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## Men and suicide prevention: a scoping review

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Men and suicide prevention: a scoping review

Abstract

**Background:** Male suicide rates are higher than their female counterparts in almost every country around the world. Several developed countries have attempted to implement suicide prevention programmes, but few have specifically targeted men.

**Aims:** To identify what is currently known about suicide prevention strategies, programmes, and interventions of relevance to men.

**Method:** A scoping review guided by Arksey and O'Malley's five-stage framework.

**Results:** 22 studies were included. Thematic analysis identified three categories: (i) male suicide prevention interventions; (ii) factors or coping strategies that interrupt the suicidal process in men; (iii) men's perspectives on service provision. Interventions included awareness campaigns; training of community 'gatekeepers'; psychological support; and educational initiatives targeted to either GPs or depressed or suicidal men. Men emphasised the need to receive support from a trusted and respected individual, preferably in an informal setting. Connecting with others, reframing help-seeking as masculine, and the use of emotional regulation techniques were all identified as factors with potential to interrupt the suicidal process.

**Conclusions:** This review demonstrates the need for further research examining the perspectives of suicidal middle-aged men and their close family and friends.

**Declaration of interest:** None.

## Introduction

Suicide is a global public health concern, representing the second leading cause of death for people aged 15-29 worldwide (WHO, 2014). A striking feature of suicide epidemiology is the significant gender difference in incidence rates: despite females exhibiting a greater prevalence of suicidal ideation and behaviour (Beautrais, 2002; Henderson et al., 2005), male suicide rates are significantly higher than their female counterparts in almost every country across the globe. Although exceptions exist – China and Bangladesh have higher rates of female suicide thought to be due to specific combinations of sociocultural factors unique to these countries (WHO, 2012) – in richer countries, three times as many men die by suicide than women. Men aged 50 years and over are particularly vulnerable (WHO, 2014).

Although the strongest clinical predictor of suicide is a previous attempt or history of suicidal behaviour (Barzilay & Apter, 2014; Oquendo, 2004), it is widely recognised that the pathways to suicide are diverse, multifactorial, and complex. Risk factors include loss, grief, misuse of drugs or alcohol, social isolation and low self-esteem, and long-term mental or physical illness (Centers for Disease Control and Prevention, 2014). Men's suicidal risk also changes with age and life circumstance (Hawton & van Heeringen, 2009). For example, it is known that relationship breakdown and unemployment are social factors which pose substantially greater risks for males than for females (Milner et al., 2012; Scourfield & Evans, 2015; Tiffin et al., 2005). Marriage may confer a protective effect through provision of meaningful social support and reduction of risky behaviours that often precipitate suicide, while men's separation from their children has been cited as a primary cause of suicide in several coroner's inquests (Joiner, 2011; Payne et al., 2008; Shiner et al., 2009).

Research is also increasingly showing that male suicide is closely linked with conformity to traditional

(hegemonic) masculine norms which stem from dominant models of male socialisation in the Western world (Connell & Messerschmidt, 2005; Wyllie et al., 2012). To be seen as strong, resilient, and in control has been identified as a key practice of masculinity in many Western and developed countries (O'Brien et al., 2005). Mental health problems can often leave people feeling weak, powerless and vulnerable, and have therefore been theorised to be 'incompatible' with masculine ideals and norms (Courtenay, 2000; Emslie et al., 2006; Warren, 1983).

Several studies have identified relationships between hegemonic masculinity and higher levels of mental health stigma and suicide attempts (Robertson et al., 2015). Evidence suggests that encountering depression or unemployment can serve to erode valued aspects of some men's masculine identity and lead to suicide being viewed as a legitimate and rational path out of perceivably untenable situations (Emslie et al., 2006; Heifner, 1997; Jensen et al., 2010; Oliffe & Han, 2014). Masculinities can also restrict help-seeking behaviour, primarily due to the perceived stigma attached to disclosing feelings of distress to peers, family members and health care professionals (Cleary, 2012). However, research has also emphasised that masculinity should not be viewed as a 'toxic' monolithic construct. Men are able to redefine their own masculine ideals outside of usual hegemonic discourses, reconstructing a valued sense of self as part of their recovery following mental illness (Emslie et al., 2006; Tang et al., 2014).

Male suicide is a significant health concern requiring urgent attention, and the growing evidence of male-specific risk factors has important implications for planning and evaluating suicide prevention interventions. Several countries have attempted to implement suicide prevention programmes (Althaus & Hegerl, 2003; Szekely et al., 2013), which typically involve multisectoral strategies that aim to address the range of causes at an individual and population level, with particular attention to mental health and improved screening of depressed patients in primary care. Previous reviews of

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3 suicide prevention strategies have focussed on the effectiveness of interventions, but have not  
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5 reported on important gender differences in suicide risk and behaviour (Mann et al., 2005; Zalsman  
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7 et al., 2016). With this in mind, we scoped the empirical literature on suicide prevention strategies,  
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9 programmes, and interventions with the aim of highlighting studies of relevance to men. Our aim  
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11 was to identify what is currently known about approaches to suicide prevention in men, and explore  
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13 areas for future research and policy development.  
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## 18 **Methods**

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20 We undertook a scoping review as our aim was to provide an overview of the current state of  
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22 knowledge on the issue of suicide prevention in men. Scoping reviews are commonly used when  
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24 studies in the reviewed sources are likely to have employed a range of data collection and analysis  
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26 techniques, and/or when no prior synthesis has been undertaken on the topic (Arksey & O'Malley,  
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28 2005). The scoping review methodology allows the breadth of research on particular topic to be  
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30 examined so that any gaps may be identified, guiding and developing the focus of future research.  
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32 The approach taken in this review is grounded in the five-stage framework proposed by Arksey &  
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34 O'Malley (2005), considering various enhancements recommended by Levac et al. (2010).  
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### 40 **1. Identifying the research question**

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42 The research question developed to guide the review was: *What is known from the existing*  
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44 *literature about approaches to suicide prevention in men?* Given the broad nature of a scoping  
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46 review, it is important to define the parameters outlined before proceeding. In the context of this  
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48 review, we took 'men' to encompass men and boys of all ages. 'Suicide' was considered to refer to  
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50 completed or attempted suicide, suicidal behaviour, or suicidal ideation. The suicidal process is not  
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52 necessarily a linear one; thus it is not always possible to extricate one stage from the other, given  
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54 that they are often intrinsically linked (Chi et al., 2014). Therefore, studies that focused on any stage  
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of the suicidal process were of interest to this review. We defined ‘prevention’ approaches as being any specific intervention, programme or service which aimed to reduce the incidence of suicide or suicidal behaviour or ideation in males, or strategies employed by men themselves (or those around them) that attempted to address suicidal behaviour and/or promote help-seeking.

**2. Identifying relevant studies**

Arksey & O’Malley (2005) suggest that broad keywords and search terms should be adopted that enable the breadth of the available literature to be covered. Search terms were developed relating to the three key concepts underpinning our review question: ‘suicide’; ‘male’; and ‘prevention’, and combined using Boolean operators. Free text terms were mapped to relevant subject headings (where possible, Medical Subject Headings [MeSH] were employed). Five databases were searched: CINAHL Plus; Embase; MEDLINE; PsycINFO; and OpenGrey on 11th of August 2016 using search strings tailored to each database to take account of variations in exploded terms and field aliases (see supplementary file 1).

**3. Study selection**

Records were imported into EndNote (version X7.5) and screened against the follow inclusion criteria:

- (1) Article reported primary or secondary research using any study design: RCTs, cohort, case-control, population or hospital based case-series, case report, qualitative interview/questionnaire, secondary analysis of data, review article (systematic or otherwise).
- (2) Study focuses on intervention relating to suicide prevention, or perspectives/experience of preventative strategies or treatment.
- (3) Study participants are male (any age) or results are stratified by gender (if quantitative);

participants are male or were in close contact with affected men e.g. friends, family, service providers (if qualitative).

(4) Study was conducted in an industrialised/developed country (as defined by the International Monetary Fund, 2016).

(5) The article was published in English after 1980.

Preliminary searches of the literature retrieved many studies referring to suicidal behaviour as a result of enduring mental conditions other than unipolar depression, such as schizophrenia or dementia. The 'NOT' operator was therefore applied to exclude these studies from the search in order to increase specificity. We recognise this as a limitation of our review, as discussed later.

Electronic searches identified 2,808 records. Four additional records were identified through hand searching of key journals. Of these, 2,768 were excluded following deduplication and first stage screening. The remaining 40 articles were read in full by the first author (SS), leaving 22 which were deemed to meet the inclusion criteria (see figure 1).

#### 4. Charting the data

In line with Arksey & O'Malley's framework (2005), data from each article selected for final inclusion were extracted and charted using the following categories: *author; year of publication; study location; aim of study; study design; participant population; intervention or topic; and main findings* (see supplementary file 2) . A basic numerical analysis of the extent, nature and distribution of the charted findings was then conducted, in accordance with guidance by Levac et al. (2010). This involved calculating absolute frequencies for the: *geographical distribution* of included studies; *age groups* of study participants; the *research methods* used; and the *outcome measures* (if relevant). Charted findings were thematically analysed and are summarised narratively, below.



**Results**

Twenty-two articles were identified that reported the findings of studies of relevance to suicide prevention strategies, programmes or interventions in men (see supplementary file 2). The studies originated from 11 countries: the UK (3), Australia (3), Canada (3), the USA (3), and Japan (3). The remainder were from Israel (1), Taiwan (1) and Europe (4) (Hungary, Germany, Ireland, and Switzerland). Of these, six were qualitative studies, two were mixed methods, and the remainder were quantitative studies (RCTs; post-intervention measures; pre- and post-intervention, with or without control; and secondary analysis). Study participants typically spanned the young adult to middle-age years (11 articles), with two focusing solely on adolescents, one on middle age, and the rest (8) targeting all men aged 18 years and over. Reported quantitative outcome measures included at least one of: *male suicide rates* (6), *number of suicide attempts* (4), and *suicidal ideation or suicidal thoughts* (6).

Thematic analysis of the study findings resulted in the identification of three categories:

- (i) male suicide prevention interventions;
- (ii) factors or coping strategies that interrupt the suicidal process in men;
- (iii) men’s perspectives on service provision.

**Male suicide prevention interventions**

Several interventions that specifically aim to prevent male suicide have been evaluated and reported in the literature. Interventions were predominantly complex/multimodal (i.e. characterized by several different modes of activity or occurrence), encompassing awareness campaigns (Hübner-Liebermann et al., 2010; Matsubayashi et al., 2014; Ono et al., 2013; Szekely et al., 2013; Wang et al., 2013); training of community ‘gatekeepers’ (Hübner-Liebermann et al., 2010; Knox et al., 2003; Ono et al., 2013; Shelef et al., 2016); psychological support (Britton et al., 2014; Chen et al., 2012;

Knox et al., 2003; Mishara et al., 2005; Nakao et al., 2007; Ono et al., 2013; Pratt et al., 2015; Saewyc et al., 2014); and educational initiatives targeted to either GPs or depressed or suicidal men (Hübner-Liebermann et al., 2010; Knox et al., 2003; Nakao et al., 2007; Shelef et al., 2016; Szanto et al., 2007; Szekely et al., 2013). Of the six multimodal interventions, all except one (Wang et al., 2013) were reported as significantly decreasing male suicide rates or attempts. Wang et al. (2013) reported that, following their depression awareness campaign, suicide attempts remained unchanged but lifetime prevalence of suicidal ideation decreased significantly by 10%.

#### *Awareness campaigns*

Posters, leaflets and websites providing information on the symptoms of depression, as well as the resources available to men should they feel the need to seek help, have been widely utilised in awareness campaigns (Hübner-Liebermann et al., 2010; Matsubayashi et al., 2014; Ono et al., 2013; Szekely et al., 2013; Wang et al., 2013). Typically, telephone numbers for the provision of general support have been provided, as well as emergency contact details for any men experiencing a crisis or urgent need, though the intensity of campaigns varied considerably across included studies. In addition to the above, cinema advertisements, public lectures, annual action days, and community workshops have been utilised (Hübner-Liebermann et al., 2010; Szekely et al., 2013). Only one study mentioned suicide explicitly in their campaign, where there was a particular focus on the risk factors of suicidal behaviour and awareness of available resources and referral procedures for people potentially at risk (Ono et al., 2013). This study, which examined the effectiveness of a community-based multimodal intervention for suicide prevention in rural areas of Japan with high suicide rates, found that the intervention worked to reduced suicide attempts, though not in highly populated rural areas (Ono et al., 2013). No explanation was offered by the authors as to why this might be the case. Awareness campaigns that had not been integrated into a wider suicide prevention programme have also been found to exhibit diminished effects on suicide rates and suicidal

behaviour: Matsubayashi et al. (2014) distributed informative leaflets to commuters at major train stations and the surrounding streets across a Japanese city. A significant decrease in male suicide rates was observed two months after leaflet distribution, but this effect waned at the five-month mark, illustrating that public awareness campaigns alone, if intensive, have the potential to impact suicide rates in the short-term. As a control region was not included in the study, however, it was unclear whether this decrease was simply part of a wider trend observed across surrounding areas at the time.

**Health education**

*Community involvement*

Several studies have explored strategies involving key members of the community charged with increasing awareness and understanding of risk factors that make men more vulnerable to suicide (Hübner-Liebermann et al., 2010; Knox et al., 2003; Ono et al., 2013; Shelef et al., 2016). These interventions have aimed to improve early detection of suicidal individuals, in order to signpost them to the appropriate mental health or social care service(s). To achieve this, the current evidence suggests that establishing ‘gatekeepers’ is a universal priority (Hübner-Liebermann et al., 2010; Knox et al., 2003; Ono et al., 2013; Shelef et al., 2016). In this context, gatekeepers have been defined as individuals who have face-to-face contact with large numbers of community members as part of their regular routine, and are trained in the recognition and referral of those at risk of suicide (US Department of Health and Human Services, 2012). Gatekeepers have included community leaders, doctors, nurses, pharmacists, police personnel, priests, school teachers, and youth workers (Hübner-Liebermann et al., 2010; Ono et al., 2013).

As part of a four-level intervention programme, Hübner-Liebermann et al. (2010) held over 30 community training workshops, and also produced a media guide for reporting suicide in

collaboration with the regional press. Two studies in military settings have examined the impact of similar community education and training on suicide (Knox et al., 2003; Shelef et al., 2016). All of the aforementioned studies reported decreases in male suicide rates following the various interventions. Directly attributing the observed decreases in male suicide rates across these studies to interaction with gatekeepers is challenging, however, as no single study focused on community involvement alone – all were multicomponent suicide prevention programmes.

#### *GP education and collaboration*

A range of initiatives have focussed on raising awareness among GPs, mainly through lectures, educational videos, interactive workshops, large-scale collaborative events or conferences, improved depression screening, and strengthening partnerships between GPs and other psychiatric outpatient services (Hübner-Liebermann et al., 2010; Szanto et al., 2007; Szekely et al., 2013). Similar to the awareness campaigns, the majority of educational packages have centred on depression and have been part of a larger suicide prevention strategy, although one study (Szanto et al. 2007) focused solely on GP education in Hungary, including case discussions of patients who had recently died by suicide. Another study implemented their two-year community-based four-level intervention programme in a similarly sized town in Hungary, where interactive educational workshops were developed and offered to GPs (Szekely et al., 2013). Hübner-Liebermann et al. (2010) aimed to improve collaboration with GPs through the distribution of teaching videos and patient videos, information brochures, and screening sheets, as well as eight continuing medical education events attended by over 350 participants, conducted in association with the regional confederation of doctors. The above studies used a quasi-experimental (before and after) cohort study design with at least one control region. All reported significant declines in male suicide rates, except Wang et al.'s (2013) depression awareness campaign, where only suicidal ideation decreased. The low-base rate of completed suicide attempts may mean that studies such as this lacked sufficient power to detect

a change in outcome (Nock et al., 2008).

*Education targeted toward men*

A number of studies have explored the effectiveness of educational initiatives aimed at men, which have formed part of a larger, multi-layered suicide prevention programme (Knox et al., 2003; Nakao et al., 2007; Shelef et al., 2016). Two studies have been conducted in military settings, which incorporated suicide prevention into their curriculum, covering knowledge of basic suicide risk factors, intervention skills and referral procedures for people potentially at risk (Knox et al., 2003; Shelef et al., 2016). A Japanese-based study has examined the impact of an ‘Employee Assistance Programme’ (EAP) on suicide-related behaviours in the workplace (Nakao et al., 2007). The programme involved seminars on job-related mental health, including early detection of depressed or distressed colleagues and communication skills, honing men’s aptitude in careful listening through role-playing. Though these seminars did not explicitly allude to suicide, the initiative achieved a significant decrease in the number of men reporting suicidal thoughts; though this may have been a result of the concurrent offering of free, anonymous psychological support (Nakao et al., 2007).

**Psychological support**

*Guidance from trained professionals*

The provision of contact with either a mental health professional or trained volunteer has been widely explored as a male suicide prevention intervention (Chen et al., 2012; Knox et al., 2003; Mishara et al., 2005; Nakao et al., 2007; Ono et al., 2013). In one study where anonymous support was offered to men free of charge via email, phone, or face-to-face with a counsellor, the overwhelming majority of participants appeared to prefer communicating via email (Nakao et al., 2007). Where a service user has been a third party (e.g. a concerned friend or relative), telephone contact with a trained volunteer has been identified as a more desirable and accessible method, in

terms of understanding mental health problems and improving communication with the suicidal man (Mishara et al., 2005). In both cases, these methods have been noted to be preferential to referral to a health professional and were effective in reducing suicidal ideation in the participating men. The use of a 'case management' technique has also been found to be effective in significantly reducing the risk of suicide reattempt than those in a non-contact group (Chen et al., 2012). Here, case management involved making contact with suicide attempters within one week of their attempt, followed by the provision of psychological support for a six-month period; this was primarily achieved through telephone conversations. During periods of more intensive care, home visits by public health nurses and psychiatrists provide further support and may facilitate adherence to referrals for psychiatric treatment (Chen et al., 2012; Ono et al., 2013).

#### *Cognitive techniques*

Two studies have explored the use of cognitive techniques, specifically school-based mindfulness and cognitive behavioural suicide therapy (CBST) for male prisoners (Britton et al., 2014; Pratt et al., 2015). Among the targeted populations, the latter reported significant reductions in suicidal behaviours whilst the former observed reductions in suicidal ideation. It should be noted that the training required to successfully deliver the mindfulness intervention was only eight weeks in length, in contrast to the three to five years of relevant experience demanded of the clinical psychologists providing the CBST therapy.

#### *Confidential forums for discussing sexuality*

Indirect psychological support in the form of school-based Gay-Straight Alliances (GSA) has also been shown to reduce odds of suicide attempts and suicidal thoughts in lesbian/gay/bisexual (LGB) students and heterosexual boys alike (Saewyc et al., 2014). The same effect, however, was not observed in heterosexual girls. These student-led groups provide a confidential 'safe-space' for

individuals to discuss matters pertaining to sexual orientation, gender identity and expression. The inclusivity they nurture has been suggested to potentially alter the environment in such a way that reduces stress for heterosexual boys who do not fit the stereotypes of idealised (hegemonic) masculine behaviour (Saewyc et al., 2014).

**What interrupts the suicidal process in men?**

Three key themes pertaining to influential factors or coping strategies that prevent a suicide attempt in men were discerned from the literature. Men have been reported as able to find ways of redefining help-seeking behaviour as masculine (Jordan et al., 2012; Oliffe et al., 2012), while considering consequences for loved ones appeared to exert a strong influence on interrupting a suicide attempt (Fogarty et al., 2015; Player et al., 2015; Reading & Bowen, 2014; Shand et al., 2015). Related to this, a feeling of connectedness, often established through sharing experiences with other suicide survivors or from a sense of obligation to others, emerged as a protective factor (Jordan et al., 2012; Oliffe et al., 2012; Player et al., 2015). The use of emotional regulation techniques was popular among men and highlighted their preference for a pragmatic, solution-oriented approach to overcoming suicidality (Jordan et al., 2012; Khurana & Romer, 2012; Oliffe et al., 2012; Player et al., 2015; Reading & Bowen, 2014).

*Reframing masculinity*

Some men have justified their decision to seek help by challenging unhelpful perceptions and reframing what it is to 'be a real man' (Jordan et al., 2012; Oliffe et al., 2012). Seeking support – viewed by many men as a 'feminine' behaviour - was re-evaluated by Canadian men who experienced depression as a rational, practical decision, necessary to re-establish control and safeguard survival (Oliffe et al., 2012). In another qualitative study of 36 formerly suicidal young men, participants were seen to position the above actions as brave, demonstrating their potential in

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3 serving to preserve rather than threaten an individual's masculinity (Jordan et al., 2012).  
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#### 6 7 *Connectedness*

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9 A sense of connectedness to family, friends or mental health professionals has been emphasised as  
10 an important factor in preventing male suicide. Challenging the belief that 'nobody cares', through  
11 exposure to testimony of previous suicide attempters or positive encounters with mental health  
12 professionals, has been found to be important in achieving this (Jordan et al., 2012). Idealised  
13 masculine roles of the 'provider' and 'protector' have also emerged as a protective factor: men have  
14 expressed their feelings of obligation toward loved ones, particular children, as fundamental in  
15 interrupting a suicide attempt (Olfiffe et al., 2012; Player et al., 2015). A number of studies have  
16 described how a sense of purpose and obligation associated with fatherhood, and the thoughts of  
17 the effects on their children, have motivated men to reconsider suicide (Fogarty et al., 2015; Player  
18 et al., 2015; Reading & Bowen, 2014; Shand et al., 2015).  
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#### 33 *Emotional regulation*

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35 Several studies have highlighted the positive impact of a man's ability to experience suicidal  
36 thoughts without the concomitant desire of acting upon them in the prevention of suicide attempts  
37 (Jordan et al., 2012; Olfiffe et al., 2012; Player et al., 2015; Reading & Bowen, 2014). Changing  
38 unhelpful patterns of thinking, in a manner akin to cognitive behavioural therapy, may be self-driven  
39 or achieved alongside guidance from a mental health professional (Jordan et al., 2012; Player et al.,  
40 2015). Modifying one's own thought patterns, however, requires a certain level of introspection and  
41 vigilant self-monitoring, and men may lack this self-awareness if they do not acknowledge their own  
42 distress or low mood (Olfiffe et al., 2012). Family and friends of male suicide survivors have agreed  
43 that effective monitoring of, and appropriate response to, men's warning signs are crucial in keeping  
44 men safe (Player et al., 2015). Such self-awareness may be contingent on men possessing the  
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willingness to acknowledge and receive support to address a substantial problem (Oliffe et al., 2012). However, there is evidence that using emotional regulation (keeping feelings under control) as a coping strategy may be protective in reducing the risk of suicidal ideation in young males (Khurana & Romer, 2012). Men facing acute and immediate risk may also benefit from distraction techniques. For example, family and friends of suicidal men have noted that keeping men distracted, even for an hour or two, was crucial in providing a space where they were not actively planning an attempt (Player et al., 2015). In the absence of family or friends, alternative behavioural strategies that have also successfully deterred a suicide attempt included reading, painting, exercising, and go-karting (Player et al., 2015; Reading & Bowen, 2014).

**Male perspectives on service provision and care**

Two major themes regarding constructive approaches mental health services may adopt toward helping suicidal men were identified from the literature: the importance of trust and respect between men and their mental health professional has been deemed vital by men and service providers alike (Grace et al., 2016; Jordan et al., 2012; Player et al., 2015; Reading & Bowen, 2014), while placing mental health initiatives in a less formal setting may make men more amenable to the help-seeking process (Grace et al., 2016; Jordan et al., 2012; Shand et al., 2015).

*Trust and respect*

Studies involving samples of men who have previously attempted suicide have consistently found that establishing the trust and respect of mental health professionals is fundamental to men’s initial and ongoing engagement with health and social care services (Grace et al., 2016; Jordan et al., 2012; Player et al., 2015; Reading & Bowen, 2014). Men’s wariness of approaching or seeking help from formal mental health services has been argued to support the use of more routine or casual exchanges prior to any discussion around mental health (Jordan et al., 2012); a view also

acknowledged and shared by service providers themselves (Grace et al., 2016). Communicating with genuine empathy and interest toward men's individual biographies, without judgement or condescension, have been highlighted as necessary qualities in a mental health professional (Jordan et al., 2012; Reading & Bowen, 2014). This mutual respect has been noted as driving men to reconnect with humanity and actively refute their belief that 'nobody cares' – an attitude reinforced by previously unsatisfactory experiences with health professionals or difficulty in even accessing the required services (Jordan et al., 2012; Player et al., 2015).

### *Importance of informal setting*

Studies have indicated that men find a 'subtle' approach in encouraging them to make contact with supportive services more acceptable (Grace et al., 2016; Jordan et al., 2012). Reflecting an acute awareness of the stigma associated with the use of mental health services, men have outlined a desire for more discrete services, not overtly or exclusively associated with mental health (Grace et al., 2016). In order to challenge these negative attitudes, service providers have highlighted the need to engage young men in mental health at the earliest possible stage in life by encouraging and supporting them to be more open and articulate in the recognition and expression of their feelings, thereby helping to normalise the topic (Grace et al., 2016). The use of interventions that promote social interaction, such as sports-based activities or social media (rather than those perceived as formal or clinical) have been highly valued by men, as have community-based informal support centres. Grounding such dialogue in these formats may hold promise for young men in particular (Jordan et al., 2012; Shand et al., 2015).

### **Discussion**

The unique focus of this scoping review – in summarising the current quantitative and qualitative literature of relevance to male suicide prevention strategies, programmes and interventions – has

bridged an important gap in the literature. Previous reviews of the effectiveness of suicide preventions strategies have recommended that future research on evidenced-based prevention strategies should focus on specific targeted populations, as data suggests that specific risk groups might need a tailored preventive approach (Zalsman et al., 2016). Men are a group at high risk of suicide, and the findings from our review highlight some important considerations for future research aiming to inform the development of tailored approaches to male suicide prevention.

Overall, although our findings confirm that health beliefs and behaviours related to traditional norms of masculinity are an important feature of suicidal action (Cleary, 2016), it is also evident from the current literature that men should not be considered to be a homogenous group, and that masculinity should not be considered a 'toxic', inflexible concept. It is clear in the current evidence that, at least within the context of suicide, men's identities are fluid and may be redefined depending on the situation, while different men identify with different configurations of masculinity. The 'protector' and 'provider' roles typical of Western, culturally dominant (hegemonic) masculinity have been found to instil a sense of obligation in men, where reneging on these responsibilities is regarded as both 'unmanly' and cruel, consequently interrupting the suicidal process (Olfiffe et al., 2012). This is in contrast to other studies in the literature that describe how men deliberately reconstruct their masculinity *outside* of hegemonic ideals as part of their recovery from suicidality (Emslie et al., 2006; Tang et al., 2014; emphasis added). While Olfiffe et al. (2012) have highlighted how the majority of men defined their masculinity within the context of a connectedness to others and drew strength from these support networks, these findings should be situated against the current epidemiological pattern in Western, developed countries when considering their relevance. For example, the group at greatest risk of suicide in the UK - middle-aged men - are also the least likely to feel they can rely on their partner, family or friends in case of a serious problem (ONS, 2015). The potential benefits afforded by a man's immediate social network may therefore be

severely limited in this particular group of men.

There is a paucity of qualitative research concerning the experiences and perspectives of suicidal men; we identified only four such studies in the published literature (Jordan et al., 2012; Oliffe et al., 2012; Player et al., 2015; Reading & Bowen, 2014). These important studies emphasise the need to gain further insights into men's experiences in order to help shape service delivery and highlight strategies that men themselves utilise to successfully interrupt the suicidal process. Future investigations could usefully focus on exploring the experience of men who have faced suicidality rather than depression alone. Depressive symptoms in men are poorly understood or differentiated from other mental illnesses (Oliffe et al., 2016), and suicide and depression have a complex relationship with an abundance of factors that contribute to their development. We did not identify any qualitative studies which have focused exclusively on men of middle age (45 to 65 years old). As this cohort experience the highest rates of suicide across many developed countries, efforts to recruit middle-aged men into future studies should be prioritised, since perspectives and coping strategies may differ across age groups.

In view of the value men have placed on a supportive social network in aiding recovery, additional qualitative research with members of this network may also be of benefit: exploring the attitudes toward suicidal men may foster a greater understanding of stigma, both real and perceived, and also inform ways in which these individuals may best help men at risk of suicide.

Further research is also required to determine whether male gender moderates the effectiveness of specific suicide prevention interventions and approaches. Of particular interest would be research examining the effectiveness of awareness raising and communication with young men through social media and mental health promotion in school-aged populations. While social media platforms are

popular among young men, concerns that anonymity cultivates the capacity for cyberbullying have been expressed, potentially causing further harm to already vulnerable individuals (Grace et al., 2016). Research evaluating both the effectiveness and service user perspectives relating to the use of social media platforms in engaging suicidal young men is therefore needed. The incorporation of mental health promoting strategies into the educational curriculum from a young age may serve to decrease stigma surrounding depression and suicidal ideation, consequently reducing the aversion to seeking support and accessing formal mental health services (Robertson et al., 2015). Given the apparent propensity of males to use emotional regulation techniques as a form of successful coping strategy for suicidal ideation, it seems logical to explore methods of nurturing these techniques from an early age, rather than simply changing services and waiting for men to seek help. The lack of current literature on this topic – in particular, the feasibility and cost-effectiveness of such an intervention – necessitates further research.

Our review had a number of limitations. We excluded studies that focused on men with long-term conditions or severe mental illness, as it is likely that these men have different experiences and needs. The restriction of primary study location to developed or industrialised countries was considered appropriate given the importance of sociocultural context in suicide and the Western-centred perspective of the current review. However, while social and cultural factors may share broad similarities between countries, there remains the need to replicate and evaluate these studies in local contexts. Finally, methodological appraisal of the quality of included studies was not undertaken as this is beyond the remit of a scoping review.

**Conclusion**

This scoping review has summarised the empirical literature on suicide prevention strategies, programmes, and interventions of relevance to men. Three categories were identified that highlight

some important areas for future research aiming to inform the development of tailored approaches to male suicide prevention. Key elements for consideration in the design and delivery of suicide prevention strategies for men that can be distilled from the current literature relate to receiving support from a trusted and respected individual in an informal setting; connecting with others; reframing help-seeking as masculine; and the use of emotional regulation techniques. Findings from the review indicate that future research could usefully focus on exploring men's perspectives and experiences of suicide-related behaviour, and determining whether male gender moderates the effectiveness of specific suicide prevention interventions and approaches.

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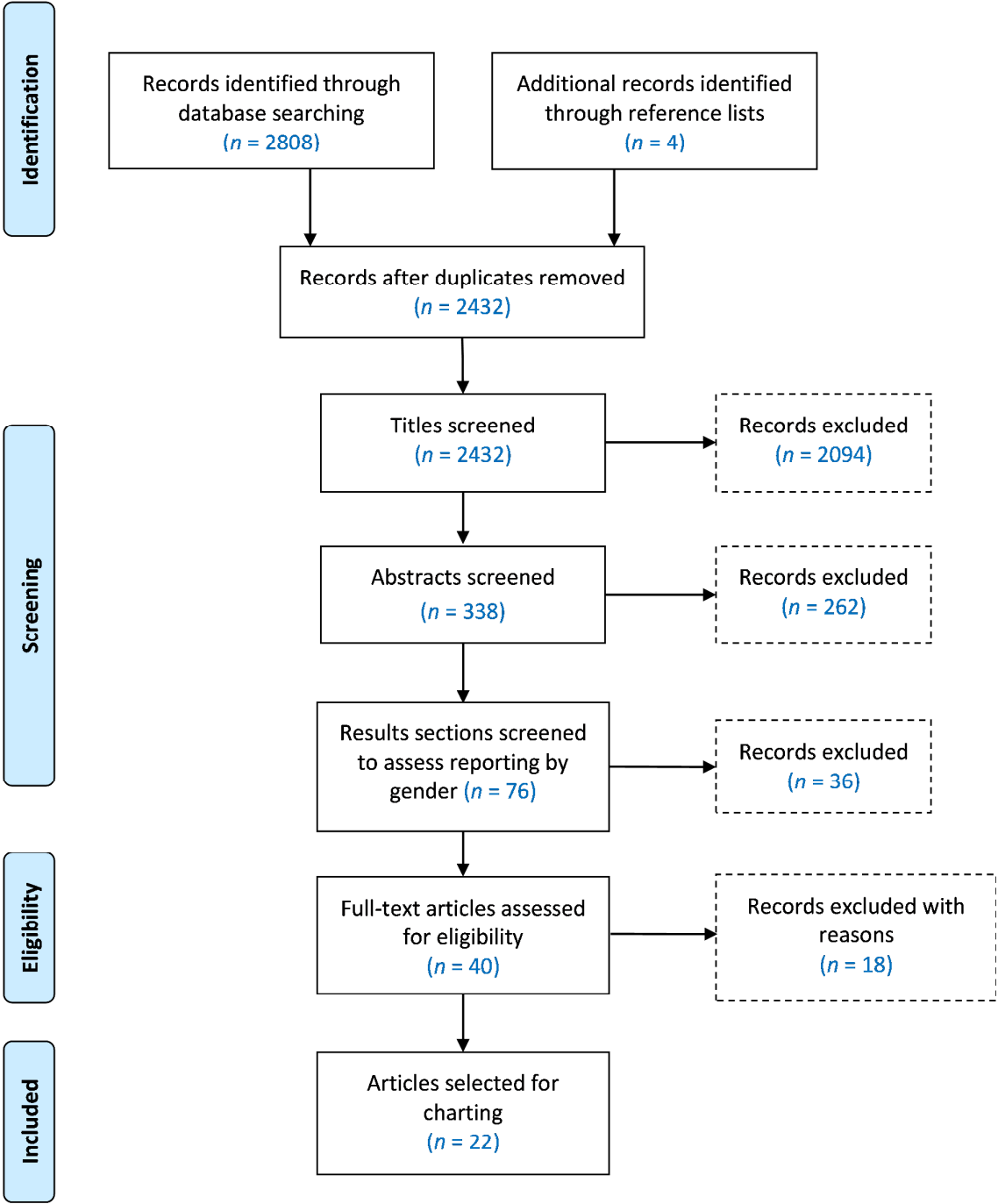


Figure 1 | Flow diagram illustrating literature search process

## Supplementary file 1: Electronic search strings

**CINAHL Plus [EBSCO]**, n = 566

Searched 11<sup>th</sup> August 2016

Limits: publication year: 1980-; English language

1. (MH "Suicide, Attempted") OR (MH "Suicidal Ideation")
2. suicid\*
3. S1 or S2
4. (MH "Masculinity")
5. TI masculinit\* OR AB masculinit\*
6. (MH "Men's Health")
7. TI male\* OR TI men OR TI boy OR TI boys OR AB male\* OR AB men OR AB boy OR AB boys
8. S4 OR S5 OR S6 OR S7
9. suicide prevention
10. (MH "Preventive Health Care") OR (MH "Health Promotion")
11. TI (suicid\* n2 (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*)) OR AB (suicid\* n2 (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*))
12. TI intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*
13. S9 OR S10 OR S12
14. S3 AND S8 AND S13
15. S8 AND S11
16. S14 OR S15
17. TI (psychosis or psychoses or psychotic or schizophrenia or bipolar or dementia) OR AB (psychosis or psychoses or psychotic or schizophrenia or bipolar or dementia)
18. S16 NOT S17



**Embase (1980 onwards) [OvidSP], n = 1269**

Searched 11<sup>th</sup> August 2016

1. exp suicidal behavior/
2. suicide\*.mp.
3. 1 or 2
4. men's health/
5. masculinity/
6. (male\* or men or boy or boys).ti.ab.
7. or/4-6
8. suicide prevention.ti,ab.
9. health promotion/
10. (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*).ti,ab.
11. (suicide\* adj2 (intervention or strateg\* or program\* or service or prevention or initiative or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*).ti,ab.
12. 8 or 9 or 10
13. 3 and 7 and 12
14. 7 and 11
15. 13 or 14
16. (psychosis or psychoses or psychotic or schizophrenia or bipolar or dementia).ti,ab.
17. 13 not 16
18. limit 17 to (english language and yr="1980 –Current")

**MEDLINE (1946 onwards) [OvidSP], n = 975**

Searched 11<sup>th</sup> August 2016

1. exp suicide/ or exp suicidal ideation/ or exp suicide, attempted/
2. suicide\*.mp
3. 1 or 2
4. (male\* or men or boy or boys).tw

5. Masculinity/

6. masculinit\*.tw

7. Men's Health/

8. 4 or 5 or 6 or 7

9. suicide prevention.mp.

10. (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*).ti.

11. "early intervention (education)"/ or early medical intervention/ or health promotion

12. (suicide\* adj2 (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*).tw.

13. 9 or 10 or 11

14. 3 and 8 and 13

15. 8 and 12

16. 14 or 15

17. (psychosis or psychoses or psychotic or schizophrenia or bipolar or dementia).tw.

18. 16 not 17

19. limit 18 to (english language and yr="1980 –Current")

**PsycINFO (1967 onwards) [OvidSP], n = 1315**

Searched 11<sup>th</sup> August 2016

1. suicide prevention/

2. suicide\*.mp.

3. suicide/ or suicidal ideation/ or attempted suicide/

4. 2 or 3

5. Human Males/

6. (male\* or men or boy or boys).tw.

7. masculinity/

8. masculinit\*.tw.

9. male attitudes/
10. or/5-9
11. intervention/ or crisis intervention/ or early intervention/ or school based intervention/ or workplace intervention/ or health promotion
12. (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*).ti.
13. (suicide\* adj2 (intervention or strateg\* or program\* or service or prevention or initiative or scheme or campaign or therapy or therapies or interrupt or perspective\* or experience\* or manag\*)).tw.
14. 11 or 12
15. 1 and 10
16. 4 and 10 and 14
17. 10 and 13
18. 15 or 16 or 17
19. (psychosis or psychoses or psychotic or schizophrenia or bipolar or dementia).tw.
20. 18 not 19
21. limit 20 to (english language and yr="1980 –Current")

## Supplementary file 2: Data charting summary

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
<b>1 Britton <i>et al.</i>, 2014, USA</b>	Examine effects of non-elective, classroom-based, teacher-implemented, mindfulness meditation intervention on mental health in schoolchildren	Pilot randomised controlled trial Schoolchildren aged 11-12 years old ( $n = 101$ ; 55 boys, 46 girls)	6 week classroom-based, teacher-taught mindfulness meditation instruction, offered during regular school lessons	Those in meditation intervention group were significantly less likely to develop suicidal ideation or thoughts of self-harm than controls
<b>2 Chen <i>et al.</i>, 2012, Taiwan</b>	Determine effectiveness of case management for prevention of suicide reattempts	Prospective cohort study 6 month follow up Individuals who had attempted suicide within past month ( $n = 4765$ , 69.6% female)	Case management: - Psychological support in form of ongoing contact with one/more identified key personnel (psychiatric nurse, psychologist or social worker), primarily over the phone - Follow-ups to increase adherence to referrals for psychiatric treatment - Individualized case-work (including coordination of use of social resources and brief crisis intervention, if necessary)	Occurrence of suicide reattempt during 6 month follow-up period significantly lower in male participants vs. female
<b>3 Fogarty <i>et al.</i>, 2015, Australia</b>	Examine positive strategies used by men to prevent and manage depression/suicidal thoughts	Qualitative 21 focus groups and 24 interviews Men from 12 metropolitan and non-metropolitan areas aged 18 or over ( $n = 168$ )	Coping strategies used by men with depression/suicidal thoughts	Several men strongly agreed that thoughts of effects on loved ones, particularly their children, motivated them to reconsider suicide
<b>4 Grace <i>et al.</i>, 2016, Ireland</b>	Investigate service providers' perspectives on factors that support/inhibit young men from engaging in services targeted at supporting their mental/emotional well-being	Qualitative 9 focus groups and 7 interviews Service providers most likely to be in contact with young men ( $n = 52$ )	How to encourage suicidal young men to engage with supportive services	Need to find ways of reconnecting with young men: - Encourage openness about mental health from early age (add to school curriculum) - Creating safety and trust in relationships - Use more routine/casual exchanges to earn trust before discussing mental health - More subtle incorporation of mental health discussion over direct approach - Sport offers significant potential to promote mental health for some young men - Utilise technology, especially social media

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
5 Hübner-Liebermann <i>et al.</i> , 2010, Germany	Assess the impact of a four-level intervention programme to improve early detection and treatment of patients with depression	Pre- and post-intervention analysis vs. control regions Intervention region: City of Regensburg ( <i>n</i> = 150,000) Control regions: County districts of Regensburg ( <i>n</i> = 180,000) and Neumarkt ( <i>n</i> = 130,000)	Four-level approach involving: - GP education: teaching/patient videos, information brochures, screening sheets, 8 continuing medical education events, conference on depression - Education campaign for general public: posters, leaflets, videos, cinema advertising; ~35 public lectures; annual action days; low-threshold telephone initiative - Community education workshops - Self-help/psychoeducational groups for those affected by depression and their families; email address set up for direct contact to Regensburg Alliance Against Depression; information on local crisis service available on flyers	Significant decrease in male suicide rate in intervention region over controls
6 Jordan <i>et al.</i> , 2012, UK	Examine young suicidal men's preferences for care to address development and provision of mental health services	Qualitative interviews Young men, formerly suicidal (at any point in their life) ( <i>n</i> = 36)	Preferences for care among young suicidal men	Key themes/suggestions included: - Reconnecting with humanity - Informal interventions: social over solely clinical interaction e.g. incorporated in sports-based activity; community-based informal support centres valued - Trust and respect of mental health professional was vital - Practical support - Understanding that suicidal thoughts are common and ability to disconnect thoughts from harmful action - Outreach through social media
7 Khurana and Romer, 2012, USA	Assess promise of coping skill training programmes as means of preventing suicidal ideation/suicide in young people	Mixed methods Nationally representative sample of adolescents and young adults ( <i>n</i> = 710; 49% male)	Coping strategies associated with decreased suicidal ideation	Problem solving, support seeking, and emotional regulation coping strategies reduced suicidal ideation over 1 year follow-up period Males tended to prefer using emotional regulation over support seeking strategies

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
<b>8 Knox <i>et al.</i>, 2003, USA</b>	Evaluate impact of US Air Force suicide prevention programme on risk of suicide	Quasi-experimental cohort study (pre- and post-intervention) US Air Force personnel ( $n = 5,260,292$ ; approx. 84% male)	Multifaceted approach involving: - Leadership involvement (messages delivered by USAF Chief of Staff every 3-6 months to all commanders) - Suicide prevention incorporated into military curriculum - Community preventative services - Community education and training (gatekeepers) - Eliminate duplication, overlap and gaps in delivering prevention services - Access to psychologist if deemed at risk of suicide Between April 2011 to March 2012, 250,000 promotional materials were distributed at 41 different locations for 80 days	33% risk reduction for suicide following intervention
<b>9 Matsubayashi <i>et al.</i>, 2014, Japan</b>	Evaluate effectiveness of public awareness campaign on suicide rates	2 year observational study Commuters at major train stations and pedestrians on streets of Nagoya, Japan	Consisted of leaflet with information on symptoms and treatment of depression; message encouraging those concerned to seek help; phone numbers for personal consultations on mental health, personal debt or other economic concerns; link to government website further detailing available medical services	Statistically significant reduction on male suicides 2 months after leaflet distribution, but effect wanes after 5 months
<b>10 Mishara <i>et al.</i>, 2005, Canada</b>	Evaluate effect of: information session; information session with telephone follow-up; rapid referral to mental health and abuse programs; or telephone support on suicide prevention in men	Pre- and post-intervention analysis (2 month & 6 month) Friends and relatives ( $n = 131$ ) who had contacted Suicide Action Montreal about a suicidal man aged 18 to 69	4 programmes: Information session: 2.5 hour group meetings for family and friends of suicidal men detailing suicidal process, how/where to seek support; emotional support - Information session with follow-up: participating in above session and receiving follow-up phone call one week afterward to answer additional questions/provide further support - Rapid referral to specialised mental health clinic (within 5 days) - Telephone support: relative/friend matched with trained phone volunteer; solution-focused approach; focus on understand suicide, masculinity, depression, alcoholism and drug abuse; supporting caller's interactions with suicidal man	Third party reported suicidal men had significantly less suicidal ideation, fewer suicide attempts and fewer depressive symptoms  Friends' and relatives' communication with the suicidal individual was described as more helpful following the intervention  Telephone support deemed most useful

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
11 Nakao <i>et al.</i> , 2007, Japan	Assess the impact of the Employee Assistance Programme (EAP) on depression and suicide-related behaviours in the workplace	2 year cohort study Male employees aged 22-38 in Japanese IT company ( <i>n</i> = 283)	Free, anonymous counselling with psychologist via mail/phone or referral to affiliated psychiatric clinic 5 seminars on job-related mental health	Significant decrease in number of men reporting suicidal thoughts
12 Olfiffe <i>et al.</i> , 2012, Canada	Examine processes used by men when contemplating and countering suicide	Qualitative interviews Men aged 24 - 50 years old ( <i>n</i> = 38)	Processes and pathways used by men who experience depression to counter and contemplate suicide	Connecting with friends, family and mental health professionals decreased suicidal action and quelled suicidal thoughts, especially when considering potential pain that would be inflicted on loved ones; masculine ideal of provider role acted as mediator in suicidal thoughts as had 'obligation' to others  Help-seeking reframed as rational behaviour vital to survival and re-establishing control  Ability to recognise suicidal thoughts but not act upon them as part of vigilant self-monitoring and self-awareness was also important
13 Ono <i>et al.</i> , 2013, Japan	Examine effectiveness of community-based multimodal intervention for suicide prevention in rural and highly populated areas	Pre- and post-intervention analysis vs. control regions Rural areas, <i>n</i> = 631,133 (47% male) Highly populated areas, <i>n</i> = 1,319,972 (50% male)	4 key areas of intervention: - Leadership involvement (local government): publicising suicide prevention messages from mayor to all officials and citizens; facilitating establishment of support networks - Education and awareness programmes (public): general campaign and regional lectures/seminars - Gatekeeper training (community/organisations) - Supporting individuals at high risk: home visits and regional social gatherings; screening and signposting to treatment  Intervention began in July 2006 and continued for 3.5 years	The relative risk of completed suicide and suicide attempts was significantly lower for males in rural areas. No effect seen in highly populated areas.

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
<b>14 Player <i>et al.</i>, 2015, Australia</b>	Examine factors assisting, complicating or inhibiting interventions for men at risk of suicide, and roles of family and friends and others in male suicide prevention	Qualitative Interviews with male suicide survivors ( $n = 35$ ) 8 focus groups with family and friends of male suicide survivors ( $n = 47$ ) Suicide survivors had attempted suicide 6-18 months prior to study	Factors that might interrupt male suicide attempts	<p>Many men did not acknowledge their own distress or low mood so effective monitoring and appropriate response to men's warning signs was crucial</p> <p>To decrease acute &amp; immediate risk:</p> <ul style="list-style-type: none"> <li>- Distraction was effective in providing respite from suicidal thoughts but did not alleviate them entirely; younger men preferred high-adrenaline activities e.g. go-karting; if deemed high-risk, mental health professionals were contacted</li> </ul> <p>In general, effective strategies to interrupt suicide involved:</p> <ul style="list-style-type: none"> <li>- Considering effect on loved ones/children</li> <li>- Talking to people whom men trust and respect; some men indicated preference for anonymity/talking to non-relatives</li> <li>- Receiving practical, solution-oriented support; reconnecting with living</li> <li>- Emotional regulation</li> </ul>
<b>15 Pratt <i>et al.</i>, 2015, UK</b>	Evaluate a cognitive behavioural suicide prevention (CBSP) therapy for male prisoners	Pilot randomised controlled trial 62 male prisoners aged 18 years and over, identified as at risk of suicide within past month (CBSP, $n = 31$ ; treatment as usual [TAU], $n = 31$ )	Initially, up to 20 sessions (~1 hour each) of CBSP delivered twice weekly, reduced to once weekly upon establishment of therapeutic engagement Therapy consisted of five components: (i) attention broadening, (ii) cognitive restructuring, (iii) mood management & behavioural activation, (iv) problem-solving training, (v) improving self-esteem & positive schema. Aimed to encourage men to change way view selves, situation and future, in addition to use of behavioural techniques to develop more helpful responses to distressing situations.	<p>CBSP group experienced significant reduction in suicidal behaviours over TAU group after 6 months</p> <p>Reduction (but not significant) in suicidal ideation for CBSP group</p> <p>At end of trial, 56% of CBSP group were considered to have made a clinically significant recovery compared to just 23% in TAU group</p>



Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
16 Reading and Bowen, 2014, UK	Explore perceptions, beliefs and abilities supporting adult male prisoners in overcoming suicidality	Qualitative interviews Male life-sentenced prisoners in Category B prison, aged 30 to 58 years old ( <i>n</i> = 8)	Strategies use by male prisoners to overcome suicidality	Key themes reported: - Connectedness: a major theme encompassing support systems (family, friends, mental health professionals), shared experiences, and feeling wanted - Sense of self: including self-understanding, leading to a greater acceptance of themselves and their situation - Presence of meaning: particular pertaining to role as father and impact on children if committed suicide
17 Saewyc et al., 2014, Canada	Explore relationship between implementation of school-based Gay-Straight Alliances (GSAs) and anti-homophobic bullying policies in secondary schools with experiences of anti-gay discrimination, suicidal ideation and attempts among lesbian, gay, bisexual (LGB), mostly heterosexual and exclusively heterosexual students	Secondary analysis of the 2008 British Columbia Adolescent Health Survey (BCAHS) Schoolchildren aged 11-18 ( <i>n</i> = 21,708; 11,741 boys)	GSAs are student-run clubs where students (LGBTQ and straight) can meet and talk about issues pertaining to sexual orientation, gender identity and expression, within a safe environment	LGB students and heterosexual boys in schools where GSAs had been implemented for 3 or more years had reduced odds of suicidal thoughts and suicide attempts
18 Shand et al., 2015, Australia	Explore what factors might interrupt suicidal behaviour in men	Mixed methods (mainly quantitative survey) Men aged 18 years and over, who had attempted suicide 6-18 months before completing survey ( <i>n</i> = 251)	Language men use to describe their depression and suicidality Warning signs Barriers to accessing help What is required to interrupt suicide attempt	Considering consequences for family (67%) and needing support from someone trusted and respected (66%) were key factors for interrupting suicide attempts  Over half cited high profile men in mainstream media as the best way to disseminate information to depressed/suicidal men

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<b>19 Shelef <i>et al.</i>, 2016, Israel</b>	Evaluate effectiveness of Israeli Defense Force Suicide Prevention Program	Quasi-experimental cohort study (pre- and post-intervention) Two cohorts of IDF mandatory service soldiers: - Cohort 1 (pre-intervention), $n = 766,107$ - Cohort 2 (post-intervention), $n = 405,252$	Weapons accessibility restricted Improved screening and management of suicidal soldiers Identification of high-risk individuals 'Gate-keeper' groups identified Education and integration of Mental Health Officers in various army units to reduce stigma associated with help-seeking behaviour	55% decrease in male suicide rate; hazard ratio for intervention effect on time to suicide was 0.44 among males Effect of intervention appeared to be related to use of weapon, increased help-seeking and decreased stigma
<b>20 Szanto <i>et al.</i>, 2007, Hungary</b>	Determine effectiveness of depression-management education programme for GPs on suicide rate	Pre- and post-intervention analysis vs. control region, surrounding county, and Hungary as a whole 28 GPs responsible for 73,000 inhabitants	Training initially involved lectures, followed by: - Booster sessions including interactive Q & A, and case discussions of patients who had recently died by suicide - Optional 1-hour lectures delivered 3 times/year by researchers across 5 year intervention period	Annual suicide rate for males decreased significantly in local regions and rural areas during 5-year intervention period compared with 5 year pre-intervention period, but not in town areas  Significant increase in antidepressant prescription rates across both genders
<b>21 Szekely <i>et al.</i>, 2013, Hungary</b>	Evaluate effectiveness of regional community based four-level prevention programme on suicide rates	Pre- and post-intervention vs. control region Implemented in Szolnok (population = 76,811; 36,314 men and 40,567 women)	4 levels of intervention: - GP education: improve detection of depression and strengthen collaboration with psychiatric outpatient service - Media campaign - 230 community facilitators trained (e.g. teachers, police, priests) - 'Emergency cards' with details of emergency hotline number	55% decrease in suicide rates for both men and women across 3 years following programme implementation; significantly lower than control region and country as a whole
<b>22 Wang <i>et al.</i>, 2013, Switzerland</b>	Assess the impact of 'Blues-out' - a depression awareness campaign targeting gay/lesbian community - on suicidality, mental health outcomes, and recognition/knowledge/beliefs about depression and treatment	Pre- and post-campaign evaluation Views assessed by Geneva Gay Men's Health Survey (GGMHS) Gay men ( $n = 762$ )	Cooperation with GPs Depression awareness campaign Establishing network of institutional partnerships to support those affected Website and brochure: information on depression, its symptoms, list of gay-friendly providers, and possible institutions for consultation Later, hotline and emergency cards	Between 2007 and 2011, significant decrease in lifetime prevalence of suicidal ideation (-18%) and suicide plans (-29%) Number of suicide attempts remained unchanged