efficacy of Interventions

Attempted suicide (p=0.8) and suicide (p=0.07) before and after intervention did not show any significant differences. Although the number of suicide reduced to 1.8 per 100000 population, the rate of attempted suicide has increased to 1.4 per 100000 population after intervention (Table 4).

In total, the districts of Boukan and Mahabad had the highest decrease and increase in the suicide attempt

rates compared to other districts. The suicide rate had the highest decrease and increase in Oshnavieh and Salmas (Table 3).

Table 3. Comparative statistics of suicide attempts and suicides in 15 districts of Western Azerbaijan province

District	Suicide attempt (per/100000)			Suicide (per/100000)		
	2017	2018	Difference (%)	2017	2018	Difference (%)
Urmia	308	291	- 5.5	8	6	-25
Khoy	187	170	-9.1	7	5	-28.6
Miandoab	181	189	4.4	10	9	-10
Boukan	140	92	-34.3	4	4	0
Mahabad	111	183	64.9	10	5	-50
Salmas	71	96	35.2	4	6	50
Piranshahr	95	96	11	8	7	-12.5
Naghadeh	258	243	-5.8	6	2	-66.7
Sardasht	138	146	85	8	10	52
Maku	73	70	- 4.1	8	2	-75
Shahin Dezh	148	133	- 10.1	6	5	-16.7
Oshnavye	172	191	11	12	3	75-
Shot	117	131	21	7	5	28.6
Chaipare	173	203	17.3	15	19	26.7
Poldasht	81	64	-21	5	5	0

Table 4. Means and Standard Deviation for suicide and suicide attempts in West Azerbaijan Province in 2017 compared to that in 2018

Variable	Year	Mean	SD*
Suicide attempt	2017	158	67.5
	2018	159.4	65.9
Suicide	2017	7.9	2.9
	2018	6.1	4.2

Discussion

Main finding of this study showed that scaling up PHC network in order to integrate follow-up service into suicide national program is feasible. By recruiting psychologists with MS degree into health system, Comprehensive Health Center, as part of national health transformation program is able to conduct telephone follow-up program by providing brief consultation. Although the intervention was not able to make significant reduction in the rate of suicide, it was able to reduce the rate of suicide at least 10% as emphasized in WHO's Global Mental Health Action Plan, 2013-2020 [29].

Involving suicide attempters after discharge in preventive and follow-up supportive programs can reduce risk of subsequent measures and hospitalization

[30, 31]. But studies [32] showed that the evidences of effectiveness of brief interventions to reduce suicidality is small. So we need more studies to determinate how effective this interventions will be in our country because the type of intervention and design of the study in each country can have different outcomes. Generally, results of our study showed that interventions reduced suicide, so that suicide rate in the province decreased approaching to average of the country (6 per 100,000), in contrast, suicide attempt showed a slight increase at the end of follow-up.

So far, many studies [33, 35] have evaluated effectiveness of follow-up interventions for those who attempted suicide in a variety of ways (visits, mails, phone messages, postal cards, crisis lines ,and case management), and results have shown that such interventions implemented based on context and time of interventions and follow-ups can result in obtaining different outcomes [33].

Contrary to our study, Cebria et al. [36] assigned the patients in two groups after discharge for 12-month telephone follow-up program. They showed that telephone follow-up program reduces and delays suicide reattempt. Also, follow-up services such as telephone call, sending messages and postcards, etc. due to their rapidity and low cost are evaluated to be comfortable and available [37], which can also be effective in preventing suicide. In one study [38], 94.5% of patients considered telephone call as a good way for communicating with them. The striking point of this study was to lay down a fluent pathway of registration and referring the patients from hospital to end point of receiving follow-up services in health sector. In this study, a follow-up service was established and implemented in extension of provincial field, which included a population more than 3 million people.

Although some studies [19, 36, and 39] have shown that follow-up intervention can reduce suicide reattempt, consistent with our study, some other articles do not confirm the positive effect of contact follow-up programs in Iran [40, 41] that this difference could be due to the diversity in their sociocultural conditions [32]. Howbeit in these studies reattempting suicide did not decrease significantly, the results showed a significant beneficial effect of the intervention in the other dimensions such as the reduction in suicidal thought, increasing life expectancy and trying to get support from outpatient/inpatient services, relatives, and friends or by telephone contact.

There was no significant difference in reattempted suicide after the intervention in our study with 12 months follow-up and other studies conducted in Iran with 6 months follow-up [21, 41], that could be because of the short time of follow-up. Whereas in the other studies [19, 42] in which the patients were followed up for 18 months and 5 years, suicide reattempt had a significant reduction. Also, approaches used in follow-up could have an effect on the result of intervention. In our study only brief consultation was used, but other studies (43, 44) that used different approaches such as CBT, DBT and psychodynamic had a positive impact on reducing suicide reattempt.

Comparison of results obtained from follow-up in various included districts showed that in some districts, suicide decreased and in other districts increased during follow-up period. This issue may have different reasons: 1) Quality of the way of implementing interventions in each district was different. 2) Quality of trained staff, skills of making empathic communication with the attempters and their families, skill of telephone interviewing may have different effects on the clients to use mental health services. For

example, different cities differ in terms of having more skilled personnel, better hospital and referral facilities, and access to such facilities for patients and their families. Also, being empathetic and communicating well with clients is an important factor in trust and proper participation of patients, decreased stigma and continuation of interventions by patients.

In our results, rate of dropout was equal to 30% for those individuals who did not attend CHC and around 67% who did not attached to the follow-up program. However, unlike our study, the dropout rate range was 1.2-16% [19, 22, 45, and 46]. One of the main challenges that our study faced was the subjects and their families' stigma, who were not compliant with follow-up service. Mental health related stigma can be a barrier for taking mental health services [47]. The majority of West Azerbaijan populations are Muslims. The Islamic or Muslim religion has principles which forbid the suicide [48, 49]. So it and other sociocultural factors can cause stigma and influenced participation of patient and their family in this study.

The other reason, which could be speculated, was different individuals who visited the patient in EDs, and the person who made telephone contact with the patient in CHC. Primary empathy was established with the patient and their families with face-to-face communication by the EDs' nurses, which was absent when the mental health staff working in CHC contacted the patients or their families a few days later.

The rate of reattempt of suicide reported 18-30% [18, 19]. However, the reattempt rate was just 1.5% in our study. This low reattempt rate could be interpreted as low report with respect to stigma and secondly, the interviewer low skill in obtaining correct data from the attempters and their families. However, some local researchers believe that the rate of reattempt is lower than expected in the western provinces of the country. They believe that suicide attempt is an impulsive behavior, which may not occur any more in the subjects' lifetime. This idea may be scrutinized hence the impulsivity trait will put the subject at risk of frequent attempt at any stressful situation of life.

A trivial increase in the number of suicide attempt, as indicated by the result of the study, could be considered as an improvement in the potency of health system to identify and register the suicidal cases. Cultural factors and social stigma of suicide in West Azerbaijan province in some ways limited the patients and their families' participation in this study.

Although this study results was not satisfactory enough, with respect to increasing the rate of suicide attempt registration and decreasing rate of suicide (1 per thousand population), the implementation of this program was succeeded in saving 33 person lives in one year. In this regard, it appears that it is too soon for making conclusion on the effectiveness of this follow-up program on the provincial level. Given that the health system has been armed to tackle suicide problem with low a cost plan in the following two-years, by improving the knowledge and skills of the staff, anti-stigma activities across the districts should be considered to continue the program for supplementary evaluation. However, this study could not prove the effectiveness of telephone follow-up interventions, but given that suicide has decreased in this study and the small increase in suicide attempt has probably been due to the improvement of the registration system, it is suggested that further studies to be performed with longer follow-up time and use different approaches in order to achieve a broader understanding about effectiveness of such interventions.

Limitation

One of the challenging issues of conducting this study was encouraging the attempters and their families to use the available mental health facilities. Another limitation of our study was changing and relocating of health center staff, difficulty in accessing psychologists in rural areas, and collecting data due to the very large sample size.

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Conflict of Interest

The authors have declared no conflict of interest for this study.

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