Systematic review

JCHC

Journal of Child Health Care
2025, Vol. 0(0) 1–21

DOI: 10.1177/13674935251374808
journals.sagepub.com/home/chc
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Risk mitigation strategies for children and young people admitted with mental health crisis to acute paediatric care: A systematic review with narrative synthesis

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Abstract

Globally, the number of Children and Young People (CYP) that experience mental health crisis and access paediatric acute hospital settings continues to increase. Many of these CYP present with thoughts and behaviours of self-harm and/or suicide and often experience severe and fluctuating emotional states. It is therefore important that the risk of self-harm/suicide is assessed during an inpatient admission and strategies implemented to mitigate risk. This study aimed to identify self-harm and suicidality risk

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management pathways that have been developed and evaluated for use with CYP admitted to acute hospital settings with mental health crisis. A systematic review was conducted. Eight online academic database were searched up to February 2022. The critical appraisal skills programme tool was used to assess the methodological rigour of included studies. Online searches identified 120 potential studies. Five studies met the predefined inclusion criteria. Six risk mitigation strategies were identified; safety huddles, urgent full mental psychiatric review within 2-h of assessment, feedback on screening responses, motivational and barrier-reducing intervention, 1:1 constant observations and environmental safety. All included strategies targeted environmental, family, and individual CYP involving modifications to equipment, surveillance, and communication to enhance safety.

Keywords
child and adolescent mental health, paediatric, care pathways, assessment

Introduction

Mental health crisis is defined as, 'an acute disruption of psychological homeostasis in which the child's usual coping mechanisms fail with some notable evidence of distress and functional impairment' (Lewis and Roberts, 2001: page 19). It is a psychiatric emergency with acute disturbance of thought, mood, behaviour, or social relationship that requires immediate intervention (Allen et al., 2002) and may include extreme anxiety or panic attacks; psychotic episodes; hypomania or mania; other behaviours that feel out of control (Mind, 2013). Increase in mental health crisis in Children and Young People (CYP) is one of the primary reasons behind suicides, self-harm attempts and eating disorders (Odd et al., 2020, 2021). Self-harm is one of the leading causes of deaths for youths globally (Liu et al., 2022; Wong et al., 2023), with suicide being the second most common cause of death in adolescents in the United Kingdom (Nuffield Trust, 2021).

Furthermore, contemporary data show an increase in admissions of CYP experiencing mental health crisis to acute paediatric healthcare facilities (Hagell and Shah, 2019; Marchant et al., 2020; Vázquez-Vázquez et al., 2024). Whilst in paediatric acute care, CYP will receive care and interventions to support medical and mental health needs and will often remain hospitalised until a mental health specialist can perform an assessment (Noelck et al., 2019). Acute care refers to when a CYP receives active, short-term treatment for a condition and in the United Kingdom (UK) National Health Service (NHS) it often includes services such as emergency department (ED), inpatient and outpatient medicine and surgery (The Health Foundation, 2024).

Whilst CYP with mental health crisis are in paediatric acute care they often experience severe and fluctuating emotional states which can be accompanied by continued urge to self-harm or attempt to end their life (Latif et al., 2020; MacDonald et al., 2020; Manning et al., 2021). Importantly, during this vulnerable time CYP are cared for by Heath Care Professionals (HCP) who do not have specialist mental health training (children's nurses and paediatricians) (The Royal College of Psychiatrists, 2014). This leads to the potential for reduced safety and poorer experiences during their admission and hospital stay, which, alongside potentially increasing the risk of further harm coming to the young person, can also negatively impact immediate and longer-term outcomes (Hagell and Shah, 2019; MacDonald et al., 2020).

Currently in the NHS there is no standardised approach for HCPs who do not have specialist mental health training to identify the immediate risk of self-harm and suicide in CYP admitted with mental health crisis to paediatric acute NHS care (Carter et al., 2018). Hospital based paediatric early warning

scores and escalation tools designed to recognise and respond to acute medical emergencies are not sufficient to do the same with self-harm and suicidality (Chapman and Maconochie, 2019). Furthermore, there are no standardised, evidence-based protocols / interventions to mitigate or minimise self-harm/ attempted suicide in acute paediatric care for this patient population which are essential for safe and appropriate care. To our knowledge no reviews have been conducted to identify and quantify risk mitigation interventions to be used by non-mental health trained HCPs when caring for CYP admitted with mental health crisis to acute paediatric care.

Aim

This review aims to; (i) systematically identify self-harm and suicidality risk management pathways that have been developed and evaluated for use with CYP admitted to acute paediatric care hospital settings with mental health crisis, and (ii) understand the context, content, mechanism and outcomes of the identified risk mitigation pathways/strategies.

Methods

A qualitative content analysis systematic review was conducted (Elo and Kyngas, 2008) and reported according to the principles of Synthesis Without Meta-Analysis (SWiM) guidelines (Campbell et al., 2020) for systematic reviews. For clarity on review methodology and robustness, review protocol was registered with the International Prospective Register of Systematic Reviews PROSPERO 2022 database (registration number: CRD42022312563).

Search strategy

Eight electronic databases were searched for potential eligible studies: Cumulative Index to Nursing and Allied Health Literature (CINAHL); Excerpta Medica Database (EMBASE); Medical Literature Analysis and Retrieval System Online (MEDLINE) (via Ovid platform); Database of abstracts of literature in the field of psychology (PsychINFO); Ecare; Joanna Briggs Institute (JBI); Allied and Complementary Medicine Database (AMED); and Health Management Information Consortium (HMIC) (via Joanna Briggs Institute platform). Online databases were systematically searched using the following key terms identified from population intervention comparator and outcome (PICO) elements: (paed* or ped* or child* or young person* or teen* or adolesc*) AND ('mental* disorder*' or mental illness* or mental health or suicide*, or eating disorder*, or self-harm or self-harm) AND (risk mitigation* or risk management* or risk pathway*). Free text and Medical Subject Headings (MeSH) were used to maximise search hits. Searches were conducted for studies published from 1966 to February 2022 and were executed by an experienced information specialist (EH). Hand searches for first generation included studies and relevant reviews was performed. A detailed search strategy is provided as supplemental material search strategy.

Eligibility criteria

Studies were included in accordance with the predefined eligibility criteria (stipulated in the review protocol): peer reviewed, primary research studies that detailed the development, validity and/or evaluation of mental health risk mitigation strategy or pathway for CYP (up to 18 years old) admitted to paediatric acute care hospital settings (including those presenting to ED). Paediatric

acute care hospital settings in this context refer to non-mental healthcare hospital settings such as ED and/or wards for children and young people in a hospital that typically treats physical health conditions (Healthcare Safety Investigations Branch, 2023; The Health Foundation, 2024). Studies published in other languages were considered if an English language translation was available. Reviews, opinion pieces or letters to the editor were excluded.

Study selection process

Once potential studies were identified, two independent authors, (ZA and AK) screened the articles at title, abstract and full-text stages. Any disagreements were resolved by involvement of a third reviewer (JCM; TM).

Data extraction

Data extraction was performed independently by ZA and AK and any disagreements was resolved by discussion or input of a third reviewer (JCM; TM). Data extracted included study details (author, year, sample size, type of study, where study was conducted), risk mitigation pathways, escalation process, context and outcomes. Data were extracted and collated from included studies into a matrix using a pre-designed data collection form.

Study methodological quality assessment

Methodological quality assessment of included studies was performed using an appropriate Critical Appraisal Skills Programme (CASP) tool depending on study methods (CASP, 2018). The tool assesses quality only and not validity. Two independent researchers (AK and ZA) completed quality assessment to ensure reliability and minimise risk of bias, and any disagreements were discussed/resolved with a third reviewer (JCM; TM).

Data Synthesis

Extracted data were categorised under the following heading as part of content analysis and narrative synthesis; context (resources, settings, inputs); content (risk mitigation actions); mechanisms (the reason behind these strategies, escalation processes); and outcomes (events, benefits, perceptions, effectiveness) of the included strategies. For clarity, the following operational definitions are provided for each category as it relates to content analysis in this review.

- *Context:* study and/ or hospital setting
- *Content:* detailed specific aspect of the identified risk mitigation strategies and resources required for strategy implementation
- *Mechanisms:* underlying principles/reasons for conducting risk mitigation strategies.
- *Outcomes:* identified achieved overall goal for conducting the intervention (pathway), within clinical practice

Results

Online searches identified 120 potential studies. Following screening at title and abstract stages 102 studies were excluded. Eighteen studies were reviewed at the full-text stage. Thirteen were excluded with five studies meeting the inclusion criteria. Figure 1 provides a detailed flow diagram of the screening process and reasons for study exclusion at full-text stage.

Figure 1 Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) diagram.

Characteristics of the studies

From the five included studies, two were randomised controlled trials (RCT) (Grupp-Phelan et al., 2012; King et al., 2015), two prospective cohort studies (Latif et al., 2020; Noelck et al., 2019) and one cross-sectional survey (Inman et al., 2019). All studies were conducted in the United States of America (USA).

Samples ranged from 24 to 676 participants (Grupp-Phelan et al., 2012; Inman et al., 2019; King et al., 2015; Latif et al., 2020; Noelck et al., 2019). One study enrolled participants aged between 6 and 17 years (Latif et al., 2020), and the rest of the studies enrolled participants aged 12 years and above (Grupp-Phelan et al., 2012; Inman et al., 2019), 14 and 19 years (King et al., 2015), and under 18 years (Noelck et al., 2019). Table 1 provides a summary of the characteristics of included studies.

Methodological quality appraisal

Three studies scored highly (>80%) on methodological quality assessment using the CASP (2018) tool, demonstrating low risk of bias in study methodology (Grupp-Phelan et al., 2012; Latif et al., 2020; Noelck et al., 2019). While two studies scored (<65%); Inman et al. (2019) scored 50% and King et al. (2015) scored 64% demonstrating higher risk of bias. The RCT CASP tool was used on two studies Grupp-Phelan et al. (2012) and King et al. (2015); the CASP tool for Cohort studies was used on two studies Noelck et al. (2019) and Latif et al. (2020); and the study by Inman et al. (2019) was assessed using the CASP tool for cross sectional studies.

Those which scored (>80%) showed several methodological strengths such as comprehensive description of the intervention, study groups characteristics were similar before the randomised allocation, reporting of confidence intervals and the adjustment of the confounding factors when calculating odds ratio as well as using validated questionnaires. For more details, please see supplemental material for the methodological quality assessment of the included studies.

Context

A summary of the risk mitigation strategies and the subsequent content analysis is presented in Table 2.

All strategies were implemented in paediatric acute care hospital settings. Two studies took place in the ED only (Grupp-Phelan et al., 2012; King et al., 2015), two in paediatric wards only (Inman et al., 2019; Noelck et al., 2019), and one in both ED and outpatient behavioural clinic (Latif et al., 2020).

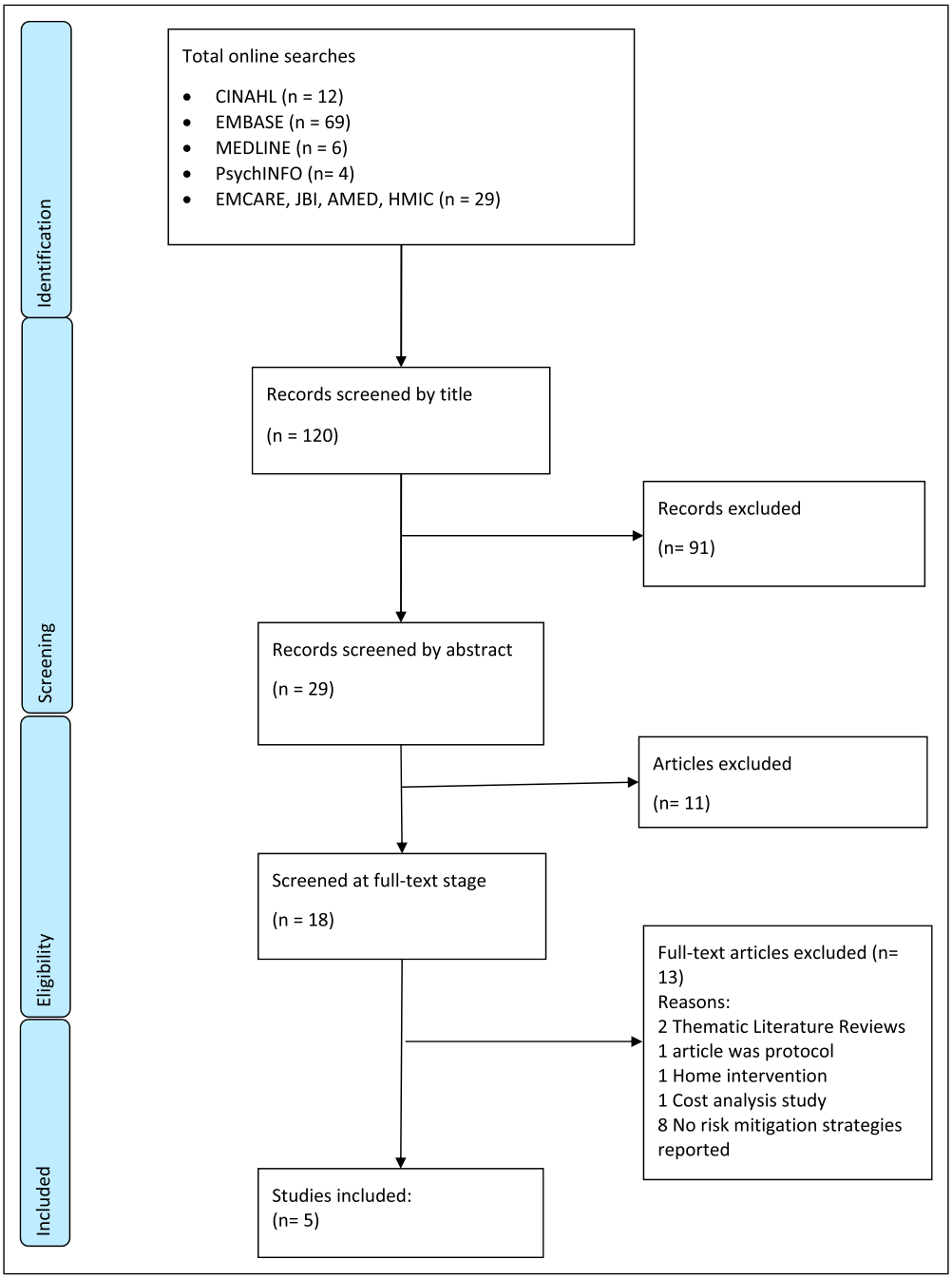

Figure 1. Flow diagram of included and excluded studies.

Table 1. Characteristics of included studies.

Author	Study location	Study design; study purpose	Sample (*N*); age		Instrument (s); intervention (s); pathway (s); protocol (s) used	Unit of measurement - main findings
(Noelck et al., 2019)	USA	Prospective cohort study; evaluation	Children and young people (CYP)	224 <18 years	Paediatric behavioural health safety protocol	Use of the paediatric behavioural health safety protocol increased to 91.8% after implementation
					Standardisation of the patient safety search	The rate of SSEs per 100 patient days decreased from an average of 2.7 events per 100 patient days in the pre-implementation period to 0.17 events per 100 patient days in the post-implementation period $p = .3$
					Implementation of a daily safety huddle	Three key drivers were developed to promote patient safety: Standardised approach to care, consistent performance of a safety search, and development of a shared mental healthcare model among care team members

(continued)

Table 1. (continued)

Author	Study location	Study design; study purpose	Sample (*N*); age			Instrument (s); intervention (s); pathway (s); protocol (s) used	Unit of measurement - main findings
(Grupp-Phelan et al., 2012)	USA	Randomised controlled trial (RCT), evaluation	Adolescents presenting to a paediatric ED.	24	≥12 years	The Columbia suicide scale was initially used for suicide related risk factors throughout adolescents' screening. Those screening positive on the Columbia suicide scale were randomly assigned to the intervention named TeenScreen-ED (short motivational interview, barrier reduction, outpatient appointment established, reminders before scheduled appointment) or standard referral (telephone number for a mental health provider). Acceptability and outpatient mental health care linkage and change in depression symptoms at 60 days after the index ED visit was measured between the two groups	24 adolescents (12%) screened positive for suicide risk factors and were randomised to the intervention (n = 11) or standard referral (n = 13) groups. The groups did not significantly differ on several measures of screen acceptability As compared with the standard referral group (15.4%), the intervention group (63.6%) was significantly more likely to attend a mental health appointment during the follow-up period (Fisher exact test, p = .03) There was also a non- significant trend toward greater improvement of depressive symptoms in the intervention than standard referral group
(Inman et al., 2019)	US.A.	Survey; evaluation and development	Children who were admitted to the general paediatric wards were screened using the ask suicide-screening questions (ASQ)	67	12 years old and above	The ask suicide-screening questions (ASQ) was used to assess Children's mental health	During the 6 weeks, 152 eligible children were admitted to the general paediatric wards and 67 were screened using the ASQ; 3/67 had a nonacute 'positive' screen and received a further psychiatric assessment

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Table 1. (continued)

Author	Study location	Study design; study purpose	Sample (*N*); age			Instrument (s); intervention (s); pathway (s); protocol (s) used	Unit of measurement - main findings
(King et al., 2015)	U.S.A	Randomised controlled trial (RCT); assessment	CYP seeking services for nonpsychiatric emergencies. They screened positive for suicide risk because of recent suicidal ideation, suicide attempt, or depression plus substance abuse	49	14–19 years old	Assessment of the teen options for change (TOC) effectiveness; an intervention for adolescents seeking general medical emergency services who screen positive for suicide risk. Youths were randomly assigned to the TOC intervention or to enhanced treatment as usual. Depression, hopelessness, and suicidal ideation were assessed at baseline and 2 months later. TOC is based on the self-determination theory of self-regulation and change, with a focus on adolescents' values, goals, and options for behavioural change	Adolescents assigned to TOC showed greater reductions in depression than adolescents assigned to the comparison group, (Cohen's d = 1.07; large effect size). Hopelessness, suicidal ideation, and substance abuse outcomes trended positively (non-significantly), with small to moderate effect sizes Findings indicate that a brief emergency department– based intervention that incorporates personalised feedback and an adaptive motivational interview may be beneficial to adolescents who screen positive for suicide risk

(continued)

Table 1. (continued)

Author	Study location	Study design; study purpose	Sample (*N*); age	Instrument (s); intervention (s); pathway (s); protocol (s) used	Unit of measurement - main findings
(Latif et al., 2020)	U.S.A	Prospective cohort study	CYP (ED and OPC) 676 6–17 Years old	The C-SSRS screener is a structured 6-question tool that screens for suicide risk by asking questions about thoughts, intent, plan, and behaviours over the past month and about any attempts over the past 3 months or the lifetime. It scores risk as high, medium, or low depending on affirmative answers. For further assessment, the C-SSRS full version asks about the intensity of ideation and the severity of behaviour, including assessing actual or potential lethality, and the risk assessment page provides a checklist of risk and protective factors	

(QI): quality improvement; (CYP): children and young people; (RCT): randomised controlled trial; (ASQ): ask suicide-screening questions; (RSQ-R) risk of suicide questionnaire–revised; (SIQ): suicidal ideation questionnaire; (BSSA): brief suicide safety assessment; (PHQ-A): patient health questionnaire adolescent version: (C-SSRS): Columbia-suicide severity rating scale; (LOS): length of stay; (QIP): quality improvement projects; C-SSRS, (TJC): the joint commission; N/A: not applicable.

Table 2. Content, mechanisms, and outcomes of risk mitigation strategies.

Context	Content (resources; components; process)	Risk mitigation strategy (s)	Mechanism (s)	Outcomes
Paediatric wards	Nursing, medical and mental health team, social work	1- Safety huddles for patients boarding with behavioural and/or mental health complaints	Safety	Clear communication both written and verbal among healthcare professionals
	Locked cabinets were needed to keep CYP's belongings in	2- Performance of a daily safety search	Support/advanced provision of care	Standardised safety procedures and processes
	Extra nurses were needed (bedside nurses) for intervention if escalation was made. Noelck et al. (2019)	3- Not allowing walks off the medical unit or to unsecured courtyards, limiting visitors, and not allowing patients to wear their own shoes and/or clothing or to have access to personal cell phones and tablets because of concerns regarding social media use	Awareness, safety	
Emergency department (ED)	Mental health specialist Grupp-Phelan et al. (2012)	1-A brief mental health treatment engagement intervention/ motivational and barrier-reducing intervention	Support	Remove barriers to service provision access
		The sessions focused on expectations for treatment, misconceptions about treatment, barriers to treatment, and making a contract for four sessions of treatment	Awareness Empowerment Access to other mental services	Patient and family's empowerment to seek required support

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Table 2. (continued)

Context	Content (resources; components; process)	Risk mitigation strategy (s)	Mechanism (s)	Outcomes
General paediatric inpatient setting	Nursing team, doctors, psychiatric consultants Inman et al. (2019)	Based on ask suicide-screening questions (ASQ) assessment, CYP can be positive, acute positive or negative 1- No action if negative 2- Positive notify doctor to initiate psychiatric review within 24 h. CYP under supervision 3- If acute positive: a) 1:1 observation b) Full mental psychiatric review within 2 h (urgent), c) Remove dangerous objects from the room	Surveillance, awareness for unexpected events Limiting hazardous/ safety environment	Adequate psychiatric coverage for CYP who are scored in a high-risk level is essential
ED	Teen options for change (TOC) intervention was delivered by a mental health professional and study therapist to all participants who showed positive response on the assessment. King et al. (2015)	TOC intervention provided: 1-A personalised feedback about teens' screening responses 2-Teens anticipated in an adapted motivational interview (approximately 35–45 min) with a mental health professional	Communication Empowerment Active listening Affirmation Assurance (increased confidence level)	Positive behavioural activation and change had a beneficial impact. As suicide risk screening becomes increasingly prevalent, triage options warrant further research and consideration, and TOC may be a useful triage option

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Table 2. (continued)

Context	Content (resources; components; process)	Risk mitigation strategy (s)	Mechanism (s)	Outcomes
ED and outpatient behavioural health clinic	Nurses and the medical health care team, EHR	1- Patients at low or moderate risk received environmental safety interventions (i.e. change to hospital gown and safe meal trays)	Awareness	N/A
	Latif et al. (2020)	2- Patients at high risk received 1:1 constant observation (CO)	Safety	
		3- General environmental safety interventions: Addition of lockers for belongings and metal detectors for visitors to the ED.	Environmental control	
		4- Each risk level automatically triggered specific safety orders in the electronic health record (EHR)		

Content

Six risk mitigation strategies were identified from the five included studies with details of each strategy provided in Tables 1 and 2. Three strategies: safety huddles (short multidisciplinary briefings, held at agreed times and places, with a focus on the patients most at risk and performance of safety searches) (Noelck et al., 2019); urgent full mental psychiatric review (when a CPY's risk of suicide/ self-harm is scored high at assessment an urgent escalation referral to the psychiatrist will be done requesting review within 2 h) (Inman et al., 2019); and Teen Options for Change (TOC) intervention which consisted of adaptive motivational interviews focused on personalised feedback about teens' screening responses (King et al., 2015) were conducted in one study each. Two interventions: motivational and barrier-reducing intervention (consisting of brief mental health treatment and motivational engagement sessions) (Grupp-Phelan et al., 2012; King et al., 2015); and the 1:1 observation (continuous observation care by a HCP to an individual patient) (Inman et al., 2019; Latif et al., 2020) were conducted in two studies each. The environmental safety intervention (consisting of safety checks, restricted movement and removing and/or avoid risk objects in the patient's room) was reported in three studies (Inman et al., 2019; Latif et al., 2020; Noelck et al., 2019).

In two studies, nurses and doctors working in emergency departments and paediatric wards assessed CYP for their level of risk and then implemented risk mitigation approaches as required (Inman et al., 2019; Latif et al., 2020). In another two (Grupp-Phelan et al., 2012; King et al., 2015), only mental health specialists and social workers implemented the risk mitigation strategies. These strategies were barrier-reducing interventions which included personalised feedback on adolescents' screening responses and an adapted motivational interview. CYP with high-risk outcome in their initial risk assessment were referred for an urgent full psychiatric review (within 2 h), completed by a consultant psychiatrist (Inman et al., 2019). In such acute high-risk situations, a 1:1 Constant Observation (CO) technique was required (Inman et al., 2019) and was carried out by HCPs who did not have mental health training.

Environmental safety interventions were also implemented for high-risk patients. The importance of conducting a safety check on CYP's belongings when admitted to ED or paediatric wards with mental health crisis was emphasised, alongside removing any dangerous objects from rooms. Risk mitigation strategies also included use of hospital gowns (Latif et al., 2020; Noelck et al., 2019), restricting access to personal cell phones and tablets because of concerns regarding the using of social media (Noelck et al., 2019) and use of safe meal trays (Latif et al., 2020). In Latif et al. (2020) study, each risk-level automatically triggered specific safety orders in the Electronic Health Records and follow-up/automatic referrals to mental health specialists. Advice on necessary changes was provided to CYP's schools, for example, when bullying at school was a factor.

Mechanisms

Safety, surveillance, awareness and control were the key mechanisms of environmental safety strategies. To achieve these objectives, strategies included the differing approaches that included: ensuring that CYP's environment and belongings were kept free of dangerous items (equipment) that could be used to self-harm (Inman et al., 2019; Latif et al., 2020; Noelck et al., 2019); restrictions on potential external influential factors such as ED visitors (Latif et al., 2020); and wandering in the medical unit or to unsecured courtyards (Noelck et al., 2019), as a means of minimising the risk of self-harm and maintaining oversight.

The 1:1 CO approach applies the mechanisms of awareness and evaluation of CYP's level of risk to prevent them from harming themselves (Inman et al., 2019; Latif et al., 2020). The mechanism of situational awareness behind the constant observation and evaluation of the patients may necessitate further actions such as referrals to the mental health care team (Inman et al., 2019). The aim of such referrals was to support and follow up CYP who needed advanced provision of care, guided by mental health specialists, using a rapid route and avoiding delays in their treatment.

Noelck et al. (2019) emphasise the importance of developing a shared mental health care model using safety huddles risk mitigation strategy. This was found to be essential to support CYP and achieve better communication allowing them to reflect and speak. Safety huddles involved the nursing, medical and psychiatric care teams, as well as social work and public safety professionals (Noelck et al., 2019).

Risk mitigation strategies facilitated creation of support, trust and communicative relationship between CYP and HCPs. Personalised feedback on adolescents' screening responses was followed by an adapted motivational interview (King et al., 2015). After their initial assessment, CYP were immediately informed of any issues to keep them updated to achieve better communication. Planning an immediate intervention depending on individual needs was a key mechanism underpinning risk mitigation approaches.

Outcomes

Observed risk mitigation strategies improved patient outcomes and patient safety by reducing CYP's attempts to harm themselves while they were nursed in acute hospital settings. Noelck et al. (2019) reported reduction of significant safety events to 0.17 from 2.7 per one hundred patient days, and Grupp-Phelan et al. (2012) reported 64% of CYP in the risk mitigation intervention group were more likely to attend their mental health appointment and follow up compared to 15% in the control group – a demonstration that at risk adolescents may benefit from a brief motivational and barrier-reducing intervention. Improvement of linkage to outpatient mental health services was a further principle for conducting such motivational interviews. These focused on expectations for treatment, misconceptions about treatment, barriers to treatment, and making a contract for at least four sessions of treatment (Grupp-Phelan et al., 2012). Interview sessions lasted 35–45 min (King et al., 2015). Active listening was part of this supportive method. Interviews were held in a private room, without parents present, with the aim of identifying the underlying reasons for suicide attempts and preventing further such attempts. Interviewing CYP on their own was reported to enable them to be free to express themselves, without fear of recompense from parents, enhancing transparency in their narration of potential influential factors.

Overview of study evaluation findings

All included studies evaluated the implementation of risk mitigation strategies. Noelck et al. (2019), in a prospective cohort study, evaluated the use of a Paediatric Behavioural Health Safety Protocol which included implementation of a daily patient safety search and safety huddle. Restrictions related to environmental safety strategies were also included. The rate of Significant Safety Events (SSEs) per 100 patient days was reduced from an average of 2.7 events per 100 patient days in the pre-implementation period to 0.17 events per 100 patient days in the post-implementation period, $p = .3$. Although this difference was statistically non-significant, the study concluded that three key drivers were important in promoting patient safety. These were a standardised approach to care, consistent performance of a safety search, and the development of a shared mental health care model among care team members. However, better communication among HCPs and clear documentation was identified as an area of further improvement.

In their RCT, King et al. (2015) evaluated the effectiveness of the Teen Option Change (TOC), which is based on the self-determination theory of self-regulation and change, with a focus on adolescents' values, goals, and options for behavioural change. Their findings indicate that a brief emergency department-based intervention that incorporates personalised feedback and an adaptive motivational interview may be beneficial to adolescents who screen positive for suicide risk. Adolescents assigned to TOC showed greater reductions in depression than adolescents assigned to the comparison group Cohen's d = 1.07, $p < .001$ with a large effect size. Hopelessness, suicidal ideation, and substance abuse outcomes trended positively but were non-significant, with small to moderate effect sizes. Similarly, in the RCT conducted by Grupp-Phelan et al. (2012), the group of CYP who received a brief mental health treatment engagement intervention were 63.6% more likely to attend a mental health appointment during a follow-up period after their discharge from the ED, compared with the standard referral group (15.4%). However, there was also a non-significant trend toward greater improvement of depressive symptoms in the intervention group when compared with the standard referral group (Grupp-Phelan et al., 2012).

Discussion

Our review aimed to identify mental health risk mitigation strategies and pathways used in paediatric acute care hospital settings. The studies included in the review reported six risk mitigation strategies (safety huddles, urgent full mental psychiatric review within 2 h of assessment, personalised feedback on screening responses, motivational and barrier-reducing intervention, 1:1 constant observations and environmental safety). Rapid response to mitigate risk and manage patients in the event of suicide and/or self-harm attempt is essential (Marzecet al., 2021). The Royal College of Psychiatrists (2014) outlined that in most hospital settings, HCPs without specialist mental health training are involved in CYP's initial contact, risk assessment and in implementing some of the risk mitigation practices. Support for CYP could be consolidated by implementing a standardised approach to care and developing a shared mental health care model among HCPs.

Management of a CYP admitted with mental health crisis is a complex intervention (Skivington et al., 2021) requiring a multifaceted (bundle intervention) approach as demonstrated by all strategies identified in this review (Inmam et al., 2019; Latif et al., 2020; Noelck et al., 2019). The first step in treatment of the CYP after a suicide attempt, self-harm or eating disorder is a control of the vital signs, depending on severity, priority reversal of the life-threatening condition, followed by underlying disease treatment taking into consideration its probable cause (Marzec et al., 2021). Effective treatment plans are preceded by assessment of the degree of risk and identifying contributory factors (Carballo et al., 2020). Assessment can be in various formats; patient's response to screening tools (Manning et al., 2021, information collected from the patient or family through interviews, healthcare professionals, and/or medical records (Srinath et al., 2019). Primarily this step is to understand characteristics of the patient's present and past level of mental state on admission, behaviour, psychological portrait and should take into consideration family environmental, economic and social dynamics and questions about sexual orientation (Cha et al., 2018; Shain, 2016). Any potential mental health risk mitigation strategy for CYP is underpinned by comprehensive routine use of a paediatric specific validated mental health assessment tool (Manning et al., 2021). Clinical pathways can empower hospital systems by providing a guide for using validated tools to identify patients at risk and apply appropriate interventions for those identified as at risk (Brahmbhatt et al., 2019).

Noelck et al. (2019) produced a Paediatric Behavioural Health Safety Protocol, detailing the implementation of the daily safety huddles and performance of safety searches to develop a shared agreed mental healthcare model among clinical teams. In addition to standardisation of care across care delivery teams, the concept's other objective was to achieve a trusted and communicative relationship between CYP and HCPs and for supporting CYP appropriately, based on their individual needs, like the interventions by King et al. (2015) and Grupp-Phelan et al. (2012). Poor communication, both verbal and written, among HCPs at any stage of the care delivery process can create conflict among team members if essential pieces of the plan of care are not clearly conveyed. In a review by Kiley et al. (2020), on the use of CO (1:1) in CYP at risk of self-harm and suicide, four themes emerged: (i) confusing language and definitions; (ii) unvalidated models of care; (iii) important privacy issues; and (iv) lack of observation strategies for this patient population. However, impaired communication underscored all themes. A shared and agreed model of safety practices (such as escalation pathways) that are consistently performed by all HCPs is more likely to bring standardised approach to care (Noelck et al., 2019) and prevent conflict amongst the team (Kiley et al., 2020). Resources such as training for HCPs especially for staff who are implementing 1:1 CO and motivational interviewing strategies are essential.

Risk mitigation strategies by King et al. (2015) and Grupp-Phelan et al. (2012) focused on communication activities with CYP at risk, accomplished through adapted motivational interviews (Grupp-Phelan et al., 2012; King et al., 2015;) and patient response feedback (King et al., 2015). Active listening was part of this supportive method. The interview process advocated the CYPs should be interviewed separately in a private room away from parents. Ideally, such an environment can facilitate and encourage the CYP to be open, sharing valuable information in the absence of family (Marzec et al., 2021). Such instances allow the CYP to provide sensitive information, which may inform the healthcare professional in cases where the CYP has or is experiencing violence. Adolescents who have survived violence, are more likely to experience suicidal thoughts and self-harm attempts (De Lijster et al., 2016; Sedgwick et al., 2019).

While the interventions identified from the included studies in this review reported positive patient outcomes, there are various challenges as outlined below for consideration and ensuring interventions are implemented in the best interest of the CYP. Current applicable legal regulations stipulate, actions taken with regards to young patients except in exceptional circumstances, require parental approval (General Medical Council, 2018). Archie Battersbee's ongoing treatment case typically exemplifies potential conflicts of opinion between healthcare professionals and parents (Rimi, 2022). The healthcare professional's interview with the CYP must be agreed with the parents and under certain circumstances may not allow to leave the child alone as they have the right and duty to know what is happening to the patient (General Medical Council, 2018). Despite legal and policy positions, reluctancy of parents and/or guardians to leave an interview room upon explicit request by the HCP under such conflicting circumstances, might be construed as a red flag signalling potential disturbed family dynamic (Marzec et al., 2021).

The value of family integrated care should not be overlooked in the development and implementation of a successful mental health risk mitigation strategy. Evidence from literature has demonstrated that parents and families are often able to recognise subtle mental health or psychological behavioural changes of the CYP before healthcare professional (Albutt, O'Hara, Conner, Fletcher and Lawton, 2017; Parshuram et al., 2018). Once a CYP has been identified as at risk for suicide or self-harm developing a rapport and engaging with family members is key for their support in implementation of a defined safety protocol (Kiley et al., 2020). Environmental safety risk mitigation strategies observed in this review involved aspects of daily searches of visitors and patients, restricted movements and use of certain equipment by the patients (Inman et al., 2019; Latif et al., 2020; Noelck et al., 2019).

Clear concise communication between the child, parents and healthcare staff is important to provide clarity and rationale regarding care expectations and privacy restrictions for the best interest of the CYP.

Study strengths and limitations

The review was conducted using robust methodology following a predefined protocol and is the first to narratively synthesise the existant literature in this under-researched area. However, only five studies were included, all of which were conducted in the USA. This has implications for the generalisability of the identified risk mitigation strategies to other international healthcare settings. Kiley et al. (2020) acknowledged the lack of studies in the literature relating to risk mitigation strategies and/ or pathways in paediatric acute inpatient care. The authors acknowledge that some knowledge can be drawn from adult inpatient studies, even though there are unique circumstances.

Age and stages of development must be factored when considering approaches to care, evaluation and observations, as they may affect the patient's ability to understand or cope with the restrictions related to some interventions such as constant observation. All risk mitigation strategies reported in this review have been developed from studies that enrolled participants aged from 6 to 19 years, which are applicable to CYP that access acute paediatric hospital settings.

Another limitation relates to the paucity of data within the included studies exploring the acceptability and/or subjective experience of receiving (from CYP) and implementing (by HCPs) the included risk mitigation strategies. This is particularly important given the iatrogenic harm that can be done through potentially effective (in terms of improving safety) but overly defensive risk management practices in mental health care.

Implications to practice and future research

A key observation from this review is the paucity of evidence on risk mitigation strategies for use in CYP admitted to paediatric acute care hospital settings with mental health crisis. Given the potential severe consequences of substandard safety management for these young people, our findings could be used as a starting point and guide for designing a standardised risk mitigation pathway for use in clinical practice. Additionally, the risk mitigation strategies identified in this review could assist HCPs in clinical practice when considering how to improve safety within their clinical environment. There is however need for the identified strategies to be refined and tested for effectiveness in improving patient safety within contexts outside of USA.

Conclusion

This review provides a comprehensive review of international literature relating to risk mitigation strategies for use in CYP admitted to paediatric acute care hospital settings with mental health crisis. Identified risk mitigation strategies focused on the environment, family, and individual CYP including modifications to equipment, surveillance, and communication to enhance safety and management of care of the CYP with mental health crisis. Despite risk mitigation strategies being recognised as essential to ensuring safety and better outcomes for CYP experiencing mental health crisis, there is a paucity of evidence in contemporary literature. This review supports a shift in thinking for the development of evidence-based standardised risk mitigation strategies for use by non-mental health trained HCP when looking after this patient population. A focus also needs to be placed on further research for high quality empirical studies in this area.

Author contributions

Systematic Review Study conceptualisation and design: All authors. Data collection: AK, ZA, TCM, TC, and JCM. Data Synthesis: AK, ZA, TCM, TC, and JCM. Manuscript writing: All authors were involved and contributed to the critical review and revision of the manuscript. All authors have approved the final manuscript.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This review is part of the 'SAPhE Pathway' Study: Co-creating a prototype digital risk mitigation pathway for Children and Young People admitted with mental health crisis to acute paediatric NHS care funded by the National Institute of Health Research (NIHR203880). Professor Joseph C. Manning is the Chief Investigator.

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Supplemental Material

Supplemental material for this article is available online.

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