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## Predictors of self-harm and emergency department attendance for self-harm in deprived communities

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### ABSTRACT

Emergency departments (EDs) are often the first point of contact for individuals following self-harm. The majority of previous research relies on hospital-based data, yet only a minority of individuals who self-harm in the community present to healthcare services. The study design is cross-sectional survey design. Data from the National Institute for Health Research Applied Research Collaboration North West Coast (NIHR ARC NWC) Household Health Survey, a community-based public health survey in North West England, was collected using stratified random sampling. Three thousand four hundred twelve people were recruited in 2018 from relatively disadvantaged areas. The sample included 1490 men and 1922 women aged 18 to 100 years ( $M=49.37$ ,  $SD=18.91$ ). Logistic regression analysis was employed to examine demographic, health and socioeconomic predictors of self-harm and ED attendance for self-harm. Age (18–24 years), lower financial status, depression, anxiety and physical and mental health co-morbidity was associated with significantly higher levels of self-harm. People aged 18–24 years, with physical and mental health co-morbidity and lower levels of social support had significantly higher levels of attending EDs for self-harm. Improving people's financial situations, social connectivity, mental and physical health may help to reduce individual risk for self-harm and strain on health services.

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Self-harm; emergency department; deprivation; community

### Introduction

Self-harm is a major public health issue in the UK and is the strongest risk factor for suicide (Mars et al., 2019; National Confidential Inquiry into Suicide and Homicide by People with Mental Illness [NCISH], 2017). Defined as 'any intentional act of self-injury or self-poisoning regardless of motivation of suicidal intent', self-harm can have a substantial negative impact on the individual and wider healthcare services (Sinclair et al., 2011). The prevalence of self-harm has increased from 2.4% in 2000 to 6.4% in 2014 (McManus et al., 2019). Despite this increase in prevalence, self-harm remains largely untreated with nearly half of young people who self-harm (48%) not receiving clinical or non-healthcare support (Ystgaard et al., 2009). Lack of help-seeking does not seem to be related to lack of services or resources; rather, stigma and perceptions of self-harm (e.g. being labelled as an 'attention seeker') reduce help-seeking behaviours (Fortune et al., 2008; Michelmores & Hindley, 2012).

Current theories of suicidal thoughts and behaviour recognise the multifaceted nature of biological, psychological, environmental and cultural factors in suicide (O'Connor, 2011). The Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV) (O'Connor, 2011) was developed to advance the current knowledge and evidence base of why

people die by suicide. The model includes three phases: pre-motivational, motivational and volitional phase. In brief, the pre-motivational phase describes background context, including socio-economic status (SES), in which suicidal ideation may develop and self-harm behaviours might occur (Wetherall et al., 2019). Socio-economic deprivation is an important factor to examine, yet little research has explored the association between socioeconomic factors and self-harm in deprived communities.

There has been a large volume of research conducted into the link between SES and suicidal behaviour over recent decades. Much of this research has solely focused on suicide attempts and a number of studies have previously examined individual factors, such as employment and education (Kposowa et al., 2019), as well as area socioeconomic characteristics related to suicide (Näher et al., 2019). Although findings demonstrate higher rates of suicide attempts and deaths by suicide among lower SES groups, results are largely inconsistent. Findings vary substantially across studies depending on the country or region where the study was conducted, and the different measures of SES used (Burrows & Laflamme, 2010).

In the UK, general population surveys and cross-sectional studies examining self-harm have typically been underpowered to detect differences between ethnic groups (McManus

et al., 2014; Rees et al., 2016). Instead, research comparing rates of self-harm commonly rely on hospital-based datasets derived from service user contact. For example, Burrows and Laflamme's (2010) review found that greater socioeconomic disadvantage was associated with higher rates of suicidal behaviour and suicide attempts. There is, however, a paucity of research in community populations. One study by Mulholland et al. (2021) found that factors such as age, sexuality, belonging and health status were significant predictors of suicidal ideation in a community sample, concluding that there is a need for community level interventions to better support individuals experiencing suicidal ideation. This study, however, did not examine self-harm behaviours or ED attendance for self-harm.

Increasingly, there is the suggestion that only a small percentage of those who have self-harmed in the community present to healthcare services for treatment or support (Carr et al., 2016; Geulayov et al., 2018). In England, more than 220,000 ED presentations with self-harm are recorded annually (Hawton et al., 2007). This figure, however, underestimates the rates of self-harm due to inaccurate and inconsistent ED coding (McCarthy et al., 2021). Some studies have examined the link between self-harm treated in EDs and both individual and area-level SES factors, with the majority finding an association between deprivation and self-harm (Griffin et al., 2019). Tsiachristas et al. (2020) found higher rates of self-harm hospital presentations in deprived areas compared with less deprived areas.

National strategy and clinical guidelines emphasise self-harm as a priority area in public health policy (Anderson & Jenkins, 2006; National Institute for Clinical Excellence [NICE], 2012; World Health Organization [WHO], 2012). Moreover, The Suicide Prevention Strategy for England recommends that EDs be prioritised as a setting for research and intervention efforts. One goal of this national agenda is to improve early identification of patients at elevated risk for self-harm (Department of Health, 2021).

Overall, the determinants of self-harm are not well understood due to poor self-harm coding and data capture of social determinants in ED departments (McCarthy et al., 2021). Further to this, previous research has often relied on data from health services; thus, it is important to triangulate these findings with data from other sources, such as community surveys. The current study aimed to develop and enhance the current evidence base to examine the predictors of self-harm and self-harm-related ED attendance. Using responses from the ARC NWC Household Health Survey (HHS), the study examined demographic, health and socioeconomic predictors of self-harm and ED attendance for self-harm.

## Method

### Study design and participants

In 2018, Wave 2 of the HHS, a cross-sectional community based public health survey, was conducted as part of the National Institute for Health Research and Applied Research Collaboration—North West Coast (NIHR ARC-NWC). A

total of 20 deprived neighbourhoods were sampled using random area probability sampling in the North West of England, with researcher's door-knocking randomly selected residences and using the 'next birthday' rule, meaning if more than one resident is home the interviewer will recruit the person whose birthday is coming up next as the participant. Deprived neighbourhoods were identified by local authority partners. To be considered a deprived area, the neighbourhood had to meet five criteria: (1) population between 5,000 and 10,000 residents, (2) population likely to be impacted by resilience interventions and (3) have local infrastructure to implement resilience initiatives. The survey was designed, in part, to test various public health interventions. Therefore, neighbourhoods needed to have adequate infrastructure for those interventions to be implemented. For example, if a neighbourhood was implementing a resilience intervention such as financial advice services, it would need to have appropriate buildings, rooms and public transport routes to accommodate the service. (4) Have an Index of Multiple Deprivation (IMD) score in the bottom 10% nationally. IMD is a widely used measure in the UK to classify the relative deprivation of small areas. IMD scores of all neighbourhoods in the UK are published by the government (Ministry of Housing, Communities & Local Government, 2019); thus, neighbourhoods needed to be in the bottom 10% based on these IMD scores. Finally, neighbourhoods needed to have a coherent or shared sense of identity among residents. This is a subjective criterion based on discussions with local residents and local authority partners. It means neighbourhoods should map onto areas where people are likely to have a coherent geographical social identity that could be easily identified and named by residents, e.g. Blackpool. A detailed description of the design, sampling method and measures is available elsewhere (Giebel et al., 2020). In total, 3412 people were recruited, comprising 1490 men and 1922 women aged 18 to 100 years ( $M=49.37$ ,  $SD=18.91$ ). Wave 1 data was not used in the present study as it did not include measures of self-harm or ED attendance for self-harm.

### Measures

Based on past research findings and theory, a subset of the overall HHS questions was included in the analysis for the current study. Demographic, socioeconomic, physical health, mental health and lifestyle factors were explored in relation to self-harm and self-harm related ED attendance. Information about self-harm was captured by the question 'have you deliberately hurt yourself in the past 12 months?'. 'Yes' was coded as '1', 'no' as '2' and 'prefer not to say' as '3'. If this question was coded as '1', respondents were then asked if they had attended any services due to deliberate self-harm. Response options included EDs, general practitioners and mental health workers. Information about self-harm related ED attendance was derived from this question.

Socio-demographic variables were coded in accordance with UK Office for National Statistics national census categories (Office for National Statistics [ONS], 2016). Variables

included in the current analysis are as follows: financial situation—Wealth and Assets Survey (Office for National Statistics [ONS], 2019); physical health—EQ-5D (Gusi et al., 2010); depression—PHQ-9 (Kroenke & Spitzer, 2002); anxiety—GAD-7 (Spitzer et al., 2006); alcohol consumption and smoking—Merseyside Lifestyle Survey (Knowsley Council. NHS Merseyside lifestyle survey, 2013). Mental and physical health comorbidity was assessed by asking participants to indicate whether they had any physical or mental health conditions (Yes/No), and then if they responded yes, to indicate which condition or conditions they had from a list of physical and mental health conditions.

### Data analysis plan and preliminary results

Data were analysed using Stata V.12 using the *logit* function. The dependent variable of self-harm was recoded into '0' self-harm absent and '1' self-harm present. Preliminary analyses revealed 94 individuals had self-harmed in the previous 12 months. Of those 94 people, 40 had attended ED for self-harm in the previous 12 months. A total of 830 people had attended ED for any reason in the past 12 months.

Two logistic regression analyses were conducted with self-harm and ED attendance for self-harm, regressed on demographic, socioeconomic, lifestyles, physical and mental health variables. Analyses were weight-adjusted to represent the demographic profile of each sampled neighbourhoods. The models provided estimates of the log-odds increase in the criterion for each 1 unit increase in the predictor, along with associated standard errors while holding all other variables in the model constant. Model 1 explored the predictors

of self-harm and model 2 tested predictors of ED attendance for self-harm. Analysis showed that no variable was missing more than 3% of values, indicating the levels of missing data to be low and thus no imputation procedures were required.

## Results

### Model 1: Logistic regression predictors of self-harm

A logistic regression was conducted predicting self-harm (Table 1). The overall model was significant, Wald  $\chi^2 = 214.84$ ,  $N = 3145$ ,  $p < 0.001$ . Significant individual predictors are highlighted with alpha set to 0.05. Age was a significant predictor of deliberate self-harm. The odds of individuals aged 18 to 24 years self-harming were twice as higher than the base category of 65+ years. Financial status was a significant predictor of self-harm with individuals being in the same financial position at 1.5 times lower odds and those in a better financial position than last year being at 1.1 times lower odds of self-harm, relative to being in a worse financial position. Both depression and anxiety were associated with higher odds of self-harm, with depression increasing the odds of self-harm by 0.8 and anxiety by 0.6. People with physical and mental health co-existence were also 2.3 times more likely to self-harm.

### Model 2: Predictors of ED attendance for self-harm

A logistic regression was conducted predicting ED attendance for self-harm (Table 2). Again, significant predictors

**Table 1.** Predictors of self-harm.

Predictor	Coefficient	Robust standard error	<i>p</i> value	95% CI
Age ( $\geq 65$ years)				
18–24 years	2.00	0.72	0.006**	0.58 to 3.41
24–44	1.07	0.69	0.123	–0.29 to 2.43
45–65	0.58	0.68	0.391	–0.75 to 1.92
Gender	–0.40	0.28	0.154	–0.94 to 0.15
Ethnicity	–1.79	1.05	0.086	–3.84 to 0.25
LGBTQ+	0.38	0.73	0.605	–1.05 to 1.81
Single	–0.44	0.46	0.335	–1.34 to 0.46
Neighbourhood	0.15	0.29	0.607	–0.42 to 0.72
Financial status (worse off)				
2 (Same)	–1.54	0.42	0.000***	–2.36 to –0.72
3 (Better off)	–1.14	0.45	0.011*	–2.02 to –0.26
Education (No qual.)				
2 (Vocational qual.)	–0.17	0.32	0.609	–0.80 to 0.47
3 (Degree or higher)	0.27	0.60	0.656	–0.91 to 1.44
Non-employment	0.58	0.37	0.121	–0.15 to 1.31
Problems with mobility	–0.07	0.55	0.900	–1.15 to 1.01
Problems with self-care	–0.35	0.45	0.434	–1.24 to 0.53
Problems with usual activities	–0.50	0.45	0.270	–1.39 to 0.39
Problems with pain	–0.04	0.45	0.924	–0.92 to 0.83
Depression (PHQ-9)	0.75	0.33	0.023*	0.11 to 1.40
Anxiety (GAD-7)	0.62	0.28	0.024*	0.08 to 1.16
Physical and mental health co-existence	2.25	0.37	0.000***	1.52 to 2.97
Smoking (current)	0.42	0.31	0.185	–0.20 to 1.03
Alcohol (1–14 units)				
0 units	0.05	0.29	0.863	–0.52 to 0.62
14–28 units	–1.26	0.87	0.149	–2.98 to 0.45
>28 units	–0.82	0.73	0.265	–2.26 to 0.62
Meet up once a week	–0.46	0.35	0.188	–1.14 to 0.22
There for me	–0.61	0.60	0.314	–1.79 to 0.57
Identity	–0.13	0.16	0.408	–0.44 to 0.18

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ .

**Table 2.** Predictors of ED attendance for self-harm.

Predictor	Coefficient	Robust standard error	<i>p</i> value	95% CI
Age (≥65 years)				
18–24 years	2.44	1.23	0.048*	0.02 to 4.86
25–44	1.16	1.21	0.336	–1.20 to 3.53
45–65	0.72	1.21	0.553	–1.66 to 3.09
Gender	–0.08	0.43	0.851	–0.93 to 0.77
LGBTQ+	–0.19	1.13	0.863	–2.41 to 2.02
Single	–0.69	0.62	0.267	–1.91 to 0.53
Neighbourhood	–0.25	0.41	0.543	–1.06 to 0.56
Financial status (worse off)				
2 (Same)	–1.23	0.68	0.073	–2.57 to 0.11
3 (Better off)	–0.88	0.73	0.229	–2.31 to 0.55
Education (No qual.)				
2 (Vocational qual.)	0.35	0.45	0.438	–0.53 to 1.22
3 (Degree or higher)	0.17	1.01	0.867	–1.81 to 2.15
Non-employment	0.54	0.53	0.304	–0.49 to 1.58
Mobility	0.76	0.78	0.331	–0.77 to 2.30
Self-care	–0.33	0.69	0.633	–1.68 to 1.02
Usual activities	–0.77	0.73	0.291	–2.21 to 0.66
Pain	–0.21	0.65	0.741	–1.49 to 1.06
Depression (PHQ-9)	0.67	0.47	0.149	–0.24 to 1.59
Anxiety (GAD-7)	0.58	0.33	0.075	–0.06 to 1.22
Physical and mental health co-existence	2.94	0.59	0.000***	1.79 to 4.10
Smoking (Current)	0.49	0.41	0.234	–0.31 to 1.29
Alcohol	–0.76	0.45	0.091	–1.64 to 0.12
Meet up once a week	–1.15	0.45	0.010*	–2.02 to –0.27
There for me	0.55	0.74	0.462	–0.91 to 1.20
Identity	–0.33	0.18	0.070	–0.70 to 0.03

\*\*\**p* < 0.001, \*\**p* < 0.01, \**p* < 0.05.

are highlighted with alpha set to 0.05. Ethnicity was not included in Model 2 as there was no variability in ethnicity for this outcome. The overall model was significant, Wald  $\chi^2 = 100.66$ ,  $N = 2860$ ,  $p < 0.001$ .

Results found that individuals aged 18–24 had 2.4 higher odds of attending ED for self-harm compared to those aged 65 years and above. Physical and mental health co-morbidity were also associated with higher odds of ED attendance; individuals who had both physical and mental health co-existence were 2.9 times more likely to attend ED for self-harm compared to those who did not have co-existence. Individuals who had people to meet up with were 1.2 times less likely to attend ED for self-harm compared to those who did not have people to meet up with.

## Discussion

The current study provides a unique investigation of the demographic, socioeconomic, health and lifestyle predictors of self-harm and ED attendances for self-harm. Using community survey data focused on deprived areas, we provide novel insights into the potential causes of mental health inequalities and elucidate differences and similarities in effects between data sources. Results showed that younger age (18–24 years old), lower financial status, depression, anxiety and physical and mental health co-morbidity predicted self-harm. Similarly, age (18–24 years) and physical and mental health co-morbidity were associated with higher odds of attending EDs for self-harm. Social support was associated with lower odds of attending EDs for self-harm related reasons.

Consistent with the existing literature, depression and anxiety were both identified as significant predictors of

self-harm. The strongest predictor of these was depression. Fliege et al. (2009) reported adolescents and adults who self-harm experience negative emotions, such as depression and anxiety, more frequently than people who do not self-harm. More recent literature has further supported the link between depression and anxiety and subsequent self-harm across different populations (Fliege et al., 2009; Islam et al., 2022; Paul & Fancourt, 2022). However, depression and anxiety were not shown to be associated with self-harm related ED attendance in the current study. This suggests a possible disconnect between self-harm behaviours and seeking help from services. Alternatively, it is possible that less severe suicidal crises and self-harm are associated with depression and anxiety, whereas more severe crises or self-harm that result in ED attendance are less likely to be linked to these symptoms.

Age has been identified as a key risk factor for self-harm, severity of self-harm and suicide (Ammerman et al., 2018; Muehlenkamp et al., 2019). Analysis of self-harm data among a general population sample reported self-harm to be most prevalent in young women aged 16 to 24 years (McManus et al., 2019), which is consistent with the findings from the current study. Those aged 18–24 years were also more likely to attend EDs for self-harm in this study. This is consistent with work by Marchant et al. (2020) who reported high rates of self-harm related ED attendances among young people aged 10–24 years in Wales, United Kingdom. Thus, our work further emphasizes the need to focus suicide prevention strategies on children and young people.

The relationship between physical health and self-harm has been explored previously (Chan et al., 2016; Singhal et al., 2014). A systematic review by Chan et al. (2016)

found that people were at higher risk of suicide and self-harm if they had poor physical health or chronic illness. Similarly, research has reported multimorbidity of physical illness and mental disorders increases suicidal thoughts and suicide attempts, compared to a control group (Kavalidou et al., 2019). Furthermore, Mitchell et al. (2017) reported hospital-treated self-harm among older adults was associated with mental health conditions, such as depression and anxiety, as well as higher odds of physical illnesses. The current study extends on these findings by suggesting that physical and mental health co-existence are a unique predictor of self-harm and self-harm related ED attendance, while adjusting for a range of sociodemographic and mental health confounds.

The finding that poorer financial status and social isolation increased the odds of self-harm and ED attendances for self-harm behaviours is particularly important given the sample was recruited from already deprived areas. This suggests that within deprived areas, people's financial situation is still deteriorating and this in turn is affecting their mental health. This is consistent with research that has found both neighbourhood identity and socioeconomic status uniquely predict self-harm behaviours and suicidal ideation in the community (McIntyre et al., 2021). Moreover, the introduction of public safety guidelines and the furlough system in 2020 resulted in reduced financial security and increased isolation for many on low incomes in the UK, suggesting people may be at even higher risk of self-harm in the present socioeconomic climate. Hawton et al. (2021) explored pandemic-related hospital presentations for self-harm and reported that COVID-related factors of isolation and loneliness were most prevalent among ED attenders for self-harm. More work is needed to understand the effects of the pandemic on self-harm and ED-related attendances for people experiencing poverty and living in deprived areas.

### **Strengths and limitations**

This study used a wide range of validated socio-economic measures in a community sample recruited from deprived areas, which has been a lacuna in past research. Examining the predictors of self-harm in the community is vital to improve efforts to prevent suicidal behaviour and subsequent healthcare presentations. Despite this, certain limitations must be acknowledged when interpreting the results. First, the survey is based on self-report measures. Indeed, due to the sensitive nature of questions, report bias may be an issue; for example, Mars et al. (2016) reported hospital attendances with self-harm to be under reported when utilising questionnaire measures. Second, self-harm was captured using a single-item measure. This may oversimplify self-harm by failing to examine the nature and intent of the self-harm. Furthermore, self-harm related ED attendance was captured by a yes/no response, which does not capture repeat/multiple presentations to EDs due to self-harm. Finally, the sample was obtained from relatively disadvantaged neighbourhoods in north west England; thus, the

findings may not be generalisable to less deprived regions and other cultures. These limitations should be considered in the context of the need to design a large public health survey that assessed a range of social determinants and health outcomes.

### **Clinical implications**

Findings from the current study are particularly relevant to the COVID-19 pandemic and have important implications for research and clinical practice. Although data from this study was collected pre-COVID, factors such as loneliness, isolation and reduced community social support are arguably more relevant in the current climate. The current study reported that lower levels of social support increased risk of self-harm related ED attendance. Recent research, however, reports a decrease in self-harm related ED presentations, which could be a result of public health messages to stay at home and protect the NHS, concerns about contracting the virus, or lack of access/availability of services (Kapur et al., 2021). In the six weeks following lockdown, self-harm referrals to liaison psychiatry were reported to have dropped by 40% across Cambridgeshire & Peterborough NHS Foundation Trust (Chen et al., 2020). This finding is consistent with a recent study examining data across 1714 UK general practices. The authors noted incidences of self-harm to be 38.5% lower in April 2020 than expected based on previous years and trends (Carr et al., 2020). This fall was particularly evident in those under 45 years, and people living in the most deprived areas. Given the relationship between the COVID-19 pandemic, lack of social support and access to services, ensuring appropriate and timely support available to individuals following self-harm is vital. Further work is needed to determine whether other available services for self-harm are accessible and appropriate in enhancing social support in the community, for example Crisis Cafés; community spaces where people can go, instead of EDs if they are feeling emotionally distressed or are in a mental health crisis.

Furthermore, the present findings highlighted that both self-harm and self-harm related ED attendance are more prevalent in younger people. Thus, emphasising the need for strategies aimed at young people. Importantly, the highlighted age group overlaps with the age of students attending university. Research has shown a number of university-related risk factors for self-harm and suicide, such as sleep disturbance, university stress, isolation and loneliness (Russell et al., 2019; Shahzad et al., 2021). Tailoring interventions to support young people in crisis may be an important consideration for future work.

### **Conclusion**

The current study examined the demographic, socioeconomic, health and lifestyle factors associated with self-harm and related ED attendances in relatively deprived communities in the UK. Younger age, physical and mental health

co-morbidity, worse financial status and lack of social connectivity were identified as important risk factors for self-harm. The findings can support early identification of high-risk individuals and the implementation of tailored suicide prevention strategies in the community.

## Ethical approval

Ethical approval was obtained from the University of Liverpool (Ref: RETH000836). Participants provided written informed consent prior to taking part in the study.

## Disclosure statement

None declared.

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## References

- Ammerman, B. A., Jacobucci, R., Kleiman, E. M., Uyeji, L. L., & McCloskey, M. S. (2018). The relationship between nonsuicidal self-injury age of onset and severity of self-harm. *Suicide & Life-Threatening Behavior*, 48(1), 31–37. <https://doi.org/10.1111/sltb.12330>
- Anderson, M., & Jenkins, R. (2006). The national suicide prevention strategy for England: The reality of a national strategy for the nursing profession. *Journal of Psychiatric and Mental Health Nursing*, 13(6), 641–650. <https://doi.org/10.1111/j.1365-2850.2006.01011.x>
- Burrows, S., & Laflamme, L. (2010). Socioeconomic disparities and attempted suicide: State of knowledge and implications for research and prevention. *International Journal of Injury Control and Safety Promotion*, 17(1), 23–40. <https://doi.org/10.1080/17457300903309231>
- Carr, M. J., Ashcroft, D. M., Kontopantelis, E., Awenat, Y., Cooper, J., Chew-Graham, C., Kapur, N., & Webb, R. T. (2016). The epidemiology of self-harm in a UK-wide primary care patient cohort, 2001–2013. *BMC Psychiatry*, 16(1), 1–10. <https://doi.org/10.1186/s12888-016-0753-5>
- Carr, M. J., Steeg, S., Webb, R. T., Kapur, N., Chew-Graham, C., Abel, K., Hope, H., Pirece, M., & Ashcroft, D. (2020). Primary care contact for mental illness and self-harm before, during and after the peak of the COVID-19 pandemic in the UK: Cohort study of 13 million individuals. *SSRN Electronic Journal*, 1–25. <https://doi.org/10.2139/ssrn.3706269>
- Chan, M. K. Y., Bhatti, H., Meader, N., Stockton, S., Evans, J., O'Connor, R. C., Kapur, N., & Kendall, T. (2016). Predicting suicide following self-harm: Systematic review of risk factors and risk scales. *The British Journal of Psychiatry*, 209(4), 277–283. <https://doi.org/10.1192/bjp.bp.115.170050>
- Chen, S., Jones, P. B., Underwood, B. R., Moore, A., Bullmore, E. T., Banerjee, S., Osimo, E. F., Deakin, J. B., Hatfield, C. F., Thompson, F. J., Artinngstall, J. D., Slann, M. P., Lewis, J. R., & Cardinal, R. N. (2020). The early impact of COVID-19 on mental health and community physical health services and their patients' mortality in Cambridgeshire and Peterborough, UK. *Journal of Psychiatric Research*, 131, 244–254. <https://doi.org/10.1016/j.jpsychires.2020.09.020>
- Department of Health. (2021). Suicide prevention in England: Fifth progress report. <https://www.gov.uk/government/publications/suicide-prevention-in-england-fifth-progress-report>
- Fliege, H., Lee, J. R., Grimm, A., & Klapp, B. F. (2009). Risk factors and correlates of deliberate self-harm behavior: A systematic review. *Journal of Psychosomatic Research*, 66(6), 477–493. <https://doi.org/10.1016/j.jpsychores.2008.10.013>
- Fortune, S., Sinclair, J., & Hawton, K. (2008). Help-seeking before and after episodes of self-harm: A descriptive study in school pupils in England. *BMC Public Health*, 8(1), 1–13. <https://doi.org/10.1186/1471-2458-8-369>
- Geulayov, G., Casey, D., McDonald, K. C., Foster, P., Pritchard, K., Wells, C., Clements, C., Kapur, N., Ness, J., Waters, K., & Hawton, K. (2018). Incidence of suicide, hospital-presenting non-fatal self-harm, and community-occurring non-fatal self-harm in adolescents in England (the iceberg model of self-harm): A retrospective study. *The Lancet Psychiatry*, 5(2), 167–174. [https://doi.org/10.1016/S2215-0366\(17\)30478-9](https://doi.org/10.1016/S2215-0366(17)30478-9)
- Giebel, C., McIntyre, J. C., Alfirevic, A., Corcoran, R., Daras, K., Downing, J., Gabbay, M., Pirmohamed, M., Popay, J., Wheeler, P., Holt, K., Wilson, T., Bentall, R., & Barr, B. (2020). The longitudinal NIHR ARC North West Coast Household Health Survey: Exploring health inequalities in disadvantaged communities. *BMC Public Health*, 20(1), 1–11. <https://doi.org/10.1186/s12889-020-09346-5>
- Griffin, E., Bonner, B., Dillon, C. B., O'Hagan, D., & Corcoran, P. (2019). The association between self-harm and area-level characteristics in Northern Ireland: An ecological study. *European Journal of Public Health*, 29(5), 948–953. <https://doi.org/10.1093/eurpub/ckz021>
- Gusi, N., Olivares, P. R., & Rajendram, R. (2010). The EQ-5D health-related quality of life questionnaire. In *Handbook of disease burdens and quality of life measures* New York, NY: Springer (pp. 87–99).
- Hawton, K., Bergen, H., Casey, D., Simkin, S., Palmer, B., Cooper, J., Kapur, N., Horrocks, J., House, A., Lilley, R., Noble, R., & Owens, D. (2007). Self-harm in England: A tale of three cities. *Social Psychiatry and Psychiatric Epidemiology*, 42(7), 513–521. <https://doi.org/10.1007/s00127-007-0199-7>
- Hawton, K., Lascelles, K., Brand, F., Casey, D., Bale, L., Ness, J., Kelly, S., & Waters, K. (2021). Self-harm and the COVID-19 pandemic: A study of factors contributing to self-harm during lockdown restrictions. *Journal of Psychiatric Research*, 137, 437–443. <https://doi.org/10.1016/j.jpsychires.2021.03.028>
- Islam, M. I., Khanam, R., & Kabir, E. (2022). Depression and anxiety have a larger impact on bullied girls than on boys to experience self-harm and suicidality: A mediation analysis. *Journal of Affective Disorders*, 297, 250–258. <https://doi.org/10.1016/j.jad.2021.10.061>
- Kapur, N., Clements, C., Appleby, L., Hawton, K., Steeg, S., Waters, K., & Webb, R. (2021). Effects of the COVID-19 pandemic on self-harm. *The Lancet Psychiatry*, 8(2), e4. [https://doi.org/10.1016/S2215-0366\(20\)30528-9](https://doi.org/10.1016/S2215-0366(20)30528-9)
- Kavalidou, K., Smith, D. J., Der, G., & O'Connor, R. C. (2019). The role of physical and mental multimorbidity in suicidal thoughts and behaviours in a Scottish population cohort study. *BMC Psychiatry*, 19(1), 1–9. <https://doi.org/10.1186/s12888-019-2032-8>
- Knowsley Council. (2013). NHS MerseysideLifestyleSurvey2012/13. <https://www.knowsley.gov.uk/pdf/knowsley-health-and-lifestyle-survey-2012-13.pdf>
- Kposowa, A. J., Ezzat, D. A., & Breault, K. (2019). New findings on gender: The effects of employment status on suicide. *International Journal of Women's Health*, 11, 569–575. <https://doi.org/10.2147/IJWH.S216504>
- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals*, 32(9), 509–515. <https://doi.org/10.3928/0048-5713-20020901-06>
- Marchant, A., Turner, S., Balbuena, L., Peters, E., Williams, D., Lloyd, K., Lyons, R., & John, A. (2020). Self-harm presentation across healthcare settings by sex in young people: An e-cohort study using routinely collected linked healthcare data in Wales, UK. *Archives of Disease in Childhood*, 105(4), 347–354. <https://doi.org/10.1136/archdischild-2019-317248>



- Mars, B., Cornish, R., Heron, J., Boyd, A., Crane, C., Hawton, K., Lewis, G., Tilling, K., Macleod, J., & Gunnell, D. (2016). Using data linkage to investigate inconsistent reporting of self-harm and questionnaire non-response. *Archives of Suicide Research*, 20(2), 113–141. <https://doi.org/10.1080/13811118.2015.1033121>
- Mars, B., Heron, J., Klonsky, E. D., Moran, P., O'Connor, R. C., Tilling, K., Wilkinson, P., & Gunnell, D. (2019). Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: A population-based birth cohort study. *The Lancet Psychiatry*, 6(4), 327–337. [https://doi.org/10.1016/S2215-0366\(19\)30030-6](https://doi.org/10.1016/S2215-0366(19)30030-6)
- McCarthy, M., Saini, P., Nathan, R., & McIntyre, J. (2021). Improve coding practices for patients in suicidal crisis. *BMJ (Clinical Research ed.)*, 375, n2480. <https://doi.org/10.1136/bmj.n2480>
- McIntyre, J., Elahi, A., Latham, C., Mullholland, H., Haines-Delmont, A., Saini, P., & Taylor, P. J. (2021). Does neighbourhood identification buffer against the effects of socioeconomic disadvantage on self-harm? *Journal of Affective Disorders*, 294, 857–863. <https://doi.org/10.1016/j.jad.2021.07.103>
- McManus, S., Gunnell, D., Cooper, C., Bebbington, P. E., Howard, L. M., Brugha, T., Jenkins, R., Hassiotis, A., Weich, S., & Appleby, L. (2019). Prevalence of non-suicidal self-harm and service contact in England, 2000–14: Repeated cross-sectional surveys of the general population. *The Lancet Psychiatry*, 6(7), 573–581. [https://doi.org/10.1016/S2215-0366\(19\)30188-9](https://doi.org/10.1016/S2215-0366(19)30188-9)
- McManus, S., Hassiotis, A., Jenkins, R., Dennis, M., Aznar, C., & Appleby, L. (2014). Suicidal thoughts, suicide attempts, and self-harm. In *Mental health and wellbeing in England: adult psychiatric morbidity survey*, Health and Social Care Information Centre (294–322).
- Michelmores, L., & Hindley, P. (2012). Help-seeking for suicidal thoughts and self-harm in young people: A systematic review. *Suicide and Suicide & Life-Threatening Behavior*, 42(5), 507–524. <https://doi.org/10.1111/j.1943-278X.2012.00108.x>
- Ministry of Housing, Communities & Local Government. (2019). English indices of deprivation 2019. <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>
- Mitchell, R., Draper, B., Harvey, L., Brodaty, H., & Close, J. (2017). The association of physical illness and self-harm resulting in hospitalisation among older people in a population-based study. *Aging & Mental Health*, 21(3), 279–288. <https://doi.org/10.1080/13607863.2015.1099610>
- Muehlenkamp, J. J., Xhanga, N., & Brausch, A. M. (2019). Self-injury age of onset: A risk factor for NSSI severity and suicidal behavior. *Archives of Suicide Research*, 23(4), 551–563. <https://doi.org/10.1080/13811118.2018.1486252>
- Mulholland, H., McIntyre, J. C., Haines-Delmont, A., Whittington, R., Comerford, T., & Corcoran, R. (2021). Investigation to identify individual socioeconomic and health determinants of suicidal ideation using responses to a cross-sectional, community-based public health survey. *BMJ Open*, 11(2), e035252. <https://doi.org/10.1136/bmjopen-2019-035252>
- Näher, A. F., Rummel-Kluge, C., & Hegerl, U. (2019). Associations of suicide rates with socioeconomic status and social isolation: Findings from longitudinal register and census data. *Frontiers in Psychiatry*, 10, 898. <https://doi.org/10.3389/fpsy.2019.00898>
- National Confidential Inquiry into Suicide and Homicide by People with Mental Illness. (2017). Annual Report 2017. University of Manchester. <https://www.hqip.org.uk/wp-content/uploads/2018/02/CApw8N.pdf>
- National Institute for Clinical Excellence [NICE]. (2012). The short-term physical and psychological management and secondary prevention of self-harm in primary and secondary care. National Clinical Practice Guidelines. <https://www.nice.org.uk/guidance/cg16/evidence/full-guideline-189936541>
- O'Connor, R. C. (2011). Towards an integrated motivational–volitional model of suicidal behaviour. *International Handbook of Suicide Prevention: Research, Policy and Practice*, 1, 181–198.
- Office for National Statistics (ONS). (2016). Classifications and harmonisation. <https://www.ons.gov.uk/methodology/classification-andstandards>.
- Office for National Statistics (ONS). (2019). Wealth and assets survey QMI. <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/debt/methodologies/wealthandassetsurveyqmi>.
- Paul, E., & Fancourt, D. (2022). Factors influencing self-harm thoughts and behaviours over the first year of the COVID-19 pandemic in the UK: Longitudinal analysis of 49 324 adults. *The British Journal of Psychiatry*, 220(1), 31–37. <https://doi.org/10.1192/bjp.2021.130>
- Rees, R., Stokes, G., Stansfield, C., Oliver, E., Kneale, D., & Thomas, J. (2016). Prevalence of mental health disorders in adult minority ethnic populations in England: A systematic review. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London. ISBN: 978-1-907345-84-5
- Russell, K., Allan, S., Beattie, L., Bohan, J., MacMahon, K., & Rasmussen, S. (2019). Sleep problem, suicide and self-harm in university students: A systematic review. *Sleep Medicine Reviews*, 44, 58–69. <https://doi.org/10.1016/j.smrv.2018.12.008>
- Shahzad, M., Munawar, K., & Riaz, F. (2021). Understanding prevalence and association of suicidal ideation, deliberate self-harm, stress, anxiety depression, and mood swings in Pakistan University students: A multilevel analysis. *Nature-Nurture Journal of Psychology*, 1(2), 12–21.
- Sinclair, J., Gray, A., Rivero-Arias, O., Saunders, K. E., & Hawton, K. (2011). Healthcare and social services resource use and costs of self-harm patients. *Social Psychiatry and Psychiatric Epidemiology*, 46(4), 263–271. <https://doi.org/10.1007/s00127-010-0183-5>
- Singhal, A., Ross, J., Seminog, O., Hawton, K., & Goldacre, M. J. (2014). Risk of self-harm and suicide in people with specific psychiatric and physical disorders: Comparisons between disorders using English national record linkage. *Journal of the Royal Society of Medicine*, 107(5), 194–204. <https://doi.org/10.1177/0141076814522033>
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Tsiachristas, A., Geulayov, G., Casey, D., Ness, J., Waters, K., Clements, C., Kapur, N., McDaid, D., Brand, F., & Hawton, K. (2020). Incidence and general hospital costs of self-harm across England: Estimates based on the multicentre study of self-harm. *Epidemiology and Psychiatric Sciences*, 29, e108, 1–23. <https://doi.org/10.1017/S2045796020000189>
- Wetherall, K., Robb, K. A., & O'Connor, R. C. (2019). An examination of social comparison and suicide ideation through the lens of the integrated motivational–volitional model of suicidal behavior. *Suicide & Life-Threatening Behavior*, 49(1), 167–182. <https://doi.org/10.1111/sltb.12434>
- World Health Organization. (2012). Public health action for the prevention of suicide: A framework. <https://apps.who.int/iris/handle/10665/75166>.
- Ystgaard, M., Arensman, E., Hawton, K., Madge, N., van Heeringen, K., Hewitt, A., de Wilde, E. J., De Leo, D., & Fekete, S. (2009). Deliberate self-harm in adolescents: Comparison between those who receive help following self-harm and those who do not. *Journal of Adolescence*, 32(4), 875–891. <https://doi.org/10.1016/j.adolescence.2008.10.010>