

## 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

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<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

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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.



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<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: - 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</p> <p>In general, effective strategies to interrupt suicide involved: - Considering effect on loved ones/children - Talking to people whom men trust and respect; some men indicated preference for anonymity/talking to non-relatives - Receiving practical, solution-oriented support; reconnecting with living - Emotional regulation</p> <p>CBSP group experienced significant reduction in suicidal behaviours over TAU group after 6 months Reduction (but not significant) in suicidal ideation for CBSP group 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>
<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.	

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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

Author, year, location	Aim of study	Study design/participant population	Intervention or topic	Main findings
<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), <i>n</i> = 766,107) - Cohort 2 (post-intervention), <i>n</i> = 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 ( <i>n</i> = 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