Admission and discharge criteria for adolescents requiring inpatient or residential mental health care: A scoping review

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Abstract

Objective

This scoping review sought to locate and describe literature criteria relating to admission and discharge to inpatient units for adolescents aged eleven to nineteen years.

Introduction

In the United Kingdom (UK) and internationally, it is estimated that one in ten children and adolescents has a diagnosable mental health problem. Children and adolescents with the highest levels of need are cared for in hospital but there is a high demand for beds and a general lack of agreement regarding the criteria for admission to, and discharge from, such units.

Inclusion criteria

We considered research studies that focused on admission and discharge criteria to mental health inpatient or residential care for adolescents aged 11-19 years. We included all quantitative and qualitative research designs and text and opinion papers.

Methods

We searched MEDLINE, EMBASE, PsycINFO; CINAHL and ERIC, British Nursing Index, ASSIA, ProQuest Dissertations & Thesis, the Cochrane Central Register of Controlled Trials, OpenGrey, Ethos and websites of professional organizations for English language citations from 2009 to Feb 2018.

Potentially relevant citations were retrieved in full and their citation details imported into the Joanna Briggs Institute's System for the Unified Management, Assessment and Review of Information (JBI SUMARI; The Joanna Briggs Institute, Adelaide, Australia). Full text of selected citations were assessed in detail against the inclusion criteria by two independent reviewers. Findings were extracted directly into tables accompanied by a narrative summary relating to the review objectives

Results

Thirty five citations were included, quantitative (n-18), qualitative (n=1) research studies, textual and opinion publications (n=16). Of the quantitative research studies sixteen used a retrospective cohort design using case note reviews and two were prospective cohort studies. The qualitative study used interviews. The research studies were conducted in nine different countries, the USA (n=7), the UK (n=3) New Zealand (n=2), Israel (n=2) Canada (n=1), Norway (n=1) Ireland (n=1) Greece (n=1) Turkey (n=1). The 16 textual and opinion publications included book chapters (n=3), reviews (n=3), policy and guidance documents (n=3), reports (n=3), service specifications (n=4). The majority of these were published in the UK (n=10) with the remainder published in Ireland (n=2), Australia (n=1), USA (n=2) and New Zealand (n=1). Research was conducted across a wide variety of settings which included child and adolescent mental health service inpatient and outpatient units, emergency department and adult psychiatric units. Length of stay, where recorded, ranged from <1 day to 351

days. Several categories emerged from the data: type of admission process, referral or point of access, reasons for admission to inpatient mental health care, assessment processes, criteria for discharge and reasons for non-admission.

Conclusion

There is little evidence identifying which behavioral or symptomatic indicators suggest admission is required, beyond retrospective identification of diagnoses attributed to adolescents who became inpatients. The threshold of severity of risk or need is not currently articulated. No studies were identified that drew on the perspectives of adolescents and their families or carers regarding criteria warranting admission to inpatient mental health care, indicating an important area for future investigation.

Keywords: Adolescents; mental health, admission, discharge

Introduction

This review scopes the literature relating to admission and discharge criteria for adolescents over eleven and under nineteen years old that are admitted for inpatient or residential mental health care. For ease of understanding the term 'adolescents' will be used but it is acknowledged that other terms, 'youth', 'young adults' 'teenagers' and 'young people' are used within the literature. An inpatient service is defined as a unit with 'hospital beds' that provides 24-hour nursing care.[1] Residential treatment centers usually house youths with significant psychiatric, psychological, behavioral, or substance abuse problems for whom outpatient treatment has been unsuccessful.[2] The term 'inpatient mental health care' will be used in this review to represent these services.

It is estimated that one in ten children and adolescents (aged between five and sixteen) in the United Kingdom (UK) has a diagnosable mental health problem[3] and this is also an area of international concern.[4] Those with the highest levels of need are cared for in hospital but there is general lack of agreement regarding the criteria for admission to such units. The demand for hospital beds is high and continues to increase, for example, there were 720 admissions during 2013 into Mc-Master Children's Hospital's child and adolescent psychiatry unit, Ontario, Canada.[5] A study in New Zealand[6] showed a 80% marked increase in admissions for children aged 4-17 following the Canterbury earthquakes. A considerable difference was found in the provision of child and adolescent mental health services across 28 European countries, with fewer than two beds per 100 000 adolescents in Portugal and Sweden to more than 50 beds per 100 000 adolescents in Germany and the Netherlands.[7] In the UK limited bed capacity influences any decisions on who to admit to inpatient child and adolescent mental health services (CAMHS). However perceptions of 'risk' are also taken into consideration which can vary upon external triggering factors and context, for example suicidal attempts take place. As a result negotiating access to inpatient beds for adolescents can be fraught with difficulties[8] and with the development of effective community based interventions for common mental health presentations in adolescents, the focus and function of inpatient care is changing.[9]

Inpatient care is often currently selected because the round-the-clock availability of nursing staff makes it possible to keep adolescents safe while assessments and interventions of their mental health is addressed.

A guidance document that can advise on the scope and criteria which warrant admissions to adolescent inpatient mental health units in the UK is currently being developed by the Royal College of Psychiatrists. Given the challenges over access and demand for services are similar across Canada, Australasia and Europe[7,10] this will have international applicability. There are several sources of good practice to which CAMHS inpatients can refer[11,12] but there is an opportunity to ensure that any further guidance documentation produced is supported by an underpinning robust evidence base.

In 2001 in the UK the Royal College of Psychiatrists introduced the Quality Network for Inpatient CAMHS (QNIC) standards against which inpatient CAMHS units can elect to be audited and are reviewed biannually.[11] One of the sections in this audit document covers access and admission. Within this category, one statement specifies that senior clinical staff members make decisions over the admission of an adolescent, this can be moderated if in their view safety or therapeutic activity will be affected. A further statement notes that adolescents at severe risk can be admitted as emergencies. Standards exist relating to process for exceeding bed capacity, for not admitting and for effective discharge planning. Absent from the standards are specific criteria about which presenting criteria determine whether admission is required. Similarly there is a lack of agreed criteria for when discharge is indicated. More recently in 2014 the national mapping of the CAMHS inpatient units across England[12] was highlighted that there was high demand and limited capacity to provide inpatient mental health care for this population, suggesting as a solution for patient flow the introduction of a pre-admission assessment.

Before starting the review an initial search on the topic are was conducted in order to identify any other scoping and systematic reviews. The following databases were searched: Campbell Collaboration Library of Systematic Reviews; Cochrane Database of Systematic Reviews, Evidence for Policy and Practice Information Centre databases; JBI Database of Systematic Reviews and Implementation Reports, International Prospective Register of Systematic Reviews (PROSPERO); Social Care Institute for Excellence database; CINAHL and PsycINFO. Two reviews have been registered on PROSPERO investigating characteristics of inpatient CAMHS and treatment outcomes[13,14] but neither considered admission criteria.

This scoping review therefore fills in the gap in the literature, while simultaneously providing the evidence base for the Royal College of Psychiatrists guidance document. A protocol for this work has previously been published by review authors.[15]

Review Question/objectives

The question guiding this review was:

What are the admission and discharge criteria for adolescents to mental health inpatient care?

The objectives of this scoping review were

- To identify criteria for admission to mental health inpatient care for adolescents
- To identify criteria for discharge from mental health inpatient care for adolescents
- To identify criteria for not admitting adolescents to mental health inpatient care

Inclusion Criteria

Types of participants

This scoping review considered all research studies that focus on adolescents between the ages of eleven and nineteen years, presenting with mental health difficulties suggestive of meeting diagnostic criteria, prior to, or on admission, to inpatient mental health care inclusive of psychosis, eating disorders and mood disorders. Research studies that focus primarily on children (under the age of eleven) or adults (over the age of nineteen) were excluded except where adolescents were part of a larger sample and it was possible to accurately identify data related to adolescents between the age of eleven and nineteen years separately.

Concept

This review considered all research studies that specifically addressed:

- Reason for admission to inpatient mental health care; for example severe self-harming behavior.
- Reason for discharge from inpatient mental health care, for example no longer an immediate risk to self.
- Reason for not admitting to inpatient mental health care, for example can be managed safely at home.

Research studies that focused on alternatives to inpatient mental health care and services specifically for learning disabilities only and forensic services have been excluded.

Context

This scoping review considered research studies conducted in any facility that provided mental health inpatient care for adolescents. This included hospitals, independent health units and residential treatment centers in any geographical setting.

Types of studies

This scoping review considered quantitative and qualitative studies and textual and opinion data

Quantitative

This scoping review considered both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies were considered for inclusion. This review also considered descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.

Qualitative

This scoping review considered studies that focused on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research.

Textual and opinion

This scoping review considered standards for clinical care, consensus guidelines, narrative case reports, and literature reviews including expert opinion, published discussion papers, government policy reports or reports accessed from web pages of professional organizations.

Studies published in the English language were included. Studies published from 2009 to February 2018 were included. In 2009 Kurtz published a review for the UK Department of Health identifying the 'Evidence Base for Tier 4 CAMHS' (inpatient provision) drawing on the evidence available at that point.[16] In this review, Kurtz identified that the inpatient services were developing from not only inpatient services, but to develop complex outpatient 'wrap around services' for adolescents, and that inpatient services should be reserved for 'highly specialist assessment in a controlled environment and away from the family'. The review recognized that although there may be benefits in this approach, it would not necessarily be the best intervention for all adolescents and recommended a comprehensive pre-admission evaluation of the child's suitability for treatment in a psychiatric inpatient setting before admission.[16] This scoping review will therefore consider studies published since the publication of this 2009 report.

Methods

This scoping review was conducted in accordance with the Joanna Briggs Institute methodology for scoping reviews.[17]

Search Strategy

The search strategy aimed to locate both published and unpublished studies. An initial limited search of PsycINFO and CINAHL was undertaken followed by analysis of the text words contained in the titles and abstract, and of index terms used to describe the articles. This informed the development of a search strategy tailored for each information source. A full search strategy for all databases is detailed in Appendix I. The search strategy, including all identified keywords and index terms was

adapted for each included information source. The reference list of all included studies selected were screened for additional studies.

Information Sources:

The databases searched included:

On the OVID platform:

MEDLINE

EMBASE

PsycINFO

On the EBSCO platform:

CINAHL

ERIC

On the ProQuest platform

British Nursing index

ASSIA

ProQuest Dissertations & Thesis

The trial registers to be searched included:

Cochrane Central Register of Controlled Trials

The search for unpublished studies and other grey literature included:

OpenGrey

e-thesis online service for the British Library (Ethos)

Websites of professional organizations; for example Royal College of Psychiatrists, Royal College of Nursing, International Society for Psychiatric Nursing, Headspace, Canadian Mental Health Association.

Authors, experts and organizations active within the phenomenon of interest were contacted to attempt to identify further published, un-published and ongoing studies.

Study screening and selection

Following the search, all identified citations were loaded into Endnote V7.7.1 (Clarivate Analytics, PA, USA) and duplicates removed. Titles and abstracts were screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant studies were retrieved in full and their citation details imported into the Joanna Briggs Institute's System for the Unified Management, Assessment and Review of Information (JBI SUMARI; The Joanna Briggs Institute, Adelaide, Australia). The full text of selected citations were assessed in detail against the inclusion criteria by two independent reviewers. Any disagreements that arose between the reviewers at each stage of the study selection process were resolved through discussion, or with a third reviewer.

Data extraction

The data extracted included specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives. The JBI data extraction tool was adapted to suit this scoping review.[17]. This is in line with charting the data as outlines in stage four of Arksey and O'Malley's[18] framework for conducting scoping reviews and updated by Levac et al[19]. Any disagreements that arose between the reviewers were resolved through discussion or with a third reviewer. Authors of papers were contacted to request missing or additional data where required.

Presentation of results

The review findings are discussed in a narrative form including tables. The approach described by Arksey and O'Malley[18] and Levac[19] was followed and an overview of all included material is summarized in a tables which maps the literature. Literature was tabulated using the following headings: research design, geographical location, year of publication, characteristics of study population and research outcomes. A narrative summary accompanied the tabulated results,[18] and described how the results related to the review objectives and question.[17]

Study inclusion

The database searches yielded a total of 3609 citations after duplicates were removed. The titles and abstracts for these 3609 citations were screened and 72 citations considered for further detailed assessment of the full paper yielding a total of 35 original citations for inclusion in this review. Reasons for exclusion of full text studies that did not meet the inclusion criteria have been recorded and reported Appendix II. The results of the search are reported in full and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram[20], see Figure 1.

Insert Figure 1 here

Characteristics of the included studies

Publication type

The thirty five included citations included quantitative research studies (n=18), qualitative research studies (n=1) and textual and opinion publications (n=16). Of the quantitative research studies sixteen used a retrospective cohort design using case note reviews and 2 were prospective cohort studies.[21,22]. The study using a qualitative approach was conducted using interviews[8]. A summary table mapping the included research material is presented in Appendix III. The sixteen textual and opinion publications included book chapters (n=3), reviews (n=3), policy and guidance documents (n=3), reports (n=3), service specifications (n=4). A summary table mapping the textual and opinion publications is presented in table 1

Insert table 1 here

Country of publication

The 19 research studies were conducted in nine different countries. Seven were conducted in the USA[23–29] three in the UK,[30–32] two in New Zealand,[8,33] two in Israel,[22,34] one in Canada,[35] one in Norway,[21] one in Ireland,[36] one in Greece[37] and one in Turkey.[38] The majority of the textual and opinion publications were published in the UK (n=10) with the remaining being published in Ireland (n=2),[39,40] Australia (n=1),[41] USA (n=2)[42,43] and New Zealand (n=1).[44]

Participant details

The mean age of participants varied from 11 years[23] to 15 years[28]. Bryson and Akin[23] included data for children as young as 3-5 years, data was only extracted for participants' age 11-19 years. All research studies included a mix of genders apart from one[25] where the participants were all male and one further study[34] did not specify gender. The participants in the qualitative study were community clinicians (n=48) from varying clinical backgrounds.[8]

Sample size

Sample size varied considerably related to the nature and type of the study, from 34 participants[31] to 1,293 participants[23]. This study, however the one included all those admitted for acute inpatient psychiatric care one or more times during a one-year period within one Midwestern state and of these. 66.2 % of these participants fell in the included age category (12-14: 29.4% and 15-17: 36.8%).[23] The qualitative study included 48 participants.[8]

Period of data collection

The time period over which data was collected for the retrospective cohort studies varied from six months[36] to eight years[37]. The other retrospective cohort studies collected data over a one year,[23,24,26,27,35] sixteen months,[38] eighteen months,[28] two year,[25,30,32,34] three year,[29,31], or five year[33] period. One of the prospective cohort studies collected data over three years [22] whereas the data collection period was not specified for a further two studies.[8,21]

Setting

Research was conducted across a wide variety of different settings (see table 2) which included Child and Adolescent Mental Health Service inpatient units (n=6)[21,25,30,35,36,38] emergency departments (n=4),[24,27–29] adult acute psychiatric units (n=2), specialist eating disorder units (n=2),[22,32] adolescent units with a general psychiatric ward (n=2),[31,37] inpatient pediatric unit (n=1)[26] services making referrals into CAMHS units (n=2)[8,34]

Insert table 2 here

Length of stay

The length of stay was recorded in 11 studies.[21,23–26,28,30,33,35,37,38] Psychiatric boarding ranged from <1day[24,27] to 5 days or less.[26] For mental health units, the range was <30 days[23] to 351 days.[21] It is

difficult to compare length of stay across research studies as a range of different types of provision across different countries was reported.

Review findings

The summary is presented as three categories generated from the three objectives proposed for this review: criteria for admission, criteria for discharge and reasons for not admitting.

Criteria for admission

Four sub categories which emerged from the data within criteria for admission: Type of admission process, referral or point of access, reasons for admission to inpatient mental health care and assessment processes.

Type of admission process

The type of admission process was reported within six textual and opinion publications[39,45–48] and nine research studies.[21,23,26–28,30,31,33,37] It was evident that there are two separate processes for admission to inpatient mental health care dependent upon whether the clinical presentation was deemed routine or urgent/emergency admissions. Some of the research studies in their methods or discussion sections described the type of service that the units offered, such as those that accept acute and emergency admission around the clock seven days a week.[21,30] Others did not describe the service offered by the unit outside of the remit of the research study.[26–28,31,33,37]

Some of the US literature used the term 'psychiatric boarding' a term used to describe when young people who were medically fit and awaiting admission to a mental health facility.[26,27] The research studies in question looked at this issue within pediatric units[26,28] and emergency departments.[27,28]

Professionals noted that admission of adolescents with mental health needs also was into general medical wards, pediatric wards and adult mental health wards.[45,48] Although no specific explanation for these decisions was provided the CAMHS professional reported that one of the reasons for not admitting to inpatient mental health care was lack of availability of beds.[45,48]

Two research studies investigated the process and circumstances by which adolescents who were younger than 18 years were admitted to either an adult acute psychiatric units[33] or to an adolescent unit within a general psychiatric ward.[37] Park et al.[33] found that the majority of admissions took place outside of working hours with more than half coming from rural areas with a high usage of the Mental Health Act on admission. Zilkis et al.[37] conducted a retrospective case note review of adolescents admitted in a Greek integrated adolescent and adult mental health hospital. Of the 25 beds available, five were reserved for adolescents, 86.5% of whom were aged 16 and above. This was a specialized unit. Another unit which served adolescents up to aged 14 was excluded from this study.

Admission under the Children's Act or Mental Health Act was mentioned in four of the textual and opinion publications.[39,46,47,49] In these exceptional cases admission was required to prevent any serious deterioration of the health of the young person.[39] The numbers of adolescents who required involuntary/compulsory admission to units was reported across six research studies (20%,[35] 5%,[36] 9%,[30] 33%[21] and 61%[33]. Duddu et al.[30] also reported that a further 22% of adolescents were detained after their admission. One study which was conducted across several inpatient mental health care units found the final decisions for compulsory admission were based on each unit's consultant and that as a result rates (7 to 67%) varied significantly between units.[21]

The focus of three of the research studies was around adolescents who required involuntary or compulsory admission to their unit using the respective mental health legislation within each country.[28,31,35] The study by Patil et al.[31] examined the characteristics, presentation and outcomes of adolescents who had required involuntary/compulsory admission over a three period and demonstrated that the majority (82%) had been sectioned because of threatened or potential harm to self. Persi et al.[35] conducted a comparison of voluntary and involuntary adolescent admissions and found that a higher percentage of involuntary admissions was taking place outside of office hours. The remaining study investigated the impact of pediatric psychiatric patients who had been admitted involuntarily of boarding in a pediatric medical unit due to a lack of psychiatric beds.[28].

Referral or point of access

Six research studies[22,26,27,33,36,37] and one textual and opinion publication[50] detailed the point of access or source of referral for those adolescents who had been admitted (both routine and emergency admissions) to their units. A wide variety of sources are reported across the research studies as shown in table 3. The main source of referrals reported in the audit carried out by the Care Quality Commission[50] was from community child and adolescent mental health service tier 3 teams and the crisis team including emergency department liaison. Other sources included specialist community services and crisis teams, primary care/general practitioners.[50]

Insert table 3 here

Reasons for admission to inpatient mental health care

Only one research study[36] and 11 textual and opinion publications,[39–45,50–53] used the term admission criteria, and for a further two research studies[21,28] admission criteria could be inferred from within the text

> "*Written admission criteria stipulate that referred individuals should be aged 16–18 years old, living in the primary catchment area and have a likely psychiatric diagnosis based on the clinical assessment of the referring psychiatrist.*"[36 p.556]

"The ED only admits or transfers psychiatric patients deemed to require an involuntary psychiatric hold (72-hour hold) for danger to self or others or grave disability; others are referred for outpatient services". [28 p.126]

"The following conditions are specified as qualifying a person for necessary assessment and treatment in an acute psychiatric service without delay, to ensure that the units accept emergency admissions" [21 p.3]

A further six research studies looked at reasons for admission from within the methods sections of the papers.[8,21,29,34–36] From across all types of evidence two different ways of understanding the reasons for promoting admission were evident, reasons that are based on diagnosis or presenting behavior. The data available about the clinical presentation of the young person that prompted the referral for admission was collected retrospectively and referred to diagnoses made at point of admission, or diagnosis at point of discharge.

There was a general consensus across all types of evidence reviewed about the criteria for admission to inpatient mental health care in terms of the presenting difficulties that prompted admission. The need for admission was often categorized as high risk where the young person presented with severe and complex needs[42,45,49,52] leading to significant functional impairments[42,49,52] and/or risk that could not be safely managed in the community.[8,39,49,52,53] The nature of the problems is such that they could not be adequately addressed in a less restrictive environment[43,44,46,53] or community or home settings[39,40] or where intensive treatment was required that could not be provided in the community or at home.[39,40,44,44,45,47,49,51,52] Some noted the requirement of a 24 hour assessment with a multi-disciplinary team[44,45,51,53]

Risk was defined as:

- suicidal thoughts or behaviors[8,29,34–36,41,42,51]
- a risk of serious self-harm[42,43,45,50]
- a risk to physical self for example through malnutrition that was beyond the family's or community's ability to manage[45]
- a risk of harm to others[21,35,41–43,50]

Other presenting difficulties included

- family difficulties[42,51] for example where the caregivers had difficulty coping with the child or young person due to their own distress[34] or being less able to cope[29,45] or needed urgent help[21]
- where the young person lacked sufficient competence to look after themselves[35]
- unresponsive to outpatient care[45,51,53]
- difficulties with assessment or diagnosis[43,51]

- medically unstable[39]

A literature review alongside a consensus forming exercise involving specialist mental health professionals working in both community and inpatient settings identified a number of other appropriate reasons for admission as follows:[45]

- young person's willingness or desire to engage in treatment package
- the need to provide a detailed psychiatric assessment in a controlled environment
- to improve control over the young person's behavior
- to establish better therapeutic control
- to facilitate future placements
- to achieve psychological separation between the parents and the young person
- to provide therapeutic peer-group experience

Clinicians from both community and inpatient services were in agreement that the risk of suicide and risk to physical health are amongst the most important factors that influence decisions to admit along with serious harm to self.[45] Given that there is a degree of shared understanding about what might constitute reasons for admission, there is the potential to develop a set of criteria that could be agreed in advance and form the basis for decision making at these critical points[45].

Three textual and opinion publications[41,46,52] and one research study[21] presented diagnostic criteria by which admission would be considered:

- Psychosis[21,41,52]
- Anxiety and Emotional Disorders[41,52]
- Severe PTSD[41]
- Affective disorders[52]
- Obsessive Compulsive Disorders[52]
- Self-harm, Attachment and Emotional Regulation Disorders[52]
- Primary diagnosis of Mental Illness with co-morbid Learning Difficulties[52]
- Serious mental health problems[46]

Across the included research studies, there was a difference in how diagnoses were reported (summarized in Appendix III). The majority used diagnosis on admission (n=13),[8,21–23,25–27,29–31,33,34,37] others on discharge (n=2),[24,35] on referral (n=1)[36] and on initial contact with the service (n=1).[32] A further two research studies not report this information.[28,38] Both the International Classification of Diseases[54] (ICD-9) (n=1)[24] & ICD-10[55] (n=4)[21,23,26,30] and the Diagnostic and Statistical Manual of Disorders (DSM IV)[56] (n=6)[22,25,27,33,34,36,38] were used. One further study reported that they classified diagnosis using behavioral and emotional symptoms[29] and six research studies did not report this kind of information.[8,28,31,32,35,37]

Three research studies[8,35,36] identified reasons for seeking admission as part of the research data, risk to self or others were found to be common reasons,[8,35,36] with psychosis[8] and depression[36] also cited. Three research studies looked at predictors of, or factors influencing admission.[23,29,34] Factors influencing admission were the severity of psychotic disorders, affective disorder and violent behavior (but not anxiety), rates of suicidal behavior, levels of parental rejection and inappropriate empathy[29,34] compared the characteristics of those children referred for outpatient services with those children admitted to inpatient treatment. Those admitted were determined to have greater depressive, anxious, and psychotic symptoms and were judged to be at higher risk of suicide, other physical self-harm, and of harming others.[29] Predictors of admission included clinical factors, prior hospitalization, receipt of two or more concurrent psychotropic medications, older age, and urban residence.[23]

Four research studies presented rates of admission for inpatient mental health care.[24,31,32,37] The study conducted by House et al.[32] focused on adolescents who presented with eating disorders in areas with and without specialist eating disorders services. The authors concluded that specialist eating disorders services and specialist CAMHS were comparable in terms of presenting cases and admissions for inpatient treatment[32]. Sheridan et al.[24] found that children with mental health needs presenting to a psychiatric affiliated pediatric emergency department had more than double the rate of admissions than a unit with no psychiatric affiliated pediatric emergency department after controlling for patient characteristics and emergency operational variables.[24] One study conducted in Greece, collected admission data over an 8 year period of adolescents (located within two separate rooms) within a general ward, where clinical responsibility of the hospitalized adolescents belonged to the child and adolescent psychiatry team. Over the time period there were 253 admissions of adolescents, 65.61% were first admissions and 34.39% readmissions.[37]

Assessment processes

The majority of research studies (n=16)[8,21,22,25,25–27,29–31,34–38,42] and seven textual and opinion publications[11,39,40,42,49,53,57] covered some aspect of the assessment process. A variety of assessment processes were explored throughout the included research studies, which included pre admission assessments (n=6,)[8,22,25,30,36,37] assessments on admission in the ED (n=3),[26,27,29] assessment on admission to inpatient units (n=8).[8,21,25,30,31,34,35,38] These tended to detail who had conducted the assessments and what tools were used to aid the assessment process.

Pre-admission assessments were carried out in order to determine priority with limited bed availability,[29,36] suitability for treatment when distance from home was an issue,[36] engagement of the young person[22,36] or to determine the referrers concerns.[37] Duddu et al.[30] found that pre-admission assessments in their unit which accepts referrals 24 hours a day, seven days a week were conducted by a range of mental health workers including nurses, social workers, adult crisis recovery and home treatment teams, accident and emergency liaison teams, custody nurses.[30] One study reported that decisions to admit were made by the nursing office for male adolescents admitted to the treatment unit.[25] Adolescents with eating disorders in the study by Fennig et al.[22] underwent pre-admission

assessment using motivational interviewing techniques. A small number (less than 5%) who after this process did not consent to hospitalization in the unit (less than 5%) were referred to other psychiatric facilities with more restrictive treatment plans.[22] Use of the Structured Clinical Interview for DSM-IV or other standardized diagnostic assessment tools was reported as being preferred but not mandatory in another unit.[36] In New Zealand, admission to inpatient CAMHS follows a community assessment and discussion with senior clinician from the inpatient service and out of hours, admission is via community crisis teams and on-call psychiatrist.[8]

Initial assessments on admission to inpatient mental health care are undertaken in order to evaluate the mental state of the adolescents as well as to determine the risk for the patient for self and others[38,49] and to establish if an admission is desirable and explore alternatives[53] which is usually completed with 24 hours[49] Publications reported that assessments were usually carried out by either specialist staff[53] or the nursing and medical team[30] and if the admission occurred out of hours a multi-agency review should be carried out as soon as possible.[53] Decisions about the seriousness of a young persons' mental health and whether admission is required is made by the consultant psychiatrist.[39,57] Thompson and Clark[11] reported that young people have a comprehensive multi-disciplinary assessment completed within four weeks of admission including mental health and medication, psychosocial needs, strengths and weaknesses and own views of admission.

A number of standardized measures were used to contribute to the assessment process:

- Assessment of Severity of Psychopathology (TSP) instrument was used to determine seriousness of mental state[38]
- Children's Global Assessment Scale (CGAS) is a clinician rated measure 0-100, higher number reflecting better functioning that can be repeated at 30 day intervals[25,35,38,42]
- Child Behavior Checklist which asks parents to rate problem behavior over the past six months[35]
- Suicide Risk Self-Report[35]
- Clinical Global Impression (CGI) Severity ratings 1-7, with 1 indicating not present and 7 indicating extremely which can be administered daily[30,34]
- Health of the Nation Outcome Scale for Children and Adolescent[21]
- Child and Adolescent Level of Care Utilization System/Child and Adolescent Service Intensity Instrument[42]

  Goal based outcome measure[53]

Also used were a number of diagnosis specific scales such as:

- Hamilton Depression Rating Scale (HD)[38]
- Young Mania Rating Scale (YM)[38]
- Yale Brown Obsession and Compulsive Rating Scale (YBOC)[38]
- Child Depression Inventory (CDI)[38]

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Hansen et al.[21] found that the proportion of units using standardized diagnostic interviews to aid the admission processes into inpatient mental health care varied significantly from 11% to 38%. The authors suggested that the differences could be due to the differences in diagnostic competence or in the implementation of systematic assessments at the acute units.[21] A single center study reported that 94% of adolescents had "comprehensive" assessment entries.[31]

A number of different tools were detailed as being used as part of the assessment processes undertaken on admission to the ED., the Crisis Assessment Tool,[29] and the psychiatric assessment.[26,27] Wharf et al.[27] reported that initial assessment in the emergency department were undertaken by a hospital social worker before being seen by a trained mental health worker.[27] Admission was then based on the information obtained from these assessments which was either inpatient hospitalization or referred for outpatient services.[29]

Criteria for discharge

Only two research studies[8,30] and three textual and opinion publications[40,49,53] discussed their discharge processes. They report that discharge should take place when the child/young person's mental state is such that they can be managed by the community mental health team and/or day hospital services[40] and be based on a significant reduction in risk[8,49] and when and follow up care can be provided by community mental health teams, step-down team and tier 4 (high intensity) outreach team.[30,49] This should also be a collaborative process (after having taken risk into consideration) involving the child/young person and their parents/carer's and include the referrers and other agencies as appropriate.[53] This should happen as soon as the community based alternatives are able to meet the child/young person's mental health needs.[40]. Discharge preparation included creating early warning signs monitoring and strategies for the young person to cope.[8]

As with admission assessment a number of standardized measures were used to contribute to the discharge process: TSP instrument;[38] CGAS;[25,38] CGI Severity and improvement ratings;[30] Assessment of General Rehabilitative Achievement;[38] and diagnosis specific rating scales (HD, YM and YBO rating scales[38] and the CDI.[38]

Reasons for not admitting

Six research studies[21,22,29,30,36,37] and nine textual and opinion publications[11,40,41,45,47,49,50,52,53] made reference to reasons for not admitting a person to an inpatient unit. Exclusion criteria for admission to inpatient mental health care were eating disorders in some cases where separate commissioning arrangements were in place;[30] delirium;[21] forensic risk;[36] living outside the catchment area;[36] unwilling to co-operate;[36] or not consenting to admission;[22] psychiatric diagnosis unlikely;[36] and when outpatient care was sufficient.[29,37]

There seems to be a difference of opinion about whether children and young people with a primary diagnosis of autistic spectrum disorder should be admitted to inpatient mental health care,[45] as it is

both cited as an indicator[49,53] and an exclusion.[40] When considering diagnostic indicators for admission clinicians tend to agree on the inappropriateness of admitting young people whose primary problem is conduct disorder alone.[40,41,45,47,52] A number of units also exclude patients where intellectual/learning disability.[30,40,41,47,52] recommending that such children and young people be treated in specialist services for those with those primary diagnosis of mental illness with co-morbid learning difficulties[52] whereas other will admit those with mild learning disability.[49] Such units were found to exclude patients with eating disorders[41] alcohol problems[47] or substance abuse[41,47,49,50,52] but this was not always the case.[49,52,53]

A large number of contextual factors have been cited as reasons for not admitting children and young people to inpatient mental health care, these included

- medical issues requiring admission to pediatric wards[45,53]
- history of arson[50]
- incidents of violence[50]
- the need for forensic care[47,49,52]
- where admitting a child/young person may compound their difficulties[40,53]
- the young person or parent refused an offer of a place[45]
- staff considered that inpatient was not considered appropriate[45]
- the condition of the young person improved after an assessment or while they were waiting for an assessment or admission[45]
- young people whose primary need is for accommodation due the breakdown of family or other placement[49]
- extreme behavior disturbance[52]
- young people who are deaf where care may be more appropriately be accommodated provided by the National Deaf Child and Adolescent Mental Health Service[49]
- If there are concerns about separating the child/young person from their home environment[53]

A gate keeping assessment prior to admission to inpatient mental health care considers treatment/care needs, the best environment/ level of service in which the care should be provided, risks, the ability of the holding/referring organization to safely care for the patient until admission can be arranged and considers the wishes of the child or young person and the family[45,57] and whether admission is likely to do more good than harm.[53] Senior clinical staff members including the ward manager make decisions about young person being admitted and can refuse to accept young people if they fear that the mix will compromise safety and/or therapeutic activity.[11,53]

Discussion

This scoping review included 35 publications including research studies and textual and opinion papers published over a 9-year period that investigated or described issues related to admission and

discharge criteria for adolescents to mental health in-patient care. The vast majority of research studies used a retrospective cohort design using case note review related to admission processes, as opposed to discharge criteria. Using this kind of methodology allows for the examination of data that has been recorded in the case notes but the quality of such data is likely to be variable. The nuanced information that illuminates the threshold behavioral signs presenting by the adolescent that informed why they were admitted may not have been captured. It nevertheless offers some insights as to how such decisions are made and how the combination of risk and diagnosis are important.

There was only one qualitative study included Stanton et al.[8] and this considered the perceptions of practitioners. It is of note that there were no studies that investigated the perceptions of families or young people of the admission or discharge criteria for inpatient mental health care, despite the recommendation for research in this area.[16]

The key findings of this review addressed type of admission process, referral or point of access, reasons for admission to inpatient mental health care, assessment processes, criteria for discharge and reasons for non-admission. The main two sources of referrals for inpatient mental health care originated from community mental health services for young people, including crisis teams and emergency department liaison services. Apart from inpatient mental health care, young people were admitted to general medical wards, pediatric services and adult mental health wards. The Royal College of Psychiatrists have reported that admission to non-specialist services has resulted in untoward incidents and 'near misses' with adolescents being exposed to higher risks, and experiencing degrading treatment.[58 p.10]

Compulsory admission through either mental health legislation or law pertaining to children was discussed in six studies and four textual and opinion publications but where voluntary admission occurred, the value of negotiating this with the young people was noted. In the evidence the reasons for admission covered both routine and emergency admissions. Diagnostic criteria were mainly determined either on admission or discharge and a range of diagnoses using both DSM and ICD classifications were identified, these did not elucidate the differential characteristics between young people with the same diagnosis not requiring admission. There was however consensus about what constituted a high-risk presentation in a young person; a young person with severe and complex needs who was unable to be safely managed in the community or family within the existing resources.

Whilst adolescent inpatient mental health care deals with both planned and unplanned admissions the main focus of the included literature was on emergency admissions. Four research studies found pre-admission assessments to be useful for planned admissions.[22,30,36,37] The literature suggests that admission and discharge decisions reflect a tension sometimes related to bed capacity or appropriateness of the facility, for example admission to a pediatric medical unit[28] rather than a mental health, or an adult mental health unit.[23,33] When evidence for pre-admission assessments were available what was evident was that these were not uniform approaches and a number of different

models were used. Decisions to admit were made by different professionals, typically involving the consultant psychiatrist, nursing and social work. Standardized measures were used in some cases to assist decision making and the most frequently reported use was of the CGAS. Such measures could be repeated to inform discharge decision making alongside evidence of reduction in risk, and a consideration that the young person could be managed safely in the community. The most clarity in the evidence was informing decisions not to admit based on either the young person's functioning or diagnosis. Decisions not to admit occurred where the young person did not agree, where they had a risk of offending, lived outside the catchment area and where they were safely supported in the community or still had on-going medical issues that needed addressing. The diagnostic issues noted in the evidence were around eating disorders; admission not supported where specialist eating disorder services were available. There was a lack of agreement about whether young people with autistic spectrum diagnoses should be admitted.

Internationally, different models of care exist to meet the needs of adolescents with severe and complex mental health needs and so direct comparisons are not always possible. Psychiatric boarding for example has been reported in the USA[26–28] but not in the UK. However, the need to a consensus regarding criteria for admission is nevertheless a global issue.

Limitations of the Review

The objectives of this review were to identify the criteria for admission to and discharge from mental health inpatient care for adolescents and to identify the criteria for not admitting. A date limit was set on this review of 2009-2018. It was assumed that the review published by Kurtz[16] in 2009 had drawn on all the available evidence to date, but there is the possibility that there is some research evidence prior that could have informed this scoping review. Of the nineteen studies retrieved, only one qualitative study was located and the others were of a retrospective cohort design resulting in there being little specific evidence articulating the threshold for admission an adolescent based on their presenting behavior, clinical symptoms or risk. This review has been influenced by a significant number of non-research papers (sixteen), most of these UK based (twelve). This may bias this scoping review towards operational processes in the UK.

The review was drawn from international evidence, represented by Europe, North America and Australasia, but no evidence was retrieved from South America, Asia or Africa. Such evidence may have been excluded by language limits (English) or because of the different approach to mental health care for young people in these different contexts with care often being delivered in children's services or by family and community carer's.[59,60]

Conclusions

This scoping review highlighted that there are a number of different criteria upon which decisions are made for adolescents to be admitted to inpatient mental health care. Consensus exists about when admission is not required apart from adolescents with autistic spectrum disorders, and on what

constitutes risk in terms of admission threshold. There is little evidence of what behavioral or symptomatic indicators suggest admission is required beyond a retrospective identification of what diagnoses were attributed to adolescents who became inpatients. It is the threshold of severity of risk or need that is not currently articulated in the literature. It is difficult therefore to predict which diagnoses predict admission because it is the impairment of functioning alongside a consideration of risk in the context off the availability of family and community resources that appear to determine whether an adolescent needs admission.

Inpatient mental health care for adolescents is available for both routine or planned and emergency admission and the evidence suggests these two different pathways require different admission criteria. For routine admission pre-admission assessments with a range of disciplines is an option. In some cases, standardized measures were used to aid assessments and guide discharge.

Recommendations for research

Any further research in this area might usefully adopt methodologies that allow an illumination of the decision-making processes that inform admission. There were no studies identified in this scoping review that drew on the perspectives of adolescents and their families or carer's about what constituted criteria warranting admission to inpatient mental health care indicating an important area for future investigation.

Conflicts of interest

None to declare

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Appendix I: Search strategies

ASSIA, BNI and ProQuest Dissertations & Thesis (On the ProQuest Platform):

Searched: 5th Feb 2018

(ti(adolescen*) OR ab(adolescen*) OR ti(teen*) OR ab(teen*) OR ti(youth*) OR ab(youth*)

AND

(ti(mental NEAR/1 health) OR ab(mental NEAR/1 health) OR ti(mental NEAR/1 illness) OR ab(mental NEAR/1 illness) OR ti(psychiatr*) OR ab(psychiatr*)

AND

(ti(admit*) OR ab(admit*) OR ti(admission) OR ab(admission) OR ti(discharge*) OR ab(discharge)

Open Grey and Ethos:

Searched 5th Feb 2018

Admission and youth or adolescent or teen

Admit and youth or adolescent or teen

Discharge and youth or adolescent or teen

Child and adolescent mental health

ERIC (on the EBSCO platform)

Searched 22nd Feb 2018

S1 TI adolesc* OR AB adolesc*
S2 TI teen* OR AB Teen*
S3 TI youth* OR AB youth*
S4 S1 OR S2 OR S3
S5 TI (mental N1 health) OR AB (mental N1 health)
S6 TI (mental N1 illness) OR AB (mental N1 illness)
S7 TI psychiatr* OR AB psychiatr*
S8 S5 OR S6 OR S7
S9 S4 AND S8
S10 TI admit* OR AB admit*
S11 TI admission* OR AB admission*
S12 TI discharge OR AB discharge
S13 S10 OR S11 or S12
S14 TI inpatient OR AB inpatient
S15 TI in-patient OR AB in-patient
S16 TI residen* OR AB residen*
S17 hospitalization
S18 S14 OR S15 OR S16 OR S17
S19 S9 AND S13 AND S18 (limit from 2009)
S20 S9 AND S13 AND S18 (limit to English language)

(on the EBSCO platform)

S1 TI adolesc* OR AB adolesc*
S2 TI teen* OR AB Teen*
S3 TI youth* OR AB youth*
S4 (MM "Adolescence+")
S5 S1 or S2 or S3 or S4
S6 TI (mental N1 health) OR AB (mental N1 health)
S7 TI (mental N1 illness) OR AB (mental N1 illness)
S8 TI psychiatr* OR AB psychiatr*
S9 S6 OR S7 OR S8
S10 S5 AND S9
S11 TI admit* OR AB admit*
S12 TI admission* OR AB admission*
S13 TI discharge OR AB discharge
S14 S11 OR S12 OR S13
S15 TI inpatient OR AB inpatient
S16 TI in-patient OR AB in-patient
S17 TI residen* OR AB residen*
S18 (MM "Adolescent, Hospitalized") OR (MM "Adolescent Health Services")
S19 (MM "Hospitalization") OR (MM "Hospitals, Psychiatric") OR (MM "Inpatients")
S20 (MM "Community Mental Health Services+") OR (MM "Mental Health Services+")
S21 (MM "Residential Facilities+")
S22 S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21
S23 S10 AND S14 AND S22 (limit from 2009)
S24 S10 AND S14 AND S22 (limit to English)

Ovid MEDLINE(R) (on the OVID platform)

Searched 2nd Feb 2018

1. adolesc$.ti,ab.
2. teen$.ti,ab.
3. youth$.ti,ab. 23
4. exp ADOLESCENT/
5. 1 or 2 or 3 or 4
6. (mental adj1 health).ti,ab.
7. (mental adj1 illness).ti,ab.
8. psychiatr$.ti,ab.
9. exp *Mental Disorders/
10. exp Mental Health/
11. exp Adolescent Psychiatry/
12. exp *Child Psychiatry/
13. 6 or 7 or 8 or 9 or 10 or 11 or 12
14. 5 and 13
15. admit*.ti,ab.
16. admission.ti,ab.
17. discharge$.ti,ab.
18. exp *FACILITY DISCHARGE/ or exp *DISCHARGE PLANNING/ or exp *PSYCHIATRIC HOSPITAL DISCHARGE/ or exp *HOSPITAL DISCHARGE/
19. 15 or 16 or 17 or 18
20. inpatient.ti,ab.
21. in-patient.ti,ab.
22. residen$.ti,ab.
23. exp Mental Health Services/
24. exp Psychiatric Hospitals/
25. exp Community Mental Health Services/
26. exp HOSPITALIZATION/
27. exp Residential Facilities/
28. exp ADOLESCENT, HOSPITALIZED/ or exp ADOLESCENT HEALTH SERVICES/ or exp ADOLESCENT, INSTITUTIONALIZED/
29. 20 or 21 or 22 or 24 or 25 or 26 or 27 or 28
30. 14 or 19 or 29
31. limit 30 to (english language and yr="2009 - 2018")

Embase (on the OVID platform)

Searched 2nd Feb 2018

1. adolesc$.ti,ab.
2. teen$.ti,ab.
3. youth$.ti,ab.
4. exp ADOLESCENT/
5. 1 or 2 or 3 or 4
6. (mental adj1 health).ti,ab.
7. (mental adj1 illness).ti,ab.
8. psychiatr$.ti,ab.
9. exp *Mental Disorders/
10. exp Mental Health/
11. exp Adolescent Psychiatry/
12. exp *Child Psychiatry/
13. 6 or 7 or 8 or 9 or 10 or 11 or 12
14. 5 and 13
15. admit*.ti,ab.
16. admission.ti,ab.
17. discharge$.ti,ab.
18. exp *FACILITY DISCHARGE/ or exp *DISCHARGE PLANNING/ or exp *PSYCHIATRIC HOSPITAL DISCHARGE/ or exp *HOSPITAL DISCHARGE/
19. 15 or 16 or 17 or 18
20. inpatient.ti,ab.
21. in-patient.ti,ab.
22. residen$.ti,ab.
23. exp Mental Health Services/
24. exp Community Mental Health Services/
25. exp HOSPITALIZATION/
26. exp Residential Facilities/
27. exp ADOLESCENT, HOSPITALIZED/ or exp ADOLESCENT HEALTH SERVICES/ or exp ADOLESCENT, INSTITUTIONALIZED/
28. 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27
29. 14 and 19 and 28
30. limit 29 to (english language and yr="2009 -Current")

PsycINFO (on the OVID platform)

Searched 2nd Feb 2018

1. adolesc$.ti,ab.
2. teen$.ti,ab.
3. youth$.ti,ab.
4. 1 or 2 or 3
5. (mental adj1 health).ti,ab.
6. (mental adj1 illness).ti,ab.
7. psychiatr$.ti,ab.
8. exp Mental Disorders/
9. Mental Health/
10. exp Adolescent Psychiatry/
11. exp Child Psychiatry/
12. 5 or 6 or 7 or 8 or 9 or 10 or 11
13. 4 and 12
14. admit*.ti,ab.
15. admission.ti,ab.
16. discharge$.ti,ab.
17. exp HOSPITAL ADMISSION/ or exp FACILITY ADMISSION/ or exp PSYCHIATRIC HOSPITAL ADMISSION/
18. exp FACILITY DISCHARGE/ or exp DISCHARGE PLANNING/ or exp PSYCHIATRIC HOSPITAL DISCHARGE/ or exp HOSPITAL DISCHARGE/
19. 14 or 15 or 16 or 17 or 18
20. inpatient.ti,ab.
21. in-patient.ti,ab.
22. residen$.ti,ab.
23. exp Psychiatric Hospitalization/
24. exp Mental Health Services/
25. exp Residential Care Institutions/
26. exp Psychiatric Hospitals/
27. exp Community Mental Health Services/
28. exp Treatment Facilities/
29. exp Hospitalized Patients/
30. 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29
31. 13 and 29 and 30
32. limit 31 to (english language and yr="2009 -Current")

Appendix II: Studies excluded on screening

Ahmed et al 2015.[1] Discharges from an early intervention in psychosis service: Where do patients stand after 3 years.
Reason for exclusion: Wrong patient population

Allison et al 2012.[2] Toward brief "red flags" for autism screening: The short Autism Spectrum Quotient and the short Quantitative Checklist in 1,000 cases and 3,000 controls
Reason for exclusion: Wrong patient population

Aupont et al 2013.[3] A collaborative care model to improve access to pediatric mental health services
Reason for exclusion: Not about referral, admission or discharge

Beecham et al 2009.[4] Cost variation in child and adolescent psychiatric inpatient treatment
Reason for exclusion: Not about referral, admission or discharge

Benneyworth et al 2015.[5] Cross-sectional comparison of critically ill pediatric patients across hospitals with various levels of pediatric care
Reason for exclusion Wrong patient population

Biancosino et al 2009.[6] Factors related to admission of psychiatric patients to medical wards from the general hospital emergency department: a 3-year study of urgent psychiatric consultations
Reason for exclusion Wrong patient population

Bromley et al 2015[7]: "You might lose him through the cracks": clinicians' views on discharge from assertive community treatment
Reason for exclusion: Wrong patient population

Curtis et al 2009.[8] County variation in use of inpatient and ambulatory psychiatric care in New York State 1999-2001: need and supply influences in a structural model
Reason for exclusion: Wrong patient population

Dazzi et al 2015.[9] Predictors of inpatient psychiatric admission in patients presenting to the emergency department: the role of dimensional assessment
Reason for exclusion: Wrong patient population

Freestone et al 2012.[10] Assessments and admissions during the first 6 years of a UK medium secure DSPD service
Reason for exclusion: Wrong setting: forensic

Fuchs et al 2016.[11] Child and adolescent psychiatry patients coming of age: a retrospective longitudinal study of inpatient treatment in Tyrol
Reason for exclusion: Not about referral, admission or discharge

Haheim and Helgeland 2014.[12] Agreement between referral information and discharge diagnoses according to Norwegian elective treatment guidelines - a cross-sectional study
Reason for exclusion: Wrong patient population

Hepworth 2015.[13] Understanding the management of people seeking voluntary psychiatric hospitalization who do not meet the criteria for inpatient admission: a qualitative study of mental health liaison nurses working in accident and emergency departments in the north of England
Reason for exclusion: Wrong patient population

Hill et al 2016.[14] Characteristics of male patients admitted to an adolescent secure forensic psychiatric hospital
Reason for exclusion: Wrong setting: forensic

Hill et al 2016.[15] Characteristics of female patients admitted to an adolescent secure forensic psychiatric hospital
Reason for exclusion: Wrong setting: forensic

Jacob et al 2013.[16] Clinical characteristics of aggression in children and adolescents admitted to a tertiary care centre
Reason for exclusion: Not about referral, admission or discharge

Jefferies-Sewell et al 2015.[17] To admit or not to admit? The effect of framing on risk assessment decision making in psychiatrists
Reason for exclusion: Wrong patient population

Lamb and Lamb 2009.[18] Alternatives to admission for children and adolescents: providing intensive mental healthcare services at home and in communities: what works?
Reason for exclusion: Not about referral, admission or discharge

Lambe 2012.[19] Admission of adolescents to psychiatric units
Reason for exclusion: Comment on an article

Madan et al 2016.[20] Adolescents are less satisfied with inpatient psychiatric care than their parents: does it matter?
Reason for exclusion: Not about referral, admission or discharge

Manuel et al 2015.[21] Trends in hospital discharges and dispositions for episodes of co-occurring severe mental illness and substance use disorders
Reason for exclusion: Wrong patient population

McLeod and Simpson 2017.[22] Exploring the value of mental health nurses working in primary care in England: A qualitative study
Reason for exclusion: Wrong patient population

Mushtaq and Nabeel 2012.[23] A comprehensive and specialist CAMHS service model
Reason for exclusion: Comment on an article

Patterson et al 2016.[24] Situation awareness: when nurses decide to admit or not admit a person with mental illness as an involuntary patient
Reason for exclusion: Wrong patient population

Phillips et al 2012.[25] Risk assessment of self- and other-directed aggression in adolescent psychiatric inpatient units
Reason for exclusion: Not about referral, admission or discharge

Rippon 2010.[26] Inpatient services for children and young people with an intellectual disability
Reason for exclusion: Wrong patient population

Shepperd et al 2009.[27]Alternatives to inpatient mental health care for children and young people
Reason for exclusion: Not about referral, admission or discharge

Stewart et al 2012:[28] Care coordinators: A controlled evaluation of an inpatient mental health service innovation
Reason for exclusion: Wrong patient population

Ward and Gwinner 2014.[29] "It broke our hearts": understanding parents' lived experiences of their child's admission to an acute mental health care facility
Reason for exclusion: Not about reason for referral, admission or discharge

Zanus et al 2017.[30] Adolescent admissions to emergency departments for self-injurious thoughts and behaviors
Reason for exclusion: Wrong setting: admission to emergency departments

Tabone et al 2016.[31] Transitions of youth in mental health residential care to less restrictive settings: The role of strengths and gender

Reason for exclusion: Discharge was from mental health residential care to less restrictive settings such as foster care, specialised foster care, group homes and transitional living and independent living.

Remberk et al 2018.[32] Inpatient psychiatric treatment is not always effective in adolescent sample
Reason for exclusion: No data about reason for referral, admission or discharge

Van Kessel et al 2012.[33] Trends in child and adolescent discharges at a New Zealand psychiatric inpatient unit between 1998 and 2007
Reason for exclusion: No data about reason for referral, admission or discharge

Royal College of Psychiatrists 2015.[34] Survey of in-patient admissions for children and young people with mental health problems, Young people stuck in the gap between community and in-patient care.
Reason for exclusion: No data about reason for referral, admission or discharge

Firth 2017.[35] Inpatient provision for children and young people with mental health problems.
Reason for exclusion: No data about reason for referral, admission or discharge

Scottish Executive 2017.[36] Child and adolescent mental health services: inpatient report.
Reason for exclusion: No data about reason for referral, admission or discharge

North of Scotland Public Health Network 2010.[37] Tier 4 Adolescent mental health needs assessment for the North of Scotland.
Reason for exclusion: No data about reason for referral, admission or discharge

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<table>
<tr><td colspan="3">Appendix III: Characteristics of included research studies</td></tr>
<tr><td colspan="3">Bryson and Akin 2015.[23] USA: Retrospective cohort using case note reviews
To examine acute inpatient psychiatric admissions among child Medicaid recipients with a mental health diagnosis in one Midwestern state</td></tr>
<tr><td>Setting
Acute inpatient psychiatric care within one Midwestern state during 2009

Participants
178,558 child Medicaid recipients (3-17 years)
51,233 had a paid mental health claim within the study period.
1,293 were admitted one or more times</td><td>Gender
Females: 40.8%

Age (years)
3-5: (3.0%)
6-8: (13.7%)
9-1: (17.1%)
12-14: (29.4%)
15-17: (36.8%)

Length of stay
Typical <30 days</td><td>Clinical / diagnostic categories
Recorded on admission from inpatient and outpatient claims using ICD-10

Mood disorder (n=1,140)
Disruptive disorder (n=918)
Anxiety disorder (n=779)
PPD/ASD (n=116)
Psychotic disorder (n=160)
Other mental health disorder (n=1,024)</td></tr>
<tr><td colspan="3">Duddu et al. 2016.[30] UK: Retrospective cohort using case note reviews
To describe the approach used in one country to address the mental health needs of 16 to 17 year olds and a descriptive evaluation of its early experiences</td></tr>
<tr><td>Setting
All admissions to a 6 bed acute inpatient psychiatric unit (16-17 years) over a 2 year period from April 2010 to March 2012
This is a 24-hour service, with patients being assessed in various emergency situations including hospital A&Es, custody suites and patients' homes

Participants
n=97</td><td>Gender
Females: 54.6%

Age (years)
17: 59.8%

Length of stay
Average in first year 30 days (excluding one patient who had a 364-day admission, and 23.1 days in the second year)</td><td>Clinical / diagnostic categories
Recorded on admission using ICD-10

Adjustment disorder, anxiety disorders, PTSD, social phobia (32.6%)
Emerging personality traits or disorders (15.8%)
Schizophrenia, unspecified psychosis, delusional disorder, acute psychotic episode (14.7%)
Dysthymia, depressive episodes and manic episodes (14.7%)
Harmful use/dependence on alcohol or illicit substances, secondary psychiatric symptoms (14.7%)
Impulsive self -harm (2.1%
Incomplete assessments (4.2%)</td></tr>
</table>

		Outcome measures used on admission Severity of psychiatric disorders: CGI-S scale Outcome measures used on discharge Severity and improvement of psychiatric disorders: CGI-S scale
Golubchik et al. 2013.[34] Israel: Retrospective cohort case using note review To investigate the major clinical criteria affecting child psychiatrists' decision to recommend hospitalization		
Setting Psychiatric outpatient clinic for children and adolescents (7-13 years) treated between 2006–2008 Participants n=80 The patients were divided into three groups: Group A: (n=20 who were hospitalized) Group B: (n= 20 who were candidates for psychiatric hospitalization, but ultimately, were not hospitalized) Group C: (n=40 who were admitted to the outpatient clinic and were never considered for hospitalization)	Gender Not specified Age (Mean±SD) years Group A: 11.1±1.1 Group B: 10.1±1.7 Group C: 10±1.4 Length of stay Not reported	Clinical / diagnostic categories Recorded on admission using DSM IV Psychotic disorders Affective disorders Anxiety disorders Violent behaviours Outcome measures used on admission Severity of psychiatric disorders: CGI-S scale
Hanssen-Bauer et al. 2011[21] Norway: Prospective cohort (Pre-post design) To investigate the patients at four acute in-patient psychiatric units for adolescents in terms of: 1) the characteristics of the patients at admission, 2) their outcomes at discharge and 3) the predictors of outcome		
Setting Four acute inpatient psychiatric services for adolescents (13-17 to years) with a total of 31 beds	Gender Females: 70% Age (Mean±SD) years	Clinical / diagnostic categories Recorded on admission using ICD-10 and DSM-IV Axis one diagnosis

Pre-post data from the first episode of care, which started in 2005 for all patients Participants n=192	15.7±1.4, range 10-18 years) Length of stay Median 8.5 days (range 1-351 days), Psychosis had highest median 37 days No diagnosis had the lowest median 3 days	No axis one disorder (16%) Affective disorder (28%) Externalizing disorder (26%) Neurotic disorder (18%) Psychotic disorder (11%) Eating disorder (2%) Outcome measures used on admission Mental health problems and their severity: HoNOSCA
House et al. 2012.[32] UK: Retrospective cohort using case note reviews To explore the role of specialist outpatient eating disorders services and investigate how direct access to these affects rates of referral, admissions for inpatient treatment, and continuity of care		
Setting Services (n=37/42) that provided treatment for adolescents with eating disorders in London (13-17 years) which included outpatient services specialising in eating disorders (n=12), specialist CAMHs (n=5) and non-specialist CAMHS (n=10), those seen between Dec 2006 and Nov 2008 Participants n=98	Gender Females: 96.8% Age (Mean) years 15.1 Length of stay Not reported	Clinical / diagnostic categories At initial contact or re-contact Anorexia Nervosa/EDNOS-AN (100%)
Sheridan et al. 2017.[24] USA: Retrospective cohort using case note reviews To compare PED mental health care between a pediatric tertiary care center with PAPED and NOPED with the hypothesis that children have longer LOS at the PED without an inpatient unit		
Setting Two pediatric emergency departments. One is a psychiatric affiliated pediatric emergency department and the other has no psychiatric affiliated pediatric emergency department.	Gender NOPED: Female: 48% PAPED: Females: 51% Age (Mean) years	Clinical / diagnostic categories From discharge summary using ICD-9 NOPED Mood disorders (30%)

Admissions between March 2012 and June 2013 patients <19 years Participants NOPED: n=271 PAPED: n=1138	NOPED 14 PAPED: 14 Length of stay NOPED: 5.6 hours PAPED: 6.3 hours	Substance-related disorders (18%) Anxiety disorders (15%) PAPED Mood disorders (40%) Personality disorders (20%) Anxiety disorders (9%)
Zilikis et al. 2011.[37] Greece: Retrospective cohort using case note review A report of an experience from Northern Greece of 253 admissions in a general psychiatric ward at a university general hospital gives		
Setting Psychiatric Department of the Medical Faculty of the Aristotle University of Thessaloniki Of the total 25 beds, 5 (in two rooms, for boys and girls) were reserved to adolescent patients Admissions over a period of eight years Participants n= 253 65.61% were first admissions and 34.39% readmissions	Gender Females: 44.7% Age (years) 13: 3% 14: 4.8% 15: 8.4% 16: 19.3% 17: 21.1% 18: 22.3% 19+: 21.1% Length of stay Mean 27.91 days <30 days: 68.1% 31-60 days 23.5% 61-90 6.0% >91 days 2.4%	Clinical / diagnostic categories On admission Psychotic disorders (42.8%) Personality disorders (14.5%) Attempted suicide (9.6%) Drug related disorders (9.6%) Affective disorders (9.0%) Neurotic disorders (8.4%) Conduct disorders (5.4%) Eating disorders (4.5%) Mental deficiency (3.0%) Reactive (adjustment) disorders PTSD (2.4%) Organic (neurological) disorders (2.4%) Sexual abuse (1.2%) Psychosomatic disorders (1.2%) Other (7.2%)
Stanton et al. 2017.[8] New Zealand: Qualitative study using interviews To more formally assess community clinicians experiences, perspectives, and needs of engaging with an acute child and adolescent mental health inpatient unit		
Setting Mental health services	Not relevant	Clinical / diagnostic categories On admission

Participants Community clinicians (n=48) Of the 48 participants, nine were from services in the metropolitan area and 39 from smaller centers. Six were psychiatrists or other doctors. Others included nurses, psychologists, occupational therapists, social workers, and cultural workers		There are more than 20 referring teams with more than 350 admission annually, mostly adolescents with parasuicidal behaviour or psychosis. Conduct disorder, substance abuse, and sequelae of trauma are common comorbidities
Scharko 2010.[25] USA: Retrospective cohort using case note reviews To characterize patients admitted to a mental health Adolescent Male Treatment Unit over an 18-month interval		
Setting Consecutive admissions to adolescent Male Treatment Unit from July 2008 to January 2010 Participants n=238	Gender Male: 100% Age (Mean) years 15 (Range: 9 to 17) Length of stay < 5 days (44%) > 5 to < 14 days (22%) > 14 to < 30 days (13%) > 30 days 43 (21%)	Clinical / diagnostic categories Most frequent psychiatric diagnoses on admission using DSM IV Mood disorder -NOS (24%) Disruptive behavior disorder – NOS (22%) Attention deficit/hyperactivity disorder - combined type (17%) Parent/child relational problem (5%) Adjustment disorder with mixed disturbance of emotions and conduct (3%) Cannabis abuse (13%) Attention deficit/hyperactivity disorder – NOS (13%) Autistic disorder (4%) Bipolar disorder – NOS (4%) Reactive attachment disorder (4%)
Patil 2013.[31] UK: Retrospective cohort using case note reviews To examine the characteristics, presentation and outcomes in adolescents brought to a place of safety under s.136 of the Mental Health Act 1983		
Setting All adolescents, under the age of 18 across a 3 year period admitted under s.136 of the Mental Health Act 1983 between 1 January 2007 and 31 December 2010 (3 years) to London Mental Health NHS Trust	Gender Female: 67.6% Age (Mean) years 15.9 (Range: 13 to 17)	Clinical / diagnostic categories Most common past diagnosis before admission No diagnosis (17.6%) Depressive disorder (17.6%) Conduct Disorder (14.7%)

Participants n=34/40	Length of stay Not reported	
Persi 2016.[35] Canada: Retrospective cohort using case note reviews To compare voluntary and involuntary groups of patients and provides the first detailed description of involuntary admissions to a Canadian child and adolescent inpatient psychiatry setting		
Setting All inpatient discharges between April 2007 and March 2008 across 26 acute care hospitals. Excluded elective admissions Participants n=225	Gender Involuntary admission: Female: 59% Voluntary admission: Female: 64% Age (years) Involuntary admission Child 5-12: 13% Adolescent 13- 17: 87% Voluntary admission: Child 5-12: 27% Adolescent 13- 17: 73% Length of stay Median was 6 days with a range from 1 to 147 days. The distribution was skewed because most patients were discharged within days, but several stayed over 2 months	Clinical / diagnostic categories From discharge summary (% not reported) Psychosis Bipolar Depression Anxiety Substance Abuse Adjustment Behavior No diagnosable disorder Outcome measures used on admission Total problems at admission: CBCL Global functioning: CGAS Suicide risk: Suicide Risk Self-report
Wilson et al. 2012.[36] Ireland: Retrospective cohort using case note reviews To describe referral and admission patterns to an adolescent inpatient unit in Ireland		
Setting	Gender	Clinical / diagnostic categories

All referrals to St. Joseph's Adolescent Inpatient Unit (6 bed unit) Dublin for the first 6 months of opening Participants Adolescents 41 referrals 21 assessed 19 (46 %) admitted	Female: 63% Age (Mean) years 16.2±1.0 Length of stay Not reported	On referral using DSM-IV Depression (42%) Anorexia (11%) Psychosis (21%) Anxiety disorders (5%) Bipolar disorder (5%) Obsessive compulsive disorder (5%) Conduct disorder (0%) No clear diagnosis (11%)
Fenning et al. 2017.[22] Israel: Prospective cohort study To examine changes in core perceptions and thoughts during the weight restoration phase of inpatient treatment for adolescents with anorexia nervosa		
Setting Adolescents with anorexia nervosa consecutively admitted to an inpatient paediatric-psychiatric unit specializing in eating disorders from 2009 to 2012. Admit patients from the age of 6 to 18 years (mostly adolescents) Participants n=44	Gender Female: 93% Age (mean±SD) years Mean 14.80 ±1.73 Range 11.8 to 18.8 Length of stay Not reported	Clinical / diagnostic categories Pre admission on clinical interviews, patient observation, parental information and medical evaluations using DSM-IV Eating disorders (100%) Outcome measures used on admission Specific to study evaluation
Guvenir 2009.[38] Turkey: Retrospective cohort using case note reviews To examine the treatment outcome of our newly opened CAMHS inpatient unit in terms of patients functioning levels via key variables which were measured at two time periods, namely (i) at admission to the unit and (ii) at discharge		
Setting Consecutive admissions of adolescents over a 16 month period to a 10 bedded inpatient unit adolescents with severe behavioural and emotional disturbance	Gender Female: 67.8% Age (years) 15.3 (range 10-18)	Clinical / diagnostic categories Timepoint of diagnosis made not specified but categorized using DSM IV Affective disorders (37.7%) Psychotic disorders (24.3%)

Participants n=97	Length of stay 77.3 days (range 14-136)	Physical & sexual abuse (11.0%) Anxiety disorders (11.0%) Disruptive behaviour disorders (6.6%) Dissociative disorders (5.5%) Anorexia nervosa (4.4%) Tourettes (2.2%) Trichotillomania (2.2%) Gender identity disorder (1.1%) Parent child relational disorder (62.2%)
Gallagher et al. 2011.[26] USA: Retrospective cohort using case note reviews To describe (1) trends in boarding volume over 3 years, (2) demographic and psychiatric and psychosocial characteristics of PBs seen over a 1-year period with particularly high PB volume, and (3) interventions provided by the PCS and outcomes of boarding		
Setting Inpatient pediatric units at one hospital Participants Psychiatric boarders (n=437) between January and December 2013	Gender Female (64.1%) Age (mean±SD) years 15.16±6 2.80- Length of stay 3.11±3.34 days. Most psychiatric boarders (82.6%) boarded after medical clearance for 5 days or less, psychiatric placement was secured within 24 hours for 82 patients (18.8%), and a small proportion of patients boarded longer than 5 days	Clinical / diagnostic categories Recorded on admission using ICD-9 Depressive disorders (56.5%) Anxiety disorders (33.6%) Disruptive behavior disorders (24%) Bipolar disorders (18.1%) Eating disorders (16%) Pervasive developmental disorders (10.1%) Post-traumatic disorders (9.8%) Somatoform disorders (9.8%) Substance use disorders (9.2%) Psychotic disorders and delirium (6.2%) Adjustment disorders (2.3%) Outcome measures used on admission CGAS CGI

<table>
<tr><td colspan="3">Wharff et al. 2011.[27] USA: Retrospective cohort using case note reviews
To describe the extent of the boarder problem in a large, urban pediatric ED, compares characteristics of psychiatrically hospitalized patients with boarders, and compares predictors of boarding in 2 ED patient cohorts</td></tr>
<tr><td>Setting
Psychiatric boarders between July 2007 and June 2008 at an ED of a large urban pediatric teaching hospital

Participants
n= 157</td><td>Gender
Female: 56.7%

Age (years)
<10 Years: 14%
10-13: 4.8%
13-18: 68.2%

Length of stay
Mean 22.7 +8.08 hours
Median 21.18 hours</td><td>Clinical / diagnostic categories
Recorded on admission using DSM-IV Axis one

Depression (32.5%)
Other depressive disorders (17.2%)
Psychosis (11.5%)
Biploar (8.3%)
Trauma (6.4%)
Eating disorder (5.1%)
Behavioural disorder (4.5%)
Adjustment disorder (3.8%)
Substance abuse (1.3%)
Other (2.5%)</td></tr>
<tr><td colspan="3">Claudius et al. 2014.[28] USA: Retrospective cohort using case note reviews
To evaluate the rate of admission of psychiatric patients to a medical unit, psychiatric care provided, and estimated cost of care</td></tr>
<tr><td>Setting
Medical Center is a urban county hospital with a dedicated pediatric ED. Patients (n=1108) on involuntary psychiatric holds presenting to 1 pediatric ED from July 2009 to December 2010

Participants
Admitted for boarding (n=523)
Transferred from ED to an inpatient psychiatric facility (n=553)</td><td>Gender
Boarding
Females: 46.2%
Transfer
Females: 50.5%

Age (Mean±SD) years
Boarding: 14.1+3.0
Transfer: 15.6+2.5

Length of stay
Median (range) days
Boarding 2.0 (1-30)
Transfer: N/A</td><td>Clinical / diagnostic categories
Not reported</td></tr>
</table>

Williams et al. 2018.[29] USA: Retrospective cohort using case note reviews To characterize pediatric mental health–related ED presentations in a large urban center and identify factors predictive of inpatient hospitalization		
Settings All pediatric patients (5-18 years) from the managed care plan network who presented in mental health crisis to 1 of 9 regional EDs. January 2012 to April 2014 Participants n=225	Gender Female: 54% Age (Mean±SD) years 14.1+SD, 2.7 Length of stay Not reported	Clinical / diagnostic categories Reported on admission using child behavioral/emotional symptoms Impulsivity (45.2%) Depression (42.9%) Problems with anger control (40.9%) Oppositional (31.1%) Anxiety (29.4%) Conduct problems (28.6%) Difficulties adjusting to trauma (22.7%) Psychotic symptoms (19.1%) Substance use (14.7%)
Park et al. 2011.[33] New Zealand: Retrospective cohort using case note reviews To investigate patterns of child and adolescent admissions to an acute adult psychiatric unit in a rural city. Correlates of admissions were then considered in terms of service reform for this vulnerable, under-resourced group		
Setting Consecutive admissions to the regional acute adult psychiatric unit, approximately 130 km from a specialized child and adolescent inpatient unit from January 2002 to December 2007 Participants n=332	Gender Female: 51% Age (Mean±SD) years 16.5±1.1 Length of stay Average 7.18 days, (SD 12.6). However, over half of admitted patients (186/332) were discharged within three days	Clinical / diagnostic categories Recorded on admission using DSM-IV Axis one Comorbid Axis one diagnosis (11.4%) Any mood disorder (38.2%) Any anxiety disorder (9.6%) Any psychotic disorder (25.7%) Any disruptive behaviour disorder (6.8%) Adjustment disorder (6.8%) Substance abuse (7.1%) Other (3.7%)

	The durations of admission of two patients were considered statistical outliers (lengths of stay 157 and 247 days); in both cases, admission duration was due to difficulty finding post-hospital accommodation) were excluded from the analysis	

Key:

A&E: accident and emergency; AN: anorexia nervosa; CAMHs: child and adolescent mental health service; CBCL: Child Behavior Checklist; CGAS: Children's Global Assessment Scale; CGI: Clinical Global Impressions scale; CGIS: Clinical Global Impression Scale; CGI-S: clinical global impression-severity; CMHTs: community mental health teams; CPA: care programme approach; CRHT: crisis resolution and home treatment; DSM IV: Diagnostic and Statistical Manual of Mental Disorders, 4th edition; ED: Emergency department; EDNOS: eating disorder not otherwise specified; EDNOS-AN: eating disorders not otherwise specified; EITs: early intervention teams; GAF: Global Assessment of Function; HoNOSCA: Nation Outcome Scales for Children and Adolescents; IC10-9: International Classification of Diseases 9; ICD-10: International Classification of Diseases 10; LOS: lengths of stay; NOPED: no psychiatric affiliated pediatric emergency department; NOS: not otherwise specified; PAPED: psychiatric affiliated pediatric emergency department; PBs: Psychiatric boarders; PCS: psychiatry consultation service; PCT: primary care trust; PDD/ASD: pervasive developmental disorders/autistic spectrum disorders; PED: pediatric emergency department; PICU: psychiatric intensive care unit; PTSD: post traumatic stress disorder

Table 1: Characteristics of included textual and opinion publications

Author/s,	Type of publication Title of publication	Country of publication
Rogers and Al-Mateen 2016[43]	Book chapter Inpatient psychiatric hospitalization	USA
Cotgrove 2014[51]	Book chapter Inpatient services	UK
Gosselin and DeMaso 2009[42]	Book chapter The adolescent unit	USA
Hayes et al 2018[41]	Systematic review Evaluating effectiveness in adolescent mental health inpatient units: A systematic review	Australia
Murcott 2016[48]	Scoping review A scoping review of care received by young people aged 16-25 when admitted to adult mental health hospital wards	UK
NSW Ministry of Health 2017[44]	Rapid review Evidence check. Inpatient care for children and adolescents with mental disorders	New Zealand
Welsh Health Specialised Services Committee 2014[47]	Policy Tier 4 Specialised service policy: CP19 Specialised services policy for Tier 4 child and adolescent mental health services	Wales, UK
Care Quality Commission 2017[50]	Report Review of children and young people's mental health services	UK
Health Services Executive 2015a[39]	Service specifications A national model of care for paediatric healthcare services in Ireland. Chapter 13 CAMHs	Ireland
Health Service Executive 2015b[40]	Service specifications Child and adolescent mental health services: standard operating procedures	Ireland
NHS England 2013[52]	Service specifications NHS standard contract for tier 4 child and adolescent mental health services (CAMHS): children's services	England, UK
Thompson and Clark 2016[11]	Standards Service Standards. Eighth Edition	UK
NHS England 2014[53]	Report Child and adolescent mental health services (CAMHS) tier 4 report	UK
NHS England 2015[46]	Guidance Specialised mental health services operating handbook protocol	England, UK

O'Herlihy et al. 2009	Report The care paths of young people referred but not admitted to inpatient child and adolescent mental health services	UK
NHS England 2018[49]	Service Specifications Child and adolescent mental health services tier 4 (CAMHS t4): general adolescent services including specialist eating disorder services	England, UK

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Table 2: Settings where research was conducted

Emergency Departments	
Williams et al. 2018.[29]	One of nine regional EDs in a large urban center, USA.
Sheridan et al. 2017.[24]	Comparison between two pediatric emergency departments one psychiatric affiliated and the other with no psychiatric affiliation, USA
Claudius et al. 2014.[28]	Pediatric ED in an urban county hospital
Wharff et al. 2011.[27]	Large urban pediatric ED, USA.
Adult acute psychiatric unit	
Park et al. 2011.[33]	Acute adult psychiatric unit in a rural city, New Zealand.
Bryson and Akin 2015.[23]	State wide acute inpatient psychiatric care for those with Medicaid insurance
Patil 2013.[31]	Compulsory admissions within one mental health NHS Trust, London, UK
Specialist eating disorder units	
Fenning et al. 2017.[22]	Inpatient pediatric-psychiatric unit specializing in eating disorders, Israel.
House et al. 2012.[32]	Services that provided treatment for adolescent with eating disorders in London, UK
Adolescent unit with a general psychiatric ward	
Zilikis et al. 2011.[37]	5 beds across two rooms for adolescents within a general psychiatric ward at a University general hospital, Greece
CAMHs / Age specific mental health units	
Scharko 2010.[25]	Adolescent male treatment Unit USA.
Hanssen-Bauer et al. 2011.[21]	Four acute in-patient psychiatric units for adolescents, Norway.
Persi 2016.[35]	Child and adolescent inpatient psychiatry setting across 26 acute care hospitals, Canada.
Wilson et al. 2012.[36]	St. Joseph's Adolescent Inpatient unit (6 bed unit), Dublin, Ireland
Duddu et al. 2016.[30]	6 bed acute inpatient psychiatric unit, UK
Guvenir 2009.[38]	Newly opened CAMHS inpatient unit, Turkey
Inpatient pediatric units	
Gallagher et al. 2011.[26]	Inpatient pediatric units at one hospital, USA
Services making referrals into CAMHs units	
Stanton et al. 2017.[8]	Community mental health service teams referring into CAMHs units, New Zealand
Golubchik et al. 2013.[34]	Psychiatric outpatient clinic for children and adolescents, Israel

Table 3: Sources of referral

Source of referral	Percentage referred
Hospital emergency departments	16.3%,[33] 32.5%[37]
Outpatient mental health services	38%,[26] 15%,[37] 9%,[36] ns[22]
Police	28.9%,[33] 5.5%[37]
Family member	48%,[26] 31%[33]
Social services Social services/ schools	ns[36] 5%[37]
Consultation-liaison	8%[37]
Psychiatric services	21%[37]
Private psychiatric	9.5%[37]
Non psychiatric services	2.0%[37]
CAMHs service	47%[36]
Adult mental health	32%[36]
Other hospital inpatient facilities such as adult, pediatric, psychiatric or medical wards	ns,[22] 21%,[36] ns,[27] ns[26]
Family physicians	ns[22]
Community psychiatrists	ns[22]