

Identification of Important Factors and Actions to Prevent Suicide among Military Forces and Soldiers; a Systematic Review

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Abstract

Introduction: Suicide among soldiers is not accidental and, as a result, a stream of thoughts, behaviors, situations and interpersonal relationships are often rooted. This study was aimed to review important factors and actions to prevent suicide among military forces and soldiers. **Method and materials:** International databases including PubMed, ISI and Scopus were considered for search of English articles by 30 Dec, 2018. and eight published articles were finally entered into the study. **Keywords** were suicide, soldier, military and veteran, or a combination of them in the title/abstracts. **Findings:** There were more than 493,423 subjects reviewed in this systematic review of eight published articles consisted of four interventional, one cohort and three cross-sectional studies. **Conclusion:** According to the results, education can be considered as a way for reducing suicide in soldiers and military personnel.

Key words: Suicide, Soldier, Veteran, Military

Introduction

Suicide attempts include those actions that a person performs for his own destruction, but does not lead to death. Suicidal thoughts also relates with non-being and the desire to die, which has not yet been taken into account (Fortinash and Holodayworret, 2008). The military service is a hard period in the life of young men, and its difficult conditions can facilitate suicide as an important psychological problem in this period (Andres and Hempstead, 2011). However, suicide rates in military staff are higher than civilians (Anisi et al., 2006; Timothy, Lineberry and Stephen, 2012). According to many studies, successful suicide in civilians and military personnel is 9 per 100,000 people and 12 per 100,000 people, respectively (Sadock and Sadock, 2005). However, there are few studies on suicide and attempted suicide in Iranian military forces, but reports indicate a high prevalence of suicide among soldiers from that of other middleeast countries (Anisi, fathi-Ashtiani and Seyed Hossien, 2005). In a study by Nuri et al. in Iran, 4.4% of soldiers had a history of suicide ideation and self-destruction due to mental disorders (37.2%), family conflicts (36.7%), incompatibility with peers and working setting (13.8%). Also, 75.1 % committed the suicide by weapons, 18.5 % by drug, 1.2% by eating oil and washing detergents , 4.4% by hanging out and 0.9% by falling from height. Given the underlying factors, soldiers must be examined at the time of entering the military environment, as well as regularly and accurately, and appropriate suicide prevention interventions such as education, counseling and psychotherapy should be conducted for them (Nouri et al., 2012). In a Systematic Review study by Bakhtar and Rezaeian, the prevalence of suicide ideation was 4.2% to 8.5% (Bakhtar and Rezaeian, 2018). Suicide is one of the unfortunate phenomena that has biological, psychological, social, cultural and economic dimensions (Anisi, fathi-Ashtiani and Seyed Hossien, 2005). Due to the increasing trend of suicide attempts in recent years, the World Health Organization (WHO) designated 10 September as the World Suicide Prevention Day (WSPD), and on this day a special program will be considered for some countries (Organization, 2000). Of every one hundred suicidal attempts, one case ends in death, and the suicidal rate after one year following self-injury is approximately one hundred times higher than the normal population without self-injury (Nouri et al., 2012; Eftekhary and Ammar-Saidi, 2004; Hajebi et al., 2009). More than half (62%) of the suicides commitment occur in military by weapon, one of the most violent types of suicides (Nouri et al., 2012). In Polish soldiers, after hanging, shot suicide is a common method to commit suicide (Florkowski, Gruszczyński and Wawrzyniak, 2001). Suicidal thoughts and behaviors (STBs) cannot be assessed in laboratory settings and there is not a technology to study them in situ. Therefore, identifying risk factor as predictors can contribute in this regard (Nock, Ramirez and Rankin, 2019). To identify soldiers at risk, administrative records from personnel, medical, legal, and family services systems must be applied (Ursano et

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al., 2018). Nowadays, dozens of putative risk factors were recognized using machine learning methods for diagnosing people at risk to commit suicide (Kessler et al., 2015). Suicide in the Army is happened due to a complex interaction of multiple factors, as has been suggested by other researchers. Nock et al., revealed the importance of the vast range of mental disorders and stressful events to facilitate suicidal behaviors (Nock et al., 2008). According to the study of Zuromski et al. there are three major risk factor for suicide including a history and severity of self-injurious, thoughts and behaviors, mental disorders, and sociodemographic and army career characteristics, in which can be checked using a small number of self-report questions such as time since onset of ideation, having ideation only, ideation with a plan but no attempt and Ideation with a planned / unplanned attempt (Zuromski et al., 2019).

The presence of young soldiers in a new environment, the lack of family support and support systems, and the acceptance of new responsibilities can lead to major changes in individual psychosocial performance and, as well as the disparity with these pressures and environmental stress may lead to adaptive problems and imbalance of mental-social health (Fathi-Ashtiani, Soltani Nejad and Amire, 2006; REiazian et al., 2018).

Several factors are associated with an increase in suicidal ideation including male gender (Yip, Chi and Yu, 1998), mental disease and personality disorder, being single, being unemployed, drug abuse, family problems (Sadock and Sadock, 2011), the year of service (Fathi-Ashtiani, Aslami and Hossien, 2002), the difficulties of service in the system, fear of punishment, interpersonal violence relationships (Sosedko and Pustovalov, 1994), past suicide history (Mehlum, 1990), alcohol abuse (Miller et al., 2000), low-ranks of military (Helmkamp, 1995), disagreement with commanders, separation from the family, and low communication with others (Bullman and Kang, 1996). The effect of training, counseling and psychotherapy on the prevention of suicide attempts among soldiers was approved (Balko, 2013). The aim of this study was to review important factors and actions to prevent suicide attempts among military personnel and soldiers.

Methods

Search strategy

In this systematic review, international databases including PubMed, ISI and Scopus were considered for search of English articles by 30 Dec, 2018. Keywords were suicide, soldier, military and veteran, or a combination of them in the title/abstracts. (((((((Suicide[Title/Abstract]) AND soldier[Title/Abstract]) AND military[Title/Abstract]) OR veteran[Title/Abstract]) was the search strategy of this study.

Inclusion criteria

After collection of articles of interest, references imported to Endnote software and removed duplicate titles. Then, after browsing titles, studies with irrelevant purpose were removed, and then the remaining studies assessed by two independent investigator. The selected studies were performed on humans and published in English.

Data extraction

Information dealing with the selected articles (the author's last name, year of publication, study design, sample size and the results of each article were taken by two independent investigators. The differences observed in this process corrected by a third investigator who was independent with the two previous investigator.

Findings

There were more than 493,423 subjects reviewed in this systematic review of eight published articles consisted of four interventional, one cohort and three cross-sectional studies.

The details of quality assessment was performed as following:

A minimum of 8 score out of 12 regarding quality of methods, data collection tool and population according to Table 1 were included in the final review for each article, in such a way that articles with 8 scores and higher were selected for further data extraction and analysis. Finally, the studies published in English were included in this systematic review. When several studies from a single cohort or population are published, only the results from the latest study find the conditions necessary to enter this analysis. The summart of the selected articles was shown in Table 2.

The selection process using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement can be seen in Figure 1.

Table 1. Quality of materials, methods, data, and the key component of the final articles

	Question	Score
1	Are the research questions clearly stated?	No=0 Yes=1
2	Is the approach appropriate for the research question?	No=0 Yes=1
3	Is the study context clearly described?	No=0 Yes=1
4	Is the role of the researcher clearly described?	No=0 Yes=1
5	Is the sampling method clearly described?	No=0 Yes=1
6	Is the sampling strategy appropriate for the research question?	No=0 Yes=1
7	Is the method of data collection clearly described?	No=0 Yes=1
8	Is the data collection method appropriate to the research question?	No=0 Yes=1
9	Is the method of analysis clearly described?	No=0 Yes=1
10	Are the main characteristics of the population well described?	No=0 Yes=1
11	Is the analysis appropriate for the research question?	No=0 Yes=1
12	Are the claims made supported by sufficient evidence?	No=0 Yes=1

Table 2. The summary of reviewed articles in this systematic study

ID	Reference	Title	N	Design	Age	Conclusion
1	Rudd et al. in 2015	Brief Cognitive-Behavioral Therapy Effects on Post-Treatment Suicide Attempts in a Military Sample: Results of a Randomized Clinical Trial With 2-Year Follow-Up	152	Clinical trial	≥18	Brief Cognitive-Behavioral Therapy is effective for preventing follow-up suicide attempts in active-duty military forces with current suicidal attitude and/or a recent suicide attempt. This is suggesting that soldiers using brief cognitive-behavioral therapy were less likely to commit suicide attempt.
2	Denneson et al. in 2017	Curiosity improves coping efficacy and reduces suicidal ideation severity among military veterans at risk for suicide	117	Randomized clinical trial	20-77 years	Findings suggest that curiosity may buffer against the effect of heightened levels of distress on suicidal ideation and help facilitate stronger gains in coping efficacy over time. Curiosity facilitated stronger gains in coping efficacy when distress was high.
3	Bryan et al. in 2018	Mechanisms of Action Contributing to Reductions in Suicide Attempts Following Brief Cognitive Behavioral Therapy for Military Personnel: A Test of the Interpersonal-Psychological Theory of Suicide	152	Randomized clinical trial	Mean±SD: 27.4±6.2	Army staff with recent suicide attitude or attempts have fewer suicide attempts using Brief cognitive behavioral therapy (BCBT). Tests of the moderated mediation failed to support an indirect effect for the Interpersonal-Psychological Theory model were specified as mediators or moderators and do not consider for reducing in suicide attempts in BCBT.
4	Varner et al. in 2011	Suicide Prevention in a Deployed Military Unit	50	Interventional	Not reported	Education, identification, and intervention programs (deployment cycle prevention program) may decrease rates of suicide in the combat environment. This program may serve as a model for other suicide prevention programs.
5	Wilks et al. in 2018	Anger, social support, and suicide risk in U.S. military veterans	2467	Cross-sectional	Mean±SD: 37.48 ±10.22	The results suggest that suicide prevention may benefit from anger management interventions as well as interventions regarding social and family support can lower suicide risk in veterans.
6	Gordana and Miliwoje in 2007	Suicide Prevention Program in the Army of Serbia and Montenegro	-	Cohort (15 years)	30	Results of the educational program application showed constantly reducing over the period 2004 to 2005, so that in soldiers, four times less than in the civilian male population, in the period of adaptation to the military setting. Suicide Prevention Program proved to be successful in decreasing the suicide.

7	Daruvala et al. in 2018	Suicide ideation and self-efficacy to avoid suicidal action among psychiatrically hospitalized military personnel	139	Cross-sectional	Mean±SD: 30.17 ±8.85	Evidence-based treatments such as cognitive behavior therapy for suicide prevention is useful. Future research on how self-efficacy to avoid suicidal action can be considered as an effective method.
8	Bruce et al. in 2010	Suicide risk and prevention in veteran populations	490,346	Cross-sectional	20-65 years	This paper describes the response of veterinary affair to these data to develop and conduct suicide prevention interventions.

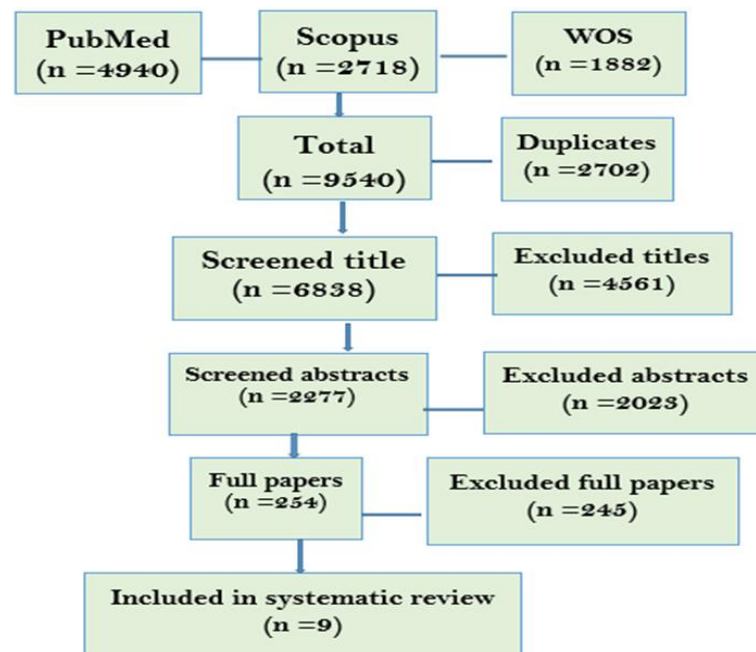


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for this study

Discussion

Suicide attempts are some actions to commit suicide without happening death. Suicidal thoughts or ideation is related to hinking about death and planning for suicide (Fortinash and Holodayworret, 2008). Suicide of soldiers cannot be accidental and a chain of thoughts, behaviors, situations and interpersonal relationships are often rooted in the event of suicide (Fathi-Ashtiani, Aslami, Hossien, 2002; Sosedko and Pustovalov, 1994). In this study, important factors and actions to prevent suicide among military forces and soldiers were reviewed.

In a study conducted by Noori et al. entitled "identification of the suicide causes in soldiers of a military force", the results showed that the most common causes were psychological disorders, family problems, incompatibility with colleagues and the work environment, respectively. The highest frequency of suicide and self-destruction was related to the winter season. Due to the underlying factors, individuals should be visited periodically and accurately while entered the military environment to be involved in the prevention interventions such as education, counseling and psychotherapy (Noori et al., 2012).

In a study by Anisi et al. entitled "investigating the prevalence of suicide thoughts and related factors", the results revealed that low education, previous suicide history, drug addiction, smoking and dissatisfaction with military service, inappropriate psychological status and conflict with other soldiers and commanders had a significant relationship with the increase of suicide thoughts (Anisi, fathi-Ashtiani and Seyed Hossien, 2005). Also, Maslowski et al., found that demographic characteristics and socioeconomic status had a low impact and the quality of communication and social relationships had a great impact on individuals' suicide such as child injuries, stress and job difficulties, satisfaction with friendship and social support in which play an important role. Early identification of these factors, screening for the at-risk people and preventing their loneliness have an important effect on the prevention of suicide (Maslowski, Vescera and Bongar, 2017). Ursano et al., in their study entitled "identifying the risk factors, methods, and times of committing suicide among US soldiers in a longitudinal study", showed that male gender, young people under 30 years of age, single, lower education, non-white race,

accessibility to firearms and lack of proper mental health, service have a direct impact on the suicide of individuals who need attention (Ursano et al., 2016).

In a study by Ejdesgaard et al. that risk factors of suicide attitude and attempts among soldiers of Denmark were assessed, substance abuse, poor financial status, heavy workload, unemployment, hard childhood, lack of recreation and sports, and non-payment of salaries are important factors. Prevention programs including home-based communication, screening of at-risk people, minimizing heavy duty, sports and recreational programs, and meeting needs should be considered as vital considerations to reduce suicide occurrence among soldiers (Ejdesgaard et al., 2015). In a study done by Bagley et al. in the United States on suicide prevention programs for soldiers and veterans, the results showed that military personnel and veterans were at high risk for suicide because psychological problems among military personnel were widespread that counseling, supportive programs, psychotherapy, and guidance to prevent suicide can reduce suicide, albeit the success of these programs has been proven and the rate of suicide in the population is generally reduced (Bagley, Munjas and Shekelle, 2010). Considering some risk factors, the diagnosis of suicide attitude can be easier and then they can be treated after diagnosis.

Mental health problems increase significantly after six months of military services in a combat environment according to the Army's Mental Health Assessment Team, Fourth Report (MHAT-IV and -V) and another study by Warner et al. (MHAT-IV, 2006; MHAT-V, 2008; Warner et al., 2007). This is a good time for soldiers and military staff to be on leave to spend at least fourteen days with their lovely friends or family at home.

In a randomized controlled trial conducted by Rudd et al, assessment of incidence of suicide attempts during the follow-up period was done with the Suicide Attempt Self-Injury Interview using survival curve analysis for determining the effect of treatment by time. Use of cognitive-behavioral therapy model decreased more than half of suicide attempt during follow-up compared with soldiers in usual treatment without brief cognitive-behavioral therapy (Rudd et al., 2015). This noteworthy finding was consistent with some previous studies showing the positive therapeutic effect of dialectical-behavior therapy (Linehan et al., 1991; Linehan et al., 2006) and cognitive therapy (Brown et al., 2005). Given that the main target of brief cognitive-behavioral therapy is problem-solving skills development and emotion control, it can be used in this regard.

In a study by Daruwala et al., suicidal action among psychiatrically hospitalized military personnel was investigated (Daruwala et al., 2018). Individuals with suicide attitude need improvement of the self-efficacy for avoiding engagement in suicidal behaviors. In this study, low level of the self-efficacy was as a risk factor for suicidal behaviors. Military personnel psychiatrically hospitalized after a history of a suicide-related event provided a full history of suicidal behaviors. Data were analyzed using multiple linear regression. Severity of suicide attitude was correlated to the self-efficacy. Self-efficacy can be enforced using cognitive behavior therapy. The results of this study were consistent with the theory of self-efficacy, in such a way that previous failures to cope with a difficult situation reduces the self-efficacy beliefs (Bandura, 1977).

Warner et al. showed that a deployment cycle prevention program consisted of education, early identification and intervention according to the specific activities and stressors of working unit can reduce suicide in the military staff and soldiers. This program is based on a modification of tenets outlined in army regulation, suicide prevention and surveillance, specifically tailored to fit the needs of the individual unit throughout the phases of deployment. This program developed by Warner et al. may consider as a model for other suicide prevention programs (Warner et al., 2011). Peaks in suicidal attitude and behaviors were observed during months 2, 6, and 12 of deployment. Using this model decreased the rate of suicide compared to the past.

Conclusion

According to the results, education such as brief cognitive-behavioral therapy for preventing follow-up suicide attempts in active-duty military forces with current suicidal attitude and/or a recent suicide attempt, education of self-efficacy, education how to manage anger, can be considered as a way for reducing suicide in soldiers and military personnel. It is suggested to perform cohort studies with large sample to find out causality association of variable to be focused on the variables of interest.

Ethical considerations

Ethical subjects such as plagiarism and double publication have observed in this study.

Conflict of interest

The authors declare that there is no conflict of interest in this study.

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