Research portfolio examining the role of imagery and safety planning for self-harm and suicide prevention in young people and adults: a mixed-methods approach

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Abstracts

Critical Review of the Literature

Potential impact and psychological mechanisms associated with viewing self-harm imagery on the internet and social media platforms: a critical systematic review

Background: Concerns regarding the harmful effects of the internet and social media have led to changes to online harms policy. This systematic review critically evaluated the potential impact of, and mechanisms associated with, viewing self-harm imagery on the internet and social media.

Method: A literature search was conducing using CINAHL, Cochrane Library, EMBASE, HMIC, MEDLINE, PsycArticles, PsycINFO, PubMed, Scopus, Sociological Abstracts and Web of Science Core Collection databases. Titles and abstracts were screened, and potentially eligible articles were reviewed in full.

Results: Across the fifteen included studies, ten areas of potentially harmful and helpful impact were identified, relating to self-harm behaviour, sharing and commenting, help-seeking, help-giving, emotional (dys)regulation, self-harm cognitions, physiological responses, social connection, comparison, and personal identity. All studies showed potentially harmful effects, including an escalation of self-harm and being emotionally triggered, and could lead to individuals sharing or commenting on content, thus reinforcing self-harm behaviour. Helpful effects included peer support and social connection. Most studies did not explicitly test or discuss potential mechanisms beyond contagion, and causality and directionality of impact could not be determined in any study.

Conclusions: Viewing self-harm imagery online can lead to both helpful and harmful effects via several mechanisms. A Model of Online Self-Harm Imagery Impact was

developed to direct future research exploring the factors that may contribute to these effects, and elucidate the mechanisms involved. Implications for clinical practice and policy are discussed.

Keywords: Self-harm, self-injury, social media, internet, systematic review

Service Improvement Project

Improving Safety Planning in an NHS Adult Inpatient and aligned Community Mental Health Team

Evidence suggests safety planning interventions (SPIs) are effective in reducing self-harm and suicide risk. As part of one NHS Trust's suicide prevention strategy, this project used quality improvement methodology to improve SPIs across an adult inpatient and outpatient mental health team. The study examined whether SPI training, co-designed and co-delivered by Experts by Experience, would improve staffs' knowledge and confidence, the perceived usefulness and likelihood of SPIs, and increase the frequency and quality of SPIs being completed with patients. Knowledge, confidence and likelihood of using SPIs significantly improved following training. An improvement in SPI frequency was observed for both teams, but was not statistically significant, suggesting further measures, beyond training, are required. Reviewing the quality of SPIs against competency criteria, training feedback and informal discussions with staff, helped to identify recommendations for further training and practice. As the project was undertaken in only one NHS Trust, these recommendations may have limited generalisability; however, the outcomes provide insight into SPIs in clinical settings and highlight some of the possible challenges and solutions when implementing SPIs and training.

Keywords: Safety planning, training, self-harm, suicide, quality improvement

Theoretically Driven Research

A Preliminary Investigation of Visual Self-Harm-Related Mental Imagery in Young People: A Mixed-Methods Approach

Background: Growing evidence suggests that self-harm-related mental imagery (SH-MI) is involved in self-harm ideation-to-enactment. However, there has been little research in adolescent populations.

Method: A mixed-method study, using both a questionnaire (Study 1: n=55) and qualitative interviews (Study 2: n=16), explored the role of SH-MI in a transdiagnostic clinical population of young people who had recently self-harmed (Study 1 & 2), and whether negative affect (NA) and future-oriented SH-MI could predict self-harm frequency (Study 1).

Results: Study 1 found that SH-MI was highly prevalent with 96% of young people reporting future-oriented and past imagery. A hierarchical multiple regression found future-oriented imagery was a significant predictor of self-harm frequency, after accounting for depression, anxiety, age and NA. NA was inversely related to self-harm frequency, which may reflect divergent affect regulation functions of self-harm or lower thresholds. Study 2 identified three themes relating to SH-MI: 1) origins and context, 2) impact, and 3) the factors that affect the impact of imagery. Imagery could trigger self-harm but also be protective.

Conclusion: SH-MI is likely to play a role in ideation-to-enactment in young people. However, further research with less reliance on retrospective self-report is required. Clinical implications are discussed.

Keywords: Self-harm, mental imagery, young people, mixed-methods, qualitative, regression

Critical Review of the Literature

Potential impact and psychological mechanisms associated with viewing self-harm imagery on the internet and social media platforms: a critical systematic review

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Internal Supervisor: Dr Rebecca Knowles-Bevis, Oxford Institute of Clinical Psychology Training and Research, University of Oxford

Regional Supervisors: Professor Keith Hawton & Dr Anne Stewart, University of Oxford

Target Journal: Journal of Child Psychology and Psychiatry (JCPP; Appendix 1F)

This is a leading international journal covering both child and adolescent psychology and psychiatry, with the aim of furthering knowledge of the mental health and behaviour of children and adolescents. A proposal to submit the review for publication to this journal has been accepted.

Abstract

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Conclusions: Viewing self-harm imagery online can lead to both helpful and harmful effects via several mechanisms. A Model of Online Self-Harm Imagery Impact was developed to direct future research exploring the factors that may contribute to these effects, and elucidate the mechanisms involved. Implications for clinical practice and policy are discussed.

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Introduction

Self-harm and suicide are serious public health issues, with suicide being the third leading cause of death among 15-19-year-olds (WHO, 2019), and self-harm being a major risk factor for suicide (Carroll et al., 2014), including in young people (Hawton et al., 2020a). Self-harm is defined in this systematic review as any intentional self-injury or self-poisoning, irrespective of the degree of suicidal intent (Hawton et al., 2003; NICE, 2011).

The prevalence of self-harm in non-clinical community samples under the age of 25 years is estimated to range from 11-18% (Hawton et al., 2002; Swannell et al., 2014). Self-harm and suicide-related internet use is common among young people; associated with higher levels of self-harm and suicidal intent (Mars et al., 2015; Padmanathan et al., 2018), and a reported antecedent to young suicides (Rodway et al., 2016).

Concerns regarding possible contagion or copycat effects following exposure to self-harm or suicide-related content via the media (e.g., newspapers, TV) have been well documented (Hawton et al., 2020b). The Werther effect is a term used to describe imitation effects of suicidal behaviours or 'clustering' following mass reporting of a suicide in the media (Haw et al., 2013; Niederkrotenthaler et al., 2009), and has led to the development of media reporting guidelines for suicide and self-harm (Samaritans, 2020). Others have noted positive effects of publicising suicidal behaviours, known as the Papageno effect (e.g., reduction in suicides and increased help-seeking narratives; Niederkrotenthaler & Stack, 2017). Several psychological mechanisms and factors have been proposed to account for suicidal clusters following media reporting, such as contagion, descriptive norms (normalising), social learning (imitation), priming, assortative relating, and positive social

reinforcement, among others (Haw et al., 2013; Hawton et al., 2020b; Jarvi et al., 2013; Appendix 1D).

Since the inception of social media, several reviews have raised concerns that self-harm and suicidal content may be harmful, by normalising self-harm and discouraging help-seeking, for example (Bell, 2014; Daine et al., 2013; Lewis & Seko, 2016; Marchant et al., 2017, 2021; Memon et al. 2018). However, positive influences such as peer support have also been reported (Bell, 2014; Daine et al., 2013; Lewis & Seko, 2016; Marchant et al., 2017, 2021; Memon et al., 2018). Reviews to-date have combined studies exploring: the content of self-harm imagery, the motivations for posting self-harm imagery, and the evidence for the impact, or responses to, self-harm imagery, making it difficult to tease out the volume and quality of evidence relating to impacts in particular. This is important as UK policy changes are being made on the basis of assumed harm.

More recently, there has been rising concern regarding exposure to "graphic" or visual self-harm imagery online, such as photos or videos of self-harm or suicide-related content (Baker, et al., 2013; Jacob et al., 2017; Lewis et al., 2012). However, existing reviews have tended to combine the findings relating to verbal and imagery content (Daine et al., 2013; Marchant et al., 2017; Memon et al., 2018) or do not focus on the impact of viewing self-harm imagery or the range of potential mechanisms involved (Marchant et al., 2021). Imagery is purported to be more emotionally provocative than verbal content (Kensinger & Schacter, 2006), but unlike research exploring the effects of media reporting on suicides, research related to self-harm imagery has focused less on the potential mechanisms. This systematic review therefore aimed to address the following questions: 1) What are the potential negative and positive impacts (e.g., on self-harm behaviour,

emotions, thoughts, help-seeking and giving) of viewing self-harm imagery on the internet and on social media platforms?; and 2) What potential psychological mechanisms may account for these harmful and helpful effects? The findings led to the development of a conceptual model to direct further research and inform clinical practice and policy development.

Method

Search strategy and selection criteria

This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines (PRISMA; Moher et al., 2009) and was registered on PROSPERO (ID CRD42019137674). Reviewer one (KS) conducted an electronic database search for articles published from inception to 1st February 2021. The databases searched were CINAHL, Cochrane Library, EMBASE, HMIC, MEDLINE, PsycArticles, PsycINFO, PubMed, Scopus, Sociological Abstracts and Web of Science Core Collection. Keyword searching of titles and abstracts, as well as medical subject headings (MeSH; where possible) were conducted, following librarian guidance, to maximise search sensitivity using:

1. Self-harm terms:

(selfharm* OR “Self Harm*” OR “Self-Harm” OR “Self Injur*” OR “Self-Injur*” OR Cutting OR “Non Suicidal Self Injur*” OR “Non-Suicidal Self Injur*” OR “Non-suicidal self-injur*” OR “Self Destructive Behavio?r” OR “Self-Destructive Behavio?r” OR “Self Injurious Behavio?r” OR “Self-Injurious Behavio?r” OR “Self Inflicted Wound*” OR “Self-Inflicted Wound*” OR “Self Poisoning” OR Overdos* OR “Self-Poisoning” OR “Head banging” OR “Suicidal Ideation” OR “Attempted Suicide” OR Suicid* OR

“Suicidal Behavio?r*” OR Parasuicide OR “Self Mutilation” OR “Self-Mutilation” OR automutilation OR NSSI OR SIB)

Example MeSH: self-injurious behaviour

2. AND imagery terms:

(image* OR video* OR picture* OR graphic* OR "graphic image*" OR photo*6 OR “digital image*” OR “digital media” OR “digital video*” OR “image* shar*” OR “video shar*” OR “photo* shar*” OR galler*)

Example MeSH: Photograph

3. AND social media terms:

("social media" OR internet OR online OR web* OR blog OR Facebook OR Instagram OR twitter OR Tumblr OR snapchat OR “online social network*" OR "online community" OR "social interaction" OR "electronic communication" OR "communications media” OR chatroom OR forum* OR chat OR “social network*” OR tweet* OR virtual* OR Whatsapp OR Pinterest OR vine OR vlog OR YouTube OR Flikr OR Reddit)

Example MeSH: Social media

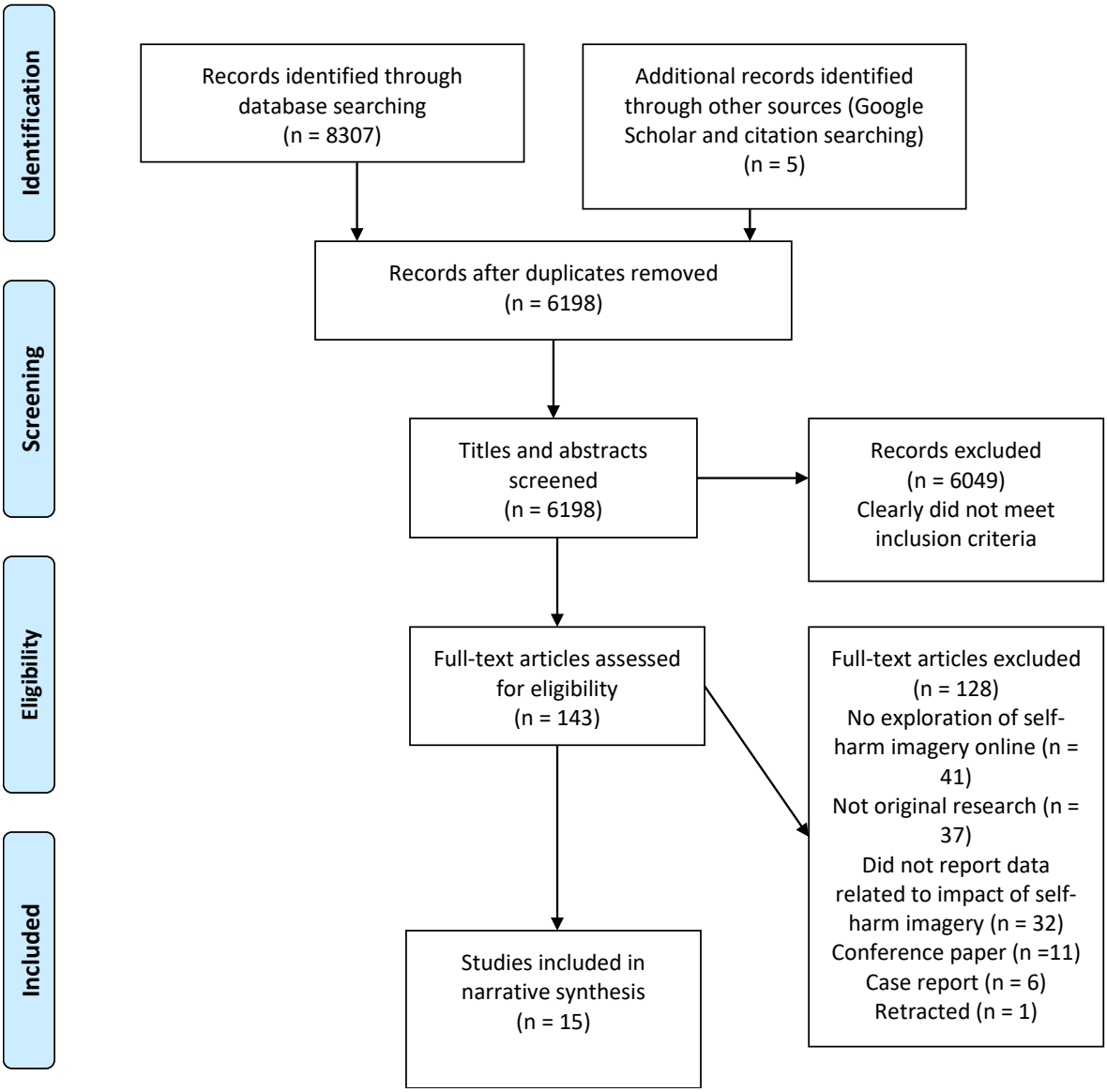
Supplementary searches were conducted using Google Scholar, and through forward and backward citation searching related reviews and included studies. Contact with field experts identified any recently published (or in press) studies and clarified eligibility questions.

Identified studies across databases were imported into Mendeley. After duplicates were removed, KS screened titles and abstracts. The second reviewer (FG) independently screened 10% of the papers to confirm decisions made at this stage and there were no disagreements. Where it was not possible to determine eligibility, the full-text was

reviewed during the second stage. Full-text articles identified as potentially eligible were independently assessed by KS and FG. Studies were included if they met all of the inclusion criteria (Appendix 1B): 1) peer-reviewed; 2) empirical research; 3) English language; 4) investigated the viewing of self-harm imagery (e.g., images/videos of self-injury/self-poisoning or related); 5) self-harm imagery appeared online or on social media; and 6) reported findings related to the potential impact, or responses to, viewing self-harm imagery. Studies were not included if they only examined verbal content, recovery-based initiatives, impact of fictional self-harm imagery (e.g., Netflix), or did not assess the potential impact, such as content only or algorithm studies. Age of participants was not an exclusion criterion as many studies included anonymous users. A rationale for each decision was recorded by KS and FG and disagreements were resolved by discussion between KS and FG using the inclusion/exclusion criteria as a guide (Appendix 1B), or through group consensus, which included the other authors (BKB, AS & KH), if agreement between KS and FG could not be reached. The main disagreements between KS & FG related to differences in the interpretation of the inclusion/exclusion criteria relating to whether self-harm-related content was included (criterion 4) and whether a study explored potential impacts (criterion 6). The inclusion/exclusion criteria were subsequently clarified to reflect that self-harm-related content that did not show self-harm/suicidal imagery (e.g., images of cuts) would not be included in the review (e.g., suicide prevention initiatives raising awareness but not showing imagery) and that potential impact could also be related to responses to imagery (e.g., comments left on imagery/videos). Inter-rater agreement between KS and FG was good before discussion (κ=0.71), and very good after discussion (κ=0.95; Landis & Koch, 1977). Fifteen studies were included (Figure 1).

Figure 1

PRISMA diagram



Data extraction and analysis

A data extraction sheet developed by KS, facilitated extraction of key study information, such as demographics, potential positive and negative impact of imagery, and

potential related mechanisms. KS completed full data extraction for all papers, and FG independently extracted data relating to the main findings/themes, potential positive and negative impact, potential mechanisms, strengths and limitations.

The findings across studies were synthesised and grouped according to the different areas of potential impact identified (positive and negative), the potential underlying mechanisms, and the quality appraisal. Themes of potential impact were generated in a bottom-up, iterative process to ensure they were data driven. On completion of data extraction, a framework of positive and negative potential impact and potential mechanisms was devised and agreed by all authors based on the areas identified (Table 1). Evidence for both potential positive and negative impacts were recorded where applicable. Results from studies relating to impact could be recorded in more than one area (e.g., evidence of potential impact on emotion and self-harm behaviour). The heterogeneity of the methodology and findings of papers precluded meta-analysis or meta-synthesis, so a narrative synthesis was conducted to "tell the story" of the qualitative and quantitative findings collectively (Popay et al., 2006).

Table 1

Definitions of positive and negative areas of potential impact

Areas of potential impact	Potential Positive Impact	Potential Negative Impact
1: Self-harm behaviour	Mitigating or reducing self-harm	Triggering or increasing self-harm
2: Sharing, commenting or reinforcing self-harm imagery behaviours	Sharing or commenting on self-harm imagery which reinforces recovery narratives, such as including messages of hope or recovering (healing wounds or scars)	Sharing or commenting on self-harm imagery which reinforces the creation/sharing of self-harm imagery and may encourage self-harm behaviours
3: Help-seeking behaviours	Encourages help-seeking online/offline towards recovery	Lack of help-seeking behaviours towards recovery and help-seeking towards self-harm (e.g., sharing self-harm methods or encouraging self-harm in other ways)
4: Help-giving behaviours	Helpful help-giving behaviours which may encourage help-seeking/recovery, reduce isolation or discourage self-harm	Unhelpful help-giving behaviours that discourages help-seeking/recovery or encourages self-harm (e.g., sharing methods) and help-giving which may increase emotional strain, distraction from own needs and responsibility for others
5: Emotion	Change in emotions that reduces likelihood of self-harm (e.g., vicarious relief, higher aversion or disgust)	Change in emotions that increases the likelihood of self-harm enactment (e.g., emotional dysregulation, lower mood, stigma, lower aversion)
6: Self-harm cognitions (including self-harm urges and mental imagery)	Reduction in thinking about self-harm or self-harm urges	Increase in thinking about self-harm or self-harm urges, or thinking about self-harm as an acceptable behaviour
7: Physiological sensations	Physiological change (e.g., adrenaline rush) leading to reduction in self-harm (proxy)	Physiological change (e.g., rush, faster heart rate) leading to an increase in desire to self-harm

8: Social connection	Increase in sense of belonging, connection, identification, validation and normalisation, reducing feelings of isolation which may curb urges to self-harm or stigma	Increase in sense of validation, belonging, connection, peer-support, identification that normalises self-harm as part of a group identity or "crowd mindset" that self-harms
9: Social Comparison	Comparing own self-harm with imagery discouraging self-harm behaviours	Comparing own self-harm with imagery leading to an escalation of self-harm behaviours
10: Personal identity	Self-harm imagery encouraging self-expression, reflection and recovery leading to reduced self-harm and increased sense of self-efficacy and control over self-harm	Self-harm imagery encouraging a self-harm identity

Potential mechanisms related to positive or negative impact of online self-harm imagery exposure were identified (see Appendix 1D). A mechanism was defined as something that potentially explained the relationship between exposure and impact or may be contributing to a change in affect, cognition or behaviour (Holmes et al., 2016). Potential mechanisms were extracted by identifying any mechanism that was explicitly or implicitly mentioned by the study authors, as well as informed by related papers in the field (Haw et al., 2012; Hawton et al., 2020b; Jarvi et al., 2013; Appendix 1D). Potential mechanisms were not mutually exclusive or exhaustive, and multiple potential mechanisms could account for different effects.

Quality and risk of bias was assessed with the widely used Clinical Appraisal Skills Programme checklists (CASP). The cohort study checklist was used for quantitative studies, as this seemed the most appropriate following personal communication with CASP as this tool looks at the effects of harm (e.g., assesses measurement of exposure, outcome, and follow-up). The qualitative checklist was used for the qualitative studies. Tools were used according to how the study authors defined their research (e.g., qualitative and/or quantitative). Where a study reported both quantitative and qualitative data analysis (e.g., Sternudd, 2012), both checklists were used, and a combined quality rating was given. Applying conventional cut-offs (Darlow et al., 2012; Marchant et al., 2017, 2021), articles were grouped into low (<50%), medium (50-75%) and high (>75%) quality depending on their overall CASP score. KS and FG independently completed quality ratings for all papers and disagreements were resolved by discussion to reach consensus. Weighted kappa (κ_w) calculations with linear weights (Cicchetti & Allison, 1971) showed inter-rater reliability was excellent ($\kappa_w = .91$; Fleiss et al., 2003). More experienced reviewers (BKB and AS) completed

full data extraction and quality analysis on approximately half (seven) of the papers as an extra reliability check. Findings from higher quality papers were given more weight in the results and discussion.

Results

Summary of studies

Fifteen studies, comprised of seven quantitative, seven qualitative, and one mixed-methods study, were included in the systematic review (Table 2).

Table 2

Summary of studies

Author Year Country Design	**Aims**	**Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx**	**Imagery Source & Type**	**How self-harm imagery exposure was measured**	**How impact/response(s) to self-harm imagery were measured**	**Main findings**	**Key findings related to potential impact/ response to self-harm imagery**	**Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed**
1: Arendt et al. (2019) USA Quantitative longitudinal	Tested whether exposure to self-harm imagery increased risk for self-harm and suicide in those with existing risks for self-harm/ suicide	n=1262 (1st wave), n=729 (2nd wave) M^{age} = 24.15 (3.23) 81.6% Female (1.7% other) 72% White Wave 1: 28% self-harm Hx (n=695) Wave 2: 19% had self-harmed in last month (n=694) MH Hx = NR	Self-harm imagery on Instagram. Only 20% had searched for content deliberately	Asked about exposure to self-harm imagery on Instagram. 45% had never been; 18% just once; 25% more than once; 12% did not know / refused to answer	Questionnaire measuring self-harm, suicidal ideation (Youth Risk Behaviour Survey), plans and risk (Suicide Probability Scale); Beck's Hopelessness Scale, Brief Reasons for Living Scale, emotional disturbance and perspective taking, and presumed copycat influence	Exposure to self-harm imagery was associated with suicidal ideation, self-harm, and emotional disturbance after controlling for exposure to similar sources. Exposure to self-harm imagery predicted self-harm and suicidality 1 month later	Exposure to self-harm imagery was reported as emotionally disturbing (63.9%); led to emotional perspective taking, where 59.6% said they had thought about doing the same thing; and 32.5% stated that had imitated self-harm behaviour following exposure to self-harm imagery on Instagram. At-risk individuals were more likely to intentionally access self-harm content but those with more intentional exposure were not more likely to self-harm	Negative (1, 5 & 6) Authors stated findings provided evidence exposure leads to contagion or imitation and emotional dysregulation in vulnerable users

Author Year Country Design	**Aims**	**Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx**	**Imagery Source & Type**	**How self-harm imagery exposure was measured**	**How impact/response(s) to self-harm imagery were measured**	**Main findings**	**Key findings related to potential impact/ response to self-harm imagery**	**Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed**
2: Baker & Lewis (2013) Canada Qualitative Cross-Sectional	How individuals respond to photographs of NSSI online	n=88 M^{age} = NR % Female NR Ethnicity = NR Some of posters had self-harmed but percentages NR MH Hx = NR	Reactions of NSSI photographs on large NSSI e-community message board; ranged from mild scratching to very severe cuts and burns; some showed wounds still bleeding up to scars	Not directly measured but self-report reactions to NSSI photographs were analysed	Naturalistic: 89 postings of self-harm forum were analysed. No individuals were contacted	Individuals reporting positive perceptions said the photographs reduced loneliness and NSSI enactment. People reporting negative perceptions argued photographs reinforce, trigger and encourage NSSI	Three main themes: photographs are helpful (photographs show how bad NSSI can get, enable identification and support, can curb urges to self-injure); photographs are not helpful (social responsibility, normalisation/glamorisation/competition); and triggering (trigger warning is effective, some photographs trigger (others do not), trigger warning not effective). 51.7% endorsed NSSI pictures as unhelpful, 44.9% endorsed NSSI photos as helpful. Fresh cuts and blood were said (for some) to be more likely to trigger NSSI, while photographs of scars were (for some) more likely to discourage NSSI.	Positive (1, 3, 4, 5, 6, 7, 8) & Negative (1, 2, 3, 6, 8, 9) Authors mention that imagery may reinforce NSSI through narrative reinforcement (descriptive norms) and competition

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3: Brown et al. (2018) Germany Quantitative Cross-sectional	Examined the effect of social reinforcement and predicted positive associations of pictures and comments being posted	n=1154 accounts M^{age} = subset (n=480) mean= 14.8 (1.6) Subset (n=819), 91% appeared to be Female Ethnicity = NR Self-harm/MH Hx = NR	2826 NSSI wounds on Instagram found using German NSSI hashtags over 4-weeks. Most images depicted cutting	Not directly measured but pictures, associated comments and user accounts were analysed	6651 comments posted on 2826 images of NSSI by other users than the person posting the picture	Pictures with increasing wound grades and those depicting multiple methods of NSSI generated more comments. Most comments were neutral or empathic (23.5%) with some offering help; few comments were hostile (6.8%)	Pictures depicting more severe wounds received more comments, suggesting role of social positive reinforcement. Time-related analysis did not find any evidence of social contagion or reinforcement as they could not identify any clustering of NSSI photos on Instagram; however, they acknowledged that their analysis was limited to identifying posted self-harm images as evidence of contagion	Positive (4) & Negative (2, 3, 4, 5) Authors state that social positive reinforcement might play a role in the posting of more severe NSSI pictures. Also stated comments with emotional content (offering help, hostile) might have the most impact on users

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
4: Brown et al. (2020) Germany Qualitative Cross-sectional	Aimed to assess the motivation to share pictures of NSSI wounds on Instagram, gain more insight into the reactions adolescents with NSSI have to viewing NSSI pictures online, and how adolescents perceive comments on their own NSSI pictures	n=59 M^{age} =16.7 years (1.2 years; n=9 did not want to answer) 72.9% Female Ethnicity = NR Participants had engaged in NSSI in the past month and had posted at least one photo of their own NSSI in the last month MH Hx = NR	NSSI images or videos of cuts posted on Instagram	Not directly measured but motivation and self-reported impact measured through online interviews	Semi-structured interviews conducted via Instagram messaging app (identified participants from Brown et al. 2018)	Motivations for posting were mainly social (connection, disclosure, communication of distress, imitation) but also included self-focused reasons like documenting NSSI or recovery. All participants reported having received positive reactions (being offered help, connecting, empathy), and negative comments (harassment, being misunderstood)	Participants reactions to other users NSSI content (only referred to cuts) on Instagram was often identification with the content, being triggered, as well as wanting to offer help, or being momentarily deterred from NSSI. Severity of self-harm cuts differentiated reactions/responses reported by participants (more severe images = more severe reactions). No participants mentioned successful referral to professional help through online NSSI activity	Positive (1, 4, 5, 8, 10) & Negative (1, 2, 3, 4, 5, 8, 9) Maslow's hierarchy of needs 'belonging', and social reinforcement and contagion mentioned

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
5: Cha et al. (2016)* Conducted in USA (105 countries (64.2% U.S.A residents) Quantitative Cross-sectional Experimental (Study 1 only web-based)	Examined impact of self-harm imagery (cut skin) vs words (suicide, death) on mood, self-harm and desire to die, using Implicit Association Tests on web-based responders (Study 1 only)	n=3,304 (randomised to 3 groups; only 1 group exposed to self-harm images) M^{age} = 28.4 (11.3) 67.1% Female Ethnicity =White (77.4%), Hispanic (9.2%), Other (7.6%), Asian (6.7%), Biracial/Multiple (5%), African American (3.3%). Lifetime SITB = 86.3% MH Hx = NR	Experimental images of self-harm (cutting) compared with words (death, suicide) presented on web based IAT	Measured exposure by comparing three groups (images of cut skin, words associated with death, words associated with suicide). Did not measure previous exposure to self-harm imagery	Self-report questionnaires: Before and after each IAT, participants were asked about their desire to self-injure, desire to die, and mood on a Likert scale. SITBI assessed NSSI, suicide ideation, suicide plan, and suicide attempt	There was minimal change in self-injurious or suicidal urges detected across all IAT studies. A slight mood decline was detected across the 3 samples but was isolated to female participants and 1 type of IAT that presented SITB-related images (vs. words only)	For study 1, there was a slight but significant mood decline for the self-injury IAT (images) but not suicide or death word IATs, even when controlling for self-harm history. Suggests that self-harm images may impact on mood, more than words/phrases, particularly in females	Negative (5) Authors state findings suggest images related to self-injury and suicide may be more emotionally provocative than words, supporting neuroscience literature

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
6: Chen et al. (2021) China Qualitative Cross-sectional	Explore what triggers and maintains non-fatal self-harm among Chinese adolescents and the barriers to help-seeking	n=22 M^{age} = 18.05 (2.98) 86.4% Female 100% Chinese All participants had self-harmed at least twice (cutting was predominant method) MH Hx = NR	Pictures of self-harm on chat groups	Did not measure exposure but explored impact through interviews	Semi-structured interviews	Non-fatal self-harm triggered by multiple factors in the first instance, but subsequent self-harm can be causeless	Peer influence related to sharing self-harm imagery on online chat groups inspired ideas of self-harm	Negative (6) Authors mention normalising influence of seeing pictures of peer self-harm online
7: Fu et al. (2013) China Quantitative Cross-sectional	Investigate consequences of presenting self-harm behaviour on social media: 1) how people respond to the self-presentation of self-harm; 2) how posts propagate online; 3) implications for suicide prevention	n=5,971 microblogs (n = 3,696 reposters) M^{age} = NR 42.8 % female (2.8% NR) Ethnicity = NR SH Hx = NR MH Hx = NR	One wrist cutting picture posted on Sina Weibo (Chinese social media platform)	Did not directly measure exposure. Measured responses to one wrist-cutting picture through content of comments and reposts	Comments and reposts	Concluded that social media can be a double-edged sword: it may contagiously affect others by spreading suicidal thoughts and acts, but may also play a positive role by assisting people at risk for suicide, providing	The original post was reposted 3,974 times and received 1,997 comments by 3,696 micro bloggers within 3 hours, yielding 5,971 microblog pieces of content. They found that a significant portion of written responses (36.6%) could help vulnerable netizens by providing peer-support and calls for help. 23.4% evidenced a negative attitude (i.e., cynical or indifferent comments, cyberbullying), 19.5% were emotional presentations of shock, and 20.4% were merely reposts. The top 10 most influential micro bloggers who reposted the original message showed concern and care for the person who self-harmed	Positive (4) & Negative (2, 4, 5) Authors state help-giving may reinforce help-seeking as per hyperpersonal model and lead to contagion effects. Comments may cause emotional

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
						rescue or support		dysregulation in viewers
8: Hetrick et al. (2020) Australia Qualitative Cross-sectional	To identify triggers to self-harm and helpful strategies to manage self-harm in young people	n=7 M^{age} = 20.6 (SD=2.23) 71% Female Ethnicity = NR Participants had history of self-harm/ suicidal ideation but were excluded if had self-harmed or had severe suicidal ideation in the last 3 months. Participants were either currently or had been seen by a tertiary mental health service	Graphic images on Tumblr or Instagram (e.g., cuts, scars)	Did not measure but explored impact through interviews	Semi-structured interviews	Identified several themes related to what triggers urges to self-harm, such as self-harm exposure and social comparison	Exposure to graphic self-harm imagery on Tumblr and Instagram was reported to normalise self-harm and lead participants to engage in self-harm themselves. Some reported other people sharing details about self-harm methods was triggering. Participants would also compare their own self-harm, to the images of others' self-harm online, and this was reported to lead people to feel bad if their self-harm were not as severe, and feel more isolated because they did not conform to social norms of self-harm	Negative (1, 5, 9) Authors mention normalising influence of images as well as role of comparison and competition

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
9: Jacob et al. (2017) Wales, UK Qualitative Cross-sectional	Explored lived experiences of young people's use of the Internet for self-harm purposes and impact of self-harm imagery	n=21 M^{age} = 19 (NR) 85.7% female Ethnicity = NR All had previous self-harm history; 76% had sought professional help for their self-harm MH HX = NR	Self-harm images online	Did not directly measure but explored impact through interviews. Exposure to self-harm images was sometimes unintentional . 2/3 male participant used the internet for self-harm and actively viewed images for this purpose. 11/18 females sought out pictures of self-harm, and 3/18 shared their own images	Semi-structured interviews; Nineteen conducted individually, and one was conducted in a dyad. Explored motivations for self-harm; receipt of formal and informal support; use of the Internet; navigation of the Internet prior to, during, and following self-harm; perceptions and experiences of different online content and mediums of communication; and the interaction of online behaviour with real world behaviour	Reported role of the Internet in normalising young people's self-harm. Images rather than textual interactions were the primary reason cited for using the Internet for self-harm purposes (75% of participants). Images invoked a physical reaction and inspired behavioural enactment, with Tumblr (permits anonymous sharing of images) being	Self-harm images triggered desire to self-harm, brought back memories of self-harm that enabled them to envisage how they could self-harm, brought desire to recreate self-harm images or perform more severe self-harm. Tumblr was perceived to permit an immediate and intimate connection with others, which had led to normalisation and exacerbation of self-harm in participants. Viewing online images served a vital role in many young people's self-harm, as part of ritualistic practice. Images were described as more impactful than words	Negative (1, 2, 4, 5, 6, 7, 8, 9, 10) Authors discuss normalising role of self-harm images through behavioural enactment, sharing of techniques and role of competition

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
						the preferred platform		
10: Jaroszewski et al. (2020)* USA Quantitative Cross-sectional Experimental	Validating first-person suicide images and comparing between suicidal and non-suicidal groups (web-based = study 1 only)	n=221 (control group (n= 118); suicidal group (*N*= 94) M^{age} =39.19 (11.62); Supp data: control group: 38.9 (Mdn= 26, SD=11.4); suicidal group: 38.9 (Mdn= 26, SD=11.4) 46.7% female; Supp data: control group (51 female, 1 other); suicidal group (48 female) 79.5-83% white (see paper for more information)	First person (FP) suicide images (e.g., looking down the barrel of a gun) compared with positive (looking at a cookie), third-person (TP) suicide image (someone jumping off a cliff), and other positive /negative images (International Affective	Measured exposure to self-harm imagery by randomly presenting pictures and asking participants to rate emotions	Questionnaire asked participants to rate images on aversiveness, arousal and threat	FP-suicide images had good construct validity cross three subjective rating dimensions (valence, arousal, threat). Participants rated FP-suicide images as much more aversive, arousing, and threatening than IAPS neutral images and similar to both TP-	In terms of aversion, the Suicide group rated TP-Suicide images as significantly more pleasant and FP-positive images as less pleasant than the Non-suicide group. In terms of arousal, the Suicide group rated FP-Suicide, TP-Suicide, and IAPS negative images as significantly more arousing than the Non-suicide group. In terms of threat, the Suicide group rated FP-Suicide and TP-Suicide images as significantly less threatening than the Non-suicide group.	Potentially Negative (5) Authors discuss how individuals with suicidal history may have lower aversion to this stimuli (barriers; Benefits & Barriers Model (Hooley & Franklin, 2018) or have acquired capability through habituation (Joiner, 2005)

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
		Control group = no self-harm Hx Suicide group = if reported lifetime thought of suicide	Picture System; IAPS)			suicide and IAPS negative images across all three rating dimensions		
11: Lavis & Winter (2020) UK Qualitative Cross-sectional	To explore why and how young people engage with online self-harm content, and explore what they post	n=10 for interviews, and 10,169 original posts and 36,934 comments including written and pictorial content (collected at two time-points) M^{age} = NR % Female = NR Ethnicity = NR Self-harm/MH Hx = NR	Self-harm interactions on Twitter, Reddit and Instagram	Not measured but explored impact through responses and interviews	10,169 original posts and 36,934 comments including written and pictorial content (collected at two time-points) Ten semi-structured interviews with young people who had used social media to engage with self-harm content	Peer support was found as a key driver for seeking online interactions related to self-harm. Those accessing content are likely to be already self-harming	The impact of people sharing self-harm imagery online was often peer concern and support which may mitigate self-harm. Seeing images of others' self-harm could trigger viewers to self-harm due to their distress, not necessarily due to the image per se. To maintain online support, some viewers felt they needed to keep showing they needed support, and self-harm more severely. Online peer-support may also preclude offline help-seeking, thinking other people will not understand. Ideas for how to self-harm safely were also offered in response to graphic images.	Negative (1, 3, 4, 5, 8) & Positive (4) Authors discuss how imagery may normalise or exacerbate self-harm and also discuss how people who are already self-harming may be driven to this content (i.e., assortative relating)

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
12: Lewis et al. (2012) Canada Quantitative Cross-sectional	To examine viewers' responses to non-suicidal self-injury (NSSI) YouTube videos to determine the potential risks (NSSI) and benefits (recovery-oriented social support) of the videos	n=NR (869 comments) M^{age} = NR NR % female Self-harm Hx NR but a small portion of self-disclosure comments indicated that individuals had a mental illness (7.83%)	100 most-viewed YouTube Videos with NSSI content (50 videos with no live person, and 50 videos with at least 1 live person) whereby majority had graphic NSSI imagery	Did not directly measure but measured impact to NSSI videos on YouTube by analysing comments	869 randomly selected comments from 100 most viewed NSSI videos on YouTube (either all available comments if <10 or random 10 if >10 comments per video)	Most frequent comments were self-disclosure where individuals shared own NSSI experiences (38.39%), followed by feedback for video uploader, including admiration (15.40%) or encouragement (11.15%). The majority did not mention recovery (42.89%) and indicated they were still self-injuring (34.00%). Recovery statements were uncommon	Results suggest that viewers' responses to videos (e.g., sharing own NSSI experiences, admiration, encouragement) may maintain or normalise NSSI behaviour, as well as through rarely encouraging or mentioning recovery (albeit some). Comments about sharing NSSI methods and strategies (e.g., wound cleaning, concealing) were not common (1.38%). Some comments mentioned that the video content was triggering and evoked NSSI urges (1.72%)	Positive (3 & 4) & Negative (2, 3, 4, 5, 6) Authors suggest that viewers' responses to videos may maintain NSSI behaviour through normalisation (by sharing their own self-injury experiences) and because they rarely encourage or mention recovery

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
13: Seko et al. (2015) Canada Qualitative Cross-Sectional	Gain understanding of participants' reasons for using online media to share NSSI experiences, the needs they expect the Internet to fulfil, and their perceptions about the potential impacts of NSSI materials on their own NSSI behaviours	n=17 M^{age} = 19.94 (NR) 82% female 76% White, 12% South Asian, 12% Mixed Ethnicity 71% diagnosed with one mental health condition All had Hx of NSSI (average onset 10.64 years)	Self-harm content online; 7/17 had posted images and 3/17 had posted videos	Not directly measured but asked about self-reported experience of producing and posting NSSI-themed content on the Internet using interviews	Semi-structured interviews conducted by email or text chat asking: (a) What are the reasons why you create and post NSSI-themed content online? (b) Who do you think your audiences are? (c) What do you think your audiences think of your work? (d) How do you feel and react to NSSI-themed materials when you see them online?	Thematic analysis of participants' narratives identified two motives: self-oriented motivation (to express self and creativity, to reflect on NSSI experience, to mitigate self-destructive urges); and social motivation (to support similar others, to seek out peers, to raise social awareness). Participants reported impact of NSSI content both as a trigger and a deterrent to NSSI	Although NSSI materials were described to provide audience with a sense of validation and vicarious relief, and even serve as a deterrent against NSSI, some participants reported viewing or reading NSSI materials could increase the urge to engage in NSSI, particularly if already in a negative state of mind. Some felt stronger attachment to textual representations as they provide greater context, while others found visual content more powerful and triggering. Whether NSSI imagery acted as a trigger or a deterrent would depend largely on their emotional state. Online communities were seen to provide participants with emotional support that was largely absent from their offline life	Positive (1, 3, 4, 5, 6, 8, 9, 10) & Negative (1, 2, 3, 4, 5, 8, 10) Authors discuss online social connection and validation and emotional and NSSI urge regulation in vulnerable users with history of self-harm

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
14: Seko et al. (2018) Canada Quantitative Cross-sectional	To examine visual, textual, and compositional attributes of photo-based images on Tumblr, exploring how these multimedia assemblages represent self-injury on Tumblr	n=NR (294 posts) M^{age} = NR 75.3% were female in a subset of images (unsure if they were poster) Ethnicity = NR SH Hx = NR MH Hx = NR	294 posts on Tumblr containing self-harm images (e.g., direct self-injury or memes from the media). 123 images (41.8% of the total sample) depicted self-injured bodies or body parts (mostly cuts)	Did not measure imagery exposure directly but explored impact through reblogs and attached narratives	Reblogs and attached narratives (texts, tags, notes) of direct self-harm images	Visual narrative analysis revealed images of self-inflicted wounds received 10 times less reblogs than images without wounds, and media memes conveying hopeless moods were the most widely distributed	The most reblogged among direct self-injury images were denotative images (n = 13, 590 reblogs), followed by SI normalisation (n=12, 137 reblogs), and hopeful/pro-recovery images (n=21, 132 reblogs). The act of reblogging may further reshape what SI means to viewers (e.g., scars seen as recovery; normalisation of self-harm)	Positive (2, 4, 8, 10) & Negative (2, 3, 5, 10) Authors discuss social belonging and narrative reinforcement (descriptive norms) of NSSI may be detrimental to vulnerable viewers who identify with these messages

Author Year Country Design	Aims	Sample characteristics n M^{age} (SD) % Female Ethnicity Self-harm/MH Hx	Imagery Source & Type	How self-harm imagery exposure was measured	How impact/response(s) to self-harm imagery were measured	Main findings	Key findings related to potential impact/ response to self-harm imagery	Potential Positive or negative impact (area no.) and whether mechanisms or theory discussed
15: Sternudd (2012) Authors from Sweden (respondents mostly USA and UK) Mixed-Methods Cross-sectional (closed questions analysed quantitatively; open questions measured qualitatively)	Examined discourses about self-harm photos, specifically how producers and consumers (users) are establishing the meaning of self-harm photos	n=52 (40 had taken SI-photos) M^{age} = NR (70% were 15-20 years old) 87% female Ethnicity = NR 100% had previous experience of self-harm; 42% currently self-harming MH Hx = NR	Images of self-harm wounds and scars on a community forum.	Did not measure imagery exposure directly but measured reactions to self-harm images generally using questionnaires	Questionnaire included questions regarding reactions to being exposed to self-harm images	Participants reported effects of self-harm images were alleviating of self-harm, and the production of images served to help with memory, proof, share experiences with others and give and/or receive help. Participants emphasised the outcome of viewing self-harm images varies depending on individual / situational differences	40% of statements were interpreted as positive, 25% were interpreted as negative and 35% were neutral. Reactions to exposure of self-harm images were described as comforting/calming in nearly half the statements. About a third of statements described the outcome of looking at self-harm images as triggering. 25% of the statements experienced self-harm images as disturbing and inspiring, which could indicate a preventative and triggering effect. Impact of images varied depending on mood at the time. Former self-injurers were twice as likely to state they were positively influenced. Those with less experience of self-harm or more frequently self-harming were more negative about exposure to self-harm images	Positive (1, 3, 4, 5, 6, 8, 9, 10) & Negative (1, 2, 3, 4, 5, 6, 8, 9, 10) Authors mention how discourse may normalise self-harm and impact on identity as a "self-injurer" depending on individual and situational factors

Note: NR = Not reported; *data from study 1 and/or supplementary info only; SITB = Self-injurious thoughts and behaviours; SH = self-harm; MH = Mental health; NSSI = non-suicidal self-harm; Hx = History.

Most of the studies originated from Western countries, with four from Canada, three from the USA, two each from China, Germany and the UK, and one each from Australia and Sweden. Studies explored the effects of exposure to self-harm imagery on social media platforms such as Instagram, Reddit, Tumblr, Twitter, San Weibo (China), and YouTube, or the effects of viewing online imagery more generally, such as in self-harm chat groups and forums. Most studies did not explore effects across multiple platforms (but see Lavis et al. 2020; Hetrick et al., 2020). All of the studies were cross-sectional, except for Arendt et al., (2019), who adopted a longitudinal design. Studies explored the potential impact of self-harm imagery exposure through questionnaires (Arendt et al., 2019; Sternudd, 2012), semi-structured qualitative interviews (Brown et al., 2020; Chen et al., 2021; Hetrick et al., 2020; Jacob et al., 2017; Lavis et al., 2020; Seko et al., 2015; Sternudd, 2012), analysis of comments, or reposts/reblogs (Baker & Lewis., 2013; Brown et al., 2018; Fu et al., 2013; Lavis et al., 2020; Lewis et al., 2012; Seko & Lewis, 2018), or measuring exposure to self-harm imagery directly in an experimental design (Cha et al., 2016; Jaroszewski et al., 2020). Fourteen studies discussed the potential impact of self-injury imagery (images and/or videos) and one explored suicidal and self-injurious imagery (e.g., looking down barrel of gun or knife; Jaroszewski et al., 2020). Ten studies reported the effects of “graphic imagery” (e.g., images depicting cuts or blood). Only two quantitative studies examined the evidence for a contagion mechanism (Arendt et al., 2019; Brown et al., 2018), although study authors did sometimes explicitly and implicitly discuss possible mechanisms (Table 3).

Table 3

Studies reporting positive and negative areas of potential impact and mechanisms that may be associated

Area of Potential Impact	**Potential Positive impact studies H, M, L quality papers**	**Potential mechanisms that could underlie positive impact**	**Potential Negative impact studies H, M, L quality papers**	**Potential mechanisms that could underlie negative impact**
1) Self-harm behaviour	H: 2, 4, 13 M: -- L: 15 (4/15)	Aversion or disgust (barrier) (*2, 4; **13, 15) Emotion regulation or automatic reinforcement (*2, 13; **15) Self-reflection (**15)	H: 2, 4, 8, 9, 11, 13 M: 1 L: 15 (8/15)	Assortative Relating (*1, 11, 13, 15; ** 2, 8, 9) Descriptive Norms (*2, 8, 9, 11; 15; **1, 13) Emotion dysregulation (*4, 9, 13, 15) Habituation (**15) Positive social reinforcement (**2, 13) Re-experiencing mental imagery (**15) Social integration and regulation (**2, 8, 11, 15) Social learning (*1, 4, 13; **2, 8, 9, 11)
2) **Sharing or liking self-harm imagery behaviours**	M: 14 (1/15)	Descriptive norms (**14) Positive social reinforcement (**14) Social integration and regulation (*14)	H: 2, 4, 9, 12, 13 M: 3, 14 L: 7, 15 (9/15)	Assortative Relating (*12, 13; **2, 4, 7) Descriptive Norms (*2, 9; 12, 14, 15; **3, 4, 7, 13) Positive social reinforcement (*3, 4, 7, 12; **2, 9, 13, 14)

Area of Potential Impact	Potential Positive impact studies H, M, L quality papers	Potential mechanisms that could underlie positive impact	Potential Negative impact studies H, M, L quality papers	Potential mechanisms that could underlie negative impact
				Social integration and regulation (*14; **2, 3, 7, 13) Social learning (*4, 13; **2)
3) Help-seeking behaviours	H: 2, 12, 13 M: -- L: 15 (4/15)	Assortative Relating (**2, 13) Descriptive Norms (**2, 12, 13, 15) Positive social reinforcement (**2, 12, 13, 15) Social integration and regulation (**2, 13)	H: 2, 4, 11, 12, 13 M: 3, 14 L: 15 (8/15)	Assortative Relating (*12, 13; **2) Descriptive Norms (*2, 12; 14, 15 **3, 13) Positive social reinforcement (*3, 12; **2, 11, 13, 14, 15) Social integration and regulation (*14; **2, 3, 12, 13, 15) Social learning (*13; **2,)
4) Help-giving behaviours	H: 2, 4, 11, 12, 13 M: 3, 14 L: 7, 15 (9/15)	Assortative Relating (**2, 13) Descriptive Norms (**2, 12, 13, 14, 15) Positive social reinforcement (*3, 4, 7; **2, 11, 12, 13, 14, 15) Social integration and regulation (*14; **2, 4, 13)	H: 4, 9, 11, 12, 13 M: 3 L: 7, 15 (8/15)	Assortative Relating (*12, 13) Descriptive Norms (*9, 11, 12, 15; **3, 7, 13) Positive social reinforcement (*3, 4, 7, 12; **11, 13, 15) Social learning (*4, 13; **9) Social integration and regulation (**3, 9, 11, 12, 13, 15)

Area of Potential Impact	Potential Positive impact studies H, M, L quality papers	Potential mechanisms that could underlie positive impact	Potential Negative impact studies H, M, L quality papers	Potential mechanisms that could underlie negative impact
5) Emotions	H: 2, 4, 13 M: -- L: 15 (4/15)	Assortative Relating (**2) Aversion or disgust (barrier) (*2, 4; 13 **15) Descriptive Norms (**2) Emotion regulation or automatic reinforcement (*2, 13,15) Positive social reinforcement (**2) Re-experiencing mental imagery (**15) Social integration and regulation (**2)	H: 4, 8, 9, 11, 12, 13 M: 1, 3, 5, 10, 14 L: 7, 15 (13/15)	Assortative Relating (**15) Awareness of aversion (**14) Emotional dysregulation (*1, 3, 4, 5, 7, 9; 11, 12, 13; 15; **8, 14) Emotional regulation (*9, 15) Habituation (*10; **15) Less Aversion (lower barrier) (*10) Re-experiencing mental imagery (**15) Social learning (*4)
6) Self-harm cognitions (including self-harm urges and mental imagery)	H: 2, 13 M: -- L: 15 (3/15)	Aversion (barrier) (**15) Emotion regulation or automatic reinforcement (*2, 13, 15) Positive social reinforcement (**13) Priming (including mental imagery) (**15) Self-reflection (**13, 15)	H: 2, 6, 9, 12 M: 1 L: 15 (6/15)	Descriptive Norms (*6) Priming (including mental imagery) (*9; **1, 2, 6, 12, 15) Social learning (**9)
7) Physiological sensations	H: 2 (1/15)	Emotion regulation (*2)	H: 9 (1/15)	Emotional dysregulation (*9)

Area of Potential Impact	Potential Positive impact studies H, M, L quality papers	Potential mechanisms that could underlie positive impact	Potential Negative impact studies H, M, L quality papers	Potential mechanisms that could underlie negative impact
8) Social connection	H: 2, 4, 13 M: 14 L: 15 (5/15)	Assortative Relating (**2, 13) Descriptive Norms (**2, 13, 15) Positive social reinforcement (*4; **2, 13, 14, 15) Social integration and regulation (*14; **2, 4, 13)	H: 2, 4, 9, 11, 13 M: -- L: 15 (6/12)	Assortative Relating (*11, 13; **2, 4, 9) Descriptive Norms (*2, 9, 11; 15 **4, 13) Positive social reinforcement (*4; **2, 9, 11, 13, 15) Social integration and regulation (**2, 9, 11, 13) Social learning (*4, 13; **2, 9, 11)
9) Social comparison	H: 13 M: -- L: 15 (2/15)	Aversion or disgust (barrier) (**13, 15) Emotion regulation or automatic reinforcement (**15) Self-reflection (**13, 15) Social comparison (**13) Social integration and regulation (**15)	H: 2, 4, 8, 9 M: -- L: 15 (5/15)	Comparison & Competitiveness (*2, 8, 9; 15; **4)
10) Personal identity	H: 4, 13 M: 14 L: 15 (4/15)	Self-reflection (**4, 13, 14, 15)	H: 9, 13 M: 14 L: 15 (4/15)	Assortative relating (*13; **9) Descriptive norms (*14; **13) Emotional dysregulation (*15)

Area of Potential Impact	Potential Positive impact studies H, M, L quality papers	Potential mechanisms that could underlie positive impact	Potential Negative impact studies H, M, L quality papers	Potential mechanisms that could underlie negative impact
				Positive social reinforcement (*13; **9, 14) Social integration and regulation (*14; **9, 13) Social learning (*13)

Note: Numbers denote the study number; H=high quality, M=medium quality, Low=low quality; *Potential mechanisms mentioned/implied by study authors; **Potential mechanisms identified by review authors; Assortative relating=individuals who possess similar difficulties/interests may be more likely to form relationships; Aversion/disgust=natural barrier that may protect some people from self-harm; Descriptive norms (normalisation)=perception a behaviour is more common than it might be; Emotional dysregulation=when negative affect is amplified; Emotional regulation= when negative affect is reduced and/or positive affect is increased; Habituation=reduction in aversion through repeated exposure; Positive social reinforcement=individuals engage in behaviours to generate desired social outcomes (e.g., connection, validation); Priming=activation of one thought my trigger other thoughts/images or behaviours; Self-reflection=enabling sense of control over self-harm; Social comparison=comparing self with others; Social integration & regulation=sharing of ideas in closed/cohesive communities; Social learning=modelling and imitation of behaviour if there are shared characteristics.

Ten studies reported age, with participants ranging from 14-25 years old (eight studies; although one paper included individuals with a mean age of 39 years old (Jaroszewski et al., 2020)), the majority being female and White. Three studies were unable to report demographics due to the anonymous nature of posts and some studies could only report demographic information for a subset of participants. Ten studies reported that participants had a history of self-harm or were currently self-harming, whilst the other studies did not collect, or report, this information. Little was also known about participants' mental health history, which was not usually assessed, although Lewis et al. (2012) found that 8% disclosed their mental health difficulties in the comments.

Quality of studies

Eight papers were rated as high quality, five of medium quality, and two of low quality (Appendix 1C). Most studies included large samples and the majority of the qualitative studies were of high quality.

Causality and directionality of impact could not be determined in any of the included studies. Most studies were cross-sectional and relied on retrospective self-report of exposure to self-harm imagery and impact, which is susceptible to memory bias. Studies often used unvalidated single-item measures. Most studies did not, or could not, due to methodological limitations, measure self-harm imagery exposure (type or severity), or demographic and vulnerability factors (e.g., exposure to self-harm via other sources, such as the media or family/friends, with the exception of Arendt et al. (2019)). The longer-term duration of impact following self-harm imagery exposure was not measured in any study. Interpretation of findings from observational studies (e.g., comments) were subjective and open to bias, and not all authors acknowledged or controlled for this. Additionally, analysis

of posts focused on the assessment of the potential impact on active users who left comments, and the perspectives of individuals who view but do not interact with self-imagery are underrepresented in the included studies. Most studies only explored one platform, and overall there was a lack of generalisability (e.g., mostly White, female participants).

Potentially Harmful & Helpful Impact of Online Self-Harm Imagery

A summary of the potential negative and positive impacts and mechanisms associated are shown in Table 3 (see Appendix 1E for further information). All studies reported results indicating a negative impact, and nine studies also reported findings indicating a positive impact.

More evidence related to the potential harmful effects of self-harm imagery on emotions, behavioural reinforcement (sharing or commenting on imagery), help-seeking and giving, increased self-harm behaviour and cognitions, social connection, comparison, and competitiveness. Most of the evidence pertaining to a potential helpful impact related to the effects on social connection, help-giving and seeking, emotions, and mitigating self-harm behaviour.

Self-harm behaviour

Increase in self-harm.

Exposure to graphic images (Arendt et al., 2019; Baker & Lewis, 2013; Hetrick et al., 2020; Jacob et al., 2017; Sternudd, 2012), or videos (Brown et al., 2020; Lavis & Winter, 2020; Seko et al., 2015), were reported to “trigger” self-harm (although “triggering” was used to describe thoughts, feelings and behaviours across studies), with

some reporting an increase in the frequency and severity of self-harm (Baker & Lewis, 2013; Jacob et al., 2017; Lavis & Winter, 2020). Those who shared their self-harm images online appeared to engage in more severe self-harm over time, which was encouraged by the self-harm community (Jacob et al., 2017; Lavis & Winter, 2020), with some authors suggesting a possible normalising influence. Arendt et al. (2019) found that nearly a third of participants (32.5%) performed the same or similar self-harm as a consequence of seeing self-harm on Instagram, with some authors suggesting a potential social learning (imitative) influence. Some participants reported intentionally searching for self-harm imagery to trigger the right mood to self-harm (Arendt et al., 2019; Jacobs et al., 2017; Sternudd, 2012) or if they were already in a negative state of mind, self-harm imagery would push them to self-harm (Seko et al., 2015). Authors suggested a possible assortative relating influence, highlighting the importance of intention and pre-existing vulnerability factors associated with determining the potential impact of self-harm imagery.

Reduction in self-harm.

In Baker & Lewis (2013), viewing self-harm images gave participants a similar feeling to when they self-harm, so the act of viewing images served as a proxy to self-harm, suggestive of a possible emotional regulation mechanism. Others reported that viewing more severe self-harm, or seeing scars, discouraged individuals from self-harm at least in the short-term (Baker & Lewis, 2013; Brown et al., 2020; Seko et al., 2015; Sternudd, 2012), perhaps through aversion or disgust, and some used imagery as a strategy to avoid more severe self-harm acts (Baker & Lewis, 2013; Seko et al., 2015; Sternudd, 2012).

Sharing, commenting or reinforcing self-harm imagery

Encouraging self-harm imagery.

Participants reported that viewing self-harm imagery encouraged them to start self-harming or to post their own self-harm images (Baker & Lewis., 2013; Brown et al. 2020; Jacob et al., 2017; Seko et al, 2015). This was referred to as normalising. Images depicting wounds elicited more comments than images without self-harm, and images with more severe wounds generated more comments than those with less severe wounds (Brown et al., 2018). Comments and reblogs associated with self-harm images and videos, often normalised self-harm as an effective coping strategy (Lewis et al., 2012; Seko et al., 2018; Sternudd, 2012). This led viewers to reinforce the sharing of self-harm imagery by showing admiration to, complimenting, or encouraging uploaders (Brown, 2018; Lewis et al., 2012), or by showing empathy and offering help (Brown et al., 2018). Whilst these were not always framed as negative consequences, they may encourage viewers to create more severe content to receive continued validation and support, as reported in Lavis & Winter (2020).

Reinforcing recovery narratives.

Seko et al. (2018) found that the third most reblogged self-injury images included messages of hope and recovery, and approximately a third of images depicted scars or healing wounds, rather than bleeding injuries.

Help-seeking behaviours

Discouraging help-seeking.

Some studies found that there was little or no mention of successful referrals for professional help, or of recovery (Brown et al., 2020; Lewis et al., 2012). Additionally, imagery was reported to portray self-harm as a desirable behaviour (Baker & Lewis, 2013), encouraging others to create and upload similar images (Lavis & Winter, 2020; Seko et al., 2015), and get ideas for self-harm methods, or how to hide injuries (e.g., Brown et al., 2018; Lavis & Winter, 2020; Seko et al., 2018; Sternudd, 2012), reducing the likelihood of help-seeking. This was supported by Lewis et al. (2012), who found that the majority of content did not mention recovery and 34% of participants shared they were still self-harming.

Encouraging help-seeking.

Some studies found that self-harm imagery was a way of seeking help, support and advice from online self-harm communities (e.g., whether they needed medical support; Baker & Lewis, 2013; Lavis & Winter, 2020; Seko et al., 2015; Sternudd, 2012), and comments sometimes encouraged the uploader to seek help (Lewis et al., 2012) and resulted in a decrease in the frequency and severity of self-harm (Baker & Lewis, 2013), which may also encourage others to do the same.

Help-giving behaviours

Unhelpful help-giving.

Unhelpful help-giving, such as sharing self-harming imagery and portraying self-harm as an acceptable coping mechanism (Baker & Lewis, 2013; Lewis et al., 2012; Seko et al., 2015), or providing peer-support, self-disclosure (normalization/validation) or empathy (Brown et al., 2018, 2020; Fu et al., 2013; Sternudd, 2012; Seko et al., 2015), might inadvertently reduce help-seeking behaviours and maintain self-harm, or even escalate self-harm in order to maintain the same level of peer-support (Lavis & Winter, 2020). For example, Brown et al. (2018, 2020) found that images with greater wound severity received more comments, suggesting increased help-giving for those depicting more severe self-harm and distress. An escalation of self-harm may result through the sharing of new techniques, which might be conceptualised as help-giving (Brown et al., 2018; Jacob et al., 2017; Lewis et al., 2012; Sternudd, 2012), such as ideas on self-harm "safely", precluding offline help-seeking (Lavis & Winter, 2020). Help-giving may also lead to increased emotional strain and distraction from individuals' own needs by feeling pulled into help-giving roles.

Helpful help-giving.

Self-harm imagery encouraged others to provide online peer-support, helping individuals to identify with one another and feel socially connected, validated and less isolated (Baker & Lewis, 2013; Brown et al. 2018, 2020; Fu et al., 2013; Lavis & Winter, 2020; Lewis et al., 2012; Seko et al., 2015). Comments also encouraged others to stop the behaviour (Brown et al., 2018), seek help (Baker & Lewis, 2013; Brown et al., 2020; Lewis

et al. 2012; Sternudd, 2012) or offered help (Brown et al., 2018, 2020; Fu et al., 2013; Lewis et al., 2012; Sternudd, 2012). Images of scars or self-harm were sometimes shared to discourage self-harm and help others see how bad self-harm can get (Baker & Lewis, 2013; Sternudd, 2012). Self-harm imagery was sometimes reblogged with hopeful pro-recovery messages (Seko et al., 2018). Peer-support may reduce social isolation and self-harm and encourage help-seeking (Lavis & Winter, 2020).

Emotions

Change in emotions increasing likelihood of self-harm.

Many studies found graphic self-harm images and videos were disturbing and could trigger self-harm (Arendt et al., 2019; Brown et al., 2020; Jacob et al., 2017; Jaroszewski et al., 2020; Lavis & Winter, 2020; Lewis et al., 2012; Seko et al., 2015; Sternudd, 2012). Images could be used to promote the right mood for self-harm (Jacob et al, 2017; Sternudd, 2012).

Some reported that self-harm imagery brought back memories of past self-harm and mental imagery, enabling them to envisage self-harm and imagine how it felt, which brought relief (Jacob et al., 2017). Self-harm imagery could adopt a first-person perspective, which may have enabled users to imagine how it felt (Seko et al., 2018).

Changes in affect, such as invoking the right mood for self-harm, depression, grief, shock, disgust, isolation and concern were reported (Hetrick et al., 2020; Lavis & Winter, 2020; Sternudd, 2012; Cha et al., 2016).

Cha et al. (2016) found that self-harm images led to a greater decline in mood compared to words, particularly in females, suggesting that imagery may have a greater impact on emotions, which was also reported by Seko et al. (2015). Seko et al. (2018) and

Brown et al. (2018) found that images with wounds were shared less frequently than images without wounds, and Seko et al. (2015) found that individuals would put warnings on graphic images, suggesting they were aware of the triggering nature of imagery.

More comments were left for severe images, asking posters to stop self-harming (Brown et al., 2018), and some individuals engaged in cyberbullying, leaving hostile or cynical comments, such as urging posters to complete suicide or suggesting that they were attention seeking (Brown et al., 2018; 2020; Lewis et al., 2012; Fu et al., 2013), which may be both upsetting and stimatising.

Those with less experience of self-harm, were more likely to describe the impact of self-harm imagery as negative (Sternudd, 2012; Jaroszewski et al.,2020). Individuals with experience of suicidality rated third-person suicide images as more pleasant and arousing, and as less threatening than the non-suicidal history group (Jaroszewski et al., 2020). Jaroszewski et al. (2020) suggested that this might result from habituation (Interpersonal Theory of Suicide; Joiner, 2005), where repeated exposure to this stimuli becomes less frightening or aversive over time (increasing acquired capability), or because natural barriers (high aversion), which might typically inhibit self-harm or suicide, are lower (Benefits and Barriers Model; Hooley & Franklin, 2018).

Change in emotions decreasing likelihood of self-harm.

Some participants reported that viewing self-harm imagery gave rise to vicarious relief, “comfort” or “calm”, acting as a proxy so self-harm did not need to be enacted (Baker & Lewis, 2013; Sternudd, 2012). Some participants reported fear or disgust which helped to deter from self-harm or more severe forms (Baker & Lewis, 2013; Brown et al., 2020; Seko et al., 2015).

Self-harm cognitions

Increased thinking about self-harm.

Self-harm imagery increased thoughts about self-harm, such as evoking urges or inspiration to self-harm (Baker & Lewis, 2013; Chen et al., 2021; Jacobs et al., 2017; Lewis et al., 2012; Sternudd, 2012), and increased suicidal ideation and hopelessness, and reduced reasons for living (Arendt et al., 2019). There was some evidence that self-harm imagery evoked mental imagery of previous self-harm, enabling individuals to envisage what self-harm felt like, to feel anticipatory relief and want to self-harm in a similar way (Jacob et al., 2017).

Reduction in thinking about self-harm.

Some studies reported that anticipatory relief in response to self-harm imagery could also alleviate self-harm urges as if they had self-injured (Baker & Lewis, 2013; Seko et al., 2015; Sternudd, 2012). There is also some evidence that people felt validated by seeing others self-harm, and that imagery may promote reflecting on their experience, enabling self-harm urges to be resisted (Seko et al., 2015).

Physiological responses

Physiological change increasing desire to self-harm.

There was some evidence that powerful physiological reactions (e.g., “rush”, “fast heart rate”) could be triggers for self-harm (Jacob et al., 2017).

Physiological change leading to reduction in self-harm.

In direct contrast, there was also evidence that looking at self-harm imagery may incur a similar "adrenaline rush" to actually cutting, reducing self-harm behaviour (Baker & Lewis, 2013).

Social connection

Negative.

Online self-harm imagery enabled immediate, intimate connection, validation and support, and enabled individuals to identify with engaging in self-harm as an acceptable coping behaviour ("crowd mindset"; Baker & Lewis, 2013; Brown et al., 2020; Jacob et al., 2017; Seko et al., 2015, Sternudd, 2012). Lavis & Winter (2020) found that online peer-support could inhibit offline help-seeking, as individuals thought "normies" (those who do not self-harm) would not understand. Some studies found that online connection provided support that was missing offline (Lavis & Winter, 2020; Seko et al., 2015). To maintain connection, some participants felt like they needed to keep self-harming more severely to show they needed help (Lavis & Winter, 2020).

Positive.

Viewing self-harm imagery enabled individuals to identify with each other (e.g., through self-disclosure), to make sense of their experiences, feel less alone and more connected to a community (Brown et al., 2020; Baker & Lewis, 2013; Seko et al., 2015; Sternudd, 2012), providing some hope of recovery (Seko et al., 2018), which sometimes mitigated urges to self-harm (Baker & Lewis, 2013). Imagery may therefore create a sense of belonging and acceptance and reduce stigma.

Social comparison

Negative.

Individuals compared images with their own self-harm and reported a sense of pride if their self-harm appeared worse (Brown et al., 2020), or a sense of failure to confirm to social norms if their self-harm was not as severe (Hetrick et al., 2020; Jacob et al., 2017). Imagery encouraged others to compete with each other or become "better self-harmers", engaging in increasingly severe forms of self-harm (Baker & Lewis, 2013; Jacob et al., 2017; Sternudd, 2012).

Positive.

Sometimes imagery depicting more severe self-harm than individuals own, acted as a deterrent, perhaps due to increased self-reflection or aversion (Seko et al., 2015; Sternudd et al., 2012).

Personal identity

Encouraging self-harm identity.

There was some evidence of individuals developing a self-harmer identity, which could lead to an escalation of self-harm behaviours (Jacob et al., 2017). Some concerns were expressed that sharing imagery should be a private activity, or that their images would be interpreted as "attention seeking", suggesting fears around stigma which may discourage online and offline help-seeking (Jacob et al., 2017). Others felt a desire to advocate for self-harm communities, sharing "what's behind the scars" (Seko et al., 2015, 2018). Others also reported being triggered by viewing fading scars, which were experienced as a loss of identity (Sternudd, 2012).

Encouraging self-reflection and recovery.

Studies reported a possible impact on personal identity, allowing users to express themselves or document their recovery (Brown et al., 2010; Seko et al., 2015; Sternudd, 2012). Self-reflection enabled individuals to change their relationship to self-harm (e.g., scars being seen as proof of recovery and resilience), leading to reduced self-harm and feeling more in control (Seko et al., 2015; Sternudd, 2012).

Discussion

Main findings

This systematic review examined the evidence relating to the potential impact and mechanisms associated with viewing self-harm imagery via the internet and social media. Despite the concerns, resulting in changes to online harms policy and the banning of self-harm hashtags on Instagram, only fifteen studies to-date have explored the potential impact of self-harm imagery, highlighting the infancy of research in this area.

All studies found harmful effects of self-harm imagery exposure, such as being "triggered" emotionally, cognitively and behaviourally, which could lead to self-harm, being encouraged to share imagery or compete with others, escalating self-harm, normalising self-harm as an acceptable coping response, sharing tips, and the development of a "self-harmer" identity, with little mention of recovery or help-seeking. Most studies reported the negative impact on emotions and reinforcement through sharing and commenting on self-harm imagery.

Nine studies reported helpful effects, such as viewing imagery as a proxy to self-harm or being deterred from acting, leading to a reduction in self-harm, being encouraged

to offer and seek support on/offline, enabling self-reflection, and feeling connected. The most consistent evidence for a positive impact related to help-giving and social connection.

Self-harm imagery could sometimes be both harmful and helpful, with some evidence that this may depend on individuals' mood at the time (Seko et al., 2015). Imagery may therefore have different effects or functions at different times (e.g., emotional (dys)regulation, social connection), and further research should explore this.

The findings are broadly consistent with existing reviews highlighting both harmful and helpful effects of self-harm content online (Bell, 2014; Dyson et al., 2016; Daine et al., 2013; Lewis et al., 2016; Marchant et al., 2017, 2021; Memon et al., 2016; Picardoid et al., 2020; Jenkin, 2020), including via fictional and non-fictional screen media (Posselt et al., 2020), online, inpatient and community settings (Jarvi et al., 2013), suggesting that similar mixed effects and mechanisms may operate across contexts, although this warrants further exploration.

Most studies did not investigate or explicitly refer to the potential mechanisms associated with harmful and helpful effects beyond ideas of contagion, which assumes causality. Arendt et al. (2019) and Brown et al. (2018) were the only studies to test a contagion hypothesis, where exposure to self-harm imagery may increase self-harm, although their findings were somewhat contradictory. Arendt et al. (2019) found that exposure to self-harm imagery on Instagram predicted self-harm and suicide-related outcomes one-month later, even after controlling for exposure to similar content. Brown's time-related analysis did not find any evidence of social contagion (although they did find evidence of social reinforcement) as they did not identify any clustering of non-suicidal

self-harm (NSSI) photos on Instagram. However, analysis was limited to posted self-harm images, and contagion effects may occur over a longer timeframe, or even offline.

The potential mechanisms for harmful effects most commonly discussed or implied by the study authors included normalising, assortative relating, social learning, positive social reinforcement and emotional dysregulation (Table 3). The review authors also identified social integration and regulation (sharing ideas), priming (including mental imagery), habituation, lower aversion and competitiveness as potential mechanisms. Mechanisms related to helpful effects most commonly implied by the study authors included those aforementioned, in addition to emotional regulation, aversion and self-reflection. These potential mechanisms may provide an insight into the motivations for accessing these spaces, which seem to be most consistently related to emotional (dys)regulation and social connection. This supports broader theories relating to the function of self-harm, such as the four-function model (Bentley et al., 2014; Nock & Prinstein, 2004), which proposes that NSSI is maintained through four reinforcement mechanisms related to positive or negative automatic (emotional regulation) reinforcement, and positive and negative social reinforcement. The findings also support other emotional regulation or interpersonal influence models (Hasking et al., 2017; Hooley & Franklin, 2018; Klonsky, 2007; Rodham et al., 2004) and social learning theories (Nock, 2009). However, the evidence relating to mechanisms is weak, and further research should aim to directly explore these, to elucidate the impact and functions of viewing online self-harm imagery, and the maintenance factors that keep people accessing potentially harmful content.

Interestingly, ten studies found that participants had a history of self-harm or were currently self-harming, so may have chosen to access this content due to pre-existing vulnerabilities, as suggested by Joiner (2003) in relation to an assortative relating mechanism or habituation to aversive stimuli over time (Appendix 1D). De Riggi et al. (2018) found that adolescents with recent NSSI reported higher levels of social support seeking internet use and were more likely to share NSSI content online than adolescents with historic self-harm or no self-harm history. Further research is needed.

Limited evidence suggested that self-harm imagery may prime the re-experiencing of past self-harm, so future research should explore whether online imagery evokes mental imagery. Some findings from this review suggested that imagery was more emotionally provocative than verbal content, which supports mental imagery research (Holmes & Mathews, 2005, 2010).

Strengths and limitations of included studies

Most of the qualitative studies were high quality and most included large samples. However, notable limitations mean the findings of the review should be interpreted with caution. The quantitative studies were of low or medium quality. Studies reported inconsistent findings (Table 3), which might be explained by the heterogeneity of methodologies and because most studies only referred to one platform. Causality or directionality could not be determined as studies used cross-sectional retrospective self-report measurement of exposure to self-harm imagery and its impact, and there was limited use of validated measures. Furthermore, many participants were already self-harming, so the impact of self-harm imagery on individuals who do not self-harm is unknown.

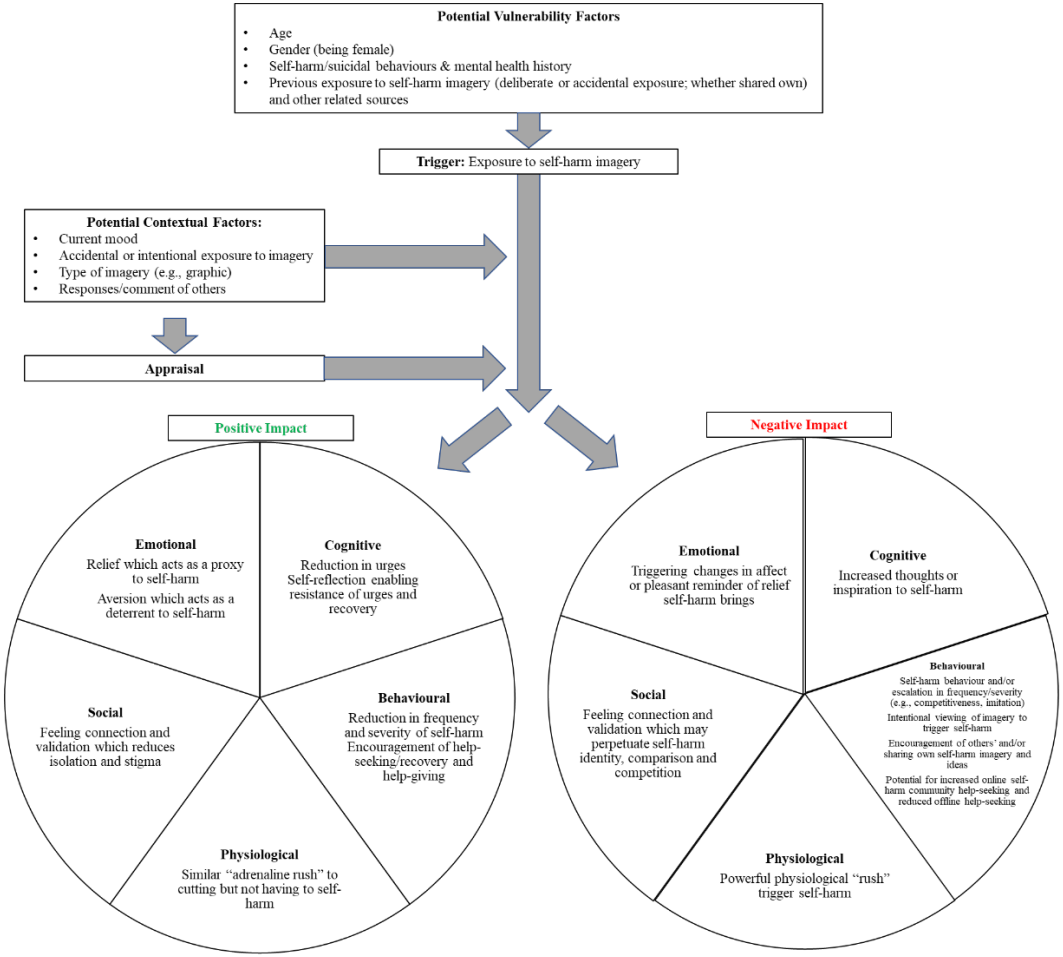
Additional limitations to generalisability apply because the majority of participants were White, Western and female.

Research implications

The findings were used to develop a conceptual model for further testing (Figure 2), suggesting how negative and positive impacts might arise through pre-existing vulnerability (e.g., self-harm history), contextual factors (e.g., mood), imagery appraisal by the viewer and others (e.g., through comments), the type of imagery and whether or not imagery has been intentionally viewed. Future research should investigate what contributes to the mixed findings related to harmful or helpful effects, and in which contexts they occur, such as whether different platforms give rise to different impacts, possibly due to moderation or recovery narratives. Specifically, the potential impacts, mechanisms, mediators and moderators may differ across those who have different self-harm or suicide histories, and future work should explore this by controlling for and comparing group differences related to self-harm (e.g., non-suicidal), suicidality and mental health history, as indicated in the potential vulnerability factors in Figure 2.

Figure 2

Model of Online Self-Harm Imagery Impact



Given that no study could determine directionality, causality or the duration of impact, further studies should employ experimental, longitudinal (e.g., diary or experience sampling methodology). Algorithm studies could also evaluate the impact of promoting recovery-based narratives. Lewis et al. (2018) found that participants who received hopeful peer feedback, had increased positive attitudes towards NSSI recovery.

Establishing gold-standard definitions of "graphic imagery", "triggering" and self-harm (rather than NSSI), would assist future work.

Clinical implications

Young people who self-harm are likely to use the internet in ways that increase their risk (Mitchell & Ybarra, 2007). The ten areas of potential impact could guide routine clinical assessments to explore the idiosyncratic impact and function of accessing self-harm imagery, and prevent harm by developing resilience, such as building emotional regulation skills and expanding peer support.

Most young people who self-harm do not access professional support (Kidger et al., 2012), so it is important to address the wider systemic factors contributing to vulnerable individuals seeking support online, such as the current mental health service context (e.g., long waiting lists) and perceived stigma (e.g., professional responses to self-harm; De Riggi et al., 2018; Fortune et al., 2008; Rowe et al., 2014; Saunders et al., 2012). Offering timely support, or having peer support mentors offline and online, could improve effective help-seeking.

Policy implications

In April 2019, the UK Department of Digital, Culture, Media and Sport (DDCMS) and the Home Office published the Online Harms White Paper (2019) highlighting the need to protect people from assumed harmful graphic content. Whilst all studies in this review indicate there are harmful effects of online exposure to self-harm imagery, there are also helpful aspects, such as reduced isolation. The impact of removing these spaces, such as by blocking hashtags, is unknown. More research into the effectiveness of trigger warnings is required, as some individuals proceed with images regardless of warnings (e.g., Baker & Lewis, 2013). Whilst imagery may require more restrictive regulation than verbal content, policy changes should be made following consultation with Experts by Experience and introduced gradually, so the impact of changes can be evaluated.

Limitations & strengths of this review

The systemic review did not include grey literature so is subject to publication bias. Publications not in English were also excluded. Studies were not excluded based on age of participants as this information was not always available; whilst more young people may use these online spaces, impact may vary with age (Jaroszewski et al., 2020). Some studies did not clarify whether the potential impact was positive, negative or both or explore the potential mechanisms involved, so this was interpreted with consensus between all the review authors. Nevertheless, the analysis of the themes relating to potential impact and mechanisms is subjective and not exhaustive, and it is possible that other readers may conceptualise these differently.

Particular strengths of the review relate to being the first (to our knowledge) to explore the potential impact and mechanisms of viewing self-harm imagery online, which

includes both quantitative and quantitative studies, and studies which analysed verbal content alongside imagery, as this is likely to influence how imagery is appraised.

Conclusion

This timely review explored the potential impact and mechanisms of exposure to online self-harm imagery. With new platforms being continuously developed, awareness of the potential harmful and helpful effects is vital. Overall, all fifteen studies reported evidence relating to harmful effects, such as escalating self-harm behaviours, emotional distress and behavioural reinforcement. There was also some evidence of helpful effects, such as peer support and connection. Although causality has been assumed, this is currently unknown. Most studies were cross-sectional and relied on retrospective self-report and did not test hypotheses related to mechanisms. Further research is warranted to determine the factors that contribute to the inconsistencies in helpful or harmful effects, and the conceptual model herein provides an initial framework for testing. Individuals may access online self-harm imagery for emotional (dys)regulation and social connection, and clinicians should routinely assess exposure to self-harm imagery and the function of accessing such content, to help build resilience and mitigate harm online.

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Service Improvement Project

Improving Safety Planning in an NHS Adult Inpatient and aligned Community Mental Health Team

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Target Journal: Crisis: Clinical Insights (Appendix 2P)

The Journal of Crisis Intervention and Suicide Prevention is an international journal that publishes original articles on suicidology and crisis intervention. Papers presenting practical experience in the field are welcomed.

Abstract

Evidence suggests safety planning interventions (SPIs) are effective in reducing self-harm and suicide risk. As part of one NHS Trust's suicide prevention strategy, this project used quality improvement methodology to improve SPIs across an adult inpatient and outpatient mental health team. The study examined whether SPI training, co-designed and co-delivered by Experts by Experience, would improve staffs' knowledge and confidence, the perceived usefulness and likelihood of SPIs, and increase the frequency and quality of SPIs being completed with patients. Knowledge, confidence and likelihood of using SPIs significantly improved following training. An improvement in SPI frequency was observed for both teams, but was not statistically significant, suggesting further measures, beyond training, are required. Reviewing the quality of SPIs against competency criteria, training feedback and informal discussions with staff, helped to identify recommendations for further training and practice. As the project was undertaken in only one NHS Trust, these recommendations may have limited generalisability; however, the outcomes provide insight into SPIs in clinical settings and highlight some of the possible challenges and solutions when implementing SPIs and training.

Keywords: Safety planning, training, self-harm, suicide, quality improvement

Introduction

Suicide rates are rising in the UK (NCISH, 2021), and self-harm is a major risk factor for suicide (Zahl & Hawton, 2012). Self-harm can be defined as any intentional self-injury or self-poisoning, irrespective of suicidal intent (Hawton et al., 2003; NICE, 2011). During 2008-2018, 27% of all UK suicides were amongst those who had been in contact with mental health services in the last 12 months (NCISH, 2021). Recently discharged inpatients are at an increased risk of suicide, with 43% of suicides occurring within a month (Hunt et al., 2009).

In 2016, the Five Year Forward View for Mental Health set a national target by 2020/21 to reduce suicide rates in England by 10% (Mental Health Taskforce, 2016). Health Education England (HEE, 2018) introduced a self-harm and suicide prevention competency framework to guide clinicians working with patients at risk of self-harm or suicide. This includes safety planning intervention (SPI) competencies, which map onto Stanley & Brown's (2012) manualised SPI, comprising six steps to co-producing a personalised written safety plan covering: 1) recognising warning signs; 2) identifying internal coping strategies; 3) utilising social contacts/settings as distraction; 4) utilising family/friends who can assist in a crisis; 5) contacting professionals/emergency resources; and 6) restricting access to means to minimise one’s ability to act on self-harm/suicidal urges.

A recent meta-analysis concluded that SPIs are effective at reducing suicidal behaviour (Nuij et al., 2021). SPIs and telephone follow-up reduced suicidal behaviour by nearly half, and improved outpatient treatment engagement six-months post-discharge from emergency departments (Stanley et al., 2018). SPIs are part of best practice for self-harm

(NICE, 2011) and Stanley & Brown's (2012) principles are becoming embedded in routine clinical practice.

Studies have shown that the quality of SPIs are important, with higher quality safety plans (covering more of the six components with higher specificity) being associated with fewer psychiatric hospital admissions (Gamarra et al., 2015) and reduced suicidal behaviour (Green et al., 2018; Miller et al., 2017). There have been promising efforts to train staff in SPIs (Bender et al., 2021; Ferguson et al., 2019; Labouliere et al., 2019; Stewart et al., 2020), and evaluate SPI practice (Moscardini et al., 2020). Whilst UK research is ongoing (O'Connor et al., 2019), little is known about SPI in routine clinical practice across inpatient and outpatient settings, and whether SPI training leads to an improvement in the frequency and quality of SPIs. In line with the emerging evidence base, and national and local self-harm/suicide prevention objectives (Appendix 2C), this study investigated the following questions in an inpatient and aligned outpatient NHS adult mental health service:

1. Does SPI training improve staffs' knowledge and confidence in SPI, and the perceived usefulness and likelihood of using SPIs?
2. What percentage of patients have a SPI or equivalent (*quantity*), and does training significantly improve the percentage of SPIs over time?
3. What percentage of the national and local standards (*quality components*) are being included in plans?
4. What changes in practice and systems are required to improve SPI across the Trust (*recommendations and functionality*)?

It was hoped that these clinical insights would add to the limited evidence base, inform future SPI training and improve practice.

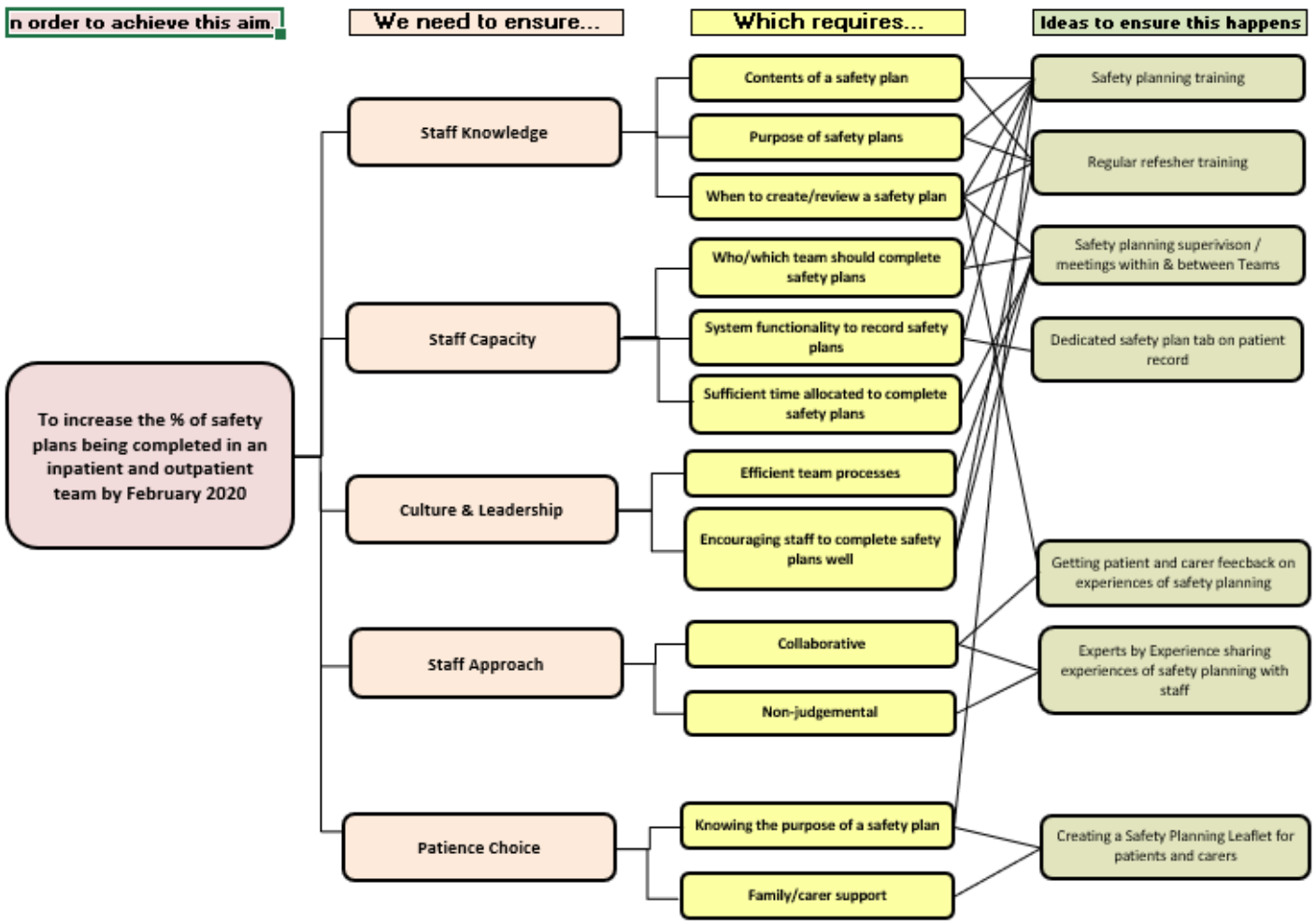
Method

Quality Improvement Design

Quality improvement (QI) methodology was implemented using a plan-do-study-act (PDSA) cycle with a time-series (AB) design (Portela et al., 2015; Speroff & O'Connor, 2004). In the 'plan' phase, discussions with clinicians led us to hypothesise that SPI training would lead to an improvement in the frequency of SPIs and the quality components being included (see driver diagram in Figure 1; Davidoff et al., 2015; Goeschel et al., 2012). The 'do' phase involved SPI training and collecting baseline (A; pre-training) and post-training (B) data from patient records on SPI practice, and informal staff feedback. The 'study' phase involved interpreting the results, and the 'act' phase identified recommendations and next steps to improve SPI practice and training. SQUIRE 2.0 guidelines informed report writing (Ogrinc et al., 2008).

Figure 1

Driver diagram outlining first test of change (PDSA cycle) - staff training with Experts by Experience



Consultation

An acute adult female inpatient ward and an adult outpatient community mental team were identified by KL based on reported learning needs, recent traumatic incidents and their readiness to contribute to the project. The trainee chaired meetings, four pre-training focus groups (two in each team) and three post-training focus groups (two outpatient, one inpatient) with managers and clinicians from both teams. This helped to inform the aims of the study (Figure 1), the outcome criteria and content of training, as well as obtain informal feedback on training and study findings. The trainee also consulted with the local QI team and six Experts by Experience from a Recovery College and a service user group, who contributed to the design and delivery of training (and patient questionnaires and qualitative interview schedules; see Appendix 2M). Experts by Experience were paid £10 p/hour.

Materials and measures

Training package

Training was comprised of HEE's SPI competency framework (Appendix 2D), Stanley & Brown's protocol (2008), local SP guidance, such as the importance of contingency planning at each step (if x does not work, try y and z), and 'Staying Safe' training guidance (https://stayingsafe.net/). In vivo role plays and questions to elicit answers for each step were included. Risk theory (Joiner, 2005), myth busting, ideas from motivational interviewing to address barriers of implementing SPIs, Cognitive Behavioural Therapy (e.g., thoughts not facts; problem solving) and Dialectical Behavioural Therapy (TIPP skill; validation; pros and cons) were included to help clinicians work with clients

who might be difficult to engage. Training incorporated Experts by Experience (e.g., role plays) and current service user experiences of SPIs (from qualitative interviews, such as reviewing SPIs; Appendix 2O) to highlight the importance of having the right approach. Live demonstrations on adding a written SP to patient records, creating an SPI alert and using the Stay Alive app (https://www.prevent-suicide.org.uk/find-help-now/stay-alive-app/) were given.

Training Feedback Questionnaire

Pre- and post-training questionnaires collated staff feedback regarding their knowledge and confidence, the perceived usefulness and likelihood of using SPIs and perceptions of training. Questions included Likert and free-text responses (Appendix 2I). A 10-point Likert scale avoided a midpoint (or hidden "don't know"; Zuell & Scholz, 2016) and forced positive or negative responses (Preston & Colman, 2000). A 4-month follow-up questionnaire examined whether scores were sustained and identify any barriers to SPIs since training.

QI outcome monitoring tool

A QI outcome monitoring tool (Appendix 2H) was developed through piloting; informed by the national standards from HEE and Stanley & Brown (2012) and local standards (e.g., evidence contingencies were discussed). A "safety plan" (SP) was defined as any plan that was evident in the patient record that included two or more of the six main content quality components of a SPI (e.g., identifying warning signs, reducing access to means). A plan was recorded as embodying SP principles if the plan only had one of six content principles. Six process criteria were also included (e.g., carer has copy of SP).

Procedure and Analysis

Training & Feedback

Eight SPI training sessions lasting 3-4 hours were co-delivered by KS and Experts by Experience from September-November 2019. Clinicians attended one session and completed questionnaires immediately before and after training. The follow-up questionnaire was emailed to clinicians 3-4-months post-training. Training packs and resources were sent to all clinicians, including those that had not attended. Pre- and post-training feedback scores were analysed using paired-samples t tests using SPSS v27. Informal themes from feedback forms and discussions with clinicians were collated but not formally analysed as this was beyond the scope of this study which focused on the quantitative findings (but see Appendix 2G). Findings were disseminated through staff feedback meetings.

QI outcome monitoring

Outcome standards and definitions were established by group discussion and piloting. Frequency and quality of SPIs (or equivalent/other plans) were assessed by KS through reviewing the patient record, assessments, clinical notes, care plans and/or correspondence for all patients where a risk of self-harm/suicide was identified in their risk assessment. Data was divided into two-week intervals from 4th April 2019 to 5th February 2020 to ensure at least 10 baseline (A; pre-training) and 10 post-training (phase B; intervention) data-points (Benneyan & Lloyd, 2003).

For inpatients, the frequency and quality of SPIs was assessed on discharge to the community. Due to small numbers of discharges per month, all eligible patient discharges

were included in the analysis, but this varied from 1-10 at any given time point. Two time-points yielded no eligible discharges, so the next two-week time points were used. Double-counting was avoided by removing repeat patients from the analysis (e.g., if discharged twice over time points). For the female inpatient service, a total of 93 patient discharges were identified. Training was delivered during weeks 11 to 15 (inclusive) across the 20 time points.

For the community team, 10 eligible patients for each two-week time-point were randomly selected from first appointments (as training encouraged SPIs from the first contact). To ensure comparable time-points were used across outpatient and inpatient services, 22 timepoints were used for the outpatient team (covering the two timepoints where the inpatient service had no eligible discharges), yielding a total of 220 patient records to be reviewed. Patients' records were searched for evidence of SPI within one-month of the first appointment. Training was delivered during weeks 12 to 16 (inclusive) across the 22 time points.

For the QI time-series analysis, percentages of SPI and quality outcome measures (content and process) were calculated over time for each team using an AB design. No formal statistical tests were undertaken. Instead, the Life Qi website (www.lifeqisystem.com) analysed SPI percentages to create Statistical Process Charts (SPC) to test the hypothesis that training would significantly increase the percentage of patients with a SPI. SPC charts enabled the identification of natural variation ("common cause"), and variation that was unlikely to be due to chance ("special cause variation" (SCV)) suggesting a statistically significant change had occurred (Benneyan & Lloyd, 2003). I charts (termed individual charts) were chosen because they are flexible and can be

used for a range of circumstances if data is collected regularly. Confidence limits (the mean) were set for the baseline (A) and intervention period (B) where SPI training had been introduced to the system. To avoid Type I or II error, upper and lower control limits were set at ±3 sigma of the distribution of the data (similar to SDs, but where normal distribution cannot be assumed) because almost all data falls within ±3 sigma of the mean if the underlying distribution is stable (in statistical control; Benneyan & Lloyd, 2003). Attention was paid to any 'astronomical' values (outliers) outside of the control limits as this indicated a significant change had occurred in the system, with a small probability of error (Portela et al., 2015). Aside from outliers, Life Qi also has other 'rules' it tests for to determine if a SCV has occurred in the intervention phase (see Appendix 2K; Benneyan & Lloyd, 2003; Mohammed et al., 2008)). Given that percentages based on a small number of data points can be susceptible to extreme scores, run charts using the median values were also explored, but did not change the interpretation of results (Appendix 2L).

The percentage of SP quality data (content and process outcomes) from any plan (comprising one+ components) were analysed descriptively but were not inputted into SPC charts due to missing data (not all timepoints had a SPI or equivalent). However, overall percentages enabled quick identification of areas for improvement.

Ethical approval

The NHS Trust's R&D and audit team confirmed that HRA ethical approval was not required. A quality improvement proposal form was approved by the audit team lead and clinical directors on the 26th of April 2019 (Appendix 2B).

Results

Clinician Demographic Information

97 staff across the inpatient and outpatient teams attended training and completed pre- and post-measures. 74% of staff were from outpatient teams, 16% were inpatient, and 9% did not specify. Approximately 50% of clinicians attended the training. Table 1 provides details of staff who attended training. 75% of staff were permanent, 20% were temporary/locum and 5% did not specify.

Table 1

Percentages of staff who attended training

Role	**Team**			
	Inpatient	**Outpatient**	**Not specified**	**Overall**
Health Care Assistant	37.50%	1.39%	0.00%	7.22%
Housing Officer	0.00%	1.39%	0.00%	1.03%
Manager	6.25%	6.94%	0.00%	6.19%
Medic/Psychiatrist	0.00%	16.67%	0.00%	12.37%
Not specified	6.25%	13.89%	44.44%	15.46%
Nurse	43.75%	27.78%	33.33%	30.93%
Occupational therapist	0.00%	9.72%	0.00%	7.22%
Other	6.25%	4.17%	11.11%	5.15%
Peer tutor	0.00%	1.39%	0.00%	1.03%
Psychologist	0.00%	1.39%	0.00%	1.03%
Recovery worker	0.00%	4.17%	11.11%	4.12%
Social worker	0.00%	11.11%	0.00%	8.25%
Overall	100.00%	100.00%	100.00%	100.00%

Table 2

Experience of SP across teams

Have you created a safety plan with patients before?	Team			
	Inpatient	**Outpatient**	**Not specified**	**Grand Total**
No	43.75%	34.72%	11.11%	34.02%
Yes	56.25%	59.72%	33.33%	56.70%
Not specified	0.00%	5.56%	55.56%	9.28%

Just over half of inpatient and outpatient staff (57%) had some experience of SPIs (Table 2). A little over a third of staff (34%) reported no experience of SPIs, and 9% did not specify.

1. Did SPI training improve staffs' knowledge, confidence, likelihood and usefulness of SPIs?

Paired-samples t tests showed that training significantly improved staff members' knowledge (Pre: M=5.45, SD=1.93; Post: M=8.24, SD=1.38), confidence (Pre: M=5.29, SD=2.11; Post: M=8.15, SD=1.19) and the likelihood of using SPIs (Pre: M=6.13, SD=2.64; Post: M=8.21, SD=1.77; Table 3). Perceived usefulness of SP increased following training (Pre: M=8.23, SD=1.73; Post: M=8.68, SD=1.31), but this did not reach clinical significance after Bonferroni correction (0.05/4 = 0.0125). Overall training was deemed useful (8.53/10).

Table 3

Pre- and post-training scores

Component	Pre-training Mean (SD) (All data; n=97)	Post-training Mean (SD) (All data; n=97)	Paired-samples t test (Paired data only)	4-month follow-up Means (SD) (n=16)
Knowledge of SPIs	5.55 (1.97)	8.22 (1.38)	*t*(86)=-12.80, p=0.001	7.94 (0.77)
Confidence in SPIs	5.39 (2.17)	8.12 (1.19)	*t*(86)=-13.89, p=0.001	8.00 (0.82)
Likelihood of SPIs	6.16 (2.67)	8.24 (1.73)	*t*(85)=-8.07, p=0.001	7.25 (2.11)
Usefulness of SPIs	8.19 (1.72)	8.60 (1.29)	*t*(70)=-2.44, p=0.017	8.00 (1.37)
Usefulness of SPI training	-	8.53 (1.46)	-	-

Clinicians reported in the post-training focus groups that there was increased awareness of SPIs which led to changes in clinical care with SPIs being incorporated at assessment, discharge planning and reviews. The main barriers to using SPIs related to patient motivation, shortage of time, and SPIs not following the patient or being locatable on their records. Clinicians felt SPI training should be made mandatory for all staff, be included in the induction, include real life examples of good and bad SPIs with differing complexity, be followed up with regular refresher sessions and be reviewed in team meetings and supervision. Other informal themes regarding clinicians' hopes, experiences of SPI training, perceived changes, challenges following training and ways to make SPIs more effective are shown in Appendix 2G.

Clinicians (n=16) responded to a follow-up questionnaire sent 3-4-months after training. There were sustained improvements in knowledge, confidence and likelihood of SP compared with pre-training. There was a slight reduction in usefulness of SP scores at

follow-up. 81% of staff reported they had completed safety planning since training. Informal feedback from clinicians' post-training questionnaires and three post-training focus groups revealed several positives, including: patients feeling empowered by SPI to identify triggers and take responsibility for managing difficulties, improved communication between patients and staff, staff feeling better equipped to implement effective SPIs, and incorporating SPs as part of admission packs and having them printed. Barriers to SPIs included difficulties engaging patients in the process or when they lacked insight or were in a crisis (not well enough to reflect), clients not meaningfully engaging with SPIs (e.g., complying with SP to enable discharge), SPI not always being effective, and SPs not being uploaded to patient records.

2. What percentage of patients have a SPI or equivalent (quantity), and does training significantly improve the percentage of SPIs over time?

Inpatient

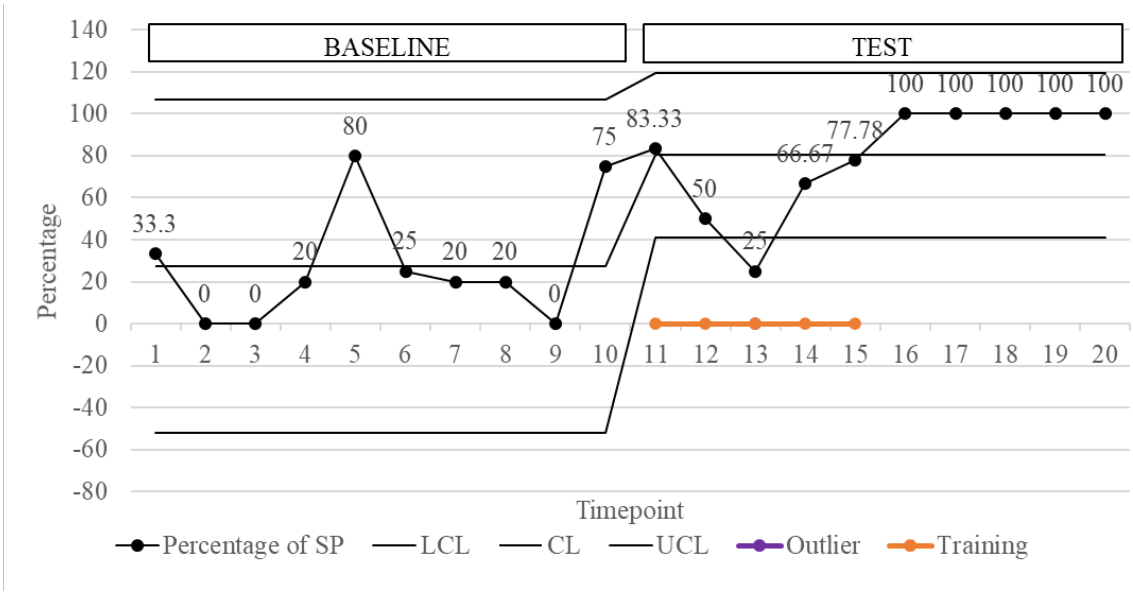
Of 93 eligible discharges, 45 patients (48%) had evidence of a SPI or equivalent (with two+ main principles) on their patient record upon discharge, and nine (10%) had a plan with only one main principle, totaling 54 (58%). 42% of patients had no evidence of any SPI principles in their records. SPs were mostly found in the care plan (52%), correspondence (41%), and clinical notes (7%). Plans were referred to as SP, SP leaflet, care plan, contingency plan, crisis plan or discharge plan, with 69% being called SPs.

Figure 2 shows that before training (baseline) 27.33% of inpatients were discharged with a SPI. Post-training, this increased to 80.28%, showing an overall improvement in SP completion at discharge by 53%. However, this was not statistically significant as no SCV

was evident in the test phase; with the exception of one negative outlier which showed a decrease in SPs in October 2019, but the cause for this was not identified. It is important to note that in the last 10 weeks (5 datapoints), all discharges left with a SP.

Figure 2

SPC (I) chart showing the percentage of inpatients with a SPI over time (with confidence limits).



Outpatient

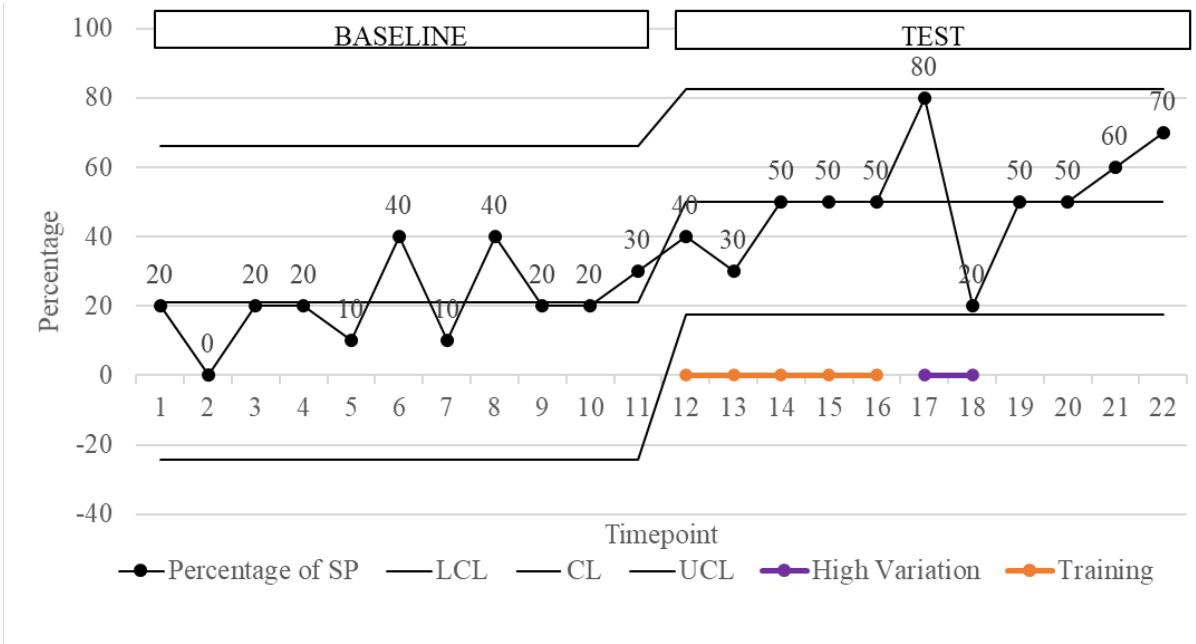
Out of the 220 patient records reviewed, 78 (35%) contained evidence of a SPI or equivalent and 46 (21%) had evidence of one of the six main SP principles, totaling 124 (56%). 43% of patients had no evidence of any SPI principles. SPs were mostly found in the care plan (42%), clinical notes (24%), risk assessment (17%), correspondence (13%)

and assessment tab (5%). Plans were called a SP (36%), care plan, crisis plan or relapse prevention plan.

Figure 3 shows that the percentage of patients with a SP following their first outpatient assessment or treatment appointment did increase over time, from 20.91% (pre-training) to 50% (post-training), but this change was not statistically significant. The cause of high variation in week 18 could not be identified.

Figure 3

SPC (I) chart showing the percentage of outpatient patients with a SPs over time (with confidence limits).



3. What percentage of the national and local standards (*quality components*) are being included in plans?

Inpatient

The percentage of all plans (n=54) that included at least one content quality component is shown in Table 4. Most quality indicators improved pre- to post-training, with a particularly marked improvement in SPs being completed collaboratively. However, variability was high, most likely due to small sample used to calculate percentages, so caution must be taken when interpreting the findings. Triggers and warning signs, internal coping strategies and professional contacts were included in SPs the most. Areas for improvement included differentiating the role of social contacts as a distraction and/or helping to resolve a crisis, and reducing access to means, which changed relatively little after training. Contingency planning was rarely evidenced in patient records, and it was often unclear whether the carer knew they featured in the SP or whether both patient and carer had a copy.

Table 4

Percentages where SPI quality components evident across plans for inpatients over time

	Baseline (Pre SP training)											Test (Post SP training)											Overall
Quality	1	2	3	4	5	6	7	8	9	10	**M**	11	12	13	14	15	16	17	18	19	20	**M**	**M**
1. Triggers & warning signs	100	-	-	100	100	100	67	75	-	67	**84**	100	100	100	100	75	100	100	100	100	100	**94**	**91**
2. Internal coping strategies	100	-	-	50	100	0	33	75	-	100	**68**	60	100	50	40	75	75	100	100	100	100	**74**	**72**
3. Social contacts as distraction	100	-	-	0	25	0	67	0	-	0	**21**	0	0	0	0	38	0	0	0	0	0	**9**	**13**
4.Social contacts to resolve crisis	100	-	-	50	25	0	0	0	-	0	**16**	20	0	50	20	50	25	67	100	100	100	**46**	**35**
5.Professional contacts	100	-	-	50	50	50	67	25	-	100	**58**	80	50	50	60	100	100	100	100	100	100	**86**	**76**
6.Reducing access to means	0	-	-	0	0	0	0	0	-	0	**0**	40	0	0	20	13	0	0	0	0	0	**11**	**7**
Contingencies discussed	0	-	-	0	0	0	0	0	-	33	**5**	0	0	0	0	0	0	0	0	0	0	**0**	**2**
SP written by patient	0	-	-	0	50	0	0	0	-	33	**16**	20	50	50	0	25	0	33	100	50	0	**26**	**22**
SP completed in collaboration	0	-	-	0	75	0	0	0	-	33	**21**	80	100	50	80	88	100	67	100	50	100	**80**	**59**
Copy of SP given to patient	0	-	-	50	50	50	67	75	-	0	**47**	80	0	50	60	75	75	67	100	25	0	**60**	**56**
Carer knows they are in SP	100	-	-	0	50	100	0	0	-	0	**33**	0	0	100	0	29	0	0	100	0	0	**17**	**21**
Carer given copy of SP	100	-	-	0	50	0	0	0	-	0	**22**	0	0	100	0	14	0	0	0	0	0	**8**	**12**

Note: n contributing to each datapoint ranged from 1-8. Some datapoints are missing as there was no plan with any SP components completed during that timepoint or it was not applicable (e.g., if no carer support were identified then giving them a copy would not be possible). M=mean. First six quality rows relate to content, last six components relate to process.

General issues with SPI practice included out-of-date versions of the SP template, referring to SP in notes but not uploading them, contact numbers for friends/family not being provided, rarely explaining why a SP was not completed (e.g., non-engagement), SPs or equivalent being hard to find (although sometimes an alert stated the location), SPs being restarted from scratch (rather than reviewed), in very short space of time resulting in a lack of continuity for the patient.

Outpatient

Quality components included in all plans (n=124) are shown in Table 5. Overall there was no marked difference in content or process measures from pre- and post-training, which may reflect the high variation in the data. Most SPIs included professional contacts, and around a third included triggers and internal coping strategies. SPs rarely evidenced including social contacts for distraction or resolving a crisis or reducing accessing to means. No evidence of discussing contingencies were found, and there was little evidence of SP being written by the patient.

Table 5

Percentages of SP quality components evident across plans in outpatients over time

	Baseline (Pre SP training)												Test (Post SP training)												Overall
Quality	1	2	3	4	5	6	7	8	9	10	11	**M**	12	13	14	15	16	17	18	19	20	21	22	**M**	**M**
1. Triggers & warning signs	0	0	0	33	0	75	33	100	0	33	75	**32**	25	29	43	38	13	63	22	29	43	43	71	**37**	**35**
2. Internal coping strategies	0	0	50	67	0	25	0	50	29	0	25	**24**	50	29	57	63	25	63	22	57	57	57	100	**52**	**43**
3. Social contacts as distraction	0	50	25	0	0	0	0	0	0	67	0	**10**	13	0	14	38	13	25	0	29	14	43	57	**22**	**18**
4.Social contacts to resolve crisis	25	0	0	0	0	0	0	25	0	0	0	**5**	0	14	0	0	13	13	0	0	14	0	0	**5**	**5**
5.Professional contacts	75	50	100	100	100	100	100	100	100	100	100	**95**	75	100	100	88	88	75	89	100	86	86	100	**89**	**91**
6.Reducing access to means	75	0	0	0	0	0	0	0	0	33	0	**10**	0	0	14	13	25	25	0	0	0	0	0	**7**	**8**
Contingencies discussed	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
SP written by patient	0	0	0	0	0	0	0	0	0	33	0	**2**	0	0	14	0	13	13	0	14	14	0	29	**8**	**6**
SP completed in collaboration	25	100	50	0	0	25	0	50	14	67	75	**34**	0	14	14	50	38	50	22	57	57	71	29	**36**	**35**
Copy of SP given to patient	25	0	0	33	0	50	33	75	0	33	25	**24**	0	43	43	13	13	38	22	29	57	57	14	**29**	**28**
Carer knows they are in SP	-	0	0	-	0	-	-	33	-	100	-	**33**	0	22	100	0	100	20	0	0	100	33	25	**31**	**32**
Carer given copy of SP	-	0	0	-	0	-	-	33	-	50	-	**22**	0	0	100	0	50	20	0	0	0	0	25	**14**	**16**

Note: n ranged from 1-9; M=mean. First six quality rows relate to content, last six components relate to process.

General observations included SPs not being completed if a patient was not accepted for treatment (a missed opportunity for prevention), no SP completed despite risks which sometimes led to escalation (e.g., inpatient admission), failure to review existing plans, SP being referred to in the notes but not locatable, and no agreed place for the assessment team to upload SPs.

Discussion

To our knowledge, this project is the first to explore the impact of SPI training on actual clinical practice, to improve safety planning across an inpatient and aligned outpatient adult mental health team in an NHS Trust. Training of 97 clinicians significantly improved staff members' knowledge, confidence and likelihood of implementing SPIs, which supports other findings (Bender et al., 2021). Prior to this training, few people had been trained in the use of SPIs, clinicians did not feel confident in SPIs, and they were not routinely documenting SPIs on patient records. Clinicians' feedback highlighted that SPI training was helpful in creating change in the system in a variety of ways, such as increasing awareness and use of SPIs, as well as flagging areas in need of improvement. Whilst the training did lead to some improvement, where the percentages of patients having a SPI increased across both inpatient and outpatient teams, training did not lead to significant change.

The inpatient team reported a larger but more variable improvement in increasing patients with a SPI compared with the outpatient team, which might be reflective of the inpatient team being a microcosm with a smaller and more variable number of patient discharges contributing to large changes in percentages. Whilst there was no significant change, a trend was emerging with five data points above the centerline, and only one more

data point above the centerline would have been required to show a significant change if percentages were not already at ceiling (100%). In contrast, the improvement in outpatients was not as marked but was less variable, which might reflect the larger team where a more consistent number of patients contributed to the overall percentages. Larger improvements in the inpatient team might also be related to risk, in that SPIs are often completed as inpatients tend to have higher risk of self-harm/suicide than community patients. Staff turnover in both teams, and relatively low rates of attendance at training (~50%), may also have accounted for the lack of a significant change.

Overall the findings suggest that SPI training increased the percentage of inpatients and outpatients with a SPI, but that training alone is insufficient to produce significant changes in practice, and additional measures are required (see Figure 1). This supports Moscardini et al. (2020), who found that self-reported training in SPI and familiarity with Stanley & Brown's (2008) manual, were not significantly associated with SPI use. As suggested by discussions with clinicians, measures to increase SPI culture within teams may be achieved through regular training and refresher sessions, SPI updates and supervision. In an anonymous survey of 119 safety plan providers, Moscardini et al. (2020) found that 70% of people indicated a need for further training, despite routinely using SPIs. Bender et al. (2021) also highlighted the need for booster training sessions, as they found that 6 months post-training, knowledge and perceived behavioural control declined. Discussing SPI practice in supervision may be particularly helpful as clinician-level individual factors contribute to whether a clinician completes a SPI (Chesin et al., 2017; Moscardini et al., 2020). Negative staff attitudes towards those who self-harm may also be

a factor (Saunders et al., 2012). Supervision and further training should explore and name these potential biases that might influence SPI decision making.

Evaluating the quality components included in all plans revealed that teams were better at including contact numbers for professionals, identifying triggers and internal coping strategies, but rarely included reducing access to means or differentiating between social contacts that can be used to distract or those that would help resolve a crisis. Contingency planning was almost never evident. This is surprising, given the evidence base emphasises the importance of reducing capability and access to means (Joiner, 2005; O'Connor, 2011). However, the lack of evidence for a SP and SPI quality components in a patient record does not necessarily mean that they were not completed and may actually reflect poor clinical record keeping rather than SPI practice. In contrast, Moscardini et al. (2020) found that staff often self-reported including social contacts as a means of distraction (90%), social contacts to help resolve crisis (90%), and means restriction (86%), but this may not be borne out in actual clinical practice. Nevertheless, the lack of evidence of SPIs on patient records does prevent continuity of care and effective SPIs as other clinicians/teams will not be aware of the SP, which both staff and patients identified as being important. Based on the findings of this study, the SPI Trust template was revised to include contingency planning and also to ensure there are conversations about reducing access to means (Appendix 2Q). A dedicated SPI tab is also being added to patient records. Findings were also fed back to the teams, who agreed to continue working on the areas of improvement and implementing the recommendations identified (Appendix 2F).

Furthermore, the presence of a quality component on a SP does not necessarily indicate a higher quality SPI, because as Gamarra et al. (2015) found that these components

can be discussed in different ways, with higher specificity in approach indicating higher quality SPIs. Collaboration is important, which was not always evident in SPIs in our study. Miller at al's (2017) findings suggest that self-administered plans may be lower quality and less well retained. Additional training that focuses on enhancing the specificity and the collaborative nature of SPIs, such as using a Contextual Behaviour Science (CBS) approach (Weinstein et al., 2021), might help improve the quality of SPIs and patient outcomes.

Limitations

Limitations to this study include the small and variable sample sizes (10 patients for community team and often fewer for the inpatient service) for each datapoint used to create SPC charts, which might explain the high variation in the data. Future studies may want to collate data over a longer time period to ensure a more consistent sample is available and assess if the results are sustained (Benneyan & Lloyd, 2003). Follow-up data was only collected from 17% of participating clinicians so it is unclear whether changes in knowledge, confidence and likelihood were sustained, and future work should aim to explore this. Analysis was not completed for a comparable control group that did not receive training to explore whether SPI practice would have improved over time without any intervention (Speroff & O'Connor, 2004). No formal statistical analysis was conducted to take into account the 5 week training period and therefore for publication purposes single-case analysis will be explored. The findings might also not be generaliseable to other services, particularly as the two teams in this study expressed an affinity to engage in SPI training, which other teams or services may not share. A pilot to develop the QI outcome tool was undertaken by KS & KL, and the SPI frequency and quality analysis was

completed by KS. Whilst the authors met for frequent discussions, the reliability of ratings have not been formally verified so the results should be viewed with caution.

Conclusion

The study provides support for SPI training in adult mental health services and provides insight into clinical practice. Training alone was not sufficient to significantly improve SPI practice and additional measures are required by the Trust, particularly in the context of high staff turnover. Based on the study findings, changes have been made to the Trust's safety planning template and a dedicated space on patient records will be developed to improve documentation. Future work should aim to implement additional measures and assess the impact (through further PDSA cycles; Figure 1), enhance training to increase the specificity of SPIs, explore personal factors that may influence SPI decision making, obtain more patient and carer experiences of SPIs and assess the impact on patient risk outcomes.

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Theoretically Driven Research Paper

A Preliminary Investigation of Visual Self-Harm-Related Mental Imagery in Young People: A Mixed-Methods Approach

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Target Journal: Journal of Child Psychology and Psychiatry (JCPP; Appendix 3P)

This is a leading international journal covering both child and adolescent psychology and psychiatry, with the aim of furthering knowledge of the mental health and behaviour of children and adolescents.

Abstract

Background: Growing evidence suggests that self-harm-related mental imagery (SH-MI) is involved in self-harm ideation-to-enactment. However, there has been little research in adolescent populations.

Method: A mixed-method study, using both a questionnaire (Study 1: n=55) and qualitative interviews (Study 2: n=16), explored the role of SH-MI in a transdiagnostic clinical population of young people who had recently self-harmed (Study 1 & 2), and whether negative affect (NA) and future-oriented SH-MI could predict self-harm frequency (Study 1).

Results: Study 1 found that SH-MI was highly prevalent with 96% of young people reporting future-oriented and past imagery. A hierarchical multiple regression found future-oriented imagery was a significant predictor of self-harm frequency, after accounting for depression, anxiety, age and NA. NA was inversely related to self-harm frequency, which may reflect divergent affect regulation functions of self-harm or lower thresholds. Study 2 identified three themes relating to SH-MI: 1) origins and context, 2) impact, and 3) the factors that affect the impact of imagery. Imagery could trigger self-harm but also be protective.

Conclusion: SH-MI is likely to play a role in ideation-to-enactment in young people. However, further research with less reliance on retrospective self-report is required. Clinical implications are discussed.

Keywords: Self-harm, mental imagery, young people, mixed-methods, qualitative, regression

Introduction

Self-harm is defined as any non-fatal intentional self-injury or self-poisoning, irrespective of suicidal intent (Hawton et al., 2003; NICE, 2011; although some differentiate between suicidal and non-suicidal self-harm (NSSI)). Self-harm is the strongest predictor of suicide (Carroll et al., 2014). Rates of self-harm are far higher in young people than adults, particularly females under 16 years (Geulayov et al., 2018).

One function of self-harm is to relieve emotional distress (Klonsky, 2007; Rodham et al., 2004), with high negative affect (NA) predicting self-harm in adults and adolescents (Nielsen et al., 2016). Several affect regulation theories of self-harm have been proposed (Hasking et al., 2017a). The Emotional Cascade Theory (Selby & Joiner, 2009) posits that individuals engage in self-harm as a means of distraction to break the emotional cascade of increasingly distressing cognitive processes (e.g., rumination). Over time self-harm is negatively reinforced by the reduction in distress and becomes a conditioned response to NA (Selby & Joiner, 2009).

Hasking et al. (2017b) suggested that mental imagery (MI) may work in a similar way to rumination (verbal thoughts), increasing distress and contributing to negative emotional cascades, increasing the risk of self-harm. MI is a perceptual experience in the absence of any external sensory input (Holmes & Mathews, 2010). MI can be multi-sensory although visual MI is the most studied and has been implicated in several disorders (Holmes & Mathews, 2010; Ji et al., 2019). MI is more emotionally activating than verbal thoughts (Holmes & Mathews, 2005) and a strong predictor of future behaviour (Libby et al., 2007) and beliefs about future outcomes (Carroll, 1978).

MI may be associated with an increased risk of suicide and self-harm. Holmes et al. (2007) found that depressed and suicidal individuals experiencing future-oriented suicidal "flash-forward" MI reported more severe suicidal ideation. Adolescents reporting suicidal MI (64%), had 2.4 greater odds of making a suicide attempt in psychiatric inpatient settings (Lawrence et al., 2021). Hasking et al. (2017b) found support for the Emotional Cascade Theory in a university student sample, where the tendency to think in images moderated the relationship between NA and the odds of self-harm. McEvoy et al. (2017) reported that >90% of adults reported that their cognitions immediately prior to self-harm were imagery-based, and most frequently depicted the self-harm act. Cloos et al's (2020) diary study of young adults found the frequency of NSSI and NSSI-MI were correlated, with imagery almost always occurring before NSSI. The only qualitative inquiry into SH-MI found individuals experienced future-oriented and past imagery, which could trigger self-harm (Dargan et al., 2016).

The tendency to experience visual future-oriented self-harm-related imagery (SH-MI), may result in even stronger emotional cascades, making self-harm more likely (Hasking et al., 2017b). However, most studies have been limited to university-based adult samples, or focused on suicidal imagery (Lawrence et al., 2020), evaluated a brief SH-MI intervention in youth aged 16-25 years (Simplico et al., 2020). A mixed-methods study was therefore conducted in a clinical population of young people aged 14-24 years old who had recently self-harmed, to investigate whether SH-MI is related to self-harm frequency (Study 1: Self-report Questionnaire) and to further understand the relationship through an in-depth analysis of individuals' experiences (Study 2: Qualitative Inquiry). Studies investigated:

Primary questions:

1. What is the prevalence of future and past-oriented SH-MI (Study 1)?
2. Does the frequency of future-oriented SH-MI, predict the frequency of self-harm (Study 1; Hypothesis 1)?
3. Does SH-MI play a role in self-harm ideation-to-enactment (Study 1 & 2)?

Secondary question:

4. Does NA predict self-harm frequency? If so, does future-oriented SH-MI moderate the relationship between NA and self-harm frequency? Individuals experiencing more future-oriented SH-MI, were predicted to experience stronger cascades (greater NA) and greater self-harm; Study 1; Hypothesis 2).

Overall approach

A parallel triangulation mixed-methods design was adopted (Creswell & Clark, 2010), where data were collected concurrently and analysed separately. Findings were integrated and interpreted in the discussion. Given the infancy of research and the limitations imposed when balancing ethics and feasibility with methodological rigour, experimental or longitudinal methods (e.g., diary study) were considered, but deemed unfeasible in this population within the study timescale (particularly due to COVID-19 impacting clinical teams). Greater weight has been given to the qualitative findings to provide a rich understanding of the interplay between affect, mental imagery and self-harm in this population.

Eight Experts by Experience aged 14-24 years were recruited through participation forums to consult (Appendix 3A) on the measures and were paid £10 p/hour.

Ethical approval was given by West Midlands Black Country Research Ethics Committee (ref: 20/WM/0148; Appendix 3B).

Study 1: Self-report Questionnaire

Participants

Convenience sampling recruited eligible young people who had self-harmed in the last two months (Appendix 3C for inclusion/exclusion criteria) through clinicians from 21 community and an inpatient NHS mental health team.

Measures

Questionnaires were presented on Qualtrics (2020; Appendix 3H). Self-report measures with good psychometric properties and validated across adolescents and adults were chosen where available and applicable (see Appendix 3G for more information).

Primary outcomes

The NA subscale from the Positive and Negative Affect Schedule (PANAS-SF; Watson et al., 1988) was used to measure experiences of ten NA states (e.g., distressed) before self-harm in the last two months. Responses were gathered on a 5-point Likert scale from 1 (not at all/very slightly) to 5 (extremely), where higher scores indicated greater NA (ranging 10-50). Internal consistency in this study was acceptable ($\alpha = .76$).

The frequency of self-harm and visual future-oriented SH-MI were measured by asking participants to estimate their frequency in the last two months on a 9-point Likert scale, from 0 (none) to 8 (more than twice per day). SH-MI was identified by participants as anything they considered related to their self-harm, but a checklist helped ensure consistency in self-harm and imagery definitions (Appendix 3D).

Ending on positive imagery questions was used as a mood elevation technique in both studies (Lloyd-Richardson et al., 2015).

Covariates

Scores on the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) and the Generalised Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) were used to account for depression and anxiety, respectively, as these are predictive of self-harm (Abdelraheem et al., 2019). Age was also controlled for because self-harm decreases with age (Steinhoff et al., 2021).

Risk management

An impact assessment (Rivlin et al., 2012; Appendix 3E) asked participants to rate their mood (0=worst; 100=best) before and after each study. A debrief asked how participants found taking part.

Procedure

Clinicians approached participants and those interested were contacted by KS to discuss the study and confirm eligibility. Eligible participants met KS on Skype to give written informed consent (or assent/parental consent if <16 years), go through self-harm and imagery definitions, and complete the questionnaire (taking 30-60 minutes to

complete). The impact of taking part was assessed and participants were debriefed and signposted to supportive organisations; Appendix 3E & F).

Data Analysis

Data were analysed using SPSS v27. Sample size was pre-specified using G*Power. Contrary to the second hypothesis, there was no significant correlation between NA and self-harm frequency (see Table 1), so moderation analysis was not undertaken. A hierarchical linear regression (HLR) was conducted to determine how much variation in self-harm frequency could be explained by NA (entered in block two) and future-oriented imagery frequency (block three), after accounting for age, depression and anxiety (block one). Frequency of imagery and self-harm were treated as continuous variables because they were ordered from none to high frequency, and because predictability at each interval of imagery on each interval of self-harm frequency (if using ordinal logistic regression) was not deemed meaningful (Kirtley et al., 2021; Pasta, 2009; Torra et al., 2006). Assumptions for HLR were met (Appendix 3J). Age was positively skewed because the majority of the sample were from CAMHS, so a reciprocal transformation was completed (although untransformed and transformed data gave rise to the same pattern of results).

Results

Participants

Convenience sampling recruited 53 participants over 9 months (08/20 to 04/21) from 15 community NHS mental health teams, and two participants from an inpatient setting. 55 young people (85.5% female; 9.1% male; 3.5% other; 1.8% preferred not to say)

aged 14-24 years old (M=16.40, SD=1.80) took part. 48/55 (87.3%) of the sample were White. See Appendix 3I for additional demographic information.

Prevalence of SH-MI

53 (96%) participants reported experiencing future-oriented SH-MI before self-harm, and 53 (96%) reported experiencing imagery of past self-harm.

Hierarchical Linear Regression

Table 1

Descriptive statistics and correlations between variables of interest

	Mean	SD	1	2	3	4	5	6
1. Age (years)	16.40	1.80	-	-.14	.06	.20	-.03	-.30*
2. Depression (PHQ-9)	19.04	4.07		-	.45**	.24*	.08	.27*
3. Anxiety (GAD-7)	13.73	3.50			-	.43**	.33*	.08
4. Negative Affect (PANAS-SF)	33.56	6.92				-	.29*	-.20
5. Freq. of future-oriented SH-MI	3.69	2.08					-	.34*
6. Freq. of SH	3.16	1.34						-

Note: *p<.05, **p<.001; Untransformed data for Age have been reported to aid interpretation.

Table 2

HLR predicting self-harm frequency from age, depression, anxiety, NA and future-oriented SH-MI

	Model 1					**Model 2**					**Model 3**				
Variable		95% CI for B					95% CI for B					95% CI for B			
	B	LL	UL	SE B	Beta	B	LL	UL	SE B	Beta	B	LL	UL	SE B	Beta
Constant	-1.80	-5.85	2.25	2.11		-.19	4.55	4.17	2.17		.25	3.72	4.22	1.98	
Age	57.31	3.27	117.88	30.17	.251	47.84	-12.42	108.10	30.00	.21	39.31	-15.71	94.33	27.38	.17
Depression	.08	-.02	.18	.05	.25	.09	-.01	.19	.05	.27	.11*	.02	.19	.04	.32
Anxiety	-.01	-.12	.11	.06	-.020	.03	-.09	.15	.06	.08	-.02	-.13	.09	.06	-.05
Negative Affect (NA)	-				-	-.05	-.11	.01	.03	-.26	-.07*	-.12	-.02	.03	-.35
Future-oriented SH-MI	-				-	-				-	.28**	.11	.44	.08	.43
R2	.14					.19					.34				
F	2.65					3.23					11.55**				
ΔR2	.14					.05					.16				
ΔF	2.65					2.88*					5.10**				

Note: *p<.05 **p<.001; CI = Confidence Intervals; SE = standard error

As shown in Table 2, Model 2 (with the addition of NA) did not lead to a statistically significant increase in R^2 compared to Model 1 (depression, anxiety and age). The addition of future-oriented imagery in Model 3 led to a significant increase in R^2 of .16, F(1, 49) = 11.55, p<.001, and a significantly better fitting model [R^2 = .34, F(5, 49) = 5.10, p< .001, adjusted R^2 = .28], accounting for 27.5% of the variation in self-harm frequency, with imagery accounting for 15.3% of the total variance.

Overall frequency of future-oriented SH-MI was the biggest predictor of self-harm frequency (B= .43), followed by NA (B=-.35; a negative relationship indicating that at higher frequencies of self-harm, NA was lower), and depression (B=.32). See Appendix 3K for further discussion.

Conclusion

Future-oriented and past mental imagery are highly prevalent in young people before self-harm, and future-oriented imagery significantly predicted self-harm frequency, suggesting imagery is likely to play a role in ideation-to-enactment of self-harm.

Study 2: Qualitative Inquiry

Participants

Convenience sampling recruited sixteen participants (14 female; M=16.06 years, SD=1.34) by inviting everyone who reported SH-MI in Study 1 (see Appendix 3N for further information). 28 participants were approached (anyone reporting SH-MI), five participants declined, and seven failed to attend appointments.

Interview

A semi-structured interview (Appendix 3L) included questions adapted from the Mental Imagery Interview (Holmes et al., 2007; McEvoy et al., 2017) and questions about self-harm.

Procedure

All participants reporting SH-MI in Study 1 were invited to take part in a telephone interview with KS within two weeks of Study 1, with rapport already having been established. Interviews lasted 30-80 minutes. The same impact assessment and debrief procedures as Study 1 were used. Interviews were audio recorded on a trust-approved iPad.

Thematic Analysis (TA)

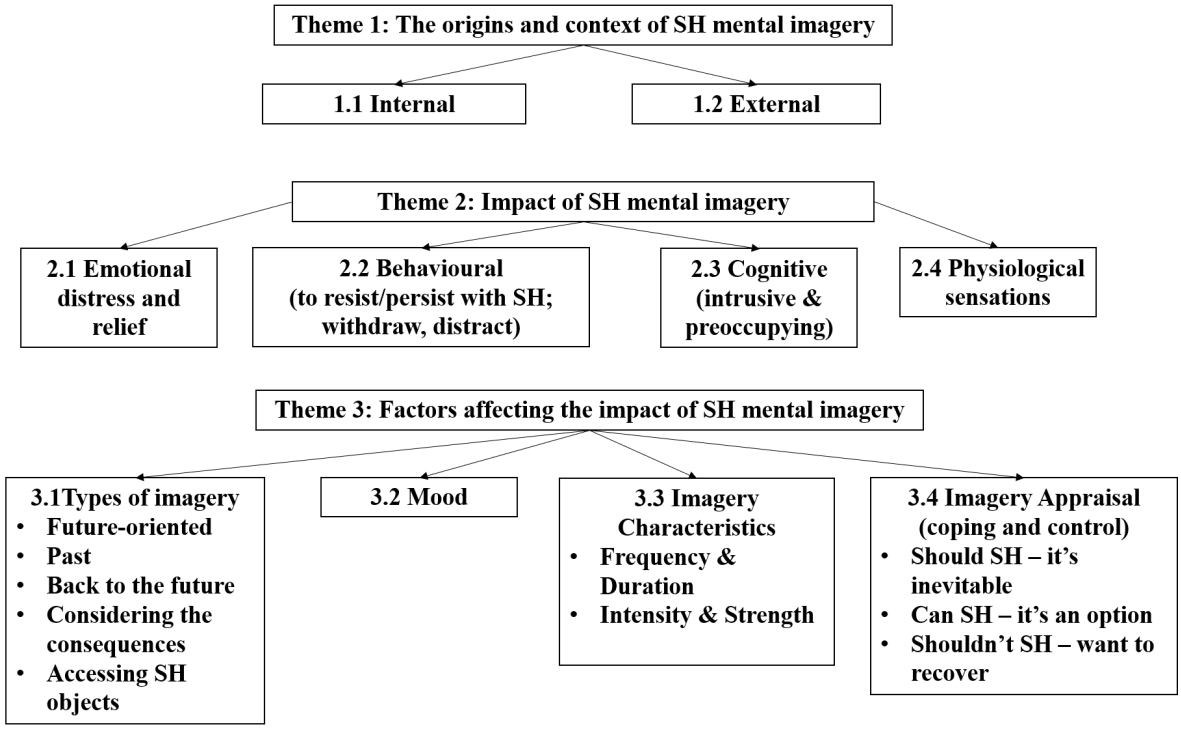
TA was conducted following the six steps outlined in Braun & Clarke (2006, 2013). All 16 interviews were transcribed verbatim and analysed by KS. TA was chosen because, unlike other methods, it is theoretically flexible, enabling more compatibility with the positivist/realist quantitative Study 1, comprising the mixed-methods design (Braun & Clarke, 2013; McEvoy & Richards, 2006; see Appendix 3M for more information).

Results

Three themes and ten subthemes were identified (Figure 1).

Figure 1

Thematic map



Theme one: The origins and context of SH-MI

The origins of SH-MI were *"[…] the same […]"* (P14) as the those reported for self-harm urges. P1 noted experiencing SH-MI *"[…] every time I get [self-harm] urges […]",* with imagery most frequently occurring *"[…] right before I self-harm."* (P15).

Subtheme 1.1: Internal triggers of imagery

Several participants reported imagery could be internally triggered by overwhelming emotions. Imagery also occurred when participants experienced an absence of emotions ('numb'), both leading to self-harm to cope and/or bring about feeling:

> KS: […] what feelings came before you having that image?
> P12: Sometimes it can be like feeling how I would feel in that moment [before self-harm] so just that overwhelmed, upset, frustrated sort of […] I feel so overwhelmed with so many different emotions that it just gets the point I feel numb.

Imagery could occur with/without verbal thoughts, relate to memories or arise spontaneously:

> P16: I don't always have the thoughts, sometimes it's just the images, but when it's together, it's very intense.
> P8: […] sometimes they [images] will just come out of nowhere and it will urge me to kinda self-harm.

Subtheme 1.2: External triggers of imagery

Imagery could be triggered externally by interpersonal conflict or reminders, such as seeing/hearing about self-harm, seeing objects, or looking at their scars, which could lead to self-harm:

> P14: […] sometimes […] I'll get the image but like without the thought […] my sister […] just said something and then like it kind of upset me and instead of like thinking oh I want to self-harm I just saw visually like self-harming, so then I did.

Theme two: The impact of SH-MI

This theme identified the complex interplay between emotional, behavioural, cognitive and physiological impacts of imagery.

Subtheme 2.1: Emotional (distress and relief)

All participants described how imagery could make distressing emotions escalate before self-harm:

> P12: It [imagery] usually causes a spiral, it can make me feel incredibly overwhelmed, usually guilty for feeling that way, and then I feel worse, and then I end up thinking about how I would use it [object imagery] and it just leads into a spiral until I end up SH-ing because I feel incredibly overwhelmed.

Imagery sometimes reminded individuals of the relief they experience when they self-harm, leading to anticipatory relief which encouraged self-harm. Many participants described imagery of blood loss as comforting:

> P13: […] you get relief afterwards like after you've done it [self-harm], like a good feeling, it [imagery] can kind of remind me of that feeling sometimes […]
> P8: […] it sounds really weird but like it's quite nice visually to kinda see blood [past imagery] […] it's comforting […].

A few participants described how the relief from imagery enabled them to resist self-harm:

> P16: Sometimes comforting, 'cause sometimes it's just enough to imagine it […] like that brings relief in itself […] sometimes it's enough.

Subtheme 2.2: Behavioural

Most participants described how SH-MI could trigger self-harm or suicidal acts:

> P4: […] if I got a picture of me let's say self-harming in the future, it will probably most likely lead to me self-harming at that moment […]
> P6: […] [imagery] needs to happen in order for me to hurt myself in the first place, because honestly I don't think without these images I would [self-harm] […] they're very scary so the only time it [imagery] goes, if I cut.

However, as aforementioned, some imagery brought relief, meaning self-harm was not acted on. Some distressing imagery was also protective (subtheme 3.1).

Imagery sometimes made participants withdraw from others (P4: *"[…]I'll just isolate myself from everyone*") or distract themselves, if they thought they should not self-harm (subtheme 3.4); P6 stated: *[…] I have to do a lot of things for me to stop myself […].*

Subtheme 2.3: Cognitive

Many participants described SH-MI as intrusive and preoccupying:

> P11: […] I can't stop my brain from like envisioning me wanting to do this […] you just kinda want [it] to go away but you can't even though it's your brain […] they're [imagery] really intrusive.
> P16: […] [the imagery] it's very tunnel visioned and sometimes I can't focus on anything else till I've completed it [self-harmed] […]

Subtheme 2.4: Physiological

Some participants described experiencing physiological changes (e.g., increased heart rate, nausea) in response to imagery. Some reported physical sensations or an *"itch"* (P2) in the area of self-injury, which increased self-harm urges, P3 stating: *"I could feel it in my arms as if I was going to do it".*

Theme three: The factors affecting the impact of SH-MI

The impact of imagery appeared to be dependent on the interplay between four factors outlined below.

Subtheme 3.1: Types of self-harm imagery

The method of self-harm in imagery matched those used by participants: *"[…] it's [imagery] relating to cutting coz that is my preferred method."* (P13). Incongruent/unrealistic methods (extreme self-harm/suicide or not easily hidden) were less likely to be acted upon unless individuals were in crisis.

'Planning future self-harm' imagery (imagining future-oriented self-harm/suicidal acts) were most frequently associated with triggering self-harm in the way envisioned compared to other imagery:

> P15: [...] well I imagine my legs and how I want them to look […] like the point that I want to reach until I stop […] it caused me to cut more [...] to make it look like this image in my head […]

Imagery helped some participants problem-solve which acts might "work":

> P6: […] if I'm feeling extremely suicidal […] I can't think of a way and then in my head it will just show me […] different images to see which one works without doing them […] that's actually how I choose […] jumping off a bridge, yes that works, overdosing paracetamol, and it actually shows me how much pills I take […].

Graphic 'Past SH-MI' of individual's own self-harm cuts and blood loss could lead to self-harm; P8 shared *"[…] the ones [images] that make me want to self-harm more is past memories of self-harm",* and P13 found these images "*disgusting but kind of weirdly soothing"*. For others, graphic images discouraged self-harm, P14 stating *"[…] I won't act on past images, they'll just be gross […] it does make me want to like never self-harm ever again because it's so like disgusting […]".*

Some participants used past imagery to repeat or build-on future-oriented imagery, named here as 'back to the future' imagery; P16 reported it's *"[…] like a step-up, it's like*

OK so now I've hurt myself like this, now next time that's not good enough I need to hurt myself like this […] only like a little bit bigger, a little bit longer, […] a little bit more blood […]". Some reported also thinking about others' self-harm they had seen/heard as an inpatient and comparing their self-harm to this; P9 stated *"[…] quite often they link back to like seeing other people self-harm or like […] when I self-harm like what that looked like and then comparing it to what I could do better in a way […]".*

Some participants reported experiencing imagery about 'accessing self-harm objects':

> P12: […] it would be things that I would use to SH so whether that be sharpeners, knives, pins […] it's like a singular image […] nothing around it […] I end up SHing […] thinking about how I would get a hold of it or what I would do with it […]

Most participants reported imagery during self-harm urges which involved 'considering the consequences', which often discouraged self-harm or suicide attempts due to the past or potential impact on family:

> P4: […] it will help me stop or the intent of doing it become a lot less […] It's just pictures of my family and their friends and how they would react and how they would feel if they found out […]

Others imagined the consequences that self-harm/suicide might have on themselves, such as physical injury/scars, shame or repeat hospitalisation which made participants reticent to self-harm in similar ways:

> P5: […] these are ones [imagery] that are more like taking an OD or things like that […] I think I don't act on it because I'm like well […] I don't want the response […] there is no certainty with it, like you could just end up back inpatient and that's not happening […]

Subtheme 3.2: Mood

Participants frequently described how mood could moderate the impact of imagery, P9 stating *"[…] it [imagery] links a lot to my mood"*. The intensity of distress before self-harm appeared to influence the intensity and presence of imagery. P14 stated *[…] if it's a lower-level trigger, just like oh I'm just upset maybe I want to do that, then I probably won't really see imagery and that probably also means I can just ignore that feeling […].* Although imagery related to 'considering the consequences' could discourage self-harm, this was dependent on participant's current mood, *"[…] if I'm feeling very overwhelmed I might not think about the consequences […]"* (P1).

Subtheme 3.3: Imagery characteristics

In conjunction with mood, participants described a relationship between the frequency of imagery and self-harm:

> P12: I think I had that image repeatedly before I did it […] If I had that image very, very, very often, frequently […] it will just feel incredibly overwhelming to the point like I feel like I have to [self-harm] like it's the only way […] I think it's definitely how frequently I see it, if it's just once it'll make it incredibly difficult, but it's less likely for me to do anything.

Several participants reported not self-harming when imagery was shorter in duration and they were in a better mood:

> P9: […] they're [imagery] shorter […] when I'm not gonna act on it coz I can just move past it quicker, whereas if I'm in a bad state of mind, I'm more likely to just obsess over it [imagery] until something does happen.

First person, vivid and graphic imagery were described as more intense, triggering, preoccupying and memorable, particularly compared to verbal thoughts or imagery that did not lead to self-harm:

> P12: I think the visual ones feel more real, it's more of a like an actual experience rather than just a passing thought cause I can try to ignore, just the normal word thoughts […] those can be a lot easier to just sort of like push them aside, whilst for visual it's like I'm experiencing it.
> P13: [discussing imagery that doesn't lead to self-harm] like less detailed and it [imagery] will probably be less deep […] or less bad.

Subtheme 3.4: Imagery appraisal

Imagery appraisals contributed to how much control participant's felt they had over their imagery and self-harm.

Many participants appraised imagery as meaning they 'should self-harm' because it felt inevitable and was the only way to get rid of the images or cope, even if they didn't want to self-harm, feeling like a *"mental battle"* (P16):

> P5: […] feels like I have to […] it just feels like almost some sort of certainty I'm like OK well if I've had that [image] then I'm definitely going to do it at some point […] felt like an only option […] it's [imagery] something that doesn't really leave me alone […] it just gets to a point where it feels like that's what I have to do […]

Some participants appraised imagery an option ('can self-harm if I need to'), which often gave rise to feelings of relief, which encouraged self-harm, but occasionally there was less urgency to self-harm:

> P13: […] well they [future images] can cause me to self-harm […] they can be kind of [be] calming sometimes like I can do this you know if I need type thing […]

Others appraised imagery as meaning they 'shouldn't self-harm' because they want to recover, where ambivalence could cause distress:

> P10: […] the images that I get are like how I kind of wanna not self-harm because I dunno I just wanna like be a better person kind of thing […]

Conclusion

Self-harm-related imagery appears to be involved in the self-harm process. Imagery can trigger, alleviate and deter people from self-harm, with the impact of imagery being dependent on the imagery type, frequency, strength, appraisal, and mood.

Impact Assessment.

Pre- and post-mood ratings were not statistically different (Study 1: [$t(54)=.96$, $p=.34$]; Study 2: [$t(15)=.55$, $p=.59$]), illustrating that asking about self-harm and imagery did not lower mood. No risk concerns following participation were identified for any participant.

Discussion

Main findings

This mixed-methods investigation in a transdiagnostic clinical population of young people who self-harm found visual SH-MI was highly prevalent, with 96% reporting both past and future-oriented SH-MI in Study 1, supporting previous research (McEvoy et al., 2017).

Study 2 identified three themes suggesting imagery may play a role in self-harm/suicidal ideation-to-enactment, perhaps due to repeated exposure (Holmes & Mathews, 2010; O'Connor & Kirtley, 2018). Most imagery occurred following aversive affective states and was felt to frequently trigger self-harm, due to imagery's emotional, preoccupying and intrusive nature, thus reinforcing emotional distress before self-harm. This provides some support for the Emotional Cascade Theory, proposing individuals self-harm to alleviate emotional cascades driven by ruminative processes (Selby & Joiner, 2009), which may include imagery (Hasking et al., 2017ab). Imagery before self-harm was often described as more emotionally provocative and triggering compared to verbal thoughts or imagery that did not lead to self-harm, in keeping with previous research (Cloos et al., 2020; Holmes & Matthews, 2010; Ji, et al., 2019). Novel findings related to identifying a connection between past and future SH-MI (termed 'back to the future' images'), where individuals would use past imagery to imagine an escalation in future-oriented SH-MI.

Study 1 provided further support for the role of imagery, where the frequency of future-oriented SH-MI predicted self-harm frequency, beyond what was explained by age, depression, anxiety and NA. However the qualitative findings highlight how the impact of SH-MI on self-harm was not only influenced by imagery frequency, but also imagery type (realistic future-oriented imagery acted on most), mood, vividness, and appraisal (Figure 2), supporting previous research (Hasking et al., 2017b; Holmes & Mathews, 2010; McEvoy et al., 2017).

Figure 2

Factors affecting the impact of SH-MI

More likely to resist Self-Harm	More likely to persist with Self-Harm
• Less distressed/low in mood • Imagery that is unrealistic/incongruent with SH method • Imagery of aversive negative consequences • Imagery that is less frequent and vivid/detailed • 'Shouldn't self-harm' appraisals of imagery (e.g., recovery-focused)	• Very distressed/low in mood • Imagery that is realistic/congruent with SH method • Imagery of future-oriented imagery or imagery that builds on the past ('back to the future') • Imagery that is more frequent and vivid/detailed • 'Should or can self-harm' appraisals of imagery (e.g., to bring relief/cope)

Study 2's findings suggested that imagery can also be protective against self-harm; alleviating urges by bringing relief which sometimes substituted the act, or deterring individuals through aversion or disgust (e.g., imagining the consequences for self/others), supporting other findings (Dargan et al., 2016; McEvoy et al., 2017).

Surprisingly, Study 1 found that NA before self-harm was inversely associated with self-harm frequency, where lower NA was reported in those who self-harmed more frequently. A similar unexpected finding was reported by Hasking et al. (2017b) who found individuals experiencing higher positive affect self-injured more frequently at low NA than high NA. In Study 2, some individuals reported anticipatory relief following imagery before self-harm and some described an absence of emotion ("numb") before self-harm. The findings may therefore reflect different functions of self-harm; participants who frequently self-harmed may have self-harmed to increase affect (positive reinforcement) rather than reduce NA (negative reinforcement; Hasking et al., 2017b) which is at odds with the emotional cascade theory. Alternatively, those who self-harm more frequently may have a lower threshold for enactment, perhaps because this response has been conditioned.

Limitations and Strengths

Whilst Study 2 provided rich qualitative data, the cross-sectional and retrospective nature of both studies cannot determine causality or directionality. Most participants were White and female. Study 1 only accounted for 27.5% of the variation in self-harm frequency and did not control for self-harm history or exposure to self-harm via other sources, which may have explained more variance. The main method of self-harm in both studies was cutting, which may not be representative of individuals who present to other services (hospital) or who do not help-seek (Geulayov et al., 2018). Findings should therefore be considered with caution until replicated. This is particularly important as retrospective reporting may be subject to bias through overgeneralised recall of affect, imagery, and their impact (Williams et al., 1996; Pile et al., 2021), although accuracy is often better for emotional memories (Buchanan, 2007). Like many self-harm studies, single-item retrospective self-report measures for the main variables of self-harm and SH-MI frequency were used in Study 1, which are also subject to memory bias and may not be reliable (Daukantaitė et al., 2020; Hom et al., 2016). However, standardised measures of self-harm imagery or self-harm (not limited to NSSI, brief and non-normalising) do not exist. Future work should seek both to develop valid and reliable measures of self-harm and self-harm imagery that are suitable for children and young people (e.g., short multi-item measurement, non-normalising of self-harm, uses NICE definition of self-harm, distinguishes between types of self-harm imagery (e,g., memories, flashforwards, related to self-harm exposure, first and third person perspectives)), and also use other measurement strategies such as experience-sampling and real-time monitoring. Whilst discussions with clinicians emphasised the study wanted to recruit anyone with a history of self-harm

regardless of whether they experience SH-MI or not, it is possible that the study's focus or title may have meant that clinicians were more likely to refer participants who experienced SH-MI.

Strengths included being among the first to explore SH-MI in young people, using mixed-methods.

Implications

Future research should use experimental and longitudinal designs harnessing diary or experience sampling methods, to provide an in-depth understanding of the roles of affect and mental imagery in the pathway to self-harm. Further qualitative inquiries, such as exploring sources of SH-MI would be helpful.

Given the prevalence of SH-MI, which can occur without verbal thoughts, SH-MI should be part of routine clinical assessments, formulation and safety planning. However, personal communication with clinicians and participants revealed that imagery is rarely assessed. This may be in part due to misconceptions that asking about SH-MI may increase risk, which was not the case in this study. The findings will inform the development of an SH-MI proforma to facilitate assessments and may also prove fruitful in enhancing treatments (e.g., imagery rescripting/reappraisal; imagining the consequences), such as innovative imagery-based interventions for young people who self-harm (Di Simplicio et al., 2020).

Conclusion

The findings suggest that SH-MI is likely to play a role in the self-harm pathway in young people. Imagery may trigger, alleviate and deter individuals from self-harm, highlighting the importance of assessing SH-MI, but may also inform novel treatments through harnessing the protective or aversive power of imagery.

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Executive Summary

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Executive Summary

Self-harm can be defined as hurting yourself on purpose, no matter what the reason. Self-harm and suicide are rising in the UK, particularly among adolescents and young adults (described here as 'young people'). Little is known about what makes young people go from thinking about self-harm to engaging in self-harm. However, it is understood that young people often self-harm to distract themselves from, or alleviate, negative emotions.

Mental imagery related to self-harm has also been implicated in self-harm. Mental imagery is defined as a perceptual experience based on information stored in the memory in the absence of any external sensory input. Recently, self-harm-related mental imagery such as imagining self-harm or suicidal acts in the future (termed future-oriented self-harm imagery here), has been suggested to be commonly experienced by adults before self-harm, and the more of these mental images someone has, the more likely they might be to self-harm. This might be because mental imagery is thought to be a stronger motivator for action than verbal thoughts alone. Nevertheless, personal communication with several clinicians in the field revealed that self-harm imagery is rarely assessed in routine clinical practice or as part of risk assessments with young people. Recently a brief mental imagery-based intervention was found to be effective for reducing self-harm in young people.

The current study aimed to explore the role of mental imagery related to self-harm in young people, using a mixed-methods study comprised of a questionnaire (Study 1) and a qualitative interview (Study 2). Study 1 also explored how common self-harm-related imagery is, and whether the frequency of future-oriented imagery was associated with self-harm.

Study 1 recruited 55 young people from mental health services across Berkshire, Buckinghamshire, Leicestershire, and Oxfordshire over 9 months. Participants were required to complete a self-report questionnaire rating their mood, anxiety, negative emotions, frequency of self-harm and future-oriented imagery. Study 2 recruited 16 young people who reported experiencing self-harm-related imagery in Study 1. Participants completed a telephone interview in which they were asked about their experience of mental imagery related to self-harm.

Study 1 findings suggested that self-harm-related imagery is highly prevalent in young people, with the frequency of future-oriented imagery being associated with how often young people self-harm. Study 2 also revealed that self-harm-related imagery is likely to play a role in the self-harm process; they can trigger, alleviate or deter self-harm urges, depending on the type of imagery experienced, the mood at the time, the frequency and strength of imagery, and the appraisal (meaning) of the imagery.

The findings help us to understand more about the prevalence and experience of self-harm-related imagery in young people and highlights the importance of assessing mental imagery related to self-harm and suicide as part of routine clinical practice. However, more research is needed with less reliance on retrospective recall to get timely information about the process of mental imagery, and its links to emotion and self-harm and suicidal behaviour.

Reflective Connecting Narrative

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Reflective Connecting Narrative

Since working as an Assistant Psychologist on implementing new waiting list management systems, I have always had an interest in how services assess and manage risk. During my first placement in an adult mental health service, my supervisor suggested I attend the "Zero Suicide" conference. I was inspired by the many speakers, which included Thomas Joiner, as well as Angela Samata, a woman who talks openly about her experience of losing her husband to suicide. This conference had a profound impact on me wanting to pursue research that would contribute to the field of self-harm and suicide prevention.

Following a conversation with Karen Lascelles, the suicide prevention lead for the Trust, I began to design my service improvement project on safety planning. I was keen to incorporate Quality Improvement methodology within this project, to develop this skill to use post-qualification. I also wanted to include Experts by Experience in the design and delivery of training, due to the importance of reducing stigma and myths around self-harm and suicide. Additionally, I wanted to ensure that clinicians approached safety planning interventions in a helpful way, as this was a theme arising from the interviews that I had undertaken with patients attending the service. Challenges arising from this project related to getting staff to be more involved in the project, such as recruiting patients to complete patient experience questionnaires or interviews or completing post-training follow-up forms. Staff that had originally expressed enthusiasm to be part of the project to help with analysis of the data, did not have time to do this later on. This meant the project was more onerous and took longer than I anticipated as I collected data from over 300 patient records and trained nearly 100 staff, as well as attempting to get service user feedback, and interview six patients on their experiences of safety planning. Whilst this took a long time, the findings do contribute to this area, and I hope to publish two papers from this work.

Discussions regarding online harms of exposure to self-harm and suicidal content, lead me to develop a protocol for a systematic review exploring the impact and mechanisms of viewing self-harm imagery online with Keith Hawton, who regularly contributes to policy and had been asked to consult in this area. I chose to focus on the

impact of imagery in particular, as this was a topic that had recently been in the media. Having not led on a systematic review before, this process took me longer than I expected, and when I refined some of our inclusion criteria, it meant rescreening 5000+ papers!

Course workshops on mental imagery really struck me, particularly as this is an area that is so often omitted from routine clinical assessment. I was surprised that I had not heard much about imagery despite many years working in the NHS. I also recall a moment where I tested out this learning during an inpatient assessment, where the psychiatrist asked if a patient had had thoughts of suicide or self-harm, which he denied. I then asked whether he had had any mental images of imagining hurting himself, to which he replied he had images of jumping off a car park roof. Changing the question to ask about imagery had completely changed the answer to this question and the implications for practice. Following this, whilst researching self-harm imagery on social media, it prompted me to think about whether there had been any research into self-harm *mental* imagery. To my surprise, no research to my knowledge had looked at self-harm imagery in young people. In the design of this project, I also felt it was important to include Experts by Experience, particularly given the challenges of getting the project through ethical review. Another challenge was balancing methodological rigour with feasibility. I attempted to think about ways of conducting an experimental or longitudinal diary design; however, it became clear from talking to my supervisors with experience of undertaking research in CAMHS, and lead clinicians in the host services, that clinicians would be reluctant to ask young people who do not self-harm to take part in a study asking about self-harm imagery, and ethical approval would be difficult to obtain. Clinicians also did not believe that young people would reliably complete a diary study. We therefore decided to undertake a preliminary investigation which predominantly focused on qualitative perspectives, despite the threats to validity relating to retrospective self-report measures, given the lack of research in this area. Completing NHS ethics and recruiting during a pandemic was a significant challenge, as CAMHS teams were extremely overwhelmed. Despite having over 20 teams involved in the study, it still took 9 months to recruit the full sample, and a considerable amount of my time was spent liaising with services and clinicians to facilitate recruitment.

Having not undertaken much clinical research before, I have enjoyed working with multidisciplinary teams and supervisors and I feel like I have learnt a lot about the research process and the importance of translating research findings into clinical practice. The collateral finding that asking about mental imagery had no adverse effects on participants, despite ethical committee qualms, is an important and interesting finding. One intended output will be to develop guidelines for clinicians on assessing imagery in children and young people at risk of self-harm and suicide. I also learnt about the challenges of undertaking research in this field in relation to the lack of appropriate measures and debates regarding self-harm terminology, and I hope to continue working in this area to develop a self-harm mental imagery measure on the basis of the findings. Furthermore, I have become increasingly aware of the importance of my own self-care strategies as a clinician and researcher when working with self-harm and suicidality.

An overarching strength of this thesis is that each study has been conducted in areas where there is a dearth of research or where the field is still in its infancy; so, the contributions arising from this thesis are timely. The research undertaken in this thesis makes a significant contribution to knowledge, helping inform self-harm and suicide prevention policy (CRL: Online Harms), clinical assessment and interventions (SIP on Safety Planning; TDRP on self-harm mental imagery) in young people and adults.

I am determined to continue to be research active (despite the challenges) in this area of interest, and others, as a qualified clinical psychologist. I strongly feel we should be producers as well as consumers of research, and so I look forward to disseminating the publications which should hopefully arise from this thesis, and beyond qualification, to continue contributing to policy and the evidence base informing clinical practice.

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"It always seems impossible until it's done" (Nelson Mandela)

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Appendices

1A. Definition of self-harm

Although distinctions have been made between self-harm that is suicidal in its intent (i.e., attempted suicide) and self-harm that is non-suicidal (non-suicidal self-injury; NSSI), these are contentious because intent can be difficult to establish (Kapur et al., 2013). Furthermore, both suicidal and non-suicidal self-harm have overlapping risk factors (Mars et al., 2014); therefore, conceptualising these as being on the same continuum might be more appropriate (Kapur et al., 2013).

1B: Inclusion and exclusion criteria

Inclusion	Exclusion
• Criterion 1: **Peer reviewed (e.g., journal)**	• Not peer reviewed (e.g., dissertation, grey literature)
• Criterion 2: **Original research (empirical papers)** Note: Can include letters to editor ONLY if data are reported	• Reviews, case reports, letters to editor with no data
• Criterion 3: **English** language	• Not in English language
• Criterion 4: Investigate the **viewing/sharing of self-harm/suicidal images/videos (self-harm imagery; cutting, overdoses, etc)** Definitions: *Self-harm/suicidal behaviours defined as intentional act to self-injure (e.g., overdoses, burning, headbanging, cutting, etc), regardless of suicidal intent (does not include anorexia, substance misuse/addiction).* *Self-harm imagery is defined as any pictures or videos related to or depicting these self-injurious acts of self-harm/suicide that is shared and may be seen by others in a social context (online/social media)*	• Do not explore viewing/sharing self-harm images or videos (e.g., recovery initiatives) • Papers that only refer to text/verbal content related to self-harm images/videos, despite being on social media • Papers that focus solely on imagery of related disorders (pro-ana websites) • Papers that focus on suicide prevention initiatives/social media campaigns/recovery to raise awareness of self-harm and suicide as these are beyond scope of review and do not focus on sharing of self-harm images.
• Criterion 5: Investigate self-harm/suicidal images/videos **that appear on the internet/social media** Definitions: *Internet and social media are defined as any online platforms, websites, apps that function as social networking (e.g., blogs, chats, twitter, facebook, youtube etc) where*	• Do not explore viewing/sharing self-harm images or videos on internet/social media • Papers that only investigate exposure to self-harm/suicide images that have been shared via other modalities not on social media or the internet (e.g., Netflix, TV, radio, music, media/news outlets)

images related to self-harm and suicide can be viewed and shared. This includes lab-based studies that get participants to complete research online.	
• Criterion 6: **Report and/or refer to the psycho-social consequences/implications/responses/effect/impact of viewing/sharing self-harm images online/on social media**, such positive and/or negative effects on self-harm and suicidal behaviours, psychosocial behavior (e.g., comments), emotional states, recovery and thoughts/mental imagery (exposure) (e.g., could encourage self-harm). Notes: • They do not need to explicitly refer to mechanisms or consequences. • They do not need to directly explore consequences (some might be implicit)	• Papers that just report existence of self-harm imagery online/social media but do not refer/report consequences/implications of viewing/sharing images on behaviour, emotions, thoughts (e.g., papers focused solely on search behaviour, providing statistics/content analysis on websites accessed but no assessment of effects/impact/responses to/of viewing this content) (e.g., algorithm studies)
• All ages – regardless of whether reported or not.	

1C. CASP quality ratings

Table 4

CASP quality ratings with limitations and strengths of included studies

Author Year	CASP Score (%)	CASP Quality Rating	Main Limitations	Main Strengths
Quantitative				
Arendt et al. (2019)	9/13 (69%)	Medium	• Causality cannot be assumed as panel analysis cannot prove causality of self-harm exposure on measured outcomes • Self-report retrospective questions, susceptible to measurement error • Use of unvalidated single-item measures which may not be reliable or valid • Non-representative convenience sample restricted to those who had Netflix access and women over-represented, limiting generalisability • Restricted sample to non-clinical and 18+ years old despite younger people more likely to use social media • Did not find dose-response effect from the way self-harm imagery exposure was measured (none vs just one vs more than once)	• Longitudinal design • Large sample • Only study to measure and control for previous exposure to online self-harm imagery

			• Did not measure the type or severity of self-harm imagery exposure on Instagram • No mental health history data	
Brown et al. (2018)	8/13 (62%)	Medium	• Causality cannot be assumed as was not directly tested (lots of possible hypotheses suggested) • Findings may not generalise to all individuals (limited to German sample that use German hashtags, and time analysis limited to those that posted images/left comments that could be analysed) • Lack of demographic data with around 80% being anonymous users (limited by methodology used) • Inter-rater reliability not calculated for first initial identification of pictures and reliability for comments was low • Less obvious or secret hashtags may have been missed	• Large sample • Naturalistic design • Tested contagion mechanism using time-related analysis
Cha et al. (2016)	8/13 (62%)	Medium	• Did not measure previous exposure to self-harm imagery • Did not include control stimuli (images and words of non-self-harm nature) • Used single-item self-report measures for mood, desire to self-harm, desire to die that have not been validated • Longer term impact unknown	• Experimental design • Large N • Included participants with and without self-harm or suicidal thoughts history • Attempted to recruit world-wide
Fu et al. (2013)	5/13 (38%)	Low	• Causality cannot be assumed as this was not directly tested	• Large N

			• Only examined comments and responses in response to one wrist-cutting picture, so has limited generalisability • Lack of demographic, self-harm or mental health history data (limited by methodology used) • Chinese government imposed legal requirement of using one's real name when using social media so this may discourage some individuals from expressing or commenting on posts	
Jaroszewski et al. (2020)	9/13 (69%)	Medium	• Use of self-report and unvalidated single items to measure history of suicidality, threat, valance and arousal	• Experimental design
Lewis et al. (2012)	10/13 (77%)	High	• Causality cannot be assumed as this was not directly tested • Lack of demographic data, self-harm and mental health history (limited by methodology used) • Findings may not generalise to all individuals (analysis limited to those that left comments only) • Timing and duration of impact/responses unknown (e.g., whether viewers watched video once or more than once, when they chose to respond, if this changed how some people appraised the video or what they said)	• Explored impact of NSSI videos
Seko et al. (2018)	7/13 (54%)	Medium	• Causality cannot be assumed as this was not directly tested	• Examined images and attached textual narratives

			• Lack of demographic data, self-harm and mental health history (limited by methodology used) • Findings may not generalise to all individuals (analysis limited to those that left comments only) • Limited reflection on limitations of study (e.g., author bias) and how this was managed	
Sternudd (2012)*	4/13 (31%)	Low	• Findings may not generalise to all individuals (possible self-selecting bias) • Limited reflection on limitations or implications of study • Ethnicity and mental health history not reported	• Large N
Qualitative				
Baker & Lewis (2013)	9/10 (90%)	High	• Findings may not generalise to all individuals (limited to those that left comments that could be analysed) • Not clear how many posters have a self-harm and/or mental health history (limited by methodology used) • Lack of demographic data and mental health history (limited by methodology used) • Did not reflect on authors' role in interpretation of themes and potential bias here	• Thematic analysis on large N • Naturalistic sample
Brown et al. (2020)	9/10 (90%)	High	• Possible self-selection bias • Findings unable to be replicated due to changes in policy for NSSI content • Did not reflect on authors' role in interpretation of themes and potential bias here	• Thematic analysis on large N

			• Only refer to responses to images of cutting so unsure how generalisable findings are to other self-harm methods	
Chen et al. (2021)	9/10 (90%)	High	• Impact of social media not the main focus of the study • Limited generalisability as mostly female participants • Did not reflect on authors' role in interpretation of themes and potential bias here	• Large N
Hetrick et al. (2020)	9/10 (90%)	High	• Only recruited young people with historic self-harm experiences, and excluded those with recent experience (last 3 months) so findings may reflect individuals who are in remission of self-harm • Help-seeking participants recruited from mental health services so findings might not generalise to young people who self-harm but don't access help • No mental health history data reported • Reliant on self-report of non-recent self-harm (>3 months)	• Conducted a systematic review to guide development of semi-structured interview framework • Thorough analysis of themes which involved member checking
Jacobs et al. (2017)	9/10 (90%)	High	• Limited generalisability (mostly female sample; recruitment restricted to individuals with a Facebook account who may have higher rates of self-harm) • Not all participants interviewed in same way (one dyad) • Over half of those that responded did not take part (self-selecting bias) • Ethnicity and mental health history not reported	• Large N

			• Did not reflect on authors' role in interpretation of themes and potential bias here	
Lavis et al. (2020)	8/10 (80%)	High	• All participants who undertook qualitative interviews were female • Did not reflect on authors' role in interpretation of themes and potential bias here • Not always clear where the findings came from	• Large sample of posts analysed • Analysed posts across multiple platforms and two timepoints, including after Instagram banned certain hashtags
Seko et al. (2015)	9/10 (90%)	High	• Sample recruited through one website (self-injury.net) which doesn't permit members to post NSSI photos, so sample may have been biased • Interviews conducted over different days so mood/answers to questions may have been variable • Limited to those that create content only (possibly not representative of NSSI community as a whole) • Broad definition of content (original vs sharing, different types of content) • Did not reflect on authors' role in interpretation of themes and potential bias here	• Member checked interviews • Obtained demographic information of participants (e.g. self-harm history)
Sternudd (2012)*	6/10 (60%)	Medium	• Findings may not generalise to all individuals (possible self-selecting bias) • Did not reflect on authors' role in interpretation of themes and potential bias here • Limited reflection on limitations or implications of study	• Large N

			• Ethnicity and mental health history not reported	

Note: <50% = low quality; 50-75% = medium; >75% = high. *Sternudd et al. (2012) was a mixed-methods study so was rated twice and received low and medium ratings for quantitative and qualitative elements, respectively, but combined scores indicated low quality overall (43%).

1D. Definitions and examples of potential mechanisms

Table 5

Summary of main potential mechanisms that could be underlying potential positive and/or negative impacts

Mechanism	**Definition**	**Potential positive impact examples**	**Potential negative impact examples**
Assortative relating (Joiner, 2003)	Occurs when individuals who have pre-existing and shared vulnerabilities may be more likely to form close peer circles, which may increase or reduce their risk of suicide and self-harm (e.g., selection effects; they form relationships with others who self-harm and then become more socialised to this).	Receiving support and connection from others who self-harm which sometimes mitigated urges to self-harm.	Ten studies found that participants accessing self-harm content online had a history of self-harm or were currently self-harming, so may have been driven to access this content due to pre-existing vulnerabilities. Some studies reported that individuals would use self-harm content online to trigger the right mood to self-harm and intentionally looked at this content or felt that other people

			would not understand or be able to help. Online imagery may perpetuate "self-harmer" identity.
Aversion or disgust (barrier) (Hooley & Franklin, 2018)	Hooley & Franklin (2018) proposed that people self-harm because natural barriers that usually prevent individuals from self-inflicted harm (e.g., high aversion) are lower.	Some participants reported increased levels of fear or disgust which helped to deter individuals from self-harm or more severe forms of self-harm.	Those with more experience of self-harm/suicidality were reported to rate images as more pleasant and less threatening, which might suggest lower aversion (barrier mechanism). Those with less experience of self-harm/suicidality often reported images as more aversive. Sharing of images with wounds was less than those without wounds, often with trigger warnings, suggesting people are aware of aversive and triggering nature of images.
Descriptive norms (Rimal & Real, 2003)	Occurs when individuals perceive a behaviour to be more common than it may be in the community (e.g., the normalisation of self-harm and suicidal behaviour by portraying it as acceptable coping strategy).	Recovery narratives shared on social media may normalise help-seeking.	Self-harm imagery was reported to trigger self-harm and lead to an escalation of self-harm over time and encouragement of self-harm online suggests a possible normalising influence. Participants reported viewing images encouraged them to self-harm and post their own images and share methods and ideas of how-to self-harm safely. Imagery enabled individuals to identify with engaging in self-harm as an

			acceptable coping behaviour, thus normalising self-harm or self-harmer identity.
Emotional (dys)regulation	Emotional dysregulation occurs when distressing affect is amplified. Emotional regulation occurs when there is an increase or generation of a desired affective or cognitive state (positive automatic reinforcement) and/or a reduction in negative feeling or cognitive state (negative automatic reinforcement; Nock & Prinstein, 2004).	Some participants reported experiencing similar feelings when viewing self-harm imagery as engaging in self-harm themselves, such as vicarious relief which acted as a proxy to self-harm, or feelings of "comfort" or "calm". Some participants reported increased levels of fear or disgust which helped to deter individuals from self-harm or more severe forms of self-harm.	Studies were reported to "trigger" self-harm suggesting a possible emotional dysregulation mechanism. Images sometimes were actively used as a strategy to promote the right mood for self-harm, possibly indicating an emotional dysregulation mechanism. Some evidence that images were more emotionally impactful than words.
Habituation (Joiner, 2005)	Habituation occurs through repeated exposure to self-harm/suicidality content (e.g., reduced aversion to self-harm over time after repeated exposure).	NR	Those with more experience of self-harm/suicidality were reported to rate images as more pleasant and less threatening. Those with less experience of self-harm/suicidality often reported images as more aversive. This might suggest a habituation mechanism occurs over time with increasing exposure to self-harm.
Positive Social Reinforcement (Nock & Prinstein, 2004)	Occurs when individuals are motivated to engage in behaviours to generate	Sense of connection, validation and support may reduce isolate	Some studies reported how more severe images elicited more comments and some people

	desired social events (e.g., connection, validation). (adapted from Jarvi et al., 2013).	and curb urges to self-harm and reduce stigma.	reported feeling like they needed to keep showing they needed help and engage in more severe self-harm to get the same level of validation and support.
Priming (Berkowitz, 1984)	Priming (or cognitive activation) of one thought (including mental imagery) may trigger related thoughts (or perhaps mental images) (adapted from Haw et al., 2013).	Some studies stated participants reported self-harm imagery could lead to a reduction in thinking about self-harm or alleviation of self-harm urges (Sternudd, 2012), through experiencing similar feelings, such as vicarious relief, as if they had actually self-injured	Self-harm imagery increased thoughts about self-harm, such as evoking urges or inspiration to self-harm. Some reported that online self-harm imagery brought back mental imagery of past self-harm, reminding participants of the emotional relief felt after self-harm and enabling them to envisage self-harm.
Self-reflection	Self-reflection enabling a sense of control over self-harm behaviour (Ryan-Vig et al., 2019).	Imagery sometimes enabled individuals to reflect on their experience and resist urges to self-harm, using their own images to document their recovery.	NR
Social comparison (Festinger, 1954)	Comparing self to others who self-harm online.	Social comparison sometimes made individuals want to stop self-harming, so they did not end up escalating self-harm as bad as others.	Online imagery encouraged people to compare and compete with others, escalating self-harm behaviours. Some reported pride if their self-harm was worse than others, or a sense of failure if theirs was not as severe.
Social integration and regulation (Mueller & Abrutyn, 2016)	Occurs in closed communities with high rates of social isolation and social cohesion that	Some reported sharing images of healing wounds and scars which might encourage recovery narratives.	Many studies reported how participants got ideas about self-harm methods or how to hide

	leads to diffusion of ideas and behaviours. Online communities may be particularly susceptible to the rapid dissemination of ideas and formation of cultural scripts associated with negative events such as self-harm/suicidality (adapted from Hawton et al., 2020b).		self-harm from others or self-harm safely.
Social learning (modelling and imitation) (Bandura, 1977)	The imitation of behaviour of others (model) occurs when there are shared characteristics (e.g., similar age).	NR	Some reported performing same or similar method as seen online, suggesting a social learning influence.

1E. Full summary of potential impact and mechanisms for each study

Table 6

Summary of potential positive and negative impacts and mechanisms for each study

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
1: Arendt et al. (2019)	NR	NR	1. **Impact on self-harm behaviour:** Analyses indicated that exposure to self-harm on Instagram was associated self-harm, even controlling for exposure to other sources with similar content. 32.5% indicated that they have imitated the same (or very similar) self-harming behaviour as a consequence of seeing self-harm content on Instagram, indicating a substantial number of participants reporting a (presumed) copycat influence. At-risk individuals were more likely to intentionally access self-harm content on Instagram but those with more	1, 5, 6: Social Learning* (imitation) / Assortative Relating (although only 20% actively searched for content), so social learning may be more likely to explain increase in self-harm behaviour and suicidality as well as emotional disturbance perhaps 1: Social Learning* / Assortative Relating* / Descriptive norms 5: Emotional dysregulation* 6: Potential evidence that mental imagery/priming may enable one to perspective-take and "imagine" what it would

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			intentional exposure were not more likely to do anything immediately about it. 5. **Impact on emotions:** Analyses indicated that exposure to self-harm on Instagram was associated with emotional disturbance. 63.9% indicated that their exposure to self-harm content on Instagram had emotionally disturbed them but did not correlated with self-harm behaviour, suicidal ideation, suicide plans or risk, or hopelessness, except for reasons for living. 6. **Impact on self-harm cognitions (including mental imagery):** Analyses indicated that exposure to self-harm on Instagram was associated with increased suicidal ideation and hopelessness, and reduced reasons for living. The	feel to engage in self-harm behaviours

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			majority (59.6%) indicated that they have thought about how it would feel if they would do the same self-harm to themselves (perspective-taking).	
3: Brown et al. (2018)	4. **Impact on help-giving behaviours:** 23.5% (n = 1562) of comments were empathic. 11.6% (n = 770) of comments were warnings asking the user to stop the behaviour. 6.9% (n = 462) of comments were offering help. Very few comments complimented the wound or picture (0.5%, n = 33).	4: Might encourage help-seeking behaviour and reduction of self-harm, through validation, positive social reinforcement* and descriptive norms	2. **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** Pictures directly depicting wounds generated around twice as many comments from other users than pictures not depicting wounds. Pictures showing very severe wounds generated more comments than mild or moderate wounds. 23.5% (n = 1562) of comments were empathic. 6.9% (n = 462) of comments were offering help. Very few comments complimented the wound or picture (0.5%, n = 33). 3. **Impact on help-seeking behaviours:** Objects for NSSI along with the	2, 3 & 4: Positive social reinforcement* might encourage users/viewers to post more severe NSSI pictures or post NSSI images to get more support/reactions from others. Might also normalise self-harm behaviour through descriptive norms and reduce help-seeking behaviour (e.g., getting ideas for methods) through social integration and regulation 5: Potential evidence of emotional dysregulation/amplification* in viewers (e.g., more comments for severe images, abusive/asking

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			corresponding wound were shown in 5.8% of the pictures. Most commonly, razor blades (4.0%) or other blades (1.3%) were depicted, followed by fingernails, knives and ropes (0.1–0.2%, respectively) 4. **Impact on help-giving behaviours:** 23.5% (n = 1562) of comments were empathic. 11.6% (n = 770) of comments were warnings asking the user to stop the behaviour. 6.9% (n = 462) of comments were offering help. Objects for NSSI along with the corresponding wound were shown in 5.8% of the pictures. Most commonly, razor blades (4.0%) or other blades (1.3%) were depicted, followed by fingernails, knives and ropes (0.1–0.2%, respectively) 5. **Impact on emotions:** Potential evidence of	user to stop) which may also cause emotional disturbance in posters/others

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			emotional disturbance in viewers (e.g., more comments for severe images). 11.6% (n = 770) of comments were warnings asking the user to stop the behaviour. 6.8% (n = 450) of comments were abusive. Very few comments complimented the wound or picture (0.5%, n = 33). Only 10% of all posts associated with NSSI hashtags depict wounds directly, perhaps suggestive that individuals are aware of "triggering" nature of posts, choosing to share these less widely.	
5: Cha et al. (2016)	NR	NR	5. **Impact on emotions:** In study 1, there was a slight but significant mood decline for the self-injury images Implicit Association Test (IAT) but not for verbal suicide or death IATs, even when controlling for self-harm history. Suggests that that self-harm images may	5: Emotional amplification*: Self-harm images cause more emotional disturbance than words/phrases, even in those without a self-harm history. A slight mood decline in females suggests they may be more vulnerable to the effects of

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			impact on mood, more than words/phrases. There was a slight mood decline among female web-based participants (Study 1).	viewing self-harm content online.
7: Fu et al. (2013)	4. **Impact on help-giving behaviours:** A significant portion of the responses appeared to be positive, characterized functionally by efforts of caregiving and offers of assistance to the call for help. Caring, empathic reactions or calling for help elicited in 36.6% of viewers of the post. This help-giving may	4: Positive social reinforcement may encourage others to offer and seek help* / offers of assistance may reinforce help-seeking behaviours as per the hyperpersonal model (Walther, 1996)	2. **Sharing or liking self-harm imagery behaviours**: The original post was reposted 3,974 times and received 1,997 comments by 3,696 micro bloggers within 3 hours, yielding 5,971 microblog pieces of content. 4. **Impact on help- giving behaviours:** A significant portion of the responses appeared to be positive, characterized functionally by efforts of caregiving and offers of assistance to the call for help. 5. **Impact on emotions:** Emotional presentations (19.5% emotional shock; 23.4% cynical or indifferent) and disconfirmation may have undesirable effects on the emotions of the	2: Positive social reinforcement* / descriptive norms / Assortative relating / Social regulation and integration 4: Positive social reinforcement* (authors refer to hyper personal model (Walther, 1996), the consequence of these caregiving responses may positively address and reinforce a suicidal individual's underlying goal of self-presentation: the cry for help (Farberow & Shneidman, 1961) / Descriptive norms. May also increase emotional strain, distraction from own needs and responsibility for others.

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	facilitate help-seeking.		attempter and other individuals who are exposed to these messages	5: Emotional amplification* in poster and viewers may have undesirable effects on the emotions of the attempter and other suicidal individuals who are exposed to these messages
10: Jaroszewski et al. (2020)	NR	NR	5. **Impact on emotions:** Suicide group rated TP-Suicide images significantly more pleasant, and FP-Positive images as less pleasant, than the Non-suicide group. Suicide group rated FP-Suicide, TP-Suicide, and IAPS negative images significantly more	5: Emotional amplification or habituation over time; people with a history of suicidality more likely to find suicide images more pleasant and arousing, and less threatening, than those without a history of suicidality. Given older age of sample,

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			arousing than the Non-suicide group. The Suicide group rated FP-Suicide and TP-Suicide images as significantly less threatening than the Non-suicide group. Young people with no/less history of suicidality or self-harm that come across imagery may find these self-harm images as less pleasant, and more arousing and threatening, providing some evidence of emotional amplification.	habituation*(Joiner, 2003) to self-harm content may occur over time with a preference for negative imagery over positive imagery. Alternatively, findings might be suggestive that those with suicidality don't have aversion to these stimuli, which enables them to act on it (Benefit and Barriers model*). People with hx of suicidality might also find images relieving as a proxy to undertaking behaviour (Kleinman, 2018).
12: Lewis et al. (2012)	3. **Impact on help-seeking behaviours:** A small number of comments encouraged the uploader to seek help (2.41%). Even less	3 & 4: Descriptive norms and positive social reinforcement might encourage commenter, poster and others to seek support	2. **Impact on sharing or liking self-harm imagery behaviours:** Most frequent comments were self-disclosure comments in which individuals shared their own NSSI experiences (38.39%), and indicated that they were still self-injuring	2, 3 & 4: Assortative Relating*, Descriptive Norms*, Positive Social Reinforcement*, lack of recovery talk may maintain NSSI*; Results suggest that viewers' responses to videos (e.g., sharing own NSSI

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	common were comments posted by individuals who indicated they had recovered (7.11%) or who expressed a desire to recover (3.78%). 4. **Impact on help-giving behaviours:** A small number of comments pertained to help-seeking and provision. An equal number of comments asked for help (2.64%) or offered help to the uploader (2.64%). Related to this, a small number of comments encouraged the		(34.00%), followed by feedback for the video uploader, including admiration of the video quality (21.95%) or message (17.01%), and admiration for the uploader (15.40%) or encouragement to the video uploader (11.15%). Almost as common were comments offering words of encouragement to the video uploader (11.15%) or thanking the uploader for sharing his/her NSSI story (9.66%). Comments expressing pride toward the uploader (e.g., "this was very powerful. good job, I'm proud of you") were rare (<1%). 3. **Impact on help-seeking behaviours:** Evaluation of the common self-disclosure comments for recovery-oriented content revealed that the majority did not mention recovery at all	experiences, admiration, encouragement) and rarely encouraging or mentioning recovery may maintain and/or normalise NSSI behaviour. 3 & 4: Social integration and regulation through sharing methods 5 & 6: NSSI imagery can be triggering, increasing NSSI urges (priming) and may lead to emotional amplification/dysregulation* potentially increasing likelihood of self-harm. Hostile comments may also lead to emotional amplification in poster or viewers.

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	uploader to seek help (2.41%), and some offered to communicate with the uploader through YouTube or e-mail (1.61%)		(42.89%) and indicated that they were still self-injuring (34.00%). Positive recovery statements were uncommon. Comments about sharing NSSI methods and strategies (e.g., wound cleaning, concealing) were not common (1.38% of comments). Comments explicitly indicating that the individuals posting the comment had not engaged in NSSI were uncommon and occurred just 2.18% of the time. Much less common were comments indicating that the commenter had tried to seek treatment in the past or that he/she was presently seeking treatment (9.56%). Even less common were comments posted by individuals who indicated they had recovered (7.11%) or who expressed a desire to recover (3.78%). A small number of comments	

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			pertained to help seeking and provision. An equal number of comments asked for help (2.64%) or offered help to the uploader (2.64%). Related to this, a small number of comments encouraged the uploader to seek help (2.41%), and some offered to communicate with the uploader through YouTube or e-mail (1.61%). 4. **Impact on help-giving behaviours:** Comments about sharing NSSI methods and strategies (e.g., wound cleaning, concealing) were not common (1.38% of comments). A small number of comments pertained to help seeking and provision. An equal number of comments asked for help (2.64%) or offered help to the uploader (2.64%). Related to this, a small number of comments encouraged the uploader to	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			seek help (2.41%), and some offered to communicate with the uploader through YouTube or e-mail (1.61%). 5. **Impact on emotions:** Comments that mentioned triggering effects were also infrequent, with only a few comments explicitly mentioning that the video content was triggering and evoked NSSI urges (1.72%). In some cases, hostile comments were made about NSSI and/or the uploader (6.55%). 6. **Impact on self-harm cognitions (including self-harm urges and mental imagery):** Comments that mentioned triggering effects were also infrequent, with only a few comments explicitly mentioning that the video content was triggering and evoked NSSI urges (1.72%).	

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14: Seko et al. (2018)	**2. Impact on sharing/liking self-harm imagery behaviours:** The third most reblogged among Direct SI images included hopeful/pro-recovery images (n = 21, 132 reblogs); messages of hope and recovery. Around a third of images depicted scars or healing wounds, rather than new, bleeding injuries. 4. **Impact on help-giving behaviours:** The third most reblogged among Direct SI images included	2, 4: Descriptive norms ('Narrative reinforcement' (Lewis/Whitlock)* / positive social reinforcement / social integration and regulation*- potentially increasing hope and help-seeking 8 & 9: Social positive reinforcement (Belonging)/ social integration and regulation (collective intelligence)* 10: self-reflection	2 **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** The most reblogged among Direct SI images were denotative images (n = 13, 590 reblogs), followed by SI normalization (n = 12, 137 reblogs; sharing methods), and hopeful/pro-recovery images (n = 21, 132 reblogs). Some reblogged images of direct SI had a sad and hopeless mood. **3 Impact on help-seeking behaviours:** In 20 images (15 Direct SI images and 5 Indirect SI images) showing self-inflicted wounds (mostly open, bleeding wounds), razor blades, or other materials that symbolize SI, the act of SI was presented as an effective coping mechanism. 5 **Impact on emotions:** Indirect images blogged	2, 3, 10: Positive social reinforcement / Normalisation (descriptive norms or narrative reinforcement)* / social integration and regulation ("collective intelligence")*; personal wounds may be used to claim membership to SI communities and may shape how images are appraised by viewers/posters and the meaning they attribute to their self-harm. repetitive digital circulation of popular media memes as "the narrative of SI" may reproduce stereotypical representation across popular media, in which SI is portrayed predominantly as superficial cutting performed by young White females (Whitlock et al., 2009).

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	hopeful/pro-recovery images (n = 21, 132 reblogs); messages of hope and recovery (e.g., scars and healing wounds) 8. **Impact on social connection:** The third most reblogged among Direct SI images included hopeful/pro-recovery images (n = 21, 132 reblogs); messages of hope and recovery (e.g., scars). Personal wounds can also be used to claim membership to SI communities. 10. **Impact on personal**		more; images with wounds reblogged 10 times less than images without wounds, seemingly suggesting individuals are aware of potentially triggering nature of images. Images were often first-person, allowing users to vicariously view and feel pain as their own. 10 **Impact on personal identity:** Authors suggest that scars may be seen as proof of resilience as an adaptive process, whereby these persons work to re-construct coherent, meaningful narratives and re-establish their sense of self-worth to fit their changing circumstances. At the same time, personal wounds can also be used to claim membership to SI communities.	5: Emotional dysregulation / awareness of aversiveness may have prevented as much reblogging of this content

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	identity: scars represented a key vehicle for storytelling, helping the uploaders to visually declare their authenticity and narrate personal pain endured. Authors suggest that scars may be seen as proof of resilience as an adaptive process, whereby these persons work to re-construct coherent, meaningful narratives and re-establish their sense of self-worth to fit their changing circumstances. At the same time,			

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	personal wounds can also be used to claim membership to SI communities.			
Qualitative Studies				
2: Baker & Lewis (2013)	1. **Impact on self-harm behaviour:** Some reported that images provide support and result in decreased frequency and severity of NSSI. Several users emphasized that they received a similar feeling from looking at the photographs	1 & 5: Aversion* 3, 4, 5 & 8: Assortative Relating / Descriptive Norms / Positive social reinforcement to connect and feel less alone / Social integration and regulation 1, 5, 6, 7: Emotion regulation* through viewing images as proxy to self-harm (vicarious self-harm)	1. **Impact on self-harm behaviour:** Fresh cuts and blood were said (for some) to be more likely to trigger NSSI. Arguments were often made on the basis that photographs are likely to encourage NSSI and may result in people using NSSI with increased frequency and severity. 2. **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** Some reported	1, 2, 3, 8: Positive social reinforcement / Social learning (imitation) / Descriptive norms (normalising or narrative reinforcement*) / Assortative Relating / Social integration and regulation 6: "Triggering" urges / Cognitive amplification/priming 9: Comparison & Competitiveness*

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	as they do from actually injuring themselves, curbing self-harm urges. Photographs of more severe self-harm or scars were (for some) more likely to discourage individuals from self-harm. 3. **Impact on help-seeking behaviours:** Some reported that images provide support and resulted in decreased frequency and severity of NSSI. 4. **Impact on help-giving behaviours:** Images can be helpful to other SI	/automatic reinforcement*	concerns that sharing images of self-harm may encourage others to do the same. 3. **Impact on help-seeking behaviours:** Several other users also described concerns that the photographs not only portray NSSI as an acceptable behaviour, but sensationalize NSSI as desirable, appealing, or even ‘‘cool’’. 6. **Impact on self-harm cognitions (including self-harm urges and mental imagery):** the desire to view injuries may contribute to urges to self-injure. A large number of users attested that the photographs were harmful because they induce urges to self-injure for some individuals (“triggering”). This was particularly salient among a number of users who described personal experience. Some reported that people in vulnerable	

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	victims on their road to recovery by displaying how bad it really could get, as well as helping people identify with one another and realize they are not alone (providing identification and support). Some reported being motivated to share their own images of scars to discourage others from self-harm. 5. **Impact on emotions:** A substantial number of individuals interpreted photographs as proof that there are others who		states of mind may not pay attention to trigger warnings and continue to view images. 8. **Impact on social connection:** Several other users also described concerns that the photographs not only portray NSSI as an acceptable behaviour, but sensationalize NSSI as desirable, appealing, or even ‘‘cool’’. 9. **Impact on social comparison:** Participants reported how photographs may encourage people to compete with others, in terms of NSSI—that people may look at the pictures and ‘‘outdo’’ or produce injuries more severe than those pictured.	

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	struggle with NSSI and this therefore reduces feelings of loneliness and isolation**.** Several users also emphasized that they received a similar feeling from looking at the photographs as they do from actually injuring themselves. Some reported feelings of fear following exposure to images, making them not want to develop reliance on NSSI. **6. Impact on self-harm cognitions (including self-harm urges and mental imagery):**			

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	looking at photos can curb urges to self-injure. Several users also emphasized that they received a similar feeling from looking at the photographs as they do from actually injuring themselves. Photographs of more severe self-harm and/or scars were (for some) more likely to discourage self-harm. 7. **Impact on physiology:** by looking at self-harm imagery, a similar "adrenaline rush" to cutting was felt.			

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	8. **Impact on social identity & connection:** Looking at self-harm images can provide identification with others and support, making people feel less alone and curb urges to self-harm.			
4: Brown et al. (2020)	1. **Impact on self-harm behaviour:** Participants reported feeling repulsed by deep cuts momentarily deterred participants from NSSI but had not helped them stop NSSI completely 4. **Impact on help-giving**	1 & 5: Aversion* 4 & 8: Positive social reinforcement* /Belonging (Maslow)* / Identity/ Social integration and regulation 9: Self-harm recovery by changing perception/relationship to self-harm /self-reflection	1 **Impact on self-harm behaviour:** Some participants noted reported finding videos triggering (30.5%) and led to self-harm. 2 **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** Following other NSSI-pages before posting pictures (40.7%). More severe reactions were	1&5: Emotion dysregulation * / Triggering self-harm behaviour / social leaning (imitation)*/ stigma/cyberbullying 2, 3, 4 & 8: Social learning (imitation)* / Normalisation (descriptive norms) / Assortative relating /

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	behaviours: Participants reported reactions they had received to their own images and/or experienced whilst viewing others' pictures: Social connection, disclosure, communication (61%); being offered help (39.2%), wanting to help (25.4%), and empathy (27.1%), which might positively reinforce and encourage help-seeking. Participants reported posting pictures in order to help others (i.e. to discourage		reported to generate more severe responses; more attention received for pictures showing NSSI wounds than for other images (54.2% reported). This might positively reinforce and encourage maintenance of sharing NSSI images to continue receiving validation and support. 3 **Impact on help-seeking behaviours:** None of the participants mentioned successful referral to professional help through their online NSSI activity, which might limit the possibility of help-seeking behaviours. 4 **Impact on help-giving behaviours:** Participants reported reactions they had received to their own images and/or experienced whilst viewing others' pictures: Social connection,	Positive social reinforcement* /Belonging (Maslow)* / 9: Social comparison and Competitiveness / Admiration

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	them from engaging in NSSI or to get their attention to then offer help). 5. **Impact on emotions:** Feeling repulsed by deep cuts momentarily deterred participants from NSSI but had not helped them stop NSSI completely 8. **Impact on social connection:** Most of the participants (N = 36, 61%) stated social reasons for initially posting their first picture online, or for continuing to post pictures online (N = 31, 52.6%). Reasons of social		disclosure, communication (61%); being offered help (39.2%), wanting to help others (25.4%), and empathy (27.1%), compliments (8.5%), Identification with content (35.6%). More severe reactions were reported to generate more severe responses; more attention received for pictures showing NSSI wounds than for other images (54.2% reported). This might positively reinforce and encourage maintenance of sharing NSSI images to continue receiving validation and support. **5** **Impact on emotions:** Some participants noted negative responses to complete suicide or only seeking attention (40.7% stigma/cyberbullying) or reported finding videos	

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	connection (57.6%), i.e. belonging to a group were mentioned frequently. Many participants expressed that they felt understood by other Instagram users much more than by family members or friends in real life. Other participants mentioned that they mainly posted pictures for reasons of self-disclosure. Several participants mentioned the fact that they felt safe talking about their NSSI in the		triggering (30.5%) and led to self-harm. 8 **Social connection:** Participants reported reactions they had received to their own images and/or experienced whilst viewing others' pictures: Social connection, disclosure, communication (61%); being offered help (39.2%), wanting to help others (25.4%), and empathy (27.1%), compliments (8.5%), Identification with content (35.6%). More severe reactions were reported to generate more severe responses; more attention received for pictures showing NSSI wounds than for other images (54.2% reported). This might positively reinforce and encourage maintenance of sharing NSSI images to continue	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	anonymity of the Internet 10. **Impact on personal identity:** Apart from social reasons, some participants started posting pictures for documentation (n=9, 15.3%). Some stated to use it as a diary without any further given intent, whereas some participants clearly stated to try and document their recovery		receiving validation and support. 9 **Impact on comparison:** The most common reaction to other users' NSSI pictures was to identify with them (n=21, 35.6%) and compare one's own wounds with those pictures. Comparing wounds (finding them pretty, being proud if own wounds worse than depicted in NSSI photographs)	

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6: Chen et al. (2021)	NR	NR	6. **Self-harm cognitions (including self-harm urges and mental imagery):** Inspiration to harm from media and online resources. Participants learned how to self-harm from thrillers, television shows and books. Some mentioned that they heard about it from online chat groups and even self-harmed with companions: 'Some guys posted pictures of them doing self-harm in the chat group. They seemed cool.'	6: Descriptive norms (normalising)* / Possibly priming thoughts of self-harm
8: Hetrick et al. (2020)	NR	NR	1. **Impact on self-harm behaviour:** Exposure to graphic self-harm imagery on Tumblr and Instagram was reported to normalise self-harm and lead participants to engage in self-harm themselves. Some reported other people sharing details about self-harm methods was triggering.	1. Descriptive norms (normalising)* / Assortative relating / Social integration & regulation /Social learning 5. Emotional dysregulation arising from feeling isolated

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			5. **Impact on emotions:** Participants would also compare their own self-harm, to the images of others' self-harm online, and this was reported to lead people to feel bad if their self-harm was not as severe, and feel more isolated because they didn't conform to social norms of self-harm **9. Impact on social comparison and competition:** Participants would also compare their own self-harm, to the images of others' self-harm online, and this was reported to lead people to feel bad if their self-harm was not as severe, and feel more isolated because they didn't conform to social norms of self-harm	9. Social comparison and competitiveness*
9: Jacob et al. (2017)	NR	NR	**1. Impact on self-harm behaviour:** Participants reported using self-harm images to trigger self-harm rituals and that viewing	1: Emotional dysregulation* and physiological amplification / Descriptive

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			images encouraged self-harm behaviour and got worse over time. Some evidence that those who shared their own images engaged in more severe self-harm behaviours and were encouraged by self-harm community. Interviewees who were overtly critical of the sharing of self-harm images appeared to engage in a less severe form of self-harm. 2. **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** For some, online community exchanges created a routine, which normalised and encouraged self-harm 4. **Impact on help-giving behaviours:** led to opportunities to discover and share self-harm practices and techniques, and increasing access to means,	norms* / Social learning / assortative relating 2: Normalisation (descriptive norms)* & Exacerbation of self-harm / Positive social reinforcement / Escalation over time 4: Social learning /descriptive norms* /social integration and regulation 5 &7: Emotional (dys)regulation* (triggering but also brought relief imagining what it would feel like to self-harm) 6: Mental imagery of past self-harm images which led to future self-harm imagery (planning self-harm) / Priming /Social learning

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			which lead to increased self-harm behaviour and severity. 5. **Impact on emotions:** Participants reported powerful and physical reactions to images which triggered desire to self-harm. Images brought back mental images of previous self-harm that enabled them to envisage how they could self-harm and feel relief. Participants reported using self-harm images to trigger self-harm rituals. 6. **Impact on self-harm cognitions (including self-harm urges and mental imagery):** Images brought back memories (mental images) of previous self-harm that enabled them to envisage how they could self-harm and feel relief and imagine what it feels like. Images also brought desire to recreate self-harm images	4 & 6: Imitation / Contagion/ Competitiveness* 8: Positive social reinforcement / descriptive norms* / assortative relating / social learning / social integration and regulation 9: social Comparison and competitiveness* 10: self-harmer identity / fear of stigma / social integration and regulation / Assortative relating / positive social reinforcement

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
			and perform more severe self-harm. Concern was expressed that the posting of images would be interpreted as attention-seeking, a category of behaviour to be avoided. 7. **Impact on physiology:** Nearly three quarters of individuals indicated that imagery (notably photographs rather than words) were the primary reason for their utilisation of the Internet, due to a powerful and physical reaction that triggered the desire to harm (e.g. "rush", "fast heart rate") 8. **Impact on social connection:** Tumblr was perceived to permit an immediate and intimate connection with others, which had led to normalisation and exacerbation of self-harm in	

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			participants (posting images was encouraged). 9. **Social comparison and competitiveness:** Exposure to other individuals' severe acts made some individuals want to become better self-harmers. Discussion was further characterised by a sense of competition, with individuals desiring to emulate the depicted harm and berating themselves when they failed to engage with more sophisticated and severe techniques. 10. **Impact on personal identity:** Exposure to other individuals' severe acts made individuals want to become better self-harmers. Interviewees who were overtly critical of the sharing of self-harm images appeared to engage in a less severe form of self-harm. Amongst this group the rejection of public displays	

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			of self-harm were based upon the belief that it should be a private activity. Concern was expressed that the posting of images would be interpreted as attention-seeking, a category of behaviour to be avoided. This might mean individuals are discouraged from online and offline help-seeking.	
11: Lavis & Winter (2020)	4. **Help-giving behaviours:** The impact of people sharing self-harm imagery online was often peer concern and support which may mitigate self-harm	4. Positive social reinforcement	1. **Self-harm behaviours:** Seeing images of other' self-harm could trigger viewers to self-harm due to their distress, not necessarily due to the image per se. To maintain online support, some viewers felt they needed to keep showing they needed support, and self-harm more severely. Ideas for how to self-harm safely were also offered in response to graphic images. 3. **Help-seeking behaviours:** To maintain online support, some viewers felt they	1 & 8: Descriptive norms* / Assortative relating* / Social learning / Social integration & regulation/ Positive social reinforcement 3: Positive social reinforcement 4: Positive social reinforcement / Social integration & regulation / Descriptive norms* 5: Emotional dysregulation*

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			needed to keep showing they needed support, and self-harm more severely. 4. **Help-giving behaviours:** Online peer-support may also preclude offline help-seeking, thinking other people won't understand. Ideas for how to self-harm safely were also offered in response to graphic images. 5. **Emotions:** Seeing images of other' self-harm could trigger viewers to self-harm due to their distress, not necessarily due to the image per se 8. **Social connection:** Online peer-support may also preclude offline help-seeking, thinking other people won't understand. To maintain online support, some viewers felt they needed to keep showing they needed support, and self-harm more severely.	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
13: Seko et al. (2015)	1. **Impact on self-harm behaviour:** Seeing others self-harm curbed urges of others to self-harm, made others want to stop (especially if more severe than their own). **3. Impact on help-seeking behaviours:** Several participants addressed that the Internet was their only source of support and connection, where they could receive empathetic reactions and emotional support from others who engage in NSSI **4. Impact on help-giving**	1: Emotion regulation* /automatic reinforcement* /vicarious relief/ proxy to self-harm) /aversive (barrier) 3, 4, 7: Normalisation of difficulties through descriptive norms might mitigate social isolation / social integration and regulation /assortative relating / positive social reinforcement 5& 6: emotional (dys)regulation*/ automatic reinforcement *or aversion (repulsion) and regulation (proxy) may lead to reduction in self-harm behaviours and urges.	1. **Impact on self-harm behaviour:** If people were in a negative state of mind/mood, looking at NSSI images made them more likely to push them to engage in self-harm. Crowd mentality pushed others to create and upload similar images. Some described sharing NSSI content as a means of offering support to others so they don't feel alone. Positive feelings when their posts received comments or were reblogged. **2. Impact on sharing/liking/reinforcing self-harm imagery behaviours:** Crowd mentality pushed others to create and upload similar images. Some described sharing NSSI content as a means of	1: Increase self-harm for those that are emotionally vulnerable (emotional dysregulation*) / Descriptive Norms/ Assortative relating* / social learning* / positive social reinforcement 5: emotional dysregulation* / triggering 2, 3, 4, 8, 10: Assortative relating*/descriptive norms/ positive social reinforcement / social learning* / social integration and regulation

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	behaviours: Some described sharing NSSI content as a means of offering support to others so they don't feel alone. 5. **Impact on emotions:** many participants spoke of empathetic feelings they had toward the content producers. One person expressed a repugnance to photographs portraying severe wounds, as they appeared "against an instinct for self-preservation" and thus made her "nauseated." Viewing NSSI imagery in this	6: Positive social reinforcement / self-reflection 9: social comparison / aversion (barrier) /self reflection 10: self-reflection of NSSI may curb self-harm urges	offering support to others so they don't feel alone. Positive feelings when their posts received comments or were reblogged. 3. **Impact on help-seeking behaviours:** Crowd mentality pushed others to create and upload similar images. Wanting support from peers. 4. **Impact on help-giving behaviours:** Offering support to peers. 5. **Impact on emotions:** many participants spoke of empathetic feelings they had toward the content producers**.** several participants who conceived visual materials more powerful and could be more triggering, as they are "more of an action than a thought." It was commonly expressed	

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	context served as a pre-emptive strategy to stay away from more severe forms of NSSI. 6. **Impact on self-harm cognitions (including self-harm urges and mental imagery):** Sense of validation from seeing others' NSSI as visual proof, which curbed some NSSI urges. Seeing others' images may serve as a substitute for the act (vicarious relief/proxy). Seeing images enabled individuals to reflect on the experience, make		that photographs of flesh, open wounds with blood were more triggering than pictures of scars and healing wounds. Most participants reported that they put trigger warnings on their materials, seemingly aware of the triggering nature of this content. **8. Impact on social connection:** Crowd mentality pushed others to create and upload similar images. Participants remarked that they create and post content to support similar others struggling with NSSI by letting them know they are "not alone." Several participants addressed that the Internet was their only source of support and connection,	

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	sense of it, and potentially stay away from a need to engage in NSSI. 8. **Impact on social connection:** participants remarked that they create and post content to support similar others struggling with NSSI by letting them know they are "not alone." Several participants addressed that the Internet was their only source of support and connection, where they could receive empathetic reactions and emotional support from others who		where they could receive empathetic reactions and emotional support from others who engage in NSSI. The feelings of loneliness and isolation repeatedly emerged in participant narratives, along with a desire for validation. Online communities were seen to provide participants with emotional support that was largely absent from their offline life. 10. **Impact on personal identity:** some participants stated a desire to advocate on behalf of NSSI communities by informing general public of their struggle and "what's behind the scars".	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	engage in NSSI. The feelings of loneliness and isolation repeatedly emerged in participant narratives, along with a desire for validation. Online communities were seen to provide participants with emotional support that was largely absent from their offline life. 9. **Social comparison:** Seeing others self-harm curbed urges of others to self-harm, made others want to stop (especially if more severe than their own).			

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	10. **Impact on personal identity:** One theme involved self-targeted motives focusing on individual benefits, including expressing the self and creativity, remembering and reflecting on NSSI experiences, and soothing the urge to engage in NSSI and stay away from NSSI. Most participants disagreed with a view that promotes NSSI as a lifestyle choice or a shared identity. Participant			

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	narratives constantly demonstrated their unwillingness to be labelled as "self-injurers" and defined by their behaviour alone.			
Mixed				
15: Sternudd (2012)	1. **Impact on self-harm behaviour:** Some reported images can reduce self-harm depending on mood at the time. Images sometimes deterred people from self-harm. 3. **Impact on help-seeking behaviours:** Self-harm images can	1 & 5: Emotion regulation*/ May encourage self-reflection / Automatic reinforcement*/ Aversive 3, 4 & 8: May encourage help-seeking through Positive social reinforcement / Validation / Normalisation (descriptive norms)	1. **Impact on self-harm behaviour:** About a third of statements described the outcome of looking at self-harm images as triggering (e.g. gruesome pictures) and can lead to self-harm. Viewing self-harm photos was also talked about being part of a strategy to provoke the right mood for self-harm or could lead to self-harm depending on the informant and/or the situation. Impact of images	1, 4, 5, 9: Emotional dysregulation* / Normalisation (descriptive norms)* / Increased self-harm behaviour/ Potentially Re-experiencing emotional mental imagery leading to increased self-harm behaviour / social integration and regulation 6: images priming self-harm urges and behaviour

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	also be a means to get instant help; they can be shown to receive advice from the self-harm community. Publishing photos as a form of help-giving (to deter people or make them feel less alone). 4. **Impact on help-giving behaviours:** Self-harm images can also be a means to get instant help; they can be shown to receive advice from the self-harm community. Publishing photos as a form of help-giving (to deter people or make	5 &6: Re-experiencing emotional imagery as a proxy to self-harm (emotion regulation)* / automatic reinforcement 6, 9: Deter self-harm through emotion regulation/ automatic reinforcement/ aversion/ encourage self-reflection* / social integration and regulation 10: self-reflection	varied depending on state of mind at the time and experience of self-harm; those with more frequent and less experience described the impact as more negative. Over time self-harm images may be constructed as more helpful (habituation)? 2. **Impact on sharing/liking/reinforcing self-harm imagery behaviours:** Publishing SI-photos is described as something that community members do, sometimes as something 'cool' 3. **Impact on help-seeking behaviours:** Self-harm images can also be a means to get instant help; they can be shown to receive advice from the self-harm community. A quarter experienced photos as inspiring and can give tips (location, how to hide).	8: Competitiveness leading to increased/more severe self-harm 2 & 8: Normalisation(descriptive norms)* 1 and 5:Habituation (joiner) / Assortative relating* 5: Emotional regulation as using images to promote right mood for self-harm 3, 4, 8:Positive social reinforcement / Promoting Self-Harm Identity* (Adler & Adler) potentially leading to increased self-harm / Validation 9: comparison and competitiveness* 3 & 4: descriptive norms* / social integration and regulation 10: emotional dysregulation* with fading scars imagery

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	them feel less alone). 5. **Impact on emotions:** Reactions to exposure of self-harm images were described as comforting/calming in nearly half the statements. Looking at SI-photos described as a strategy to re-experience feelings involved in self-harm. The outcome of these exposures could be either alleviating or exacerbating depending on the informant and/or the situation. 6. **Impact on self-harm cognitions (including self-**		4. **Impact on help-giving behaviours:** Self-harm images can also be a means to get instant help; they can be shown to receive advice from the self-harm community. A quarter experienced photos as inspiring and can give tips (location, how to hide). Publishing photos as a form of help-giving (to deter people). 5. **Impact on emotions:** About a third of statements described the outcome of looking at self-harm images as triggering (e.g. gruesome pictures) and can lead to self-harm. Viewing self-harm photos was also talked about being part of a strategy to provoke the right mood for self-harm. 25% of the statements experienced self-harm images as disturbing and inspiring, which could	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	harm urges and mental imagery): Viewing / comparing to self-harm images can alleviate urge to self-harm and be a deterrent (e.g., if more severe than own self-harm). Looking at SI-photos described as a strategy to re-experience feelings involved in self-harm. The outcome of these exposures could be either alleviating or exacerbating depending on the informant and/or the situation. **8. Impact on social connection:**		indicate a preventative and triggering effect. A wide range of feelings were reported in participants' answers, including being sad, sick and shocked. Reactions like depression, grief and concern for themselves, were also stated. Looking at SI-photos described as a strategy to re-experience feelings involved in self-harm. The outcome of these exposures could be either alleviating or exacerbating depending on the informant and/or the situation. Impact of images varied depending on state of mind at the time and experience of self-harm; those with more frequent and less experience described the impact as more negative. Over time self-harm images may be constructed as more helpful?	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	Self-harm images can also be a means to get instant help; they can be shown to receive advice from the self-harm community, reduce feelings of loneliness and feel validated. 9. **Social comparison:** Viewing / comparing to self-harm images can alleviate urge to self-harm and be a deterrent (e.g., if more severe than own self-harm) **10. Impact on personal identity:** Some reported to document their self-harm as a		**6. Impact on self-harm cognitions (including self-harm urges and mental imagery):** Looking at SI-photos described as a strategy to re-experience feelings involved in self-harm with the outcome varying depending on situational factors. 8. **Impact on social connection:** Self-harm images can also be a means to get instant help; they can be shown to receive advice from the self-harm community, reduce feelings of loneliness and feel validated. publishing SI-photos is described as something that community members do, sometimes as something 'cool' 9. **comparison:** Comparison exacerbates self-harm, can lead to competition. **10. Impact on personal identity:**	

Author Year	Area(s) of Potential Positive Impact	Potential Mechanisms related to positive impact	Area(s) of Positive Negative Impact	Potential Mechanisms related to negative impact
	way to evaluate the pros and cons of self-harm and consider if it is 'worth it' or if there are better ways to cope, creating a sense of mastery, control and distance. Taking photos as a means of keeping track to stop self-harm from escalating. Having photos can also be a means of proof and substitute new self-harm.		fading scars are sometimes triggering, with the loss of the scars you also lose your identity.	

Note: *Implied or explicitly discussed by study authors as a potential mechanism

1F: Journal instructions to authors and willingness to receive a submission

General

Contributions from any discipline that further knowledge of the mental health and behaviour of children and adolescents are welcomed. Papers are published in English, but submissions are welcomed from any country. Contributions should be of a standard that merits presentation before an international readership.

Papers may assume either of the following forms:

- *Original articles*
  These should make an original contribution to empirical knowledge, to the theoretical understanding of the subject, or to the development of clinical research and practice. Adult data are not usually accepted for publication unless they bear directly on developmental issues in childhood and adolescence or the transition from adolescence to adulthood. Original articles should not exceed **6000 words**, including title page, abstract, references, tables, and figures; the total word count should be given on the title page of the manuscript. Limit tables and figures to 5 or fewer double-spaced manuscript pages. It is possible to submit additional tables or figures as an Appendix for an online-only version. We strongly encourage you to keep the length of the manuscript within the word limit. If you would like to make an exceptional request to extend the length of your submission contact the editorial office (publications@acamh.org).

From: Barke, Edmund <edmund.sonuga-barke@kcl.ac.uk>

Sent: 01 April 2021 15:12

To: Keith Hawton <keith.hawton@psych.ox.ac.uk>

Subject: Re: Potential review for Journal of Child and Adolescent Psychiatry and Psychology

Dear Keith,

Yes we would be pleased to receive this submission. We will review it for both a practitioner review and a research review slot and find the best match and then discuss these two options with you – once of course we have a positive outcome to the review process.

Is that OK?

Best

Edmund

2A. Lay summary

Safety planning is a strategy that helps people who self-harm or experience suicidal thoughts and urges to keep themselves safe when they are feeling vulnerable. It involves highlighting warning signs and triggers that lead to self-harm or suicidal thoughts; identifying things the person can do on their own and with others to distract themselves from the thoughts; identifying who they can talk to about their thoughts and feelings, both within their social network and professionally; and how they can make sure they reduce their access to means of self-harm or suicide. A safety plan is usually completed jointly between a service user and the clinician involved in their care. There has been growing research that shows that safety plans can be effective in helping people to stay safe.

This project involved providing and evaluating safety planning training to staff from an NHS mental health inpatient ward and an aligned community mental health team. The training was delivered by a clinical psychology trainee and people with experience of self-harm and suicidal thoughts and behaviours. The aim of the project was to explore whether this training: 1) improved staff members' knowledge and confidence, and perceived likelihood and usefulness of using safety planning; and 2) improved the frequency and quality of safety plans being completed.

Following the training there was a significant change in staff members' knowledge, confidence and likelihood of using safety plans. There was also an improvement in the frequency of safety plans, but this was not a statistically significant change. There was some improvement in the quality of safety plans, but this was variable.

Overall, the findings from this study indicated that training alone was not sufficient to significantly improve safety planning practice. Additional measures should be employed

by the services, such as safety planning supervision and refresher training, to help improve practice, as well as improving training and practice by getting more feedback on patients' and carers' experiences of safety planning. Since the study, changes have been made to the safety plan template to help improve the quality of safety plans and recording keeping. A dedicated space on patient records for safety plans is also being created to ensure all clinicians can store and find safety plans more easily.

2B. Audit approval email

From: Lofthouse Emma (RNU) Oxford Health

Sent: 26 April 2019 12:56

To: Karima.Susi <Karima.Susi@oxfordhealth.nhs.uk>

Cc: Cheal Liz (RNU) Oxford Health <Liz.Cheal@oxfordhealth.nhs.uk>; Cooke Tracey (RNU) Oxford Health <Tracey.Cooke@oxfordhealth.nhs.uk>

Subject: FW: Clinical audit proposal

Hi Karima

This has now been signed off and will be added to the directorate local plan, perhaps it would be good to have a catch up again as I now have a sample for the piece of work that I am doing and you may be able to use for yours?

Thanks

Emma

From: Khosla Vivek (RNU) Oxford Health

Sent: 25 April 2019 20:41

To: Bale Rob (RNU) Oxford Health <Rob.Bale@oxfordhealth.nhs.uk>; Lofthouse Emma (RNU) Oxford Health <Emma.Lofthouse@oxfordhealth.nhs.uk>

Subject: RE: Clinical audit proposal

Hi

Thanks Rob

Happy with that.

Best wishes

Vivek

Vivek Khosla

Clinical Director | Buckinghamshire Mental Health Directorate

The Whiteleaf Centre, Bierton Road, Aylesbury, HP20 1EG | Tel: 01865 901337 (Emma Peachment)

Consultant Forensic Psychiatrist| Oxford Health NHS Foundation Trust

Oxford Clinic MSU, Littlemore Mental Health Centre, Sandford Road, Oxford, OX4 4XN

Tel: 01865 902907 (Nicola Sage)| Fax: 01865337455 |

Mobile: 07887791621 | vivek.khosla@oxfordhealth.nhs.uk |

www.oxfordhealth.nhs.uk

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From: Bale Rob (RNU) Oxford Health

Sent: 25 April 2019 17:55

To: Lofthouse Emma (RNU) Oxford Health <Emma.Lofthouse@oxfordhealth.nhs.uk>; Khosla Vivek (RNU) Oxford Health <Vivek.Khosla@oxfordhealth.nhs.uk>

Subject: Fwd: Clinical audit proposal

Fine by me but its bucks teams so have copied vivek

Regards

Rob

Dr Rob Bale

01865 902759

Begin forwarded message:

From: "Lofthouse Emma (RNU) Oxford Health" <Emma.Lofthouse@oxfordhealth.nhs.uk>

Date: 25 April 2019 at 15:54:11 BST

To: "Bale Rob (RNU) Oxford Health" <Rob.Bale@oxfordhealth.nhs.uk>, "Bark Kelly (RNU) Oxford Health" <Kelly.Bark@oxfordhealth.nhs.uk>, "Cooke Tracey (RNU) Oxford Health" <Tracey.Cooke@oxfordhealth.nhs.uk>, "Hombo Rose (RNU) Oxford Health" <Rose.Hombo@oxfordhealth.nhs.uk>, "Cleveland Natalie (RNU) Oxford Health" <Natalie.Cleveland@oxfordhealth.nhs.uk>, "Cheal Liz (RNU) Oxford Health" <Liz.Cheal@oxfordhealth.nhs.uk>

Subject: FW: Clinical audit proposal

For approval and adding to your local plan.

BW

Emma

From: Karima Susi <karima.susi@hmc.ox.ac.uk>

Sent: 25 April 2019 14:36

To: Clinical Audit (RNU) Oxford Health <Clinical.Audit@oxfordhealth.nhs.uk>

Cc: Lofthouse Emma (RNU) Oxford Health <Emma.Lofthouse@oxfordhealth.nhs.uk>; Lascelles Karen (RNU) Oxford Health <Karen.Lascelles@oxfordhealth.nhs.uk>

Subject: Clinical audit proposal

Dear Clinical Audit Team

Please find attached the clinical audit and quality improvement proposal form for the safety planning project I hope to complete under the supervision of Karen Lascelles.

Best wishes,

Karima

Karima Susi, PhD | Trainee Clinical Psychologist | The Oxford Institute of Clinical Psychology Training and Research | The Oxford Centre for Psychological Health

Oxford Health NHS Foundation Trust | University of Oxford | Isis Education Centre | Warneford Hospital | Oxford | OX3 7JX

Karima.Susi@hmc.ox.ac.uk | www.oxicpt.co.uk

2C. Trust's suicide prevention strategy document regarding safety planning

Key areas for Action

The suicide prevention key areas for action form part of the Five Year Forward workstream and the workplan and associated monitoring will be developed in partnership with the project management team.

Area for Action	Where do we want to be	How are we going to get there	Work Plan
Safety planning	All patients at risk of self-harm or suicide will have a safety plan in place	Train staff in effective safety planning in line with established safety planning principles. Ensure patients and carers understand the purpose of a safety plan. Develop safety planning mechanisms on carenotes.	

2D. Safety Planning competency framework from HEE

Safety planning

Basic principles of safety planning

An ability to draw on knowledge that a safety plan is:
a 'stepped' sequence of potential coping strategies and sources of support that a person can use during or before a suicidal crisis or an episode of self-harm
intended to be worked through step-by-step until the suicidal crisis or episode of self-harm has resolved, or a person has accessed urgent help
An ability to draw on knowledge that a person should have 'ownership' of the safety plan, and that this should be developed with them
An ability to draw on knowledge that a safety plan should be expressed in a person's own words
An ability to draw on knowledge that a safety plan should be developed in the context of the shared understanding of risk that emerges from a comprehensive assessment

Constructing a safety plan

An ability to draw on knowledge that safety plans should address the following steps:
warning signs and external triggers of a suicidal crisis or an imminent episode of self-harm that are specific to the person
coping strategies that a person can employ to distract themselves from (or reduce) the suicidal crisis or impulses to self-harm
people who can be contacted to help distract a person from (or reduce) suicidal urges or impulses to self-harm
supportive contacts (both professional and non-professional) who can help to resolve the crisis
professionals who can help to resolve the crisis
reducing access to means of harm prior to suicidal crises or episodes of self-harm
An ability to help a person understand the step-by-step nature of the safety plan
An ability to help a person describe/write each step in their own words
An ability to help a person identify a limited number of entries per step (usually no more than three) so as to keep strategies focused and specific
An ability to agree a strategy to ensure that the safety plan can be easily located or accessed and shared (e.g. with family, carers and significant others)
An ability to help a person review and amend the safety plan (to make it more likely that it will be used and be effective at times of crisis)

Warning signs

An ability to help a person identify warning signs of a suicidal crisis and/or episode of self-harm:
situations or circumstances that may act as 'triggers'
thoughts
images
thinking styles (e.g. rumination, thinking biases (such as catastrophising, or 'all or nothing' thinking)
mood
experience of shame or guilt

changes in habits or behaviours (e.g. sleeping poorly or arguing more with family)
escalating frequency and/or severity of impulses to self-harm
An ability to help a person recognise the significance of their warning signs so that they can use them as indicators of a need to initiate the safety plan

Constructing the steps of a safety plan

An ability to undertake safety planning collaboratively, and in a manner that aims to engage a person's resilience and resources

Coping strategies people can employ

An ability to draw on knowledge that a person needs some effective strategies that they can implement alone (even for brief periods) as help may not always be immediately available from others or a person may not be able to seek support from others
An ability to help a person identify activities they can use to distract themselves from their thoughts of self-harm and/or suicide, such as:
emotional regulating or self-soothing techniques learned through prior or concurrent therapeutic interventions
going for a walk, listening to music, exercising, engaging in a hobby, reading, praying (if religious)
using harm reduction strategies (substitutes for self-harming behaviour)
An ability to help a person identify potential barriers to participating in a planned distracting activity

Contacting others as a distraction from suicidal impulses

An ability to draw on knowledge that contact with family members, carers, significant others or friends (without explicitly informing them of their suicidal state/self-harming behaviour) may help to distract a person from their problems and/or their thoughts about self-harm or suicide
An ability to help a person identify key social settings and people in their natural social environment who may help to refocus their attention and so distract them from self-harming or suicidal thoughts and urges
An ability to ensure that relevant information contained within the safety plan includes:
specific details of the service or people who can be contacted, including addresses and phone numbers
consideration of any factors that may place a person at increased risk (e.g. access to alcohol and drugs)

Seeking support from others to help to resolve the crisis

An ability to draw on knowledge that this step is distinguished from contacting others as a distraction in that a person explicitly identifies that they are in a suicidal crisis or are at risk of self-harm and need support and help
An ability to help a person identify and engage with supportive individuals who:
they feel able to tell that they are experiencing thoughts of self-harm or suicide
are likely to respond in a compassionate and helpful manner
are able to engage explicitly with the safety planning process
An ability to help a person indicate what support they would like from the supportive contacts, and how they will help when contacted

Seeking support from professionals to help to resolve a suicidal crisis

An ability to help a person identify health or social care or other professionals who will provide appropriate, accessible professional help in a suicidal crisis
An ability to ensure the relevant information is contained within the safety plan and includes:
specific details of the service or people who can be contacted, including addresses and phone numbers
adequate consideration of service remit and opening times, to ensure that contacts for both daytime and out-of-hours are included

Increasing safety by reducing access to means of harm

An ability to draw on knowledge that because most suicidal acts are impulsive a plan to reduce access to potentially lethal means of harm can reduce the risk of suicide
An ability to help a person identify lethal means of harm to which they would have access in a suicidal crisis, and to help them place those means out of reach (possibly involving one of the people named in the safety plan)

2E. Suicide theory relating to Safety Planning

Several theories have been proposed to explain the transition from suicidal ideation to action, most notably the Interpersonal Theory of Suicide (IPTS) and the Integrated Motivational-Volitional Model (IMVM; Klonsky et al., 2018). IPTS suggests that thwarted belongingness combined with perceived burdensomeness leads to suicidal desire (Joiner, 2005). However, only when there is also an acquired capability for suicide, through reduced fearlessness about death via habituation from exposure to painful life events, do potentially lethal suicidal attempts arise (Van Orden et al., 2010). Within the IMVM (O'Connor, 2011), belonging and burdensomeness are also incorporated in the Motivational Phase, and acquired capability is in the Volitional Phase; however, the latter also includes access to means, planning, impulsivity and imitation (social contagion; O'Connor & Kirtley, 2018).

2F. Main Service Recommendations

1. Teams should continue to deliver safety planning training and attempting to embed SPing in team processes (e.g., refresher training, supervision, transitions, intranet). Training should focus on the process of completing a SP (e.g., collaboration, approach, timing, reviewing/contingency planning), practicing creating plans, experts by experience, personal clinician factors that may increase/decrease likelihood of SPing.
2. Clinicians should aim to put alerts on patient records so other clinicians know a SP has been completed (or not). Service should work towards creating a dedicated space on patient records for clinicians to record SPing, including reasons why SP

was not completed and the process of completing SPs (e.g., was it done collaboratively, how engaged the person was, who led on writing the SP), which will be helpful for other clinicians/teams.

3. Clinicians should focus on improving discussions and documentation related to reducing access to means, contingency planning and reviewing SPs within and between teams.
4. Clinicians should document when SPs have been given to carers/friends/family, differentiating roles where applicable (distraction and/or crisis management) and include numbers (not just names).
5. The trust should create SP leaflets for patients and staff to outline what SPs are and what they involve.
6. Teams to engage more in ongoing service evaluation and research, including QI and audits, getting more patient and carer feedback; this should be continued to be shared with teams. Teams may want to consider trialing the suicidal coping measure for 1) identifying internal and/or external coping deficits, and 2) whether these improve following SPing, with comparison with a control group.
7. Clinicians should try to undertake SPs with all those with history of self-harm, even if not currently an issue (as a preventative measure) as early as possible in a patient's entry into the system.

The training materials and outcomes of this study also informed another trainee's consultancy project on safety planning in an adult learning disability NHS mental health team.

2G. Informal themes/notes from pre- and post-training focus groups (n=7) and training feedback forms (n=97)

Hopes for training:

- Increase **confidence and knowledge in SPIs** (what, when, how)
- Learn about the **evidence base for SPIs**
- How to **problem solve challenges when undertaking SPIs** (e.g., non-engagement, hopelessness, when SP fails)
- Learn some **distress tolerance skills** to use alongside SPIs

Most Helpful Aspects of Training

Knowledge

- Learning about 6 main principles of SPIs
- Learning about evidence base / rationale for SPIs
- Lived experienced of SPI from current and ex-service users
- Learning about Joiner's interpersonal theory of suicide
- Sharing ideas with others in the training session (e.g., different coping strategies, apps, websites, documents)
- DBT skills (e.g., TIPP, pros/cons)
- Training pack helpful to guide staff

Approach

- When and how to approach SPIs (questions to ask, ways to introduce SP, motivational interviewing ideas)

- Roleplay of SPIs
- Importance of contingency planning in case a strategy does not work
- Reminder of importance of being person-centered and encouraging ownership
- Reviewing SPIs
- Overcoming challenges with SPI; being curious about non-engagement with SPI

Changes since SP training

- Increased awareness of SP in teams
- Promoted discussions in teams regarding SPing and how to develop skills
- Reminding staff of importance of SP in supervision
- SP being made part of processes (e.g., admission, discharge planning, triage meetings, crisis team, day hospital)
- Sending SPs out to patients to review prior to appointments
- Increasing self-efficacy in patients in identifying triggers and improved collaboration
- Reviewing and updating SP at subsequent contacts/if re-admitted (rather than redoing), making patients feel heard and reducing risk. Patients using SP after reviewing/updating when they did not use SP plan previously.
- Trying to include social contacts in SPing as makes a more robust SP (what has/has not worked)
- Having SP written down helps patients to use it when needed; different areas broken down

- Considering making SPing focused-piece of work that could be done in 3-4 session follow-ups.

Challenges of SPI's

- If patient unable to engage in SP (chronic difficulties, very unwell)
- Dilemma and balance between trying to encourage or not forcing them to do SP so not a meaningful activity.
- Short admissions for EUPD patients reduce capacity to do SP.
- Increasing communication of SPs between inpatient and outpatient staff (e.g., this is what we worked on, can you focus on this; continuity of care and increasing awareness of context of SP) – not about creating another process/checklist just need to communicate better/culture of communicating; using alerts.
- Fear SP might be seen by patients as patronising.
- Families might overvalue existence of SP to manage risk; underestimate need to engage with it
- Repeat admissions; SP not working despite spending time; some patients not read.
- Some patients when well, do not want to engage (too unwell and/or not wanting to talk about it and/or denial)
- When people do not want to share SP with anyone (system does not know what to do and does not have a copy of it)
- If someone has an existing SP staff might be less likely to revisit the SP which might be a barrier, whilst if a patient does not have one they might be more likely to create a SP.

- How to know when a SP has been done because there are so many places to put it (unless there is an alert) – if patient called out of hours would not be able to find it.
- Difficulties scanning SP to get it onto record.
- Restructuring in outpatient team (Jan 2020) impacting of staff using SP
- Takes time to do SP properly (compounded by staffing issues)
- Outpatient team: Staff less likely to make time to do SP if busy, not reminded or not audited/mandatory (needing extrinsic motivators); however staff may do it, but quality/approach might be impacted.
- Inpatient team: raised concerns if made mandatory at discharge and how that might impact approach if audited – dilemma regarding not being meaningful, SP done but what about quality? Not just another tick box. Feel pressure to complete SP as part of process rather than therapeutic intervention. Were against having a set figure or target for SP – fear SP would become meaningless/less therapeutic. Also for some patients doing all the principles in one go is not possible as would be overwhelming.
- Not having centralised list of community resources/support available
- Patients not always agreeing/wanting to include certain triggers/risks/diagnoses that might be more stigmatising (e.g., drug use); risk of disengaging
- Fear of recovery/change so do not engage
- Sometimes difficult to build rapport with patients
- Not everyone on CPA so not all staff see SP section
- SP hidden in patient records so hard to know if one has been done, when to review
- Carenotes – need own SP tab but delays in implementing changes

Recommendations for future SPI training

- Deliver as mandatory SP training to all staff (team-specific) as part of risk training
- Include in staff induction training
- Video/Online training facilities
- Shorter/longer training sessions depending on experience/preference
- Include real life examples of SP (differing complexity)
- 1:1 role plays with trainers to build staffs' confidence in SP
- Include more DBT/coping skills
- Consider training environment (e.g., cool room, functional IT, staff experience, handouts, interactive exercises)

Recommendations to make SPIs sustainable.

- Follow-up with regular refresher training
- Ongoing SP reviews/reflection in meetings
- SPs reviewed in supervision
- Monitor, review and audit SP
- Making SPs part of culture/current processes (e.g., CPA, transition points, discharge planning, first appointments, inter/intra team meetings).
- Regular email updates/info on SP
- SP intranet space
- SP champions in teams (six identified)

Recommendations to make SPIs more effective

- Continue getting lived experience of patients and staff
- Continue SP audits on quantity and quality
- SP leaflet for patients/family/friends
- SP examples with ideas of what to include (e.g., distraction techniques)
- Develop different SP forms depending on patient preference (e.g., first aid box picture, cupboard with different draws mapping onto 6 principles)
- Consider running SP groups for patients/carers
- Collect data on whether SP reduce risk
- Share success stories / suicide rates
- Continue auditing SPs and sharing with teams
- Reviewing SPs at every session

Recommendations to improve Functionality

- Make SPs easily accessible to all staff on patient record (e.g., safety plan tab) as not all patients have care plan; helpful reminder
- Place to record when SP has been shared with patient/friend/family
- Clarify and decide on terminology (SP, risk plan, crisis plan)
- Staff to put alerts on/liaise with one another if completed/started SP (what has worked/not worked)
- Create system so pulls through key information, rather than having to duplicate info (save time)

2H. QI outcome monitoring tool

1. Is there evidence of a safety plan or a plan of another name that meets the definition (e.g., equivalent to a safety plan or crisis plan in risk assessment or care plan)? (Yes/No)

2. If yes to Q1, where in the patient record is this plan (e.g., clinical notes, risk assessment, care plan, correspondence)?

3. If no to Q1, is there evidence of safety planning principles within patient record (e.g., in clinical notes, correspondence or care/risk management plans)?

4. If yes to Q3, where in the patient record is this evidence?

5. What is it called?

6. Is there evidence the plan was written by the patient (e.g., by their own hand or written in first person?)? (Yes/No)

7. Is there evidence that the plan was completed in collaboration with the patient? (Yes/No)

8. Is there evidence that a copy of the plan has been given to the patient? (Yes/No)

10. Is there evidence to indicate that the carer: i) know they are identified in the safety plan

11. Is there evidence to indicate that the carer: ii) has a copy of the plan

12. Is there evidence that the following principles of safety planning have been included:

i) Recognising warning signs that are proximal to an impending suicide, self-harm or mental health crisis (Yes/No)

ii) Identifying and employing internal coping strategies (e.g., going for a walk, listening to music, grounding self) without needing to contact another person (Yes/No)

iii) Use contacts with people as a means of distraction from suicidal thoughts and urges. (Social & familial contacts - without discussing suicidal thoughts) (Yes/No)

iv) Contact numbers for family members or friends who may help to resolve a crisis and with whom suicidality, self-harm or mental health concerns can be discussed (Yes/No)

v) Contacting mental health professionals (Yes/No)

vi) Reducing the potential access to means that may cause harm (Yes/No)

13. Is there evidence that contingencies have been discussed (e.g. If person X does not respond to my text I will…….., if strategy Y doesn't work I will……., how do I know I will try strategy Z. (Yes/No)

14) Has the safety plan or equivalent been updated? (Yes/No)

15) Observations/notes

2I. Staff pre- and post-training questionnaire example

1. Please state what you feel is your current level of **knowledge of safety planning**:

1	2	3	4	5	6	7	8	9	10
No knowledge at all									A lot of knowledge

2. Please state how **confident you currently feel in creating safety plans** with patients:

1	2	3	4	5	6	7	8	9	10
Not confident at all									Extremely confident

3. Please state how **likely you are currently to create a safety plan** with patients:

1	2	3	4	5	6	7	8	9	10
Not at all likely									Extremely likely

4. Please state how **useful** you feel safety planning is:

1	2	3	4	5	6	7	8	9	10
Not at all useful									Extremely useful

5. Please state what you are hoping to get out of the training today:

6. Please state if you have any specific questions you would like answered today:

Safety Planning Questionnaire 2

1. Please state what you feel is your current level of **knowledge of safety planning**:

1	2	3	4	5	6	7	8	9	10
No knowledge at all									A lot of knowledge

2. Please state how **confident you currently feel in creating safety plans** with patients:

1	2	3	4	5	6	7	8	9	10
Not confident at all									Extremely confident

3. Please state how **likely you are currently to create a safety plan** with patients:

1	2	3	4	5	6	7	8	9	10
Not at all likely									Extremely likely

4. Please state how **useful** you feel safety planning is:

1	2	3	4	5	6	7	8	9	10
Not at all useful									Extremely useful

5. Please state how **useful** you have found the training today:

1	2	3	4	5	6	7	8	9	10
Not at all useful									Extremely useful

6. Please state what were the **most helpful** aspects of the training today:

-
-
-
-
-
-

7. Please state what were the **least helpful** aspects of the training today:

-
-
-
-
-
PTO

8. How can we **improve the safety planning training we deliver**?

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..

9. **How can we improve safety planning** within the trust (e.g., for teams, across teams, on carenotes, the safety planning form, training)?

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..

10. Please state if you have any other comments/feedback/questions you would like to add:

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..

11. Would you like to be involved in trialing the suicidal coping scale we introduced as part of the training? ☐ YES ☐ NO; EMAIL ADDRESS.....

2J. Additional clinical demographic information

The breakdown according to prior SPI experience according to role is shown in Table 6.

Table 6

Experience of SP broken down by role

Role	Experience of SPIs
Health Care Assistant	14.29%
Housing Officer	0.00%
Manager	50.00%
Medic/Psychiatrist	50.00%
Not specified	66.67%
Nurse	73.33%
Occupational Therapist	85.71%
Other Role	40.00%
Peer tutor	0.00%
Psychologist	100.00%
Recovery worker	25.00%
Social worker	50.00%

Of those who reported prior SPI experience, most had completed a SP with a patient within the last month (Table 7).

Table 7

Time since last SPI

Time	Team			
	Inpatient	Outpatient	Not specified	Grand Total
1 month	44.44%	46.34%	0.00%	44.23%
2 months	0.00%	9.76%	50.00%	9.62%
3 months+	22.22%	4.88%	0.00%	7.69%
6 months	0.00%	2.44%	0.00%	1.92%
9 months +	0.00%	2.44%	0.00%	1.92%
12 months +	11.11%	4.88%	0.00%	5.77%
Not specified	22.22%	29.27%	50.00%	28.85%

Time	Team			
Grand Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

2K. Rules for interpreting special cause variation

Life QI uses the following rules to test for a SCV above what you would expect (occurs when the following rules are broken): outlier (A single point above the +3 sigma or below -3 sigma limit); shift (run of eight points in a row above or below the centerline); trend (six points increasing or decreasing; note, as with the shift rule a point equal to the last point does not add to nor resets the trend); high variation (two points out of three in the outer 1 third of the chart, between the +2 and +3 sigma or between the -2 and -3 sigma limits); low variation (fifteen consecutive points in the inner third of the chart, between the -1 and +1 sigma limits; Benneyan, 2003; Mohammed et al., 2008).

2L. Run charts

Given that I used less than 20 data points per timepoint due to feasibility, and the mean (which is used in SPC charts) may be influenced by extreme values, run charts were calculated as they use the median to calculate the confidence limit, which are unlikely to be influenced by extreme scores. Like SPC charts, a run chart provides a quick insight into how an outcome varies before and after tests of change have been implemented. The median indicates whether the variation seen in measures are natural (“common cause”) or unlikely to be occurring by chance alone (“special cause”). In both cases, the interpretation of the findings did not change, so the SPC charts have been reported in the main text.

Figure 4

Run chart showing the percentage of inpatients with a SPIs over time (with median confidence limits (CL)).

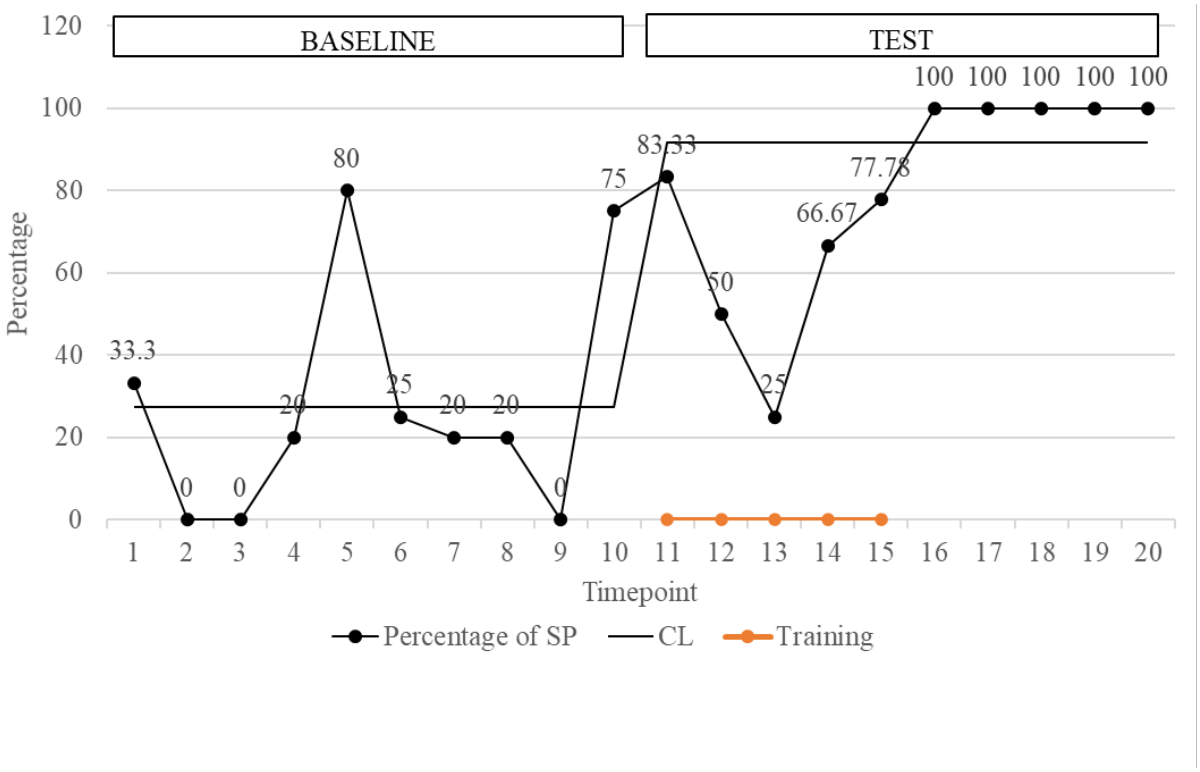
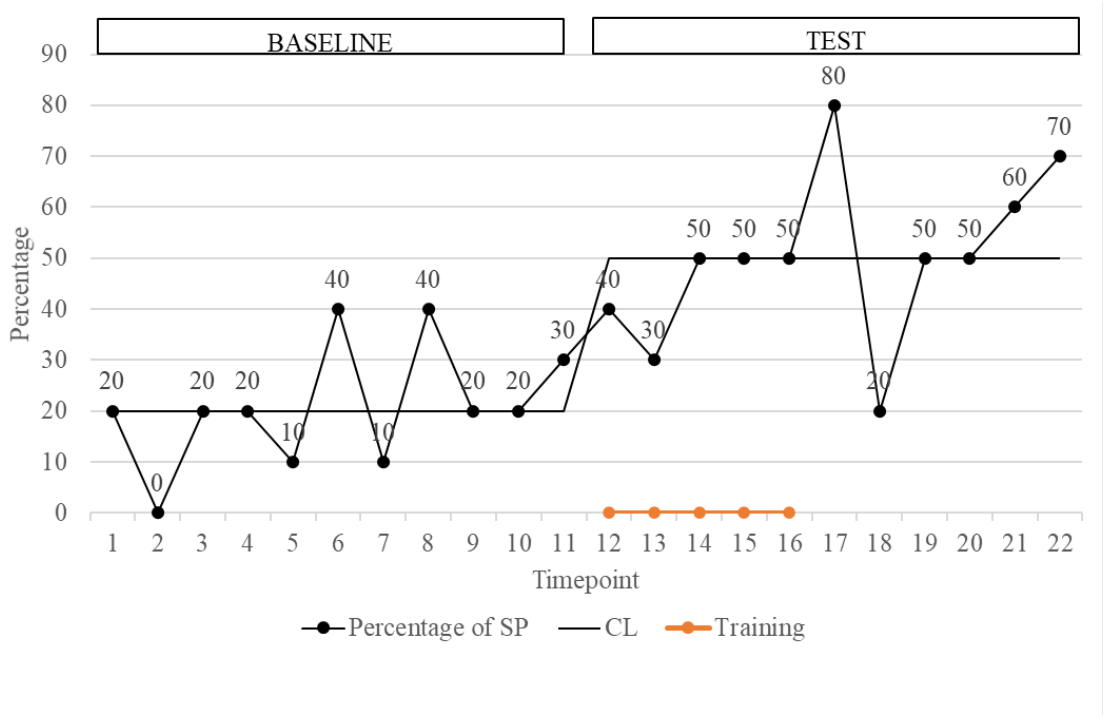


Figure 5

Run chart showing the percentage of outpatients with a SPIs over time (with median confidence limits (CL)).



2M. Additional method information

Patient questionnaires were designed to get feedback on safety planning experiences but only two forms were received within one year, despite repeated efforts, and therefore not reported. Although future work should aim to get these completed by patients.

Qualitative interviews were completed with n=6 current service users in the outpatient team and provisional candidate themes reported (see Appendix 2O) were informally fed back during training and staff feedback meetings. However, this will be written as a separate publication.

2N. Additional data information

Inpatient

100% of patients were female, aged between 18-61 years with a mean age of 36.02 years (SD=12.28). The most common diagnosis was emotional unstable personality disorder (51%).

Plans with only one SP principle were most often found in the care plan (78%) or clinical notes (22%).

Inpatient records were checked up to March 2020 for updates and 26/54 SPs or equivalent were updated (48%), with an average time of 38 days (SD=49; range 1-150) from discharge to a community team.

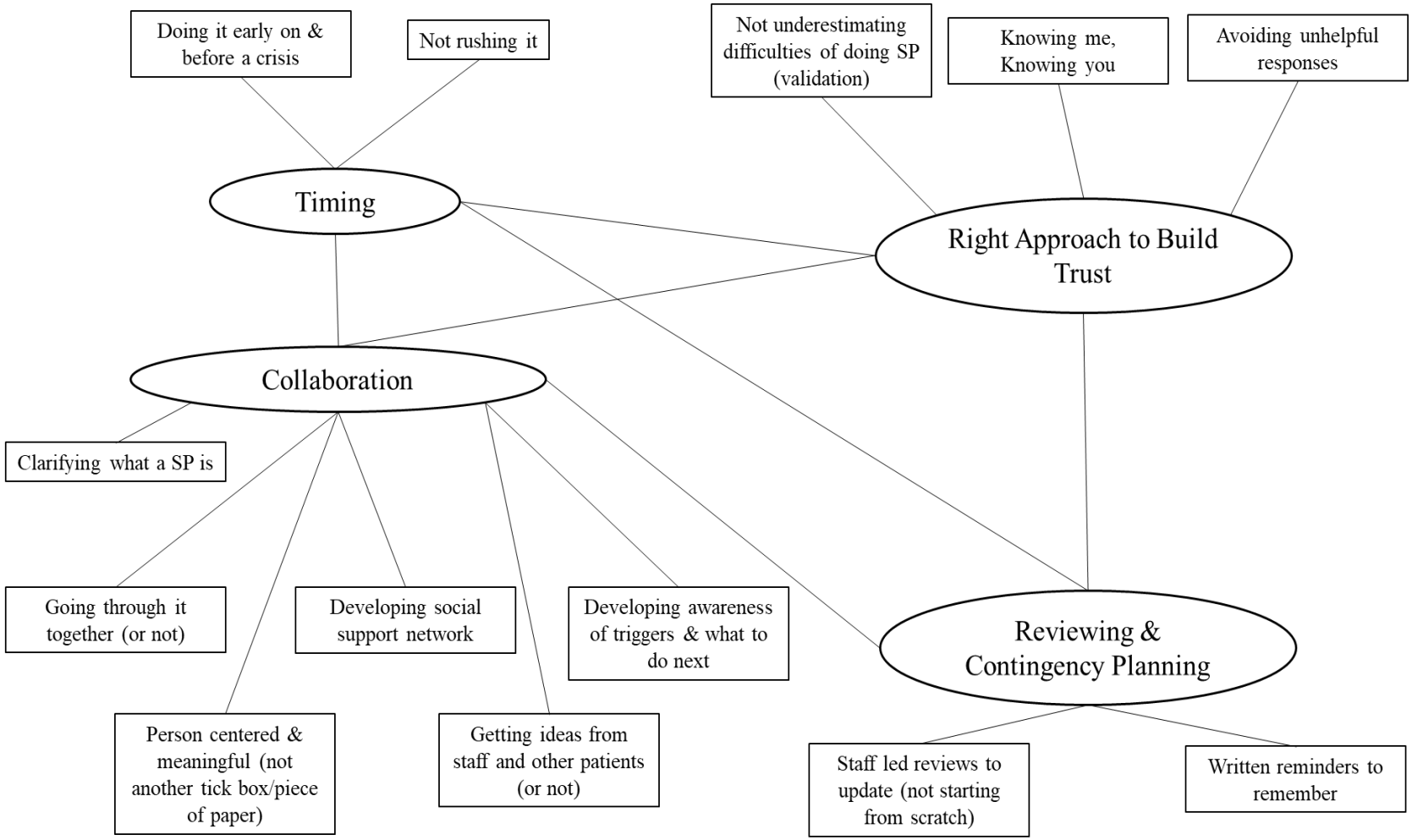
Outpatient

Patients were aged between 18-64 years (Mage=36.25 years, SD=14.25) and 59% were female. 49% did not have a specified diagnosis; however, the most common were depression (26%) and emotional unstable personality disorder (25%).

Plans with only one SP principle were most often found in clinical notes (57%), risk assessment (24%), care plan (15%) and correspondence (4%).

Outpatient records were checked up to March 2020 for updates and 19/124 SPs or equivalent were updated (15%), with an average time of 82 days (SD=66; range 3-215) from first appointment to date of update.

2O. Initial thematic map from outpatient interviews (n=6)



2P. Crisis Journal Instruction to Authors

Manuscript Format

Manuscripts should be prepared according to the *Publication Manual of the American Psychological Association* (7th ed.) as regards both style and presentation. In particular, statistical and mathematical copy as well as references and their text citations, should conform to the *Publication Manual*. **In the reference list make sure to provide the DOIs (Digital Object Identifier) of the cited journal articles.** Footnotes in the running text should be avoided.

Important: All parts of the submission, with the exception of the title page and the letter to the editors, must be free of any potentially identifying information to ensure anonymous peer review. Authors must replace names and any indication of the university/institution where a study was conducted by neutral placeholders, including file names.

The Title Page of each paper should include, in the following order: title of the article; author name(s) preceded by first names, but without academic titles; name of the institute or clinic (if there is more than one author or institution, affiliations should be indicated using superscript Arabic numerals); an address for correspondence (including the name of the corresponding author with fax and phone numbers); and the author note (including acknowledgments, disclosures, and funding sources).

An Abstract (maximum length 200 words) is required for all manuscripts. For Short Reports, Research Trends, Registered Reports, and Systematic Reviews please provide a structured Abstract. This should be divided into the following sections: Background, Aims, Method, Results, Limitations, Conclusion. For a Clinical Insights manuscript, an unstructured Abstract may be submitted, if applicable. A maximum of 5 keywords should be given after the abstract.

Figures and tables should be numbered using Arabic numerals. Each table and figure must be cited in the text and should be accompanied by a legend. Please submit tables and figures via Editorial Manager as separate files. Figures must be supplied in a form suitable for reproduction: preferably high-resolution bitmaps (e.g., jpg, 300 dpi) or as vector graphics files. Figures will normally be reproduced in black and white only. While it is possible to reproduce color illustrations, authors are reminded that they will be invoiced for the extra costs involved.

Authors should follow the guidelines of the APA Manual regarding style and nomenclature. It is recommended that authors who are not native speakers of English have their papers checked and corrected by a native-speaker colleague before submission. Standard US American spelling and punctuation as given in *Webster's New Collegiate Dictionary* should be followed.

Please make sure to avoid stigmatizing language concerning suicidal behavior by using neutral terms. Here are some examples:

2Q. Changes to Safety Planning Template Pre- and Post-study

My Safety plan

My name	Date

Warning signs that things are difficult for me

Things I can do to take my mind off my difficulties and help me cope/ what have I done in the past that will help me now?

Things I can do to keep myself and others safe and reduce my distress?

Friends or family I can call?

Name.	Number.	Do they know I might call?	I am going to give them a copy of this plan?

What can they do to help?..

..

..

Professionals or agencies I can call in a crisis?	What can they do to help?
.. .. ..	

Crisis numbers

Samaritans: 116123.	24hour.
Saneline:	Evenings 4.30-10.30pm Daily.
Oxford Health: 01865 902000	24hour
Other.	

..

Draft Version 4 - 18.05.17

Version 26 June 2020

My Safety Plan

My name .	Date
Warning signs that things are becoming difficult for me	
Things I can do when I am on my own to take my mind off my difficulties and help me cope (make sure there's a backup plan)	Who and what would be good to help distract me; things I can do to help me connect with the people and/or the world around me (make sure there's a backup plan)
Things I can do to keep my environment safe (removing or moving things that you might use to hurt yourself). .	
. .	

Who would be good to contact when I am worried about acting on thoughts of hurting myself; friends or family I can call when I need support? (Make sure there's a back-up plan)

Name.	Number	Do they know I might call?	I am going to give them a copy. of this plan?
What can they do to help? . .			
. .			

Professionals I can call in a crisis	What can they do to help?
. . . . .	
Useful numbers and Apps .	.
Stay Alive App: available at App Store	Copy this safety plan into the safety plan on the app
Distract App: available at App Store	Strategies to reduce self-harm
https://staysafe.net/	Visit this site for suggestions and tips for safety planning
Samaritans: 116123	24 hour
Shout Text Service: 85258	24hour
Hub of Hope: available at App Store	Signposts to local services

. .

3A. More information of service user consultation

Consultation with service users checked the age appropriateness and importance of the questions (e.g., questions about past self-harm imagery were subsequently added). Following feedback, changes were made to the wording and timeframe of some questions (e.g., reducing timeframe for reporting self-harm frequency from three to two months in the quantitative questionnaire), the exclusion of questions relating to verbal thoughts in the quantitative questionnaire as some felt this was too much and too confusing, and the expansion of asking about different types of imagery in the qualitative interviews, particularly relating to past self-harm imagery.

3B. Ethical approval letter

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Dr Karima Susi
Oxford Institute of Clinical Psychology Training & Research, Isis Education Centre
University of Oxford
Oxford
OX3 7JX

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

15 June 2020

Dear Dr Susi

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**A mixed-methods cross-sectional study to explore whether mental imagery increases the risk of self-harm in young people.**
IRAS project ID:	**274060**
Protocol number:	**000000**
REC reference:	**20/WM/0148**
Sponsor	**University of Oxford / Clinical Trials and Research Governance**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report

3C. Inclusion/Exclusion Criteria

Inclusion Criteria

All participants:

- Male or Female, aged 14 – 24 years (up to their 25th birthday); Age of adolescence went up to 24 years, as defined by (Sawyer et al., 2018).
- Have self-harmed one or more times in the last 2 months
- Attending/have attended mainstream education or are on roll to attend school
- Able to speak fluent English
- Able to read English, with or without glasses
- Attending a CAMHS/AMHT NHS service and have had an initial assessment

For participants aged 14-15 only:

- Willing and able to give assent for participation in the study
- Parent/guardian is willing and able to give informed consent for their child's participation in the study

For participants aged 16+:

- Willing and able to give consent for participation in the study

For qualitative interview only:

- Must have experienced mental imagery related to self-harm. This will be determined by the quantitative stage of the study.

Exclusion Criteria

The participant may not enter the study if ANY of the following apply:

- Current psychotic illness
- Current chronic substance misuse
- Intellectual disability or severe ASD, classified as those that are not able/have not attended mainstream education
- Currently in acute crisis, defined as being actively suicidal with plans.

3D. Definition checklist

IMAGERY and SELF-HARM DEFINITIONS CHECKLIST – CI/SITE RESEARCHERS

Please go through this form with the participant before getting them to complete the questionnaire, so we can check they understand the definitions we are using in the study. Please write down what they say, and re-explain anything that they don't understand.

Thank you for agreeing to take part in this study. You are about to be asked a series of questions about your self-harm and the mental images you may experience. The questionnaire should take approximately 20 minutes to complete. There are no right or wrong answers, so try not to spend too long thinking about them, and feel free to go with the answers that feel most right to you. If you don't understand something, please let us know.

What is "self-harm"?
Self-harm is hurting yourself on purpose, such as taking an overdose or deliberately injuring yourself, no matter what the reason. Self-harm is not hurting yourself by accident.

Q. Can you give me an example of a type of self-harm?

……
……
……

What are "thoughts" and "mental images"?
We are interested in the different types and forms of thoughts that can run through our minds. Sometimes we think in the form of words and phrases ('verbal thoughts'). Sometimes we think more in 'mental images' or pictures in our head/ mind's eye. Mental images are the focus of the current study.

What is a mental image?
When we think in mental images, we imagine pictures in our head or pictures in our mind's eye. For instance, if someone told you to think of a pink elephant, an image or impression of one may form in your mind. This is what is referred to as mental imagery. Mental images often take the form of visual pictures. Mental images vary widely and can be clear, vivid, weak, unclear, hard to ignore, fleeting (come and go) or persistent (there a lot of the time). When we talk about 'mental images' we are referring to all of these types of 'imagining'.

In this study, we are especially interested in **mental images you may have experienced related to you self-harming in the future.** This could include: images about what yourself, or other people, might do (e.g., a visual image of planning/preparing/completing self-harm in the future), or the consequences of self-harm and what might happen if you did self-harm (e.g., how others might react if they found out you self-harmed). You might see this image from your own

perspective (as if looking out from your own eyes), or from a different perspective (observing yourself/someone else from a different position in the room, as if you were watching a movie).

We are also interested in **mental images you may have experienced related to you self-harming in the past**. This could include images of times you have self-harmed in the past, images of how others have reacted to self-harm in the past, or images of self-harm you have seen elsewhere.

Q. Can you give me an example of a mental image related to someone self-harming in the future? (examples you can give if they don't understand: image of them hurting themselves in the future, image of what might happen if they hurt themselves in the future, what others might do/how they might react if they self-harm in the future)

.....
.....
.....

Q. Can you give me an example of a mental image related to someone self-harming in the past? (examples you can give if they don't understand: images of times you have self-harmed in the past, images of self-harm you have seen elsewhere, images of how people have reacted to self-harm in the past)

.....
.....
.....

Towards the end of the questionnaire, you will be asked about positive mental images. Positive images can be related to positive events happening to you in the future, for example going to the cinema and enjoying a film with friends.

Q. Can you give an example of a positive image?

.....
.....

You will now complete the questionnaire. Please read the questions very carefully. Important words will be capitalised and put in **BOLD** for emphasis, so please pay attention to these.

3E. Impact assessment

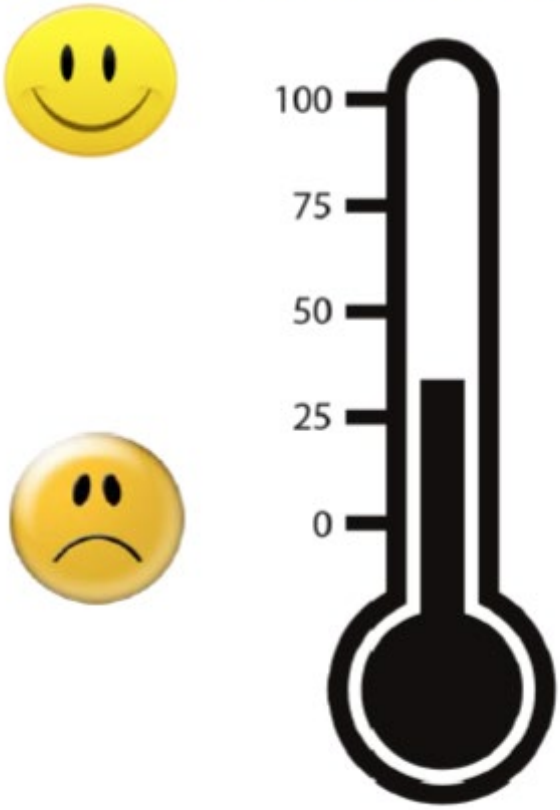
IMPACT ASSESSMENT FORM

Study Title: Exploring Mental Imagery and Self-Harm in Young People

Before the questionnaire/interview:

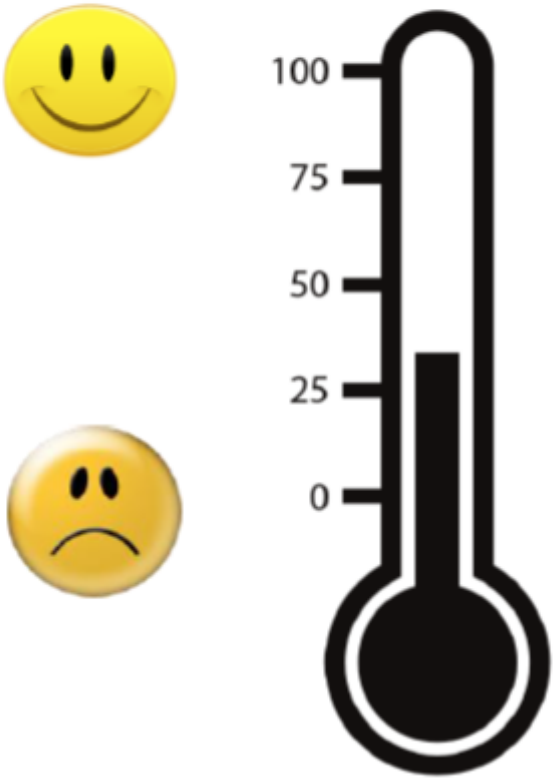
We would like to know how happy or sad you feel right now.

Please indicate on the thermometer what number your mood is right now (with 100 being the best you have felt and 0 being the worst you have felt).



After the questionnaire/interview:

We would like to know how happy or sad you feel right now. Please indicate on the thermometer what number your mood is right now (with 100 being the best you have felt and 0 being the worst you have felt).



We are now going to ask a few questions to get your feedback on what it was like to take part in this study

Taking part in this study was:

Very Easy				Very Difficult
1	2	3	4	5

Very Upsetting				Not at all Upsetting
1	2	3	4	5

Very Enjoyable				Not at all Enjoyable
1	2	3	4	5

On the whole, are you pleased you took part in this study? Please indicate the reason for your answer:

_____
_____
_____
_____
_____
_____
_____

Has anything from the interview today made you feel distressed?

_____
_____
_____

Do you know who to go to when you feel like harming yourself?

_____
_____
_____
_____

3F. Debrief sheet and risk management plan

The debrief will compare scores given on the pre and post-interview/questionnaire impact assessment and ask the participant how they found taking part in the study to monitor for any signs of distress. If a participant has been significantly affected by taking part in the study (e.g., participant sharing or showing significant deterioration in mood, and/or sharing significant distress/suicidal intent) during the debrief, the clinical team (and parent/guardian if under 16) will be immediately notified. The same debrief and impact assessment procedure will be followed for the qualitative interviews.

TRUST LOGO (if applicable), or a placeholder, 'local logo/letterhead'

Departmental Header if desired.

Chief Investigator: Dr Karima Susi, Karima.Susi@hmc.ox.ac.uk and k.susi@nhs.net

Study Code: *Site ID Code:* *Participant identification number:*

Debrief Form

Study Title: Exploring Mental Imagery and Self-Harm in Young People

Thank you for taking part in the study. If, after taking part in the study and speaking to the researcher, you feel affected by any of the things you have discussed today, please contact:

- your clinician.....
- the crisis team on [local number] between [hours]
- your GP

and/or the following external agencies:

SAMARITANS	For anyone • Open 24/7 • Call for free 116 123 • Email jo@samaritans.org
PAPYRUS PREVENTION OF YOUNG SUICIDE	For young people under 35 years old • Open Monday-Friday 10am-10pm, weekends 2pm to 10pm, bank holidays 2pm to 5pm • Call for free on 0800 068 41 41 • Text 07786 209697 • Email pat@papyrus-uk.org
childline ONLINE, ON THE PHONE, ANYTIME	For young people under 19 • Call for 0800 1111 • Won't show up on phone bill • Chat online
CAMPAIGN AGAINST LIVING MISERABLY CALM	For men • Call for free on 0800 58 58 58 – 5pm to midnight every day

If you feel it is urgent, or you are extremely distressed and/or unsure if you can keep yourself safe:

- Speak to someone, such as your GP, and/or:
- Dial 999
- Go to Accident and Emergency (A&E)

3G. Further Information on standardised measures

The PANAS-SF has been used in self-harm and imagery studies and has good psychometric properties in adult (Crawford & Henry, 2004) and adolescent samples (Huebner & Dew, 1995).

The GAD-7 and PHQ-9 were used because they are freely accessible, short, validated in both adults and adolescents and linked to DSM-V criteria for anxiety and depression, respectively. Higher scores indicate higher levels of anxiety or depression. The GAD-7 is a 7-item which asked about anxiety symptoms over the last two weeks on a four-point Likert scale (0=not at all to 3=nearly every day). The GAD-7 has good psychometric properties and been validated for use in the general population, as well as clinical adult and adolescent populations (Mossman et al., 2017). Internal consistency in this study was acceptable (α =.66).

The PHQ-9 is a 9-item measure asked about depressive symptoms over last two weeks on the same scale. It has good psychometric properties and been validated for use in adults and adolescents (Richardson et al., 2010). Internal consistency in this study was acceptable (α =.70).

3H. Qualtrics Questionnaire

Questions beyond the scope of this study were also collected but not reported herein. The full list of questions is presented below:

Self-Harm and Mental Imagery Questionnaire – Word Version

Start of Block: Unique Participant Identifier

Q1.1 Please input the participant's Unique Participant Identifier below:

_____

End of Block: Unique Participant Identifier

Start of Block: Introduction

Q2.1 **Introduction** Thank you for agreeing to take part in this study. You will be asked questions about your self-harm and it should take around 20 minutes. There are no right or wrong answers, so try not to spend too long thinking about them, and feel free to go with the answers that feel most right to you. If you don't understand something, please let us know.

What is "self-harm"? Self-harm is harming yourself on purpose, such as taking an overdose or injuring yourself, no matter what the reason. Self-harm is not hurting yourself by accident. **What is a mental image?** When we think in mental images (rather than verbal thoughts), we imagine pictures in our head or pictures in our mind's eye. For instance, if someone told you to think of a pink elephant, an image or impression of one may form in your mind. This is what is referred to as mental imagery. Mental images

often take the form of visual pictures. Mental images vary widely and can be clear, vivid, weak, unclear, hard to ignore, fleeting (come and go) or persistent (there a lot of the time). When we talk about 'mental images' we are referring to all of these types of 'imagining'. **What sort of mental imagery does this study focus on?** In this study, we are interested in **mental images you may have experienced related to self-harming in the future**. This could include: images about what yourself, or other people, might do (e.g., a mental image of you planning/preparing/completing self-harm in the future), or the consequences of self-harm and what might happen if you did self-harm (e.g., how others might react if they found out you self-harmed). You might see this image from your own perspective (as if looking out from your own eyes), or from a different perspective (observing yourself/someone else from a different position in the room, as if you were watching a movie). We are also interested in **mental images you may experience related to self-harming in the past.** This could include images of times you have self-harmed in the past, images of how others have reacted to self-harm in the past, or images of self-harm you have seen elsewhere. Please read the following questions very carefully. Important words will be capitalised and put in **BOLD** for emphasis, so please pay attention to these.

End of Block: Introduction

Start of Block: Demographics

JS

Q3.1 **Demographics** This first section asks basic questions about you. *Please **read the questions carefully** and select the answer that best applies to you.*

Page Break



Q3.2 **How old are you?**

- ○ 14
- ○ 15
- ○ 16
- ○ 17
- ○ 18
- ○ 19
- ○ 20
- ○ 21
- ○ 22
- ○ 23
- ○ 24

Page Break

Q3.3 **What is your gender?**#NextButton {display:none;}

- ○ Female
- ○ Male
- ○ Other
- ○ Prefer not to disclose

Q3.4 Please describe your gender identity below

_____

Page Break

JS X→ X→

Q3.5 **Which racial or ethnic group do you identify with?** #NextButton {display:none;}

- ○ Asian / Asian British
- ○ Black / African / Caribbean / Black British
- ○ Mixed / Multiple Ethnic Groups
- ○ White
- ○ Any other ethnic group
- ○ Prefer not to disclose

Page Break

End of Block: Demographics

Start of Block: GAD-7

Q116 Anxiety

We are now going to ask about your anxiety. Please read the questions carefully and select the answer that best applies to you.

Q117

Over the last 2 weeks, how often have you been bothered by the following

problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	○	○	○	○
2. Not being able to stop or control worrying	○	○	○	○
3. Worrying too much about different things	○	○	○	○
4. Trouble relaxing	○	○	○	○
5. Being so restless that it is hard to sit still	○	○	○	○
6. Becoming easily annoyed or irritable	○	○	○	○
7. Feeling afraid as if something awful might happen	○	○	○	○

Q118

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- ○ Not difficult at all
- ○ Somewhat difficult
- ○ Very difficult
- ○ Extremely difficult

End of Block: GAD-7

Start of Block: PHQ-9

Q114 **Mood**

We are now going to ask about your mood. Please read the questions carefully and select the answer that best applies to you.

Q115 Over the last 2 weeks, how often have you been bothered by the following problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	○	○	○	○
2. Feeling down, depressed, or hopeless	○	○	○	○
3. Trouble falling or staying asleep, or sleeping too much	○	○	○	○
4. Feeling tired or having little energy	○	○	○	○
5. Poor appetite or overeating	○	○	○	○
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	○	○	○	○
7. Trouble concentrating on things, such as reading the newspaper or watching television	○	○	○	○

8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	○	○	○	○
9. Thoughts that you would be better off dead or of hurting yourself in some way.	○	○	○	○

End of Block: PHQ-9

Start of Block: Self-harm Info

JS

Q4.1

This questionnaire will now ask you about self-harm

Please remember: **Self-harm is hurting yourself on purpose,** such as taking an overdose or injuring yourself, no matter what the reason. Please read the questions carefully and select/input the answer that best applies to you.

Page Break

Q4.2 At what age did you **FIRST self-harm**? *(please respond by inputting a number e.g., 14)*

_____

Q119 In your **LIFETIME**, approximately how many times have you self-harmed (please respond with a number only)

_____

Page Break

Q4.3 In the **LAST 2 MONTHS, what form(s) of self-harm** (examples: cutting, overdoses) have you done?

_____

Page Break

Q4.4 How do you usually **self-harm**? (example cutting)

_____

_____

_____

_____

_____

Page Break

X→ X→

Q4.5 In the **LAST 2 MONTHS**, approximately **how often** have you **self-harmed**?

	None 0	Once 1	Several days 2	On average 1-2 days per week 3	On average 3-4 days per week 4	On average 5-6 days per week 5	On average once every day 6	On average twice per day 7	On average more than twice per day 8
	○	○	○	○	○	○	○	○	○

Page Break



Q4.6 In the **LAST 2 MONTHS**, approximately **how many times** have you **self-harmed** *(please respond with* a number only)

_____

Page Break

Q4.7 **In what way(s) did you LAST self-harm (e.g., cutting, overdose, etc)?**

_____

_____

_____

_____

_____

Page Break

X→ X→

Q4.8 Please select the **reason(s) for the most recent time you self-harmed** (select all that apply):

- [ ] I wanted to show how desperate I was feeling
- [ ] I wanted to punish myself
- [ ] I wanted to frighten someone
- [ ] I wanted to get my own back on someone
- [ ] I wanted to get relief from a terrible state of mind
- [ ] I wanted to find out if someone really loved me
- [ ] I wanted to die
- [ ] I wanted to get some attention
- [ ] Other

Q4.9 You selected "Other" on the last question. Please describe the reason for why you most recently self-harmed:

_____

_____

_____

_____

_____

Page Break

End of Block: Self-harm Info

Start of Block: PANAS-SF - Negative Affect

JS

Q5.1 ***This questionnaire will now ask about your emotions immediately BEFORE self-harm in the last 2 months*** *Please* ***read the questions carefully*** *and select the answer that best applies to you.*

Page Break



Q5.2 Indicate how much you have felt each of these **emotions immediately BEFORE you self-harmed over the LAST 2 MONTHS?**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Distressed (suffering from emotional pain)	○	○	○	○	○
Upset	○	○	○	○	○
Guilty	○	○	○	○	○
Scared	○	○	○	○	○
Hostile (unfriendly)	○	○	○	○	○
Irritable	○	○	○	○	○
Ashamed	○	○	○	○	○
Nervous	○	○	○	○	○
Jittery	○	○	○	○	○
Afraid	○	○	○	○	○

Q5.3 **Are there any OTHER EMOTIONS you felt before you self-harmed?**

If applicable, please describe any **OTHER SIGNIFICANT EMOTION** (not listed above) that you experienced immediately BEFORE you self-harmed over the LAST 2 MONTHS?

_____

Q5.4 Please rate this other emotion:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Other Emotion	○	○	○	○	○

X→ X→

Q5.5 Of all the emotions listed above, which was overall the strongest and main emotion you felt **BEFORE you self-harmed in the LAST 2 MONTHS?**

- ○ Distressed
- ○ Upset
- ○ Guilty
- ○ Scared
- ○ Hostile
- ○ Irritable
- ○ Ashamed
- ○ Nervous
- ○ Jittery
- ○ Afraid
- ○ Other emotion (that you picked)

Page Break

End of Block: PANAS-SF - Negative Affect

Start of Block: Imagery Freq and Type

Q6.1 ***This questionnaire will now ask about mental images you may have experienced related to you self-harming in the FUTURE and PAST***

A reminder: When we think in mental images, we imagine pictures in our head or pictures in our mind's eye. For instance, if someone told you to think of a pink elephant, an image or impression of one may form in your mind.

What sort of mental imagery does this study focus on? In this study, we are interested in mental images you may have experienced related to self-harming in the future. This could include: images about what yourself, or other people, might do (e.g., a mental image of you planning/preparing/completing self-harm in the future), or the consequences of self-harm and what might happen if you did self-harm (e.g., how others might react if they found out you self-harmed). You might see this image from your own perspective (as if looking out from your own eyes), or from a different perspective (observing yourself/someone else from a different position in the room, as if you were watching a movie).

We are also interested in mental images you may experience related to self-harming in the past. This could include images of times you have self-harmed in the past, images of how others have reacted to self-harm in the past, or images of self-harm you have seen elsewhere.

Please read the questions carefully and select/input the answer that best applies to you.

Page Break

Q6.2 **Before self-harming in the LAST 2 months**, approximately **how often** have found yourself experiencing **mental images related to self-harming in the FUTURE?**

	None 0	Once 1	Several days 2	On average 1-2 days per week 3	On average 3-4 days per week 4	On average 5-6 days per week 5	On average once every day 6	On average twice per day 7	On average more than twice per day 8
	○	○	○	○	○	○	○	○	○

Q6.3 **Before self-harming in the LAST 2 months,** approximately **how many times** have you found yourself experiencing **mental images related to self-harming in the FUTURE** *(Please input a number)?*

_____

Q120 Please list the sort of images related to self-harming in the FUTURE you have experienced in the LAST 2 MONTHS:

_____

Q6.4 **Before self-harming in the LAST 2 months**, approximately **how often** have found yourself experiencing **mental images related to self-harming in the PAST?**

	None 0	Once 1	Several days 2	On average 1-2 days per week 3	On average 3-4 days per week 4	On average 5-6 days per week 5	On average once every day 6	On average twice per day 7	On average more than twice per day 8
	○	○	○	○	○	○	○	○	○

Q6.5 **Before self-harming in the LAST 2 months,** approximately **how many times** have you found yourself experiencing **mental images related to self-harming in the PAST** *(Please input a number)?*

_____

Q6.6 Please **list the sort of images related to self-harming in the PAST** you have experienced in the **LAST 2 MONTHS:**

_____

_____

_____

_____

_____

Page Break

End of Block: Imagery Freq and Type

Start of Block: Imagery description

JS

Q7.1 ***This questionnaire will now ask you to describe any mental images that result in self-harm***

Please read the questions carefully and select/input the answer that best applies to you.

Page Break

Q7.2 **Before self-harming in the LAST 2 MONTHS**, please describe the **most significant mental image related to self-harm** you have experienced. Please describe this in as much detail as you feel able to.

_____

_____

_____

_____

_____

Q7.3 What this image related to you...

- ○ Self-harming in the future
- ○ Self-harming in the past
- ○ Self-harming both in the future and past
- ○ Other

Q7.4 Other: Please describe how this image was related to your self-harm:

_____

Q7.5 a) How did the **mental image** make you **feel emotionally**?

Q7.6 b) What did the **mental image** make you **want to do**?

Q7.7 c) What **thoughts** did you have about the **image**?

_____

_____

_____

_____

_____

Q7.8 d) What **effect** did that image have on your **urge to self-harm**?

	No effect	Less likely to self-harm	More likely to self-harm
	○	○	○

Q7.9 Overall in the **LAST 2 MONTHS**, how likely are you to self-harm after experiencing mental images?

Not Likely	Moderately likely	Extremely likely

1 2 3 4 5



Page Break



Q7.10 **BEFORE self-harming in the LAST 2 MONTHS**, what **other types of mental images related to self-harm have you experienced?** *(please tick all that apply)*

An image of . . .

- [ ] A time you tried to harm yourself in the past
- [ ] Planning/preparing to harm yourself in the future
- [ ] What might happen to you if you self-harmed
- [ ] What might happen to other people/how they would react if you self-harmed
- [ ] A difficult thing you wanted to escape from
- [ ] A distressing event that happened to you in the past
- [ ] Something that made you feel safe or better
- [ ] Things that were fleeting/unclear
- [ ] Something that you heard/saw in person
- [ ] Something that you heard/saw online or on social media
- [ ] Other
- [ ] None

Q7.11 Please specify what **'Other' types of images** you have experienced:

_____

_____

_____

_____

_____



Q7.12 In the **LAST 2 MONTHS**, which type of **image** have you **experienced the most**?

- ○ A time you tried to harm yourself in the past
- ○ Planning/preparing to harm yourself in the future
- ○ What might happen to you if you self-harmed
- ○ What might happen to other people/how they would react if you self-harmed
- ○ A difficult thing you wanted to escape from
- ○ A distressing event that happened to you in the past
- ○ Something that made you feel safe or better
- ○ Things that were fleeting/unclear
- ○ Something that you heard/saw in person
- ○ Something that you heard/saw online or on social media
- ○ Other
- ○ None

Q7.13 Please specify **what type of 'Other' image you experience the most**:

_____

_____

_____

_____

_____

Page Break

End of Block: Imagery description

Start of Block: Appraisal of Imagery Questionnaire

JS

Q8.1 ***This questionnaire will now ask you about your thoughts and beliefs about of any mental images that you experience related to self-harming in the FUTURE ONLY.*** *Please* ***read the questions carefully*** *and select the answer that best applies to you.*

Page Break



Q8.2 **How strongly do you believe** each of the following statements about any **mental images related to self-harming in the FUTURE** that you have experienced in the **LAST 2 MONTHS**

	Not at all 1	A little 2	Moderately 3	Strongly 4	Very Strongly 5
I must act on the images	○	○	○	○	○
I cannot move on until I act on the images	○	○	○	○	○
If I do not act on the images my distress will continue indefinitely (for a long time)	○	○	○	○	○
The images are uncontrollable	○	○	○	○	○
Having the images increases the likelihood that I will self-harm	○	○	○	○	○
Having the images is helpful to me	○	○	○	○	○
My emotions will be overwhelming until I act on the images	○	○	○	○	○

Having the images makes it easier to self-harm	○	○	○	○	○
Having the images reassures me that I can self-harm if I need to	○	○	○	○	○
Having the images reminds me how unhelpful self-harm is in the end	○	○	○	○	○
Just having the images must mean that I want to self-harm	○	○	○	○	○
Having the images is helpful for planning how I will self-harm	○	○	○	○	○
Having the images turns me off self-harm	○	○	○	○	○

Having the images means that I need to take steps so that I do not self-harm	○	○	○	○	○
Having the images means I need to find support	○	○	○	○	○

Page Break

Q8.3 This questionnaire will now ask you about the impact of any mental images that you experience

*Please **read the questions carefully** and select the answer that best applies to you.*

Page Break

Q8.4 **BEFORE self-harm** in the **last 2 months**, when you had **images related to self-harming in the FUTURE**...

	Not at all 1		Moderately 3		Extremely 5
How **distressing** did you generally find these mental images?					
How **comforting** did you generally find these mental images?					
How **real** have these images generally felt to you?					
How **intrusive or hard to ignore** have these images felt to you?					

Page Break

End of Block: Appraisal of Imagery Questionnaire

Start of Block: Imagery Sources

Q9.1 ***The questionnaire will now ask you about self-harm and the images you may have seen or heard about self-harm***

Please read the questions carefully and select the answer that best applies to you.

Page Break



Q9.2 In the **last 2 months,** please **tick all that apply for each of the 3 columns**:

	Have you seen or heard anything related to self-harm in any of the following:	Have any of the following resulted in you having images about self-harm	Has self-harm shown or discussed caused you to self-harm
TV non-fiction (reality; e.g., news)	☐	☐	☐
Films or TV dramas	☐	☐	☐
Newspapers	☐	☐	☐
Magazines	☐	☐	☐
Books	☐	☐	☐
Radio	☐	☐	☐
Music	☐	☐	☐
Music Videos	☐	☐	☐
Internet	☐	☐	☐
Social media	☐	☐	☐
Family self-harming	☐	☐	☐
Friends self-harming	☐	☐	☐

Dreams about self-harm	☐	☐	☐

Page Break

Q9.3 Are there any other places you have seen or heard anything related to self-harm not described above?

- ○ Yes
- ○ No

Q9.4 **Please describe:**

1. What this was
2. If it led you to have any images about self-harm
3. Whether you think it caused you to self-harm

_____

_____

_____

_____

_____

Page Break

End of Block: Imagery Sources

Start of Block: Spontaneous Use of Imagery Scale (SUIS)

Q10.1 ***No more questions about self-harm will be asked now, and instead the questionnaire will focus on general images you have about everyday life.*** Please read the questions carefully and select the answer that best applies to you.

Page Break



Q10.2 Please read each of the following descriptions and rate how much each is appropriate for you. Do not spend a lot of time thinking about each one, but respond based on your thoughts about how you do or do not perform each activity.

If a description is always completely appropriate, please write “5”; if it is never

appropriate, write “1”; if it is appropriate about half of the time, write “3”; and use the other numbers accordingly.

	Never appropriate 1	2	Appropriate half the time 3	4	Always completely appropriate 5
When going to a new place, I prefer directions that include detailed descriptions of landmarks (such as the size, shape and colour of a petrol station) in addition to their names.	○	○	○	○	○
If I catch a glance of a car that is partially hidden behind bushes, I automatically "complete it," seeing the entire car in my mind's eye.	○	○	○	○	○
If I am looking for new furniture in a shop, I always visualise what the furniture would look like in particular places in my home.	○	○	○	○	○
I prefer to read novels that lead me easily to visualise where the characters are and what they are doing instead of novels that are difficult to visualise.	○	○	○	○	○

When I think about visiting a relative, I almost always have a clear mental picture of him or her.	○	○	○	○	○
When relatively easy technical material/school/college subjects are described clearly in a text/textbook, I find illustrations distracting because they interfere with my ability to visualise the material/what's been written in the text/textbook.	○	○	○	○	○
If someone were to tell me two-digit numbers to add (e.g., 24 and 31), I would visualise them in order to add them.	○	○	○	○	○
Before I get dressed to go out, I first visualise what I will look like if I wear different combinations of clothes.	○	○	○	○	○
When I think about a series of errands I must do, I visualise the shops I will visit.	○	○	○	○	○

When I first hear a friend's voice, a visual image of him or her almost always springs to mind.	○	○	○	○	○
When I hear a radio announcer or DJ I've never actually seen, I usually find myself picturing what they might look like.	○	○	○	○	○
If I saw a car accident, I would visualise what had happened when later trying to recall the details.	○	○	○	○	○

Page Break

End of Block: Spontaneous Use of Imagery Scale (SUIS)

Start of Block: Mood Amplifier - Positive Imagery

Q11.1 ***This questionnaire will now ask about positive imagery you have experienced***

Positive images can be related to positive events occurring in the future, for example going to the cinema and enjoying a film with friends.

Please read the questions carefully and select/input the answer that best applies to you.

Page Break

X→ X→

Q11.2 In the **LAST 2 MONTHS**, **how often** have you experienced **mental images related to positive events happening to you in the future** (e.g., going to the cinema and enjoying a film with your friends)?

	None 0	Once 1	Several days 2	On average 1-2 days per week 3	On average 3-4 days per week 4	On average 5-6 days per week 5	On average once every day 6	On average twice per day 7	On average more than twice per day 8
	○	○	○	○	○	○	○	○	○

Page Break

Q11.3 Please describe your **happiest mental image** related to a **significant positive event happening to you in the future** that you have had recently. Please describe this in as much detail as you feel able to.

_____

_____

_____

_____

_____

Q11.4 Imagine a happy and hopeful event happening to you in the future and write this down (e.g., doing something you enjoy)

_____

_____

_____

_____

_____

Q11.5 a) How did the mental image make you feel?

_____

_____

_____

_____

_____

Q11.6 b) What thoughts did you have about the image?

_____

_____

_____

_____

_____

End of Block: Mood Amplifier - Positive Imagery

Start of Block: COVID-19

Q12.1 Do you think the current COVID-19 (coronavirus) pandemic has changed the way you would have answered any of the questions today under normal circumstances (i.e., if there was no coronavirus)?

- ○ Yes, I think my answers are different due to coronavirus
- ○ No, I think my answers are the same as they would have been without coronavirus
- ○ I'm not sure

Q12.2 How much do you think your answers have been affected due to coronavirus?

0 Not at all			3 A moderate amount			6 A lot
0	1	2	3	4	5	6



Q12.3 In what way do you think COVID-19 (coronavirus) has, or might have, had an effect on the answers you have given today (e.g., which answers might be different and in what way, has covid-19 made certain things better or worse)?

_____

End of Block: COVID-19

3I. Additional Descriptive Information collected during Study 1

In total, 77 young people were referred for the study, but five declined to take part, eight were not eligible, eight did not respond to attempts to contact and one failed to attend agreed appointments.

Demographic information was obtained from participants, and diagnoses and treatment information were obtained from clinicians.

Table 3

Additional demographic information of interest from Study 1

Demographics	Information
Mean Age of SH onset	12.58 (SD=1.94)
Mean Lifetime SH Freq.	146.71 (SD=214.01)
Main SH method(s)	54/55 Cutting (98.18%) 19/55 Overdose (34.55%) 13/55 Headbanging (23.64%) 13/55 Scratching (23.64%) 8/55 Burning (14.55%) 6/55 Hitting Self (10.91%) 5/55 Pulling Hair (9.10%) 5/55 Pinching (9.10%) 5/55 Biting (9.10%) 4/55 Hitting/Punching Walls (7.27%) 4/55 Ligature (7.27%) 3/55 Picking (5.45%) 2/55 Trying to fall from height/break joints (3.64%) 2/55 Bruising (3.64%) 1/55 Rubbing (1.82%)
Reasons for last SH	45/55 (81.82%) I wanted to get relief from a terrible state of mind 33/55 (60.00%) I wanted to punish myself 25/55 (45.46%) I wanted to die 9/55 (16.36%) I wanted to show how desperate I was feeling 1/55 (1.83%) I wanted to frighten someone 1/55 (1.83%) I wanted to find out if someone really loved me 1/55 (1.83%) I wanted to get some attention 0/55 (0.00%) I wanted to get my own back on someone

Demographics	Information
	16.36% Other: (4 (44%) 'to feel something', 2 (22%) 'self-disgust/hatred', 2 (22%) 'stop spiralling mindset', and 1 (11%) 'out of addiction')
Main emotion before SH	19/55 (35.55%) Distressed 12/55 (21.82%) Upset 10/55 (18.19%) Other (4 anger; 3 numb/empty; 2 overwhelmed, 1 relief) 7/55 (12.73%) Guilty 3/55 (5.45%) Nervous 2/55 (3.64%) Irritable 2/55 (3.64%) Ashamed
Imagery experienced the most in the last two months	17/55 (30.91%) A time you tried to self-harm in the past 13/55 (23.64%) Planning/preparing to harm yourself in the future 10/55 (18.18%) A distressing event that happened to you in the past 5/55 (9.10%) A difficult thing you wanted to escape from 4/55 (7.27%) What might happen to you if you did self-harm 3/55 (5.45%) What might happen to other people/how they would react 1/55 (1.82%) Something that made you feel safe/better 1/55 (1.82%) Something you heard/saw in person
Diagnoses*	29/50 (58%) = Depression 29/50 (58%) = Anxiety 11/50 (22%) = Emerging Personality Disorder 10/50 (20%) = Social Anxiety 7/50 (15%) = ASD 5/50 (10%) = Eating Disorder 4/50 (8%) = PTSD 3/50 (6%) = Gender Dysphoria 1/50 (2%) = OCD
Impact of COVID-19 (Do you think the pandemic has changed the way you would have answered these questions under normal circumstances?)	29/55 (52.73%) = No 16/55 (29.09%) = Yes 10/55 (18.18%) = Not Sure

Note: *collected from lead clinicians but n=5 missing at time of analysis; SH = self-harm.

3J. Testing assumptions for HLR

All variables appeared to be normally distributed with skew and kurtosis with +/-1.96 limits, with the exception of age; however, this was improved to almost within limits with a reciprocal transformation. Significance tests of normality were all non-significant with the exception of age, self-harm frequency and future mental imagery frequency, which were significant; but large sample sizes are more likely to be significant, and on balance, the other tests of normality showed a normal distribution (e.g., skew and kurtosis, histogram and box-and-whisker plots). The Durbin-Watson statistic of 1.77 indicating there was independence of residuals. Tolerance values > .1 and VIF values <10.00, and no Pearson correlation above .7, indicating assumption of multicollinearity had been met. Standardised and studentised residuals were less than ±3 indicating no significant outliers. There were no leverage points >.2 expect for four but these cases and all others were not highly influential (Cook's distance values all <1). Residuals (errors) were approximately normally distributed after inspecting histogram and P-P plots.

3K. Further information on HLR results

Model 3 indicates that, with all other predictors held constant, when future mental imagery frequency increased by one unit, there was a significant and positive increase in self-harm frequency by 0.28 units [$t(49)=3.40$, $p<.01$]. When negative affect increased by one unit, there was a significant and negative decrease in self-harm frequency by -0.07 [$t(49)=-2.61$, $p<.01$], indicating that at higher frequencies of self-harm, negative affect was lower, and at lower frequencies of self-harm, negative affect was higher. For every one unit increase in depression scores, there was a 0.11 increase in self-harm frequency [$t(49)=2.40$, $p<.02$]. All other predictors were not significant.

There was 6.7% shrinkage from the R^2 and adjusted R^2 value which shows that the cross-validation of the model was good, whereby if the model was derived from the population rather than the sample then it would account for just 6.7% less variance in self-harm frequency. Examination of the Cook's distance values indicated that these

were all below one, so the model can be deemed as reliable and generalisable and has not been unduly influenced by a subset of any cases.

3L. Semi-structured qualitative interview schedule

Qualitative – Semi-Structured Mental Imagery Interview Questions

Thank you for agreeing to take part in a more in-depth mental imagery interview. Here we are interested not just in mental images related to you self-harming in the future, but also other types of images that are related to self-harm, such as images related to you self-harming in the past, or other types of images you may feel make you think about self-harm. Similar to the questionnaire, these are based on **images you have experienced in the last 2 months before self-harm**. Please answer the questions as openly and honestly as you can. If you don't understand something, please let me know and I will try my best to ask the question in a clearer way. Do you have any questions before we start?

Questions and prompts

1. ***Firstly, could you tell me about what happens in the lead-up to your self-harm?***
   - What usually triggers your feelings or urges to self-harm?
   - How much time usually passes between the first urges and you acting on them to engage in self-harm?
   - How do you usually feel when the urges first start? Does this change immediately before you self-harm? How?
   - What do you think are the main reasons you self-harm? What purpose or function do you think it has for you?

2. ***What is your experience of mental imagery related to self-harm?***
   - How often do you experience mental imagery related to self-harm?
   - What types of images do you experience? Can you tell me more about these? How often? What perspective do these take? (1st person (in your own body) or 3rd person (looking at yourself like you were watching a movie)? **What effect does this have on you?** How do these images affect your feelings/emotions? How distressing/comforting are they? What thoughts do you have about the images? How do they affect your behaviour? What do the images make you want to do/not do?

- Do you ever experience images related to you self-harming in the future (planning how you would self-harm/how others would react)? Can you tell me more about these? How often? What types of images do you experience? What perspective do these take (1st person (in your own body) or 3rd person (looking at yourself like you were watching a movie)? **What effect does this have on you?** How do images related to you self-harming in the future affect your feelings/emotions? What thoughts do you have about these images? How do images related to future SH affect your behaviour? What do these images make you want to do/not do?

- Do you ever experience images related to you self-harming in the past (memories of self-harm you or others have completed, things you have seen/heard, reactions of others in the past)? Can you tell me more about these? How often? What types of images do you experience? What perspective do these take? (1st person (in your own body) or 3rd person (looking at yourself like you were watching a movie)? **What effect does this have on you?** How do images related to you self-harming in the past affect your feelings/emotions? How distressing/comforting? What thoughts do you have about these images? How do past images related to SH affect your behaviour? What do the images make you want to do/not do?
- What types of images do you think make you more likely to self-harm (encourage self-harm)?
- **How do your mental images compare to your verbal thoughts?** Do images occur more/less frequently than thoughts? Do images have more/less impact on/affect your feelings than thoughts? How? Do images have more/less impact on/affect your behaviours than thoughts? How?

3. ***Please describe your most significant image related to self-harm during an urge that resulted in self-harm in as much detail as you can.***
   - What was the image of?
   - Was this related to planning future self-harm/effects of future self-harm (e.g., how others might react) or past self-harm or past events that have happened?
   - What perspective do these take (1st or 3rd person)?
   - What feelings preceded the image?
   - How did the image affect you? Did it impact affect your emotions/feelings? How distressing/comforting did you find the image?
   - Did the image affect your physical sensations in your body?
   - What thoughts did you have about the image?

- How did the image affect your behaviour (e.g., actions or self-harm)? What did the image make you want to do/not do?

4. ***Do you experience images related to self-harm where you don't act on the urge to self-harm? Tell me about this experience.***
   - Are they different to/same as images where you do act on self-harm? How?

5. ***Do you ever experience any positive mental images?***
   - (e.g., going out with friends, future, past)? Tell me more about this.
   - How often? What types of images do you experience? What perspective do these take (1st or 3rd person)? **What impact/affect does this have on you?** How do positive images affect your feelings/emotions? How distressing/comforting? What thoughts do you have about these images? How do these images affect your behaviour? What do the images make you want to do/not do?

6. ***Do you think the current COVID-19 (coronavirus) pandemic has changed the way you would have answered any of the questions today under normal circumstances (i.e., if there was no coronavirus)?***
   - how much do you think your answers have been affected due to coronavirus?
   - In what way do you think COVID-19 (coronavirus) has, or might have, had an effect on the answers you have given today (e.g., which answers might be different and in what way, has covid-19 made certain things better or worse)?

3M. More info on the Thematic Analysis

As outlined by Braun & Clarke (2006, 2013), the steps of the analysis included: 1) data transcription and familiarisation, 2) coding, 3) searching for themes, 4) reviewing themes, 5) defining themes, and 6) writing the report. A combined inductive ("giving voice") and deductive (top-down theoretical) approach was taken when identifying themes relevant to the research question within a critical realist ontological and epistemological position (i.e., contextualism; knowledge will be true in certain contexts; Braun & Clarke, 2013). Complete coding was undertaken using NVIVO version 12 (QSR International Pty Ltd., 2018). Semantic meanings were used to identify important themes (patterns of meaning), staying close to the

patient experiences, rather than inferring latent meanings beyond what was said. Whilst other themes beyond the scope of the study were identified (e.g., triggers and functions of self-harm), only themes related to the role of imagery in self-harm are described herein. In the context of a mixed-methods design, it is important to note that themes were identified from a realist perspective whereby the authors assumed a direct relationship between what people say and believe and what they do. The validity and coherence of themes were agreed through group discussion, which included a Consultant Psychiatrist and researcher in Suicide and Self-harm, a child and adolescent mental health service Psychiatrist with clinical and research experience of self-harm in young people and a clinical psychologist with broad clinical and research experience. However, Braun & Clarke (2020) state that 'coding reliability' is not necessary in qualitative research and this aligns with a positivist paradigm, as seen in quantitative research. Therefore, the active, interpretative, and subjective role authors played in analysis is acknowledged, where researcher subjectivity was viewed as a resource, rather than a threat, to knowledge production (Braun & Clarke, 2020). 16 interviews were conducted following guidance outlined in Hagaman & Wutich (2017) regarding data saturation and meta-theme identification.

3N. Demographic information regarding Study 2 participants

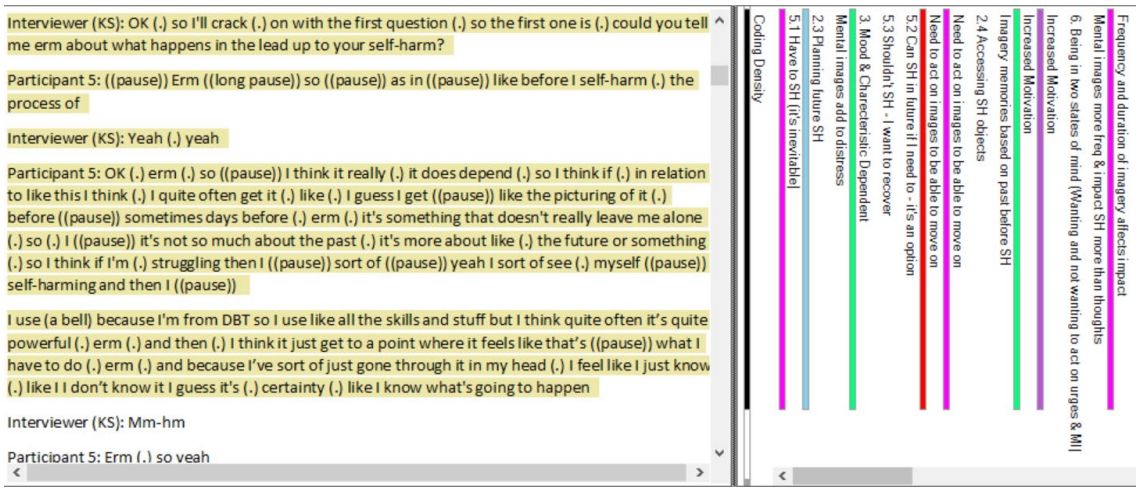
Table 4

Demographic information on Study 2 participants

Participant	Age	Gender	Self-Harm Method (s): **Bold**= main method
P1	16	Female	**Cutting**
P2	16	Non-binary	**Cutting;** bruising; hair pulling; slamming head
P3	16	Male	**Cutting;** biting; overdosing; punching; head butting; burning
P4	15	Female	**Cutting**
P5	19	Female	**Cutting**
P6	18	Female	**Cutting**
P7	14	Female	**Cutting**
P8	14	Female	**Cutting**
P9	16	Female	**Cutting;** overdoses; head banging; scratching; hitting self
P10*	17	Female	**Cutting**
P11	16	Female	**Cutting;** head banging; slapping self; overdose
P12	15	Female	**Cutting**
P13	15	Female	**Cutting;** burning
P14	17	Female	**Cutting;** scratching
P15	16	Female	**Cutting;** overdose
P16	17	Female	**Cutting;** head banging

Note: *participant completed all the main interview questions but not the mood amplifier (positive imagery) or covid-19 impact questions due to unexpected commitments and attempts to complete the interview were unsuccessful.

3O. NVivo Coded Extract Example



3P. JCPP Instructions to Authors

General

Contributions from any discipline that further knowledge of the mental health and behaviour of children and adolescents are welcomed. Papers are published in English, but submissions are welcomed from any country. Contributions should be of a standard that merits presentation before an international readership.

Papers may assume either of the following forms:

- *Original articles*
  These should make an original contribution to empirical knowledge, to the theoretical understanding of the subject, or to the development of clinical research and practice. Adult data are not usually accepted for publication unless they bear directly on developmental issues in childhood and adolescence or the transition from adolescence to adulthood. Original articles should not exceed **6000 words**, including title page, abstract, references, tables, and figures; the total word count should be given on the title page of the manuscript. Limit tables and figures to 5 or fewer double-spaced manuscript pages. It is possible to submit additional tables or figures as an Appendix for an online-only version. We strongly encourage you to keep the length of the manuscript within the word limit. If you would like to make an exceptional request to extend the length of your submission contact the editorial office (publications@acamh.org).