

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

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Supplemental appendix

Suicide risk in specific populations

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Adolescents

While most other causes of death are declining in children and adolescents in the US, injuries and suicide are increasing.¹ Between 2013 and 2016, there was 26% increase in rates of firearm suicide¹ and 12% risk for other suicide methods. Increased risk-taking behavior, differential peer and parental influence, and initiation of substance use during adolescence may explain these rises.² In younger people, negative life events, mental disorders, drug problems, family history of suicidal behaviors, externalizing disorders, access to means, and previous self-harm are associated with completed suicide.^{3 4} Treatment research is limited. Evidence exists for mentalization-based treatment in reducing self-harm in girls.⁵ Other psychological treatments have shown potential for reducing suicidal behavior but require replication, identification of active treatment ingredients, and examination of effect mediators.⁶

Older adults

Older adult men aged over 64 have high suicide risk combined with low healthcare uptake.⁷ The combination of poor physical health and difficulties in identifying psychiatric disorders in primary and somatic care are obstacles. In a large US survey, 83% of older adults received healthcare in the year prior to their suicide, but half were not diagnosed with psychiatric disorders.⁸ Risk factors for suicide in older people include functional disability and specific physical conditions, including malignant diseases, neurological disorders, male genital disorders, arthritis/arthrosis, and COPD.⁹ High suicide rates are reported within three years of diagnosis for gastrointestinal cancer in men, brain cancer in women, and liver diseases in both genders.¹⁰ Social isolation is important, losses of role and status, and most older persons who commit suicide are widowed. However, less than a fifth of the oldest old (80+) who die from suicide have recently lost a partner.¹¹ Intervention research has relied on quasi-experimental designs investigating the introduction of multifaceted program of psychoeducation, depression screening, training, group therapy and clearer referral pathways in Japanese women, particularly in rural areas.¹² Telephone counselling has been associated with reduced suicide rates in three cohort studies.¹³ Trials of collaborative care models (where depression care managers collaborate with physicians) have used suicidal behavior outcomes and reported absolute rate reductions.¹³ Thus clinical guidelines suggest optimizing the management of late life depression in healthcare settings.¹⁴ Better understanding of losses

important to older men, and problems with bodily functions (e.g., eyes, mobility) may improve risk assessment.

Primary care

Contact with primary health care prior to suicide is common, including nearly half who died in the month before death.¹⁵ However, no interventions in primary care have been linked to improved outcomes. Screening for depression and suicidal ideation,¹⁶ improved training of primary care physicians¹⁷ are not associated with reduced suicides. Most patients with mental illness are treated in primary care, and depressed persons should be asked about suicidality with urgent referral and treatment if suicidal thoughts escalate.¹⁸

Recently discharged psychiatric patients and individuals who have self-harmed

It has been estimated that 57% of those who die from suicide have had some contact with psychiatric services in their lifetimes, and 31% in the last 12 months.¹⁵ Suicide risk is substantially elevated within three months of discharge from psychiatric hospital.¹⁹ Markers strongly associated with post-discharge suicide are depressive symptoms, an unplanned discharge, and recent social difficulties.²⁰ Hazards were elevated at least five-fold for depression, bipolar disorder, schizophrenia and substance use disorder in a large US study.²¹ The contribution of previous self-harm differs by setting, diagnosis and method. A recent Swedish population study of 2.9 million discharged patients reported suicide risk elevated in discharged patients who had self-harmed within four weeks of admission.²² In those with recent self-harm episode, the highest risks of suicide were in patients diagnosed with schizophrenia-spectrum disorders. A violent method for the index self-harm, especially firearms, substantially increased hazards,²³ and other violent methods such as hanging and self-cutting increase suicide risks compared to non-violent methods where firearm deaths are rare.^{24,25}

Intervention work finds reduced repetition of self-harm after 6 and 12 months following cognitive-behavioural psychological treatment.²⁶ Other treatments after self-harm such as dialectical behavioural therapy, case management, sending regular postcards and pharmacotherapy have found no consistent reductions in self harm or suicide.²⁷ A recent large

US trial showed that simple interventions targeted at high risk groups identified by screening led to a 20% reduction in suicidal behaviors over 12 months.²⁸ Brief interpersonal interventions show promise but require independent replication.²⁹ Observational evidence triangulates these findings, and finds that 8-10 psychosocial outpatient treatments after self-harm prevents later suicide with a 3% absolute rate difference.³⁰

Prisoners

Prisoners have higher rates of suicide than community-based persons of similar age and gender. During 2011-2014, the suicide rate was 23 per 100,000 persons in all US jails and prisons, which was higher in local jails and in men (where it was 45/100,000 male prisoners, and 30/100,000 female prisoners).³¹ In some European countries, suicide rates were more than 100 per 100,000 prisoners, including Norway, France, and Finland. This translates into elevated relative risks of 3 to 6 fold in men, with greater excesses in women. However, suicide rates are higher than in men. Risk factors are similar to those in the general population, and include psychiatric diagnoses and alcohol use disorders. Prison-specific factors include single cell occupancy, being on remand, life sentence, and violent offense conviction.³² Lower incarceration is associated with decreased suicide rates, which may be explained by individuals with less serious offenses importing fewer risk factors.³¹ Near-lethal studies have reported additional risk factors including depressive disorders, comorbidity, prior prison sentences, and lower perceptions of social support.³³ Evidence on effective intervention are limited. Improved mental health treatment, and in particular linking health screening to interventions, lowers prisoner self-harm. Promoting safer environments, including the removal of ligature points, may reduce suicide rates.³⁴

Military and veteran populations

The military have historically been healthier than general populations as they are screened before entry, tend to be young and active, and provided with accessible medical care. Consequently, suicide rates were lower than the community^{35 36} apart from recent US data suggesting higher military rates from 2008.³⁷ All US veterans are now at higher suicide risk than the general population,³⁸ and those in active service had suicide rates in 2015 of 20 per 100,000 persons, unchanged from 2012-2014.³⁹ Risk factors for veteran suicides include

early separation from service,³⁵ recent deployment,⁴⁰ lower rank and younger age.³⁶ More junior enlisted soldiers are at elevated risk, and that clinical depression and multimorbidity are risk factors.⁴¹ Beyond providing high quality psychiatric care and reducing stigma to accessing such treatment, there is little intervention evidence. One brief intervention, Safety Planning Intervention (SPI) for male veterans, which involves prioritising coping strategies with telephone contact to monitor suicide risk, was associated with a reduction in suicidal behaviour during follow-up.⁴²

Nonheterosexuals

No clear associations have been found between nonheterosexuality and suicide.⁴³ Lesbian, gay and bisexual (LGB) adolescents have a two-fold elevated risk of suicide attempts than their heterosexual peers,⁴³ which may be explained by higher rates of victimization and substance use.⁴⁴ Suicidality risks are high in bisexual women.⁴⁵ Clinicians working with nonheterosexuals should discuss openly suicidality, and consider reducing internalised stigma.⁴⁵

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