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Contact with mental health services after acute care for self-harm among adults released from prison: A prospective data linkage study

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ABSTRACT

Background: Despite elevated rates of self-harm among people released from prison, the incidence and timing of self-harm aftercare has not been examined in this population.

Aims: Determine the initial contact, pathway, discharge status, rate of mental healthcare contact, and predictors of mental healthcare contact within seven days of discharge from acute care following self-harm.

Method: In a representative cohort of adults released from prisons in Queensland, Australia, we probabilistically linked person-level, state-wide ambulance, emergency department, and hospital records, both prospectively and retrospectively, and community mental health service and Medicare records prospectively, to baseline survey data. We fit multivariate modified log-linked Poisson regression models to examine the association between sociodemographic, health, and criminal justice factors and mental healthcare contact after self-harm.

Results: Of 217 discharges from acute care following self-harm, 56% (n=121) received mental healthcare within seven days of discharge. Factors associated with mental healthcare contact within seven days after discharge were substance use disorder (adjusted relative risk (ARR)=0.48; 95%CI: 0.27-0.85), dual diagnosis (ARR=0.58; 95%CI: 0.41-0.82), physical health-related functioning (ARR=0.98; 95%CI: 0.97-0.99; p=0.018), being female (ARR=1.39; 95%CI: 1.02-1.90), having previously been identified as being at risk of self-harm by correctional authorities (ARR=1.50; 95%CI: 1.07-2.09), and prior engagement with state-funded mental healthcare (ARR=1.55; 95%CI: 1.08-2.22).

Conclusions: Our findings highlight the need to improve the integration of community mental healthcare for people recently released from prison who present to acute care following self-harm. This is particularly important for men and those with substance use disorder or dual diagnosis.

Declaration of interest: None.

Key Words: Self-injurious behaviour; Prisons; Emergency service; Hospital; Data linkage

Contact with mental health services after acute care for self-harm among adults released from prison: A prospective data linkage study

INTRODUCTION

Self-harm is one of strongest predictors of suicide.[1] It is a major public health concern associated with an increased risk of subsequent self-harm,[2] poor health and social outcomes,[3] substantial acute service costs,[4] and preventable death.[1] The social determinants of self-harm and incarceration overlap and include: mental illness, low educational attainment, social disadvantage, homelessness, and unemployment.[5,6] Accordingly, people released from prison have higher rates of self-harm than the general population.[7,8]

The risk of suicide for people hospitalised following self-harm is greatest within seven days of discharge, and remains elevated for at least 30 days.[9] Contact with acute care services is an important opportunity for assessment and treatment of mental health problems that may relate to self-harm. This aftercare is especially important for people released from prison, partly because the risk of suicide in this group is considerably higher than in the general population.[7,8,10,11]

Guidelines from the National Institute for Health and Care Excellence (NICE) and the Royal Australian and New Zealand College of Psychiatrists recommend that people who present to acute care for self-harm receive timely specialist mental healthcare,[12,13] integrated with primary care after discharge.[13] In Australia, public mental healthcare is either state-funded or federally-subsidised through Medicare,[14] with the latter often accessed by referral from primary care.[15] However, less than half of people discharged from acute care following self-harm engage with mental healthcare.[16] Despite high rates of self-harm among people released from prison, the incidence and timing of contact with mental healthcare after acute care following self-harm remains unknown.

In a representative cohort of adults released from prisons in Queensland, Australia, we aimed to: 1) determine the initial contact, pathway, discharge status, and rate of mental healthcare contact (state-funded and/or federally-subsidised) within seven days of discharge from acute care following

self-harm; and 2) identify the predictors of mental healthcare contact within seven days of discharge.

METHODS

Study population

We used data from the Passports study,[17,18] a randomised contolled trial of a low-intensity service brokerage intervention for adults released from prisons in Queensland, Australia. Between 1 August, 2008 and 31 July, 2010, a baseline survey was administered to 1325 adults (≥18 years) within six weeks of expected release from seven prisons in Queensland. The prison sentence during which the baseline survey was completed is referred to as the index sentence. Except for intentional oversampling of women, the sample was representative of people released from prisons in Queensland during the study period, on demographic and criminal justice variables.[17] Informed, written consent was obtained from all participants.

The study received approval from the University of Queensland Behavioural and Social Sciences Ethical Review Committee (#2007000607), Australian Institute of Health and Welfare Ethics Committee (EC2012/4/58), Queensland Health Human Research Ethics Committee (HREC/11/QHC/40), and Queensland Corrective Services Research Committee.

Baseline measures

Self-report baseline measures included sex, age (18-24/25-39/≥40 years), Indigenous status (Indigenous/non-Indigenous), pre-incarceration accommodation (stable/unstable), years of school completed (<10/≥10), pre-incarceration employment (employed/unemployed), current relationship status (stable/unstable, or no relationship), and history of juvenile detention (yes/no). Validated screening measures included the Kessler Psychological Distress Scale (K10)[19] for identifying mental illness; the Short Form 36 Health Survey version 2 (SF-36v2),[20] from which we calculated the Physical

Component Summary (PCS) score to assess physical health-related functioning; and the Hayes Ability Screening Index[21] for ascertaining possible intellectual disability.

Linked administrative records

We probabilistically linked person-level, state-wide ambulance, emergency department (ED), and hospital records, both prospectively and retrospectively, and state-funded community mental health service and Medicare[14] records prospectively, to baseline survey data. The National Death Index was linked to identify deaths during follow-up. Queensland Corrective Services (QCS) records were deterministically linked using the QCS prisoner identification number. A description of each linked dataset is presented in supplementary material (Table S1).

Length of ED stay was computed as the total minutes between arrival and discharge. We defined specialist mental healthcare contact during ED presentation and/or hospital stay as contact that occured between admission and discharge. We defined prior engagement with mental health services as having had ≥1 contact with state-funded mental healthcare in the 12 months prior to the acute care episode following self-harm.[16] From QCS records, we classified the most serious offence pertaining to the index sentence into violent (including sexual) and non-violent offences using the Australian Standard Offence Classification.[22]

We ascertained mental health status prior to, and during, the index prison sentence from ED, hospital, and prison medical records. We used International Classification of Diseases, 10th edition, Australian Modification (ICD-10-AM) diagnostic codes to identify ED presentations and hospital admissions in which substance use disorder (SUD; F10-F19) or mental illness (F01-F09 and F20-F99) was a primary or secondary diagnosis.[23] Diagnoses of SUD and mental illness in the same hospital admission or ED presentation were considered dual diagnosis.

Two trained researchers coded prison medical records for health conditions and diagnoses managed by prison health services using the International Classification of Primary Care, second edition (ICPC-

2).[24] The date of service and type of provider seen were also extracted. We used ICPC-2 codes to identify contacts with the prison health service in which a psychiatrist, psychologist, or general practitioner made a diagnosis of SUD (P15, P18, and P19) or mental illness (P70-P76, P79-P82, P86-P98, P99), with both conditions during the index prison sentence indicating dual diagnosis.

Pre-release ICD-10-AM and ICPC-2 diagnoses in prison were aggregated to form a composite mental health exposure variable with exclusive categories for no mental disorder, SUD only, mental illness only, and dual diagnosis.

Ascertainment of self-harm

We obtained details of self-harm resulting in acute care after release from the index prison sentence until either death or end of follow-up (31 July 2012). To identify self-harm events we used ICD-10-AM external cause of morbidity codes for self-harm (X60-X84) in ED presentations and hospital admissions, and coded free-text clinical notes in ambulance and ED records, to increase case ascertainment.[7,8] Our approach to coding of free-text clinical notes is detailed in the supplementary material (p.1). Different patterns of mental healthcare referral for self-harm by poisoning have been observed,[25] thus we dichotomised self-harm by method, comparing self-harm by poisoning to self-harm by all other means.

We aggregated ED presentations and/or hospital admissions within 24 hours of an initial ambulance attendance and/or ED presentation resulting from self-harm into one acute care episode. For example, if a self-harm event was initially identified from an ambulance attendence and there was a subsequent ED presentation within 24 hours of the time at destination, and a subsequent hospital admission within 24 hours of discharge from the ED, all three acute contacts were aggregated into one acute care episode.

Outcomes

Our primary outcome was state-funded mental healthcare contact within seven days of discharge from acute care following self-harm. Our secondary outcome was federally-subsidised mental healthcare contact.[15] Table S2 presents the Medicare[14] item codes used.

Statistical analyses

The unit of analysis was discharge from acute care following self-harm, with time at risk beginning at discharge. Our primary analyses were right censored at 31 July 2012 to ensure coverage of all relevant data sources. Our secondary analyses of federally-subsidised mental healthcare were censored at two years after release from the index sentence, to align with the duration of Medicare record linkage (Table S1).

We calculated descriptive statistics for all measures and calculated the time between discharge and subsequent contact with state-funded and federally-subsidised mental healthcare, respectively. We assessed crude differences in sociodemographic, health, and criminal justice factors before release from the index prison sentence between discharge events following self-harm that had community mental healthcare contact within seven days, and those that did not, using χ^2 tests. The relationship between timely mental healthcare after self-harm and the subsequent rate of mental healthcare contact was determined using crude incidence rates (IRs) of mental healthcare contact overall and piecewise for 0-7, 8-30, 31-90, 91-180, and 181-365 days after acute care following self-harm, seperately for those who did and did not have mental healthcare contact within seven days after self-harm. We modelled time to all mental healthcare contact, and seperately by re-incarceration status, and seperately by federally-subsidised mental health plans provided by general practitioners and federally-subsidised specialist mental health consultation, via Kaplan-Meier curves.

We fit multivariate modified log-linked Poisson regression models with robust error variance to examine the association between sociodemographic, health, and criminal justice factors and mental healthcare contact after self-harm.[26] In the interests of parsimony, we only included covariates with

a univariate association of p<0.5; however, given unique barriers to mental healthcare for Indigenous Australians who experience incarceration,[27] Indigenous status was forced into the final model. The final model was adjusted for sex, age, Indigenous status, years of school completed, living alone, SF-36v2 PCS score, mental health status, prior engagement with mental healthcare services, being previously identified as at risk of self-harm by correctional authorities, history of juvenile detention, parole on release, and receipt of the Passports intervention.[17,18]

We replaced missing covariate data by multiple imputation (imputed datasets: *N*=100) using multivariate chained equations (see supplementary material p.1).[28]

We conducted sensitivity analyses to assess assumptions made in ascertaining our outcomes, and to evaluate the impact of reincarceration and subsequent self-harm events within 7 days of discharge from acute care on our measures of effect (see supplementary material p.1-2).

All analyses were conducted using STATA version 15.1.[29]

RESULTS

A total of 108 (8.3%) people accounted for 218 self-harm events resulting in acute care after release from prison (median= 1; interquartile range (IQR) 1-2; range 1-15).

Figure 1 describes the initial contact, pathway, discharge status, and mental health service contact within seven days after discharge from acute care for self-harm. Of all self-harm events, 86 (39%) resulted in initial contact with ambulance services, 113 (52%) with EDs, and 19 (9%) presented directly to hospital. Most acute care episodes following self-harm resulted in discharge from the ED (n=155; 71%) or hospital (n=54; 25%).

The characteristics of acute care for self-harm, by admission and discharge, are shown in Table S3. One-third (n=51; 33%) of ED discharges received mental healthcare during the presentation with 18 (12%) recorded as ‘did not wait’/’left at own risk’. Among people discharged from hospital stays

(n=54), 26% (n=14) received mental healthcare during the hospital stay and 9% (n=5) were discharged against medical advice (Table S3).

Characteristics of acute and mental healthcare contacts in the seven days preceding acute care for self-harm are displayed in Table S4. Overall, 38 (60%) of these service contacts had either a mental health-related diagnosis or an ambulance attendance final assessment recorded as mental health-related (Table S5). When free-text coding was included, 15 (24%) of these preceding health service contacts were for self-harm.

Time to first mental healthcare contact after acute care for self-harm is presented in Figure 2. Of the 217 discharges from acute care following self-harm, 47% (n=102), 55% (n=119), and 64% (n=139) had contact with mental healthcare within 48 hours, 7 days, and 30 days of discharge, respectively. Time to first contact was similar between people who were re-incarcerated after acute care for self-harm, and those who remained in the community during follow-up (Figure S1).

Figure S2 presents time to first contact with federally-subsidised mental healthcare. The proportion of discharges from acute care following self-harm that received federally-subsidised mental healthcare within 48 hours, 7 days, and 30 days of discharge was 2% (n=3), 5% (n=7), and 14% (n=19), respectively. Combining state-funded and federally-subsidised mental healthcare, 48% (n=105), 56% (n=121), and 67% (n=145) of discharges from acute care following self-harm received mental healthcare within 48 hours, 7 days, and 30 days of discharge, respectively (Table S6). These proportions were higher among discharges that had an ICD-10-AM code for self-harm (Table S7).

Table 1 presents the characteristics of each discharge from acute care following self-harm. Women, Indigenous Australians, and those aged 25-39 years accounted for 24% (n=52), 38% (n=82) and 61% (n=133) of discharges following self-harm, respectively. People with dual diagnosis accounted for 69% (n=149) of discharges and almost half (n=95; 44%) of all discharges following self-harm by poisoning. Most discharges (n=148; 68%) had ≥1 contact with mental healthcare in the 12 months

before self-harm. The characteristics of people discharged from acute care following self-harm are displayed in Table S8.

After model adjustment, factors associated with mental healthcare contact within seven days after self-harm were SUD (adjusted relative risk (ARR)=0.48; 95%CI: 0.27-0.85; p=0.011), dual diagnosis (ARR=0.58; 95%CI: 0.41-0.82; p=0.002), physical health-related functioning (ARR=0.98; 95%CI: 0.97-0.99; p=0.018), being female (ARR=1.39; 95%CI: 1.02-1.90; p=0.035), previously identified as being at risk of self-harm by correctional authorities (ARR=1.50; 95%CI: 1.07-2.09; p=0.018), and prior engagement with state-funded mental healthcare (ARR=1.55; 95%CI: 1.08-2.22; p=0.017) (Table 1).

The crude IR of mental healthcare contact within one year of discharge following self-harm was 10.3 (95%CI: 9.6-11.0) per person-year. Overall, the crude IR from 8 to 365 days was significantly higher for the mental health contact group (IR=15.3; 95%CI: 14.0-16.7 per person-year) compared to those without mental healthcare contact within seven days (IR=4.1; 95%CI: 3.6-4.7; crude incidence rate ratio=3.7; 95%CI: 3.1-4.4; p<0.001) (Figure 3).

Sensitivity analyses are displayed in Table S8. The association between physical health-related functioning and mental healthcare contact appeared to be sensitive to some restricted analyses. Inverse propensity weight adjustment attenuated the association between SUD only and mental healthcare contact. When we excluded mental healthcare contact during the acute care episode, prior engagement with mental healthcare services did not remain a significant predictor of mental healthcare contact after self-harm. When we evaluated mental health service contact within 48 hours and restricted the exposure to ED and hospital admissions with ICD-10-AM codes for self-harm, the associations for sex and being previously identified as at risk of self-harm by correctional authorities attenuated to the null. Restricting our exposure to ED and hospital ICD-10-AM codes for self-harm also attenuated the associations with SUD only and dual diagnosis. Overall, point estimates did not change substantially; however, confidence intervals widened such that some associations attenuated to the null (Table S8).

DISCUSSION

Despite national and international guidelines recommending that all people discharged from acute care following self-harm receive timely mental healthcare,[12,13] we found that almost half of adults with a recent history of incarceration did not receive mental healthcare within seven days of acute care following self-harm. Furthermore, over one-third did not receive mental healthcare within 30 days. Factors inversely associated with timely mental healthcare contact included better physical health-related functioning and having a SUD or dual diagnosis. Factors positively related to timely mental healthcare contact were prior engagement with mental healthcare services, being identified by correctional authorities as at risk of self-harm, and being female.

Self-harm is a key risk factor for subsequent self-harm and suicide,[1] and the risk is greatest within seven days of discharge from acute care.[9,30] Given this acute period of heightened risk, efforts should be made to ensure continuity of mental healthcare, including psychological and social support for those discharged from acute care after self-harm. Contact with acute health services for self-harm provides an opportunity to initiate care, evaluate need, and develop a management plan to prevent poor outcomes, including subsequent self-harm and suicide.[9] Disengagement with mental healthcare has been associated with suicide,[31] whereas enhanced self-harm aftercare has been associated with reduced suicide risk.[32] Following acute care for self-harm, continuity of mental healthcare is particularly important for people with a recent history of incarceration, who are at higher risk of self-harm and suicide than the general population.[7,8,10] Improving rates of access to, and the integration and effectiveness of, mental healthcare after self-harm are priorities of the National Suicide Prevention Strategy for England,[33] and the Australian National Mental Health and Suicide Prevention Plan.[34] Our findings indicate that mental healthcare following self-harm was suboptimal for adults with a recent history of incarceration. This represents a missed public health opportunity.

The proportion of adults who received mental healthcare within 30 days of acute care for self-harm was higher in our study than in the general community, where prevalence ranges from 31%-53% after ED presentation[35,36] and 41% after hospitalisation.[16] Most adults discharged after self-harm had engaged with mental health services prior to self-harm. This was the strongest predictor of receiving mental healthcare both during and after an acute care episode following self-harm, a finding consistent with the general population.[16] Conversely, only half of those discharged who had no prior engagement with mental healthcare services received timely mental healthcare after self-harm. This highlights the importance of adherence to self-harm aftercare guidelines to improve engagement and retention in mental healthcare, especially for people who have had no prior engagement with these services.

Given the high prevalence of complex mental health needs in adults released from prison,[37] a higher proportion may be connected with mental healthcare services when presenting to acute care for self-harm compared to the general population. In the general population, people with greater perceived need are more likely to access mental healthcare after self-harm.[35] However, in our study one-third of adults recently released from prison did not receive timely mental healthcare after self-harm. Targeted approaches to address the actual and perceived barriers to engagement and retention in mental healthcare experienced by adults with a recent history of incarceration are needed to improve access to self-harm aftercare.

NICE guidelines recommend increased integration of specialist mental healthcare and enhanced primary care for people discharged from acute care following self-harm.[13] However, we found that access to federally-subsidised mental health plans provided by general practitioners was low after acute care for self-harm. Research has shown that subsidies for mental health plans through primary care, under Australia's Better Access initiative, have disproportionately benefited more socio-economically advantaged people.[38] Among people with a history of incarceration, cost can be a prominent barrier to accessing specialist healthcare.[39] Maximising engagement with publicly-funded

mental healthcare, and enhanced primary care, may be an important strategy to increase self-harm aftercare for this disadvantaged group.

Dual diagnosis has been associated with increased hospital contact for self-harm in adults released from prison,[40] and people released from acute care with a mental disorder are at increased risk of suicide compared to those without a mental disorder.[41] Alcohol intoxication has been associated with self-harm, particularly more severe self-harm,[42] and substance use disorder is a risk factor for disengagement with mental healthcare and poor outcomes after self-harm, including suicide.[43,44] Although people with dual diagnosis and a history of incarceration are a highly indicated group for suicide prevention,[33] we found that they are less likely than those without a mental disorder to receive recommended self-harm aftercare. Enhanced integration between acute and community-based mental healthcare after self-harm is likely critical to preventing poor health outcomes for this group.

People with dual diagnosis experience both psychosocial and system-level barriers to accessing mental healthcare.[45] Substance use- and incarceration-related stigma are prominent barriers to accessing community services, and delay help-seeking.[46,47] Perceived poor quality of mental healthcare has been associated with decreased help-seeking,[48] and research has highlighted limitations of mental health services to meet the needs of people with dual diagnosis[49] and people released from prison.[50] People with comorbid substance use problems can present challenges for mental healthcare providers as a lack of integration between mental health and alcohol and drug services can be barriers to care and limit holistic therapeutic approaches.[51-53] Despite Australia's 'no wrong door' policy, which asserts that any community healthcare service should be a point of access for those with co-occurring health problems,[54] structural discrimination remains a concern for people with dual diagnosis and a history of incarceration.[41]

Although males are at increased risk of suicide after self-harm compared to females,[55] we found that males were less likely to receive recommended self-harm aftercare, consistent with findings in the

general community.[56] For males, mental healthcare contact after self-harm is protective against death from all causes.[56] Given evidence of a 'hyper masculine' identity in incarcerated men and associated barriers to help-seeking for mental illness,[57] targeted efforts to engage men with a recent history of incarceration who present for self-harm with appropriate mental healthcare and social services are needed.

The importance of service coordination and continuity of health information, and the potential public health benefits if throughcare is effectively provided by forensic and community service providers has been established.[58] Thus, our finding that those identified as at-risk of self-harm by correctional authorities were more likely to receive timely mental healthcare contact after self-harm is encouraging. We also found that cases in which an ICD code for self-harm was recorded in ED or hospital records were more likely to access timely mental healthcare. Accurate documentation of self-harm in acute care settings and ensuring continuity of clinical information as people transition from acute to tertiary care, is likely crucial for self-harm and suicide prevention.

Adults with better physical functioning were less likely to receive timely mental healthcare after self-harm. People who receive acute care for self-harm perceive that there is a myopic focus on physical health, sometimes to the exclusion of their mental health problems.[59] Individuals with better physical health-related functioning may be perceived to be at lower risk of self-harm and therefore more likely to be discharged without aftercare. Alternatively, they may be less likely to perceive the need to seek help. Our study design did not allow us to empirically test these mechanisms and it remains an important area for future investigation.

Strategies that have achieved the greatest reduction in suicide attempts following service contact for self-harm include psychosocial treatments and co-ordinated/assertive aftercare.[60] Effective approaches to continuity of care include those that incorporate interpersonal and familial interventions aimed at integrating in-patient and out-patient care.[61] Key strategies for prevention of recurrent self-harm after acute care include active attempts at engagement and follow-up through

phone contact or by general practitioners, treating mental health professionals or members of the treatment team, or the police.[62] As we observed that no discharges from ambulance attendances resulted in mental healthcare contact, active engagement strategies may be especially important after attendances that do not result in transport to hospital. Mobile text message interventions may be effective for engaging with people who are discharged from ambulance attendances with no further care.[63] Additionally, as police co-attendance with paramedics attending people who have self-harmed is common,[64] training first-responders to engage with people who self-harm and refer them to mental healthcare may be an effective strategy to prevent poor outcomes.

Our study had multiple strengths. Our cohort was broadly representative of all people released from prison in Queensland, Australia during the study period.[17] To our knowledge, it is the first study to combine survey and person-level linked data from state-wide ambulance, ED, hospital, Medicare and mental health service records, providing unprecedented detail on the trajectory through the health system for people with a recent history of incarceration who self-harm. Rich baseline survey data allowed for comprehensive model adjustment.

Our study also had some limitations. We ascertained some measures from a survey conducted prior to release from prison; therefore, these measures may not reflect participants' health or social status at the time of the self-harm presentation. We had modest power, which may have impacted our ability to detect differences in our sensitivity analyses and limited our ability to investigate effect modification. Our linkage with Medicare records was limited to two years of follow-up after release from prison. Thus, only two-thirds of the discharges after self-harm had sufficient follow-up time to evaluate our secondary outcome of federally-subsidised mental healthcare contact. We did not have access to mental health service records prior to index incarceration, therefore our ascertainment of prior engagement with mental health services was restricted to contacts after index release. We were unable to ascertain mental healthcare contacts in prison, for those who returned to prison during follow-up, due to the lack of access to electronic prison health records.

Conclusion

Our findings highlight the need to improve the integration of community mental healthcare for people recently released from prison who present to acute care for self-harm. The development of healthcare engagement and management strategies, initiated by first-responders and acute care clinicians, and integrated with community mental healthcare providers, augmented with broader psycho-social interventions, are urgently needed. Our findings suggest that this is particularly important for men and those with SUD or dual diagnosis.

AUTHOR DISCLOSURES

Role of Funding Source

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Contributors

SK and EH developed the original research proposal and methodology. JY developed and conducted the statistical analysis. JY wrote the initial draft manuscript. JY, RB, EH, MS, LB, DP, GA, JO, PM, and SK contributed significantly to the interpretation and synthesis of results, and all authors were involved in the development of the final manuscript submitted. JY had full access to the data used in this study and takes responsibility for the integrity of the data and accuracy of the data analysis.

Declaration of Interest

Apart from the funding resources disclosed in the acknowledgements section, all authors declare no conflicts of interest.

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expressed herein are solely those of the authors, and in no way reflect the views or policies of Queensland Corrective Services.

TABLES

Table 1: Association between sociodemographic, health, and criminal justice factors and mental healthcare contact within 7 days after discharge from acute care following self-harm

Characteristic	MH contact N(%) 119 (54.8)	No MH contact N(%) 98 (45.2)	Crude RR(95%CI)	p-value	Adjusted RR(95%CI) with imputed values	p-value
Female	34 (28.6%)	18 (18.4%)	1.27(0.99, 1.63)	0.059	1.39(1.02, 1.90)	0.035
Age in years						
- 18-24	23 (19.3%)	23 (23.5%)	ref	-	ref	-
- 25-39	74 (62.2%)	59 (60.2%)	1.11(0.80, 1.54)	0.522	1.09(0.80, 1.50)	0.580
- ≥40	22 (18.5%)	16 (16.3%)	1.16(0.78, 1.72)	0.469	1.05(0.72, 1.54)	0.803
Indigenous	49 (41.2%)	33 (33.7%)	1.15(0.91, 1.47)	0.249	1.09(0.83, 1.44)	0.538
Unstable accommodation	31 (26.1%)	26 (26.5%)	1.01(0.77, 1.33)	0.937	-	-
<10 years of school completed	66 (55.5%)	45 (45.9%)	1.19(0.93, 1.52)	0.166	1.22(0.96, 1.56)	0.107
Unemployed	70 (58.8%)	54 (55.1%)	0.93(0.73, 1.20)	0.584	-	-
Not in stable relationship	78 (66.1%)	67 (69.8%)	1.08(0.84, 1.39)	0.561	-	-
Living alone	48 (40.3%)	23 (23.5%)	1.39(1.10, 1.75)	0.005	1.06(0.79, 1.42)	0.698
High/very high psychological distress (K10)	54 (45.4%)	43 (43.9%)	1.03(0.81, 1.31)	0.825	-	-
Physical health-related functioning (SF-36v2 PCS - per unit increase)	51.8±10.2	55.1±11.4	0.99(0.98, 0.99)	0.025	0.98(0.97, 0.99)	0.018
Intellectual disability	17 (14.8%)	12 (12.5%)	1.09(0.78, 1.52)	0.619	-	-
Pre-release mental health status						
- No mental disorder	18 (15.1%)	9 (9.2%)	ref	-	ref	-
- MI only	7 (5.9%)	6 (6.1%)	0.81(0.46, 1.43)	0.463	0.62(0.34, 1.12)	0.115
- SUD only	9 (7.6%)	19 (19.4%)	0.48(0.26, 0.88)	0.018	0.48(0.27, 0.85)	0.011
- Dual diagnosis	85 (71.4%)	64 (65.3%)	0.86(0.63, 1.16)	0.311	0.58(0.41, 0.82)	0.002
Prior engagement with mental health services	96 (80.7%)	52 (53.1%)	1.95(1.36, 2.78)	<0.001	1.55(1.08, 2.22)	0.017
Identified by correctional authorities as at risk of self-harm	82 (68.9%)	47 (48.0%)	1.51(1.14, 2.00)	0.004	1.50(1.07, 2.09)	0.018
Self-harm by poisoning[a]	51 (42.9%)	44 (44.9%)	0.96(0.75, 1.23)	0.764	-	-
History of juvenile detention	60 (50.8%)	31 (31.6%)	1.42(1.12, 1.81)	0.004	1.19(0.91, 1.55)	0.203
Prior adult prison sentence	102 (86.4%)	83 (84.7%)	1.07(0.74, 1.54)	0.723	-	-
Released on parole	46 (38.7%)	45 (45.9%)	0.87(0.68, 1.12)	0.290	0.91(0.68, 1.22)	0.522
Prior violent offence	68 (57.1%)	55 (56.1%)	1.02(0.80, 1.30)	0.881	-	-
Passports intervention	61 (51.7%)	57 (48.3%)	0.88 (0.69, 1.12)	0.309	0.88(0.67, 1.16)	0.368

[a]Compared to self-harm by all other methods including hanging, strangulation or suffocation (X70); burning (X77); cutting or sharp object (X78); battering or blunt object (X79); jumping or risk-taking (X80-X82); caustic substances, crashing aircraft or electrocution (X83); and unspecified means (X84).

K10: 10-item Kessler Psychological Distress Scale; MH: Mental healthcare; MI: Mental illness; QCS: Queensland Corrective Services; RR: Relative risk; SF-36v2 PCS: Short-Form 36 Health Survey version 2 Physical Component Summary; SUD: Substance use disorder; 95%CI: 95% confidence interval

FIGURES

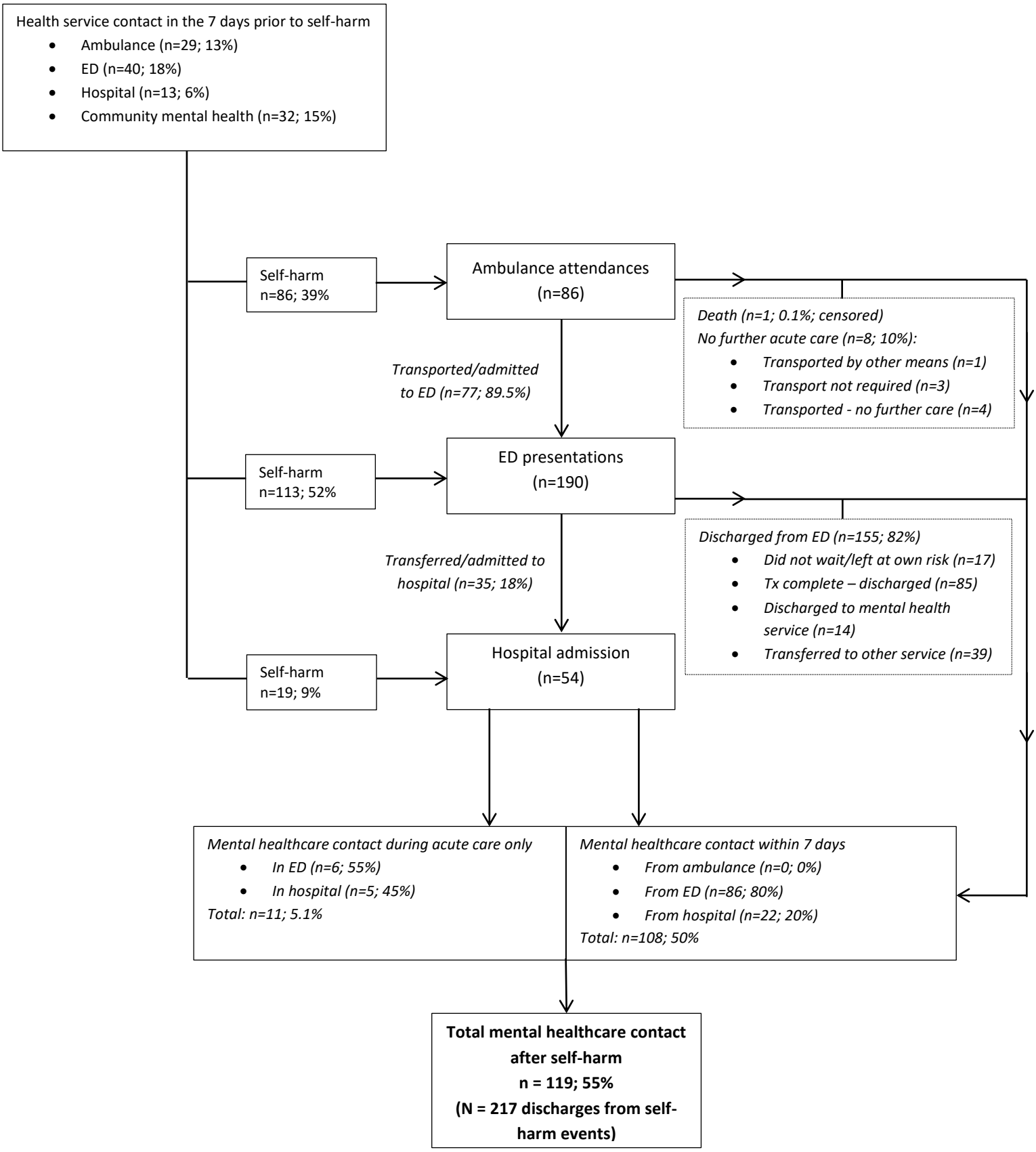

Figure 1: Study design with proportions

ED: emergency department; Tx: Treatment

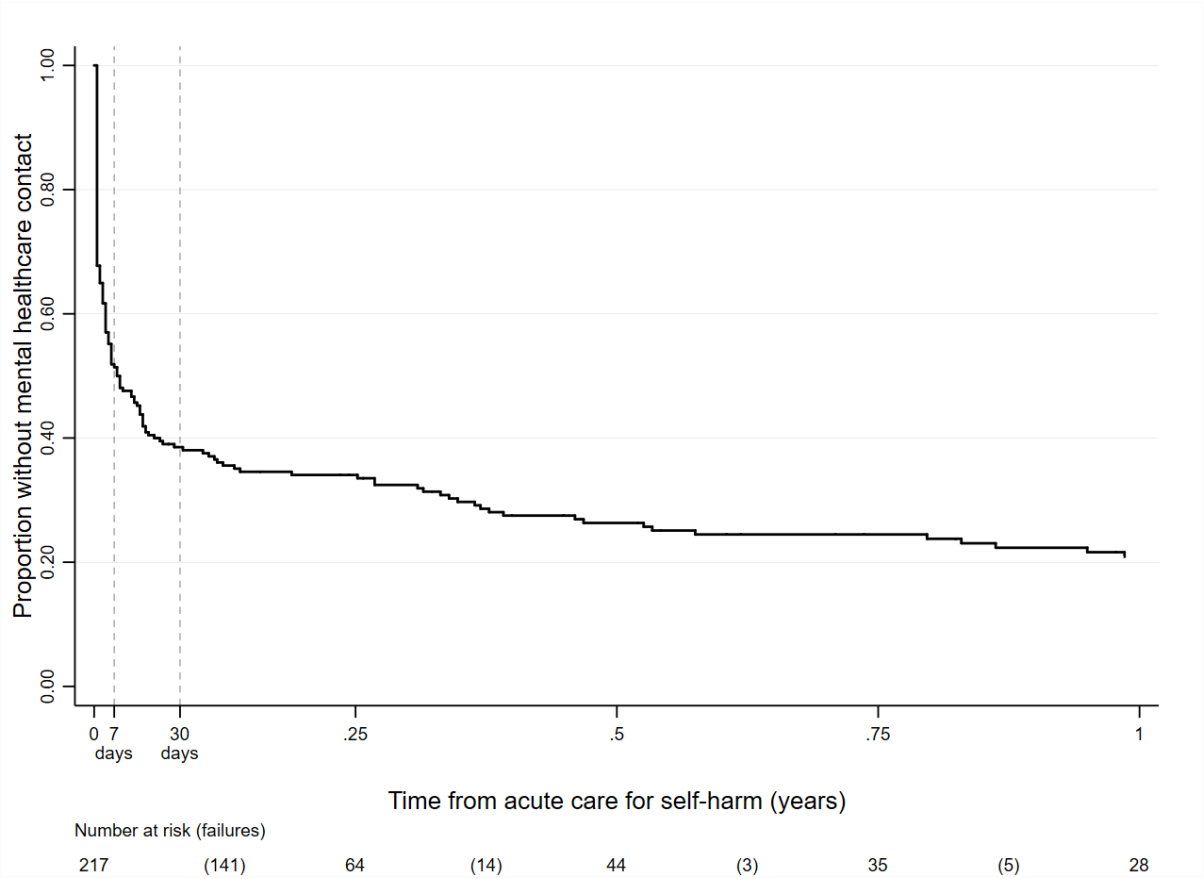

Figure 2: Kaplan-Meier survival curve of mental healthcare contact following acute care for self-harm

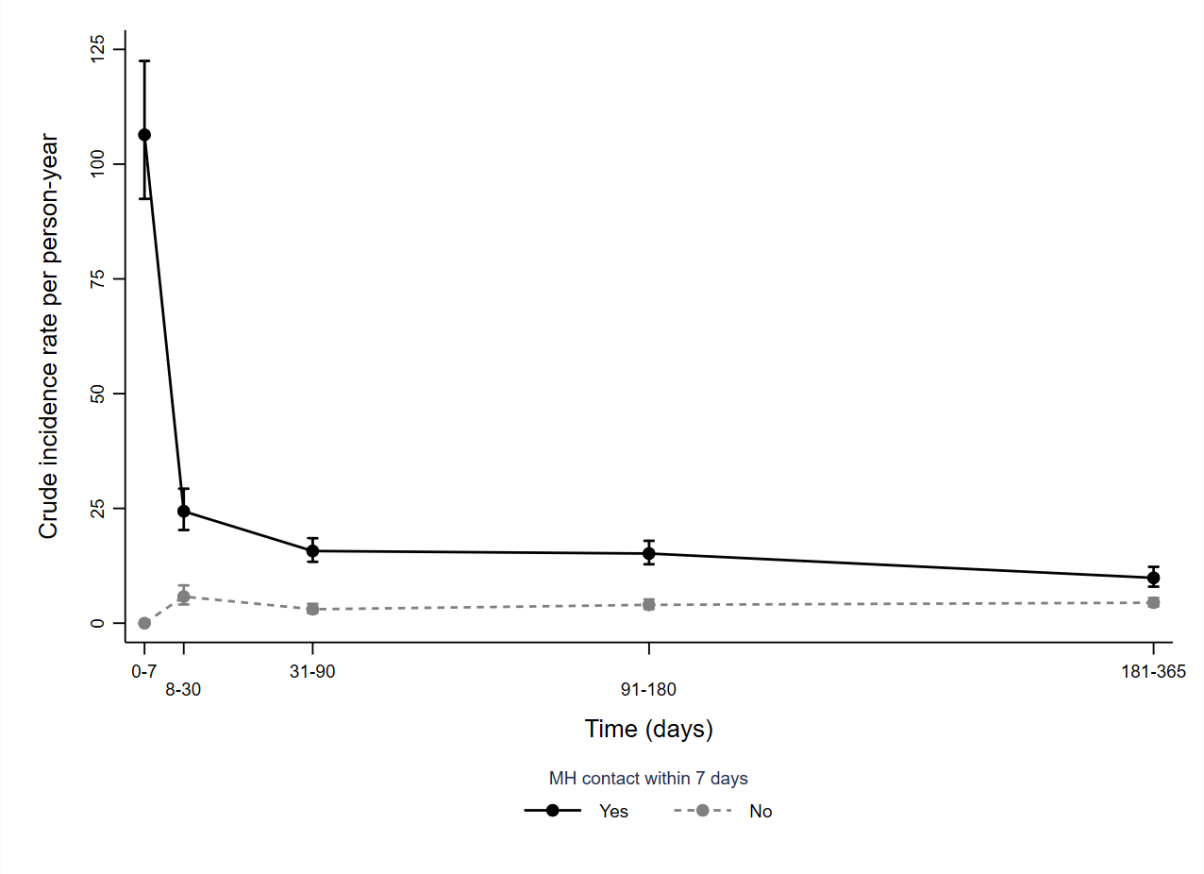

Figure 3: Piecewise incidence of mental healthcare contact following acute care for self-harm
MH: mental healthcare

REFERENCES

1. Bergen H, Hawton K, Waters K, et al. Premature death after self-harm: a multicentre cohort study. *The Lancet* 2012; **380**(9853): 1568-74.
2. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm: Systematic review. *Br J Psychiatry* 2002; **181**(3): 193-9.
3. Mars B, Heron J, Crane C, et al. Clinical and social outcomes of adolescent self harm: population based birth cohort study. *BMJ* 2014; **349**: g5954.
4. Tsiachristas A, McDaid D, Casey D, et al. General hospital costs in England of medical and psychiatric care for patients who self-harm: a retrospective analysis. *The Lancet Psychiatry* 2017; **4**(10): 759-67.
5. Roelands M, Vanoverloop J, Maron L, Bilsen J. Socioeconomic risk factors for hospital admittance due to a suicide attempt in Belgium: a population-based study using administrative data. *Soc Psychiatry Psychiatr Epidemiol* 2018; **53**(1): 53-61.
6. AIHW. The health of Australia's prisoners 2015. Canberra: Australian Institute of Health and Welfare, 2015.
7. Borschmann R, Thomas E, Moran P, et al. Self-harm following release from prison: A prospective data linkage study. *Aust N Z J Psychiatry* 2016; **51**(3): 250-9.
8. Borschmann R, Young JT, Moran P, et al. Ambulance attendances resulting from self-harm after release from prison: a prospective data linkage study. *Soc Psychiatry Psychiatr Epidemiol* 2017; **52**(10): 1295-305.
9. Olfson M, Wall M, Wang S, Crystal S, Gerhard T, Blanco C. Suicide Following Deliberate Self-Harm. *Am J Psychiatry* 2017; **174**(8): 765-74.
10. Pratt D, Piper M, Appleby L, Webb R, Shaw J. Suicide in recently released prisoners: a population-based cohort study. *The Lancet* 2006; **368**(9530): 119-23.
11. Hawton K, Linsell L, Adeniji T, Sariaslan A, Fazel S. Self-harm in prisons in England and Wales: an epidemiological study of prevalence, risk factors, clustering, and subsequent suicide. *The Lancet* 2014; **383**(9923): 1147-54.
12. Carter G, Page A, Large M, et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guideline for the management of deliberate self-harm. *Aust N Z J Psychiatry* 2016; **50**(10): 939-1000.
13. National Institute for Clinical Excellence. Self-harm in over 8s: short-term management and prevention of recurrence. Clinical Guideline (CG16): NICE, 2004.
14. Department of Health. Medicare Benefits Schedule Book. Canberra, 2014.
15. Harris MG, Burgess PM, Pirkis JE, Slade TN, Whiteford HA. Policy initiative to improve access to psychological services for people with affective and anxiety disorders: population-level analysis. *Br J Psychiatry* 2011; **198**(2): 99-108.
16. Spittal MJ, Shand F, Christensen H, Brophy L, Pirkis J. Community mental health care after self-harm: A retrospective cohort study. *Aust N Z J Psychiatry* 2017; **51**(7): 727-35.
17. Kinner SA, Lennox N, Williams GM, et al. Randomised controlled trial of a service brokerage intervention for ex-prisoners in Australia. *Contemp Clin Trials* 2013; **36**(1): 198-206.
18. Kinner SA, Alati R, Longo M, et al. Low-intensity case management increases contact with primary care in recently released prisoners: a single-blinded, multisite, randomised controlled trial. *J Epidemiol Community Health* 2016; **70**: 683-8.
19. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry* 2003; **60**(2): 184-9.
20. Ware JE, Kosinski M, Dewey JE. How to score version 2 of the SF-36 health survey (standard & acute forms): QualityMetric Incorporated; 2000.
21. Hayes S. Hayes Ability Screening Index (HASI) Manual: Faculty of Medicine, University of Sydney, 2000.
22. Australian Bureau of Statistics. Australian Standard Offence Classification (ASOC), Second edition. Cat no. 1234.0. Canberra: ABS, 2008.

23. National Centre for Classification in Health. International statistical classification of diseases and related health problems, Tenth Revision, Australian Modification (ICD-10-AM). National Centre for Classification in Health, Faculty of Health Sciences, University of Sydney. , 2004.
24. ICPC-2. International Classification of Primary Care. Second ed. Oxford: Oxford University Press; 1998.
25. Lilley R, Owens D, Horrocks J, et al. Hospital care and repetition following self-harm: Multicentre comparison of self-poisoning and self-injury. *Br J Psychiatry* 2008; **192**(6): 440-5.
26. Zou G, Donner A. Extension of the modified Poisson regression model to prospective studies with correlated binary data. *Stat Methods Med Res* 2013; **22**(6): 661-70.
27. Heffernan EB, Andersen KC, Dev A, Kinner S. Prevalence of mental illness among Aboriginal and Torres Strait Islander people in Queensland prisons. *Med J Aust* 2012; **197**(1): 37-41.
28. White IR, Royston P, Wood AM. Multiple imputation using chained equations: Issues and guidance for practice. *Stat Med* 2011; **30**(4): 377-99.
29. StataCorp. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC; 2017.
30. Haukka J, Suominen K, Partonen T, Lönnqvist J. Determinants and Outcomes of Serious Attempted Suicide: A Nationwide Study in Finland, 1996–2003. *Am J Epidemiol* 2008; **167**(10): 1155-63.
31. Appleby L, Dennehy JA, Thomas CS, Faragher EB, Lewis G. Aftercare and clinical characteristics of people with mental illness who commit suicide: a case-control study. *The Lancet* 1999; **353**(9162): 1397-400.
32. Hunt IM, Kapur N, Webb R, et al. Suicide in recently discharged psychiatric patients: a case-control study. *Psychol Med* 2009; **39**(3): 443-9.
33. Department of Health and Social Care. Preventing suicide in England: Third progress report of the cross-government outcomes strategy to save lives. London, UK: Her Majesty's Government, 2017.
34. Department of Health. The Fifth National Mental Health and Suicide Prevention Plan. Canberra: Australian Government, 2017.
35. Hunter J, Maunder R, Kurdyak P, Wilton AS, Gruneir A, Vigod S. Mental health follow-up after deliberate self-harm and risk for repeat self-harm and death. *Psychiatry Res* 2018; **259**: 333-9.
36. Chihara I, Ae R, Kudo Y, et al. Suicidal patients presenting to secondary and tertiary emergency departments and referral to a psychiatrist: a population-based descriptive study from Japan. *BMC Psychiatry* 2018; **18**(1): 112.
37. van Dooren K, Richards A, Lennox N, Kinner S. Complex health-related needs among young, soon-to-be-released prisoners. *Health and Justice* 2013; **1**(1): 1.
38. Meadows GN, Enticott JC, Inder B, Russell GM, Gurr R. Better access to mental health care and the failure of the Medicare principle of universality. *Med J Aust* 2015; **202**(4): 190-4.
39. Lincoln T, Kennedy S, Tuthill R, Roberts C, Conklin T, Hammett TM. Facilitators and Barriers to Continuing Healthcare After Jail: A Community-integrated Program. *Journal of Ambulatory Care Management Ambulatory Care and Conflict* 2006; **29**(1): 2-16.
40. Young JT, Heffernan E, Borschmann R, et al. Dual diagnosis of mental illness and substance use disorder and injury in adults recently released from prison: a prospective cohort study. *The Lancet Public Health* 2018; **3**(5): e237-48.
41. Beckman K, Mittendorfer-Rutz E, Lichtenstein P, et al. Mental illness and suicide after self-harm among young adults: long-term follow-up of self-harm patients, admitted to hospital care, in a national cohort. *Psychol Med* 2016; **46**(16): 3397-405.
42. Hufford MR. Alcohol and suicidal behavior. *Clin Psychol Rev* 2001; **21**(5): 797-811.
43. Singhal A, Ross J, Seminog O, Hawton K, Goldacre MJ. Risk of self-harm and suicide in people with specific psychiatric and physical disorders: comparisons between disorders using English national record linkage. *J R Soc Med* 2014; **107**(5): 194-204.

44. Haw C, Houston K, Townsend E, Hawton K. Deliberate Self-Harm Patients with Alcohol Disorders: Characteristics, Treatment, and Outcome. *Crisis: Journal of Crisis Intervention & Suicide* 2001; **22**(3): 93-101.
45. Priester MA, Browne T, Iachini A, Clone S, DeHart D, Seay KD. Treatment Access Barriers and Disparities Among Individuals with Co-Occurring Mental Health and Substance Use Disorders: An Integrative Literature Review. *J Subst Abuse Treat* 2016; **61**: 47-59.
46. Luoma JB, Twohig MP, Waltz T, et al. An investigation of stigma in individuals receiving treatment for substance abuse. *Addict Behav* 2007; **32**(7): 1331-46.
47. Hartwell SW. Comparison of Offenders With Mental Illness Only and Offenders With Dual Diagnoses. *Psychiatr Serv* 2004; **55**(2): 145-50.
48. Shand F, L., Batterham P, J., Chan J, K. Y., et al. Experience of Health Care Services After a Suicide Attempt: Results from an Online Survey. *Suicide Life Threat Behav* 2017; **Epub ahead of print**.
49. McGovern MP, Lambert-Harris C, Gotham HJ, Claus RE, Xie H. Dual Diagnosis Capability in Mental Health and Addiction Treatment Services: An Assessment of Programs Across Multiple State Systems. *Administration and Policy in Mental Health and Mental Health Services Research* 2014; **41**(2): 205-14.
50. Thomas EG, Spittal MJ, Heffernan EB, Taxman FS, Alati R, Kinner SA. Trajectories of psychological distress after prison release: implications for mental health service need in ex-prisoners. *Psychol Med* 2016; **46**(3): 611-21.
51. Charlotte dC, Mette G, Dennis L, et al. Service provider barriers to treatment and care for people with mental health and alcohol and other drug comorbidity in a metropolitan region of South Australia. *Advances in dual diagnosis* 2015; **8**(3): 120-8.
52. Evans-Lacko S, Thornicroft G. Stigma among people with dual diagnosis and implications for health services. *Advances in dual diagnosis* 2010; **3**(1): 4-7.
53. Phillips P. The mad, the bad, and the dangerous – harm reduction in dual diagnosis. *Int J Drug Policy* 1998; **9**(5): 345-9.
54. National Mental Health Commission. A Contributing Life, the 2013 National Report Card on Mental Health and Suicide Prevention. Sydney: NMHC, 2013.
55. Hawton K, Zahl D, Weatherall R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *Br J Psychiatry* 2003; **182**(6): 537-42.
56. Kapur N, Steeg S, Turnbull P, et al. Hospital management of suicidal behaviour and subsequent mortality: a prospective cohort study. *The Lancet Psychiatry* 2015; **2**(9): 809-16.
57. Kupers TA. Toxic masculinity as a barrier to mental health treatment in prison. *J Clin Psychol* 2005; **61**(6): 713-24.
58. Borschmann R, Young JT, Moran PA, Spittal MJ, Kinner SA. Self-harm in the criminal justice system: a public health opportunity. *The Lancet Public Health* 2018; **3**(1): e10-e1.
59. Taylor TL, Hawton K, Fortune S, Kapur N. Attitudes towards clinical services among people who self-harm: systematic review. *Br J Psychiatry* 2009; **194**(2): 104-10.
60. Krysinska K, Batterham PJ, Tye M, et al. Best strategies for reducing the suicide rate in Australia. *Aust N Z J Psychiatry* 2016; **50**(2): 115-8.
61. Boyer CA, McAlpine DD, Pottick KJ, Olfson M. Identifying Risk Factors and Key Strategies in Linkage to Outpatient Psychiatric Care. *Am J Psychiatry* 2000; **157**(10): 1592-8.
62. Kapur N. Self-harm in the general hospital. *Psychiatry* 2006; **5**(3): 76-80.
63. Larsen EM, Shand F, Morley K, et al. A Mobile Text Message Intervention to Reduce Repeat Suicidal Episodes: Design and Development of Reconnecting After a Suicide Attempt (RAFT). *JMIR Ment Health* 2017; **4**(4): e56.
64. Lloyd B, Gao CX, Heilbronn C, Lubman DI. Self harm and mental health-related ambulance attendances in Australia: 2013 Data. Fitzroy, Victoria: Turning Point, 2015.