Developing and implementing a community-based suicide prevention program in Iranian primary health care: study protocol

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Abstract

Background : Since 2013, WHO has had a global mental health action plan which includes reducing suicide rate by 10% in countries by 2020. However, only 18% of countries have a registry for suicide. The community-based Suicide Prevention Program (SPP) statistic is much lower than registry for suicide. Suicide is a growing concern in Iran. A health community assessment found that suicide and Suicidal Behaviors (SBs) are one of the most important public health problems in Malekan County, East Azerbaijan Province of Iran. This calls for a regional SPP effort in Primary Health Care (PHC).

Methods: A regional community-based SPP was established during 2014-2017 in two phases including development and implementation. The development phase focuses on three pillars: 1) review of systematic reviews, 2) expert comments, and 3) report to the health care system. The implantation phase also carried out in five steps: 1) improving coverage of SBs registration, 2) identification of determinants of SBs, 3) follow up monitoring of SBs people, 4) treatment for depression and conducting research, and 5) developing public education campaigns. Primary outcome was reducing the rate of completed suicide. Secondary outcomes were considered Suicide Attempt (SA) and re-attempt. Our ultimate goal was considered to lower by 15%, 20% and 30% rates of suicide, SA, and re-attempt, respectively.

Discussion : In this study protocol, we have been to outline and explain the steps of developing and implementing a regional community-based SPP by using the highly effective evidence and field expert's comments. Implementing SPP with low cost and easily adaptable in PHC is the most important site for the case management of SBs and materialization of interventions in the health system including various types of health service providers and coverage of a large number of people. This study is both research and action. It needs to involve and support of the health system and inter-sectoral collaborations to achieve the goal of such community-based Health System Research. This HSR was approved to number 60665 in an electronic system (Pajoochan) of Tabriz University of Medical Sciences.

Introduction

It is estimated that every year more than 1 million people die by suicide in the world, but these numbers are the tip of the iceberg and it is under-reported due to the absence of an effective registry for suicide, poor Suicide Prevention Programs (SPP), cultural stigma and many social barriers. Despite these limitations, suicide is the second leading cause of mortality among individuals aged 15–29 years, who most of them have occurred in low and middle-income countries. Since 2013, WHO has had a global Mental Health Action Plan for reducing by 10% rate of suicide by 2020 in the world, but merely 18% of countries have a registry for suicide[1]. Although suicide rates have continued to increase in the United States, the causes of this increase remain poorly understood. The suicide prevention is not only critical for persons and families but moreover profits the health care system and welfare of communities and society at huge. Primary Health Care (PHC) system is an effective and important site for developing and management of at risk persons for suicide and re-attempts. Accordingly, an innovative and flexible strategy is needed for the health care system to improve suicide prevention [2].

Strong political commitment and effective social actions are needed at the grass-root level for implementing SPP, and interventions in the societies. Therefore, the SPP should be customized with a comprehensive policy and with a multidimensional approach that includes active cooperation between the various sectors of government, health, treatment, social welfare, stakeholders, clerics, urban and rural development and legal affairs.

It is believed that suicide pattern and prevention were changed in Asia [3]. Zalsman and et al. in a systematic review study identified that suicide prevention strategies were revised in the last decade [4]. However, in most Islamic countries and Eastern Mediterranean Region the rate of suicide is low. Suicide is a growing concern in Iran in the last decade. Iran's health care system has had many reforms over the past decades [5][6]. The most important reform was the formation of the National Health Network in 1983, and recently the health reform plan and the national non-communicable diseases action plan was implemented to reduce inequity and out of pocket and control of non-communicable diseases risk factors [7][8].

The national action plan has provided an appropriate framework for Iranian PHC for non-communicable diseases control and prevention. Until now, limited community-based SPP and comprehensive interventions were performed among Iranian PHC and as well many of the first-line health care systems in the world.

Objective

According to the Health Community Assessment (HCA) by Malakan county health care system, the suicide and Suicide Attempt (SA) was recognized as one of the most important public health problems with an incidence rate of 12 per 100,000 people. The HCA was performed in 8 steps based on North Carolina community assessment [9]: 1) Establish a Community Assessment Team 2) Collect Community Data 3) Analyze the County Health Data Book 4) Combine County's Health Statistics with Community Data 5) Report to the Community 6) Select Health Priorities 7) Create the Community Assessment Document 8) Develop the Community Health Action Plan.

Consequently, to reduce the risk of suicide and Suicidal Behaviors (SBs) in Malekan County, we aimed to develop and implement a community-based SPP based on the highest level of evidence during 2014–2017.

Materials And Methods

Study Design and population

The present study was performed aimed at developing and implementing a community-based SPP in Malekan County, East Azerbaijan Province of Iran, to reduce complete suicide, SA and to prevent re-attempts. The Malkan County is located in northwestern Iran with a population of 111,319 people (female: 53,653; male: 57,666) according to the 2015 national census. The native language of all the

people of this County is Turkish and all of them are Muslims. Almost, 70% of the County population lives in rural areas. Their main occupations are farming or farming-related [10].

This intervention program was performed in the PHC system in collaboration with the department of mental health in Malekan county health network and the research center of psychiatry and behavior sciences of Tabriz University of Medical Sciences. The target population was all County people aged 10-50 years.

In Iran, medical universities are responsible authorities for the health system in each province. The Iranian health system is composed of three levels based on the referral system; the first level is the primary level of health services to access all urban and rural populations by family physicians and various types of Health Service Providers (HSP). When patients need special health services, they are referred to the second level (county hospitals) by family physicians, and when high special services are required, patients are referred to province referral hospitals with high special services.

This intervention program was divided in two main phases. The first phase included steps of protocol development (3 steps) and the second phase focuses on 5 steps for implementing of protocol. Table 1 indicates that the overall steps and actions of protocol development and implementation.

Phase 1: Protocol development

1. Review of systematic reviews

A review of systematic reviews was published in 2011 by Christina and et al [11]. So, we searched a comprehensive electronic search through Medline, Cochrane Library and PsycINFO among all English language published systematic reviews studies from January 1, 2011, and [December 30, 2014](#). Grey literatures and relevant sites, such as WHO and CDC, was explicitly explored. The initial search used the relevant MeSH terms (i.e., Medical Subject Headings) in conjunction with “suicide” “prevention” and “review” in the title and/or abstract. Then the primary search was combined with programs, strategies, methods, control, intervention, depression, suicidal behavioral/behavior, suicide attempted, primary health care, family physicians, mass media, schools, adolescents, and health promotion. Bolin operators including AND, OR, NOT was used for combined terms. All primary researches, narrative reviews, scoping review, critical review and literature review were excluded.

Data were extracted on primary outcomes of interest: suicide prevention programs, strategies or interventions, and secondary outcomes including AS, recurrent suicide, re-attempt, suicide ideation and intervention or education in public education, screening, media, suicide attempted, general practitioner, physicians, schools, primary health care, and at-risk groups. Two experts reviewed included systematic reviews and summarized in a brief explanation in the EXEL file. For discrepancies, the third expert made the final decision. In the end of this stage first draft of interventions or programs and effective efforts were prepared by two experts (mental health expert and researcher).

2. Expert comments

The first draft of extracted interventions from records (review studies) were discussed among the department of psychiatry and department of mental health (the deputy of health), Tabriz University of Medical Sciences and County health network experts to determine priority interventions and developing the best SPP and components of it. The Focus Group Discussions (FGDs) method was used for protocol development by presences of psychiatry, psychologies, mental health experts, adolescent experts, epidemiologists, health system researchers, family physicians, community health workers, and nurses of the emergency ward.

Feasibility, effect, importance, cost-effectiveness, acceptability, applicability, relevance, and other features of the various types of interventions and strategies for developing SPP were discussed in the meeting. In this stage, the first draft of the protocol was prepared.

The Nominal Group Technique (NGT) was used to finalize protocol and prioritizing prevention programs and interventions. Team members begin by writing down their ideas, then selecting which idea they feel is best. Once team members are ready, everyone presents their favorite idea, and the suggestions are then discussed and prioritized by the entire group. The final protocol focused on five pillars for performing: 1) improving coverage of SBs registration, 2) identification of determinants of SBs, 3) follow up monitoring of SBs people, 4) treatment for depression and conducting research, and 5) developing public education campaigns in hot spots.

3. Report to the health system

The final protocol reported to the County health care system. The protocol was included an action plan and responsibilities of all related HSP, especially how to manage SBs and at-risk cases. Furthermore, we have utilized various training conferences to educate and mobilize HSP, community health workers (Behvarz in Persian), family physicians, health monitoring experts, psychologies, psychiatrists and other providers.

Phase 2: Implementation

1. Improving coverage of suicidal behaviors registration

The national suicide registry system was launched in 2009 in Iran and based on reports from medical universities. In the counties, there isn't an electronic suicide registry system. The suicides reports are reported to Province medical universities based on paper formats. Malekan County isn't so large. As know, suicides are under-reported especially in small communities because of cultural barriers, stigma, and lack of an effective surveillance system.

Accordingly, we handled several efforts to increase the coverage of suicide registry in the county including 1) developing and the usage a simple and rapid checklist for gathering primary data in the emergency room for suicide registry with contain selected socio-demographic characteristics and address and contact information and methods of SB, 2) Collecting SB cases which are referred to the adjacent counties such as Miyandowab, Bonab, and Maragheh, 3) using of native community health workers

(Behvarz) for reporting and collecting any SB events, 4) promoting intra-sectoral collaborations between deputy of health and treatment, 5) rise of inter-sectoral collaboration with clergy, village assistance and councils, municipalities, and governors with several advocacies activities.

2. Identification of determinants of suicidal behaviors

To identify and for a better understanding of effective interventions as well as to determine the reasons and elements of SBs, we carried out semi-structured and face to face interviews with most of SBs cases by trained clinical psychologists. The interviews were performed with the most nearby individuals of family member's including parental, spouse or sibling instead of suicide (died) cases. A valid and comprehensive questionnaire was used to collect all suicide risk factors such as stressful life events, history of SA, psychological and depressive disorders, methods and details of SBs, cultural and religious beliefs, and socio-demographic and psychiatry and other determinants of suicide in a single and private sitting[12].

Thy validity of this questionnaire was determined by experts included two psychiatrists, an epidemiologist, a community mental health expert, and a psychologist and some questions were revised. Reliability was assessed also with Cronbach's alpha test ($\alpha=0.78$).

3. Follow up monitoring of suicidal behaviors cases

A previous SA is the main risk predictor for future attempts, as well as completed suicides. Therefore, one of the most important interventions in this program was to focus on cases with a history of SB [13],[14] , [15].

The purpose of this intervention was to prevent recurrent attempts in the future. Figure 1 shows the details and algorithm of the following and monitoring of SB cases to prevent recurrent attempts (re-attempts). We set up a suicide sentinel care with weekly reporting of SBs. The SBs events were collected from community health workers, emergency, health centers, adjacent counties and departments of mental health. Moreover, after each SB has occurred, we had created a paper-based file containing a comprehensive questionnaire, risk assessment with PHQ9 and medical histories at the nearest health center to their residence.

The SBs cases have monthly follow upped and monitored by community health workers (Behvarz). The risk of suicide was assessed by the PHQ9 tool. The high-risk cases are referred to as family physicians. Moderate and low-risk cases were followed up after 3 and 6 months, respectively. Family physicians high-risk and psychiatric disorder cases introduced to a psychiatrist in the County hospital (FARABI) to prevent future SBs.

4. Treatment for depression and conducting research

Depression is the most important risk predictor for suicide and SA. We have assessed all SBs cases in term of depressive disorders. Depressive disorders cared and treated by family physicians based on

national guideline. Because our initial interviews indicated that depressive disorders have highly prevalent in SA cases especially among young adults.

Furthermore, we developed a community-based survey for assessment of depressive prevalence rate and its determinants among 530 participants aged 13-40 years by using stratified random sampling. Depressive disorders were assessed by using the Beck Depression Inventory scale II (BDI II) for depressive symptoms. This tool had included 21 items that measured the depressing over the last two weeks. This tool was designed on a 4-point scale ranging. The normal scale is total scores ranging from BDI-II from 0 to 13, mild is from 14 to 19, moderate is from 20 to 28, and from 29 to 63 are severe[16].

5. Developing public education campaigns in the hot areas

In hot-risk areas, we held life-skills conferences and educating sessions with inter-sectoral collaborations (stakeholders and supporters of villages and cities) for heads of households, women, and teens and youth and other at-risk people. The life-skills conferences included parenting, effective communication, problem-solving, decision making, creative and critical thinking, and coping with stressful life events that were held by clinical psychologists. These workshops were held in public sites such as the health center and mosques to be accessible to the general public.

Comprehensive campaigns have designed for depression and mental health-promoting for the general population. Educational packages, posters, pamphlets, and banners were afforded and distributed throughout the city and villages. The social stigma of mental disorders and referring to a psychiatrist was largely removed with much training and mobilization to the public sector.

Outcomes

The primary outcome of this intervention program was the rate of suicide. This outcome can be assessable by comparing it with forensic medicine and Province deputy of health statistics.

The secondary outcomes are AS and recurrent attempts among people with a history of SB. Our ultimate goal was considered to lower by 15%, 20% and 30% rates of suicide, AS and recurrent attempts, respectively.

History of AS is the strongest predictor of completed suicide. In this intervention program, we tried to reduce the rate of recurrent SB in the future. Therefore, the reduction of recurrent SB among suicide attempters is one of the main secondary outcomes (indicators) in this study.

Discussion

This study aimed to explain and outline the development and implementation steps of a community-based SPP with low cost and a combination of the highest evidence and field expert's experiences in the

health care of Malekan County. The results and outcomes of this intervention program will be developed in the next paper.

In our opinion, this community-based prevention and surveillance program is one of the best and most applied Health System Research (HSR). Because after identifying the problem we have tried to resolve this problem with assistance and support of the health system, as similar to action research. We organized the health system in line with our purpose for achieving optimal performance and advancing a problem-solving perspective in HSP and also led to empowering research for theirs. It was needed extra energy and coordination.

We tried to advocate the support of health managers, County decision-makers and stakeholders with many advocacies efforts. We have used the force of clergy and influential people. The evidence has shown effective efforts to reduce suicide would need pooled interventions by different providers in several fields. In the most steps of developing and implementing phases of this comprehensive program, we combined qualitative research methods and its data collection methods (FGDs and NGT) with quantitative methods. Indeed, our study method had mixed methods in design and implementation as well as triangulation.

Furthermore, implementing the SPP in PHC is the most important site and easily adaptable for the case management of SB in the health system with various types of HSP. PHC is the first line of health cares that an SB person may be referred to it. In the world, many suicide prevention programs in various designs (RCT, descriptive, qualitative and other methods) had been performed. But these studies carried out in limited coverage and level[7], [17]–[18].

Developing and implementing a community-based SPP in the health care system and a surveillance system can be coverage of the massive population. Studies of this kind have very limited. In developing and implementing such community-based SPP that is a social and sensitive issue, we need to involve governors, influential individuals in the area and clergy. Another major strength of our study to have valid and measurable outcomes and indicators such as suicide, AS and recurrent attempts, which could represent the efficacy of interventions. This provides direct information about the effectiveness of the interventions.

Health System Research (HSR) is a basic pillar of the health system that has been neglected. HSR should be strengthened in health systems to resolve public health problems, especially in sensitive and social issues such as suicide and SB. Staff and HSP should be properly trained for research. The reformist and problem-solving approach should be stimulated for them[19].

A successful SPP should start with a comprehensive policy. Despite the successful global experiences for developing SPP, the cultural conditions and social and religious beliefs of each region must be taken into account as they are highly linked to suicide. The SPP requires a strong political commitment with Inter-sectoral collaborations between organizations of community's included government, health, treatment, social welfare, stakeholders, clerics, urban and rural development and legal affairs.

Limitations

This intervention program have limitations. First concern is the lack of screening intervention in this program for the identification of all at-risk or suicidal ideation people among the general population due to limited financial and human resources.

Another concern, which is a major challenge for such studies, it needed to engage and support the health system and mobilization of the health service providers to reach the goal of the study. In fact, it is both research and action. Therefore, it requires high coordination, double energy, and continues footwork. But it moderates a major social and public health problem.

Abbreviations

SPP

Suicide prevention program; SBs:Suicidal behaviors; SA:Suicide attempt; PHC:Primary health care; HSR:Health system research; HSP:Health service provider.

Declarations

Ethics approval and consent to participate

This study was approved by the ethics committee of Tabriz University of Medical Sciences to number TBZMED.REC.1394.674. Written informed consent was obtained from all subjects before the interview. For subjects who had under 18 years old, we have obtained written informed consent from the father or guardian of participants in a face to face position with justifying the purpose of the study.

Consent for publication

The funding organization and all authors are consent for publication.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to the sensitivity of the suicide issue and the confidentiality of the information, the consent of the sponsoring organization is required. But are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that there is no conflict of interest and financial disclosure.

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Author's contribution

Hosein Azizi: original idea and protocol development, interpretation of the data, data collection and drafted all sections of the manuscript. Mostafa Farahbakhsh and Ali Fakhari contributed in the design, preparing of the manuscript draft. Mohammad Mirzapour: contributed to the protocol development. Elham Davtalab Esmaeili: contributed to the manuscript development and interpretation of the data, and data collection and drafted all sections of the manuscript. Habibe Barzgar, Vahab Aslrahimi contributed to the development of the protocol and data collection and draft of discussion.

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Table 1

Table 1) Overall study design for developing and implementing of suicide prevention program

	Steps	Actions
Development	Review of systematic reviews (1	A systematic electronic search performed to find out the best evidences for suicide prevention
	Expert comments(2 i. discussion about found review studies via FGD j. combine electronic search results with expert comments via NGT k. developing first draft of a protocol for suicide prevention	
	Report to the health system (3 i. developing final draft of protocol j. report to the County health care system k. health system mobilization	
Implementation	improving coverage of SBs registration (1 i. developing a paper-based checklist for SB registering j. training of emergency ward staffs	
	identification of determinants of SBs (2 i. developing a valid questionnaire for collecting determinants of SB j. Face to face interviews with SB cases	
	Follow up monitoring of SBs(3 i. developing a sentinel center for gathering weekly events of SB from all wards of health system j. Filing for SB cases in the health center k. Risk assessment l. monitoring of SB to prevent future attempts	
	treatment for depression and conducting (4 research i. identifying SB with depressive disorders j. surveying depression prevalence and determinants among aged 13-40 k. Treatment of depressive disorders	
	Developing public education campaigns(5 i. hot spots identification j. campaigns	

Figures

Figure 1

the follow-up monitoring of suicidal behaviors cases to prevent recurrent attempts