

## Suicide prevention in military organizations

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### Abstract

Suicide is an important public health problem in the demographic group that forms the bulk of military populations, namely young and middle-aged men. Suicide in the military also has special significance: certain aspects of military service can lead to serious mental disorders that increase the risk of suicidal behaviour. Moreover, military organizations have control over a broad range of factors (notably the direct delivery of mental health care) that could mitigate suicide risk. This article will review the literature on suicide risk in military organizations to answer the important question: Are military personnel at increased risk for suicide? Next, Mann *et al.*'s (2005) model for specific suicide preventive interventions in civilian settings will be reviewed and then expanded, with an emphasis on identifying special opportunities for suicide prevention in military organizations, including: 1) organizational interventions to mitigate work stress; 2) selection, resilience training, and risk factor reduction; 3) interventions to overcome barriers to care; and 4) systematic quality improvement efforts in mental health care. Finally, the evidence behind comprehensive suicide prevention programmes will be reviewed, with a special focus on the US Air Force's benchmark programme.

### Introduction

#### *The significance of suicide in military organizations*

Suicidal behaviour is an important public health problem in industrialized nations and one of the leading causes of death in the demographic group that makes up the bulk of the military population. Suicide in the military also has additional significance: some aspects of military service increase the risk of PTSD, depression, and alcohol abuse, which in turn are known to be risk factors for suicidality. In addition, many service members have differential access to firearms, a common means of suicide in some countries. The unique role of military medical officers as both personal physician and 'company doctor' may serve as a special barrier to accessing mental healthcare. Finally, the US Army and Marine Corps have reported sharp increases in suicide rates since their involvement in the conflicts in south-west Asia, and other military organizations fear that they, too, will see such increases in time.

#### *The challenges of suicide prevention research*

Research on suicide prevention poses formidable methodological challenges, and those inclined to doubt will find limitations in every study. In place of

therapeutic nihilism it is reasonable to consider interventions as suicide prevention strategies provided that 1) they effectively target an important mediator of suicidal behaviour (e.g. depression), 2) they appear to have little risk; 3) they are not overly resource-intensive, and 4) in particular, they have benefits in other areas. Results from civilian settings should be presumed to apply to military settings, unless there is strong reason to suspect otherwise.

This article will first review the epidemiology of suicide in military organizations. Next, a conventional suicide prevention model will be expanded to emphasize the special opportunities for prevention in the military. Finally, the evidence behind comprehensive, community-based suicide prevention programmes will be reviewed, with a focus on the US Air Force's benchmark programme. Suicide prevention in veterans (Bagley *et al.*, 2010; Bossarte *et al.*, 2010; Bruce, 2010) will not be discussed, in order to keep the focus on the special opportunities for prevention in the military workplace.

### Methods

#### *Search strategy*

Search of English language articles indexed in MEDLINE, PsycINFO, and Embase using the

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keywords ('suicide' or 'suicidal'), 'prevention', and ('military' or 'army' or 'navy' or 'marine' or 'air force') yielded 132 unique citations. A total of 73 citations were reviewed in their entirety. Additional articles and reports were identified through cited reference searches, Google searches, and discussion with military suicide prevention experts.

**The epidemiology of suicide in military organizations**

*Military suicide rates*

Suicide rates in currently serving personnel are below the rates seen in the general population of the same age and sex distribution (Mahon *et al.*, 2005). There are two notable exceptions: 1) the UK has reported a modest excess of suicides in younger army men (Fear *et al.*, 2009); and 2) the US Army and Marine Corps have seen a recent climb in suicide rates (DoD, 2010), bringing these rates above the civilian rates.

*Suicide risk factors and triggers*

It is highly probable that the same broad range of risk factors, protective factors, and triggers for suicidal behaviour identified in the general population also applies to military populations. Those in the US Army and Marine Corps and those in security and combat arms trades (Helmkamp, 1996) have been noted to have an increased risk. Common military suicide triggers include failed intimate

relationships, financial problems, legal/disciplinary problems, work stress, and imposition of medical employment limitations (Army Suicide Prevention Task Force, 2010; Fragala & McCaughey, 1991; Hawton *et al.*, 2009).

Case series of military suicides have confirmed the prominent role of mental disorders as a risk factor, though the fraction judged to have a mental disorder may be lower than that seen in civilian psychological autopsy studies (Army Suicide Prevention Task Force, 2010). PTSD is an independent risk factor for suicidal ideation and attempts, but there is no clear evidence of an increase in completed suicides (Panagioti *et al.*, 2009).

Studies have largely shown no relationship of previous deployment to suicide, at least not as long as individuals remain in service (Mahon *et al.*, 2005). 1990–1991 Gulf War veterans have no increased risk of suicide (Gray & Kang, 2006), and most studies on Vietnam veterans (Knapik *et al.*, 2009), peacekeepers (Sareen *et al.*, 2010), and veterans of the current conflicts (Kang & Bullman, 2009) have also been negative. However, recent UK veterans have a higher rate of suicide than their civilian counterparts, particularly in the first few years after release (Kapur *et al.*, 2009). Younger army males with short periods of service were at particularly elevated risk.

**Preventive interventions**

In 2009 the Canadian Forces Expert Panel on Suicide Prevention adapted a recent model of targets

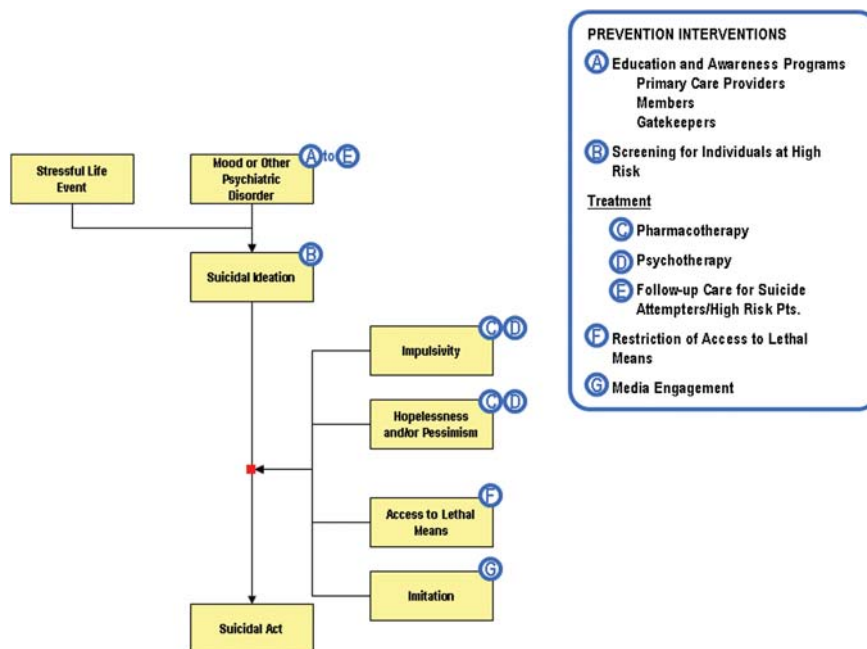


Figure 1. Model of targets for suicide prevention (Mann *et al.*, 2005). Copyright©2005 American Medical Association. All rights reserved.

for suicide prevention (Figure 1) to highlight special opportunities for suicide prevention in military organizations (Figure 2).

*Education and awareness programmes*

Potential targets for educational interventions include the general population, specific sub-groups (e.g. secondary school students, employees), those in gatekeeper roles, and healthcare professionals.

*General population.* Mass media messages on mental health and suicide prevention can improve knowledge and attitudes, but the effect on actual behaviour (e.g. care-seeking) is limited at best (Fountoulakis *et al.*, 2010).

*Specific sub-populations.* More intensive, formal educational programmes have shown the intended effects on self-efficacy and on the target attitudes and beliefs, both immediately and over as long as a year of follow-up (Takada & Shima, 2010). Only one school-based programme has been shown to decrease suicidal behaviour (Aseltine *et al.*, 2007).

*Gatekeepers.* A recent review (Isaac *et al.*, 2009) of gatekeeper training for suicide prevention concluded: ‘It has been proven to positively affect the skills, attitudes, and knowledge of people who undertake the training in many settings’ but there is no evidence of a decrease in suicidal behaviour in the target group.

*Healthcare providers.* Many community-based suicide prevention programmes that have shown decreases in suicidal behaviour (Hegerl *et al.*, 2006; Ono *et al.*, 2008; Rihmer *et al.*, 1995; Szanto, *et al.*, 2007) have included a clinician education component targeting depression and/or suicidality.

*Application of educational and awareness programmes to military organizations*

Most comprehensive suicide prevention programmes have included a prominent educational component (Dedic & Panic, 2007; Gaines & Skaer, 1979; Knox *et al.*, 2003; McDaniel *et al.*, 1990). This and data from other community-based prevention initiatives forms the most compelling argument for suicide prevention education in military organizations.

*Screening and assessment*

*Screening for suicidal ideation, depression, and PTSD.* There is no evidence that screening for suicidal ideation in unselected individuals is beneficial (Gaynes *et al.*, 2004). In contrast, screening in medical settings for depression (US Preventive Services Task Force, 2009), PTSD (Zatzick *et al.*, 2004), and high-risk drinking (Babor *et al.*, 2007) can be superior to ordinary care. Screening is most effective when it is part of a comprehensive re-engineering care (Solberg *et al.*, 2005).

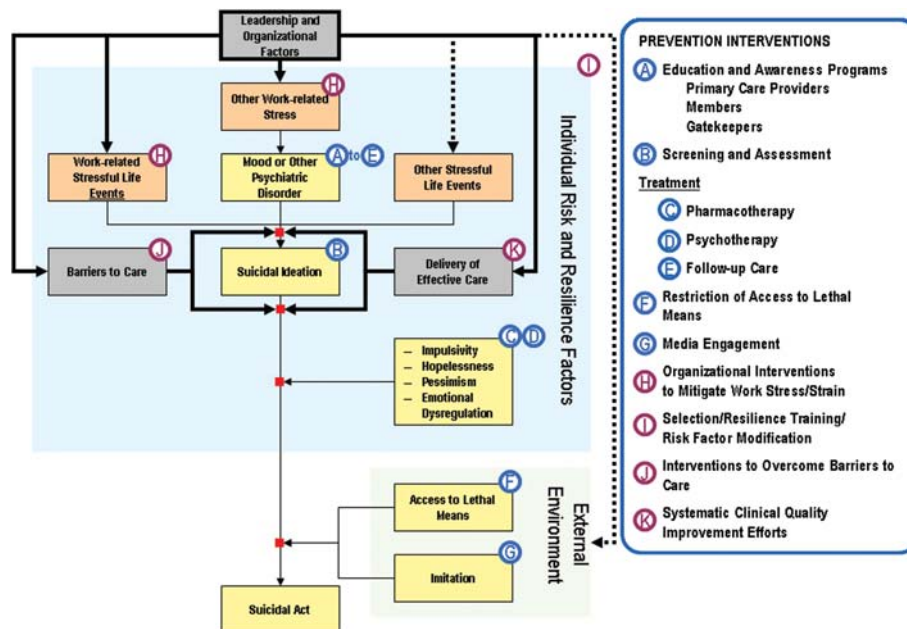


Figure 2. Canadian forces model of targets for suicide prevention in military organizations (Zamorski, 2010).

Mental health screening in military organizations remains controversial (Engel *et al.*, 2008; Rona *et al.*, 2005). Those who support it consider the civilian primary care literature to be sufficiently applicable, supported by data showing the acceptability (Warner *et al.*, 2008) and effectiveness (Warner *et al.*, 2011) in the military. Those who oppose it point to differences in the military contexts and to literature suggesting limited acceptability to personnel and (if anything) a negative impact on care seeking (Rona *et al.*, 2004).

These disparate findings suggest that the success of a screening programme depends on the screening approach and the context in which it is used. Screening programmes should obviously mirror the best practices identified in the civilian literature (Engel *et al.*, 2008).

#### *Assessment of suicidality*

The most critical decision to be made after the assessment of a suicidal patient is the optimal setting for their care. Conventional guidelines for this decision making are helpful (American Psychiatric Association, 2003), but the deployed setting poses special challenges (Hill *et al.*, 2006), leading to the use of the well-intentioned but problematic 'unit watch' for suicidal individuals (Bryan *et al.*, 2010). Two recent expert panels have recommended use only under extreme circumstances and only if guidelines and training of unit personnel can be assured (DoD, 2010; Zamorski, 2010).

#### *Pharmacotherapy*

Treatment with clozapine and lithium for psychotic and bipolar disorders has been clearly shown to lessen the risk of suicidal behaviour (Mann *et al.*, 2005). The applicability of this findings to the military is limited. Antidepressants decrease suicidal ideation and suicidal behaviour in depressed patients, on average. However, an important minority of younger patients will have a paradoxical increase in suicidal ideation and behaviour early in the course of treatment (Moller *et al.*, 2008). Guidelines for the management of this increased risk (Fawcett *et al.*, 2009) should have broad applicability to military populations, although managing this risk in the deployed setting will pose challenges.

#### *Psychotherapy*

Psychotherapy presumably attenuates suicidal risk by targeting the underlying disease process. In addition, a broad range of psychotherapies that target suicidality and its most proximal causes have shown

incremental benefits for prevention of suicidal behaviour (Weinberg *et al.*, 2010).

#### *Systematic follow-up for suicide attempters and other high-risk patients*

The period after the identification of suicidality should be characterized by frequent follow-up visits and aggressive treatment of the underlying disorder and of the suicidality itself. Unfortunately, 50% of such patients refuse treatment and up to 60% drop out after a single session (Lizardi & Stanley, 2010). There is evidence that systematic efforts to assure follow-up improve outcomes for those with mental disorders (Solberg *et al.*, 2005) and for suicidal patients in particular (Mann *et al.*, 2005).

#### *Restriction of access to lethal means*

Environmental interventions to limit access to lethal means are associated with a decrease in total suicide rates (Johnson & Coyne-Beasley, 2009). These include gun control, changes in the composition of household gas, the use of catalytic converters on automobiles, and changes in access to and packaging of certain high risk drugs. Military pharmacies dispense medications, so this is a possible target for means reduction.

In the general population, the suicide rate varies by occupational group, with physicians and some other healthcare professionals consistently showing the highest risk. This excess risk is due to much higher rates of suicide by prescription medications to which they have differential access (Skegg *et al.*, 2010). Among specific military trades, higher rates have been reported in security/law enforcement and in the combat arms, occupations in which access to firearms may be easier (Helmkamp & Kennedy, 1996). A more restrictive firearm access policy for younger personnel in the Israeli Defence Force was associated with a 40% decrease in the suicide rate in the target group (Lubin *et al.*, 2010).

The Interpersonal-Psychological Theory of Suicidal Behaviour posits that an acquired ability to overcome the fear of lethal injury is an essential factor for suicidal behaviour, and some have proposed that military service may facilitate this (Bryan *et al.*, 2010a; Joiner, 2005). This could interact with access to firearms and contribute to occupational suicide risk; it also provides an additional target for suicide prevention.

#### *Media engagement*

Suicidal behaviour can be imitative, and adherence to guidelines on the media reporting of suicides can attenuate this (O'Carroll & Potter, 1994).

Military organizations have sophisticated public affairs capabilities and hence an opportunity to encourage adherence to responsible reporting guidelines.

#### *Organizational interventions to mitigate work stress*

A variety of military-specific organizational factors have been shown to buffer the effects of work stress on mental health and, potentially, suicidality (Britt *et al.*, 2004). Organizational interventions to mitigate work stress include policies on limits on the duration and spacing of deployments, harassment prevention activities, employee assistance programmes, dispute resolution services, financial counselling services, leadership training, and many others. Additional support for military families may also pay dividends in terms of suicide prevention.

Legal and disciplinary problems are associated with mental health problems and suicidality (Army Suicide Prevention Task Force, 2010), suggesting an opportunity for managing the disciplinary process in ways that attenuate suicidal risk. Disciplinary action for having brought dishonour on a cohesive military unit may certainly activate the 'thwarted belongingness' and 'perceived burdensomeness on others' that have been shown to be important facilitators of suicidal behaviour (Bryan *et al.*, 2010a).

#### *Selection, resilience training, and risk factor modification*

*Selection.* Military personnel typically undergo periodic evaluation of their medical and psychological well-being. In theory, this presents the opportunity to identify candidates at increased risk for suicidality. In practice, military screening for psychological vulnerabilities is disappointing (Jones *et al.*, 2003) unless the number of candidates significantly exceeds the number of positions.

*Resilience training.* Interest in psychologically orientated resilience training has never been stronger. While supported by sound theory and preliminary findings from many settings, rigorous evidence of efficacy in military organizations is limited though encouraging (Adler *et al.*, 2009), although there is no evidence of a preventive effect for suicidality.

*Risk factor modification.* A number of risk factors and risk behaviours are known to increase the risk of suicidal behaviour. These include impulsivity, relationship conflict, drug and alcohol use, and others. Effective programmes and services to address these risk factors exist, but again there is as yet no clear evidence that these benefits translate into lower rates of suicidal behaviour.

*Systematic efforts to overcome barriers to care.* Nearly all suicidal individuals have evidence of a mental disorder, but at best half are receiving mental health-care at the time of their death. Military organizations typically deliver their own health services and hence have an opportunity to undertake systematic efforts to overcome barriers to care.

*Systematic quality improvement efforts.* While mental healthcare is more effective than ever, optimal care is still the exception (CCQC, 2006), and care for suicidal patients tends to be particularly deficient, at least in civilian setting (Oquendo *et al.*, 2002). Military organizations need to take the leadership role in systematically improving the quality of care they deliver – no one else can do this for us. Implementation of a collaborative care model (Dietrich, 2009), re-engineering primary mental healthcare (Engel *et al.*, 2008), and implementation of computerized mental health outcomes management systems (Lambert, 2007) all have strong evidence of benefit. Benefits in terms of suicide prevention are less clear, though one US Army medical centre saw a steep decline in suicides after intensive quality improvement efforts (Hough & Lewis, 2010).

*Comprehensive, community-based suicide prevention programmes.* The complex and multi-factorial nature of suicidal behaviour has led to the development and implementation of multifaceted suicide prevention programmes that include many of the interventions discussed above. Some have resulted in meaningful decreases in suicide rates in intervention communities (Hegerl *et al.*, 2006). A recent systematic review of 14 different programmes concluded: 'only long term programs that utilize a commitment of the society at multiple levels and succeed in establishing a community support network...can effectively reduce suicide rates' (Fountoulakis *et al.*, 2010).

The US Air Force has published the only rigorous, large-scale evaluation of a community-based suicide prevention trial in a military organization (Knox *et al.*, 2003). The intervention targeted 11 different areas, such as surveillance, community preventive services, and governance. Suicide rates declined by 33% after implementation. The programme was also associated with impressive declines in other adverse outcomes, such as domestic violence.

Critics have pointed out that suicide rates were declining in the general population over the same period (Tepper *et al.*, 2003). However, the decline in civilian rates was less impressive and largely driven by factors that should not apply to the military (Knox, 2004); lower rates have persisted for at least 11 years (Knox *et al.*, 2010), despite the heavy operational demands of the current conflicts in south-west Asia. Supporters also point to declines in suicide

rates seen in other military organizations who implemented similar programmes (Dedic & Panic, 2007; Gaines & Skaer, 1979; McDaniel *et al.*, 1990) and to those seen with community-orientated interventions in other contexts (Rihmer *et al.*, 1995; Ono *et al.*, 2008; Szanto *et al.*, 2007; Hegerl *et al.*, 2006).

Those who are critical of the methodology should keep in mind that the nature of intervention and the small number of expected events are such that no stronger methodology was a realistic option.

## Conclusions

### *Priorities for suicide prevention in military organizations*

The discussion above identifies multiple potential targets for suicide prevention in military organizations and a number of potentially effective interventions. The priorities for intervention will vary from organization to organization, depending on their circumstances. The Canadian Forces (CF) Expert Panel on Suicide Prevention identified the following priorities for intervention (Zamorski, 2010).

- Reinforcing the infrastructure for quality improvement in mental health care
- Implementing a standardized clinical quality assurance review after each suicide
- Collecting more complete information on suicides to support suicide surveillance
- Developing a protocol for mitigating suicide for personnel who are under investigation for legal or disciplinary problems
- Exploring opportunities for means reduction for suicides with service firearms and medications
- Invigorating efforts at media engagement to promote responsible reporting of military suicides

### *The potential value of the CF model of targets for suicide prevention in military organizations*

The CF Expert Panel developed the model for the purposes of organizing its review of the scientific literature, its evaluation of its suicide prevention programme, and its recommendations. Other organizations may also find the model useful for these same purposes. In addition, we have found the model to be useful for educating lay people and health services personnel on suicide prevention and as a tool to guide quality assurance reviews done after each suicide.

### *Limitations*

Many of the preventive interventions advocated above have little or no evidence of preventive efficacy

in the military or elsewhere. Most, however, have other clear benefits to military organizations and a highly plausible link to suicide prevention. The complexities of suicide prevention research are such that ironclad evidence for prevention will remain elusive. The strong cultural and contextual influences on suicidal behaviour are such that even a definitive study in setting cannot be assumed to apply to others. Thus, as is so often the case, clinicians and public health experts will be forced to make prevention decisions based on imperfect evidence. Finally, suicide prevention itself has intrinsic limitations: No suicide prevention programme will prevent all suicides.

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