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Redesigning Paediatric Emergency Care for Mental Health: A realist, mixed-methods evaluation of a new model of integrated care (Best For You)

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Abstract

Background

Adolescent mental disorders, and related emergency care utilisation, worsened alarmingly during the pandemic and have remained high. Emergency departments experienced an increased demand, calling for improved facilities and workforce training. This is supported by national and local policy guidance to deliver integrated physical-mental care, integrated acute-preventive care, early assessment and triage, and workforce capacity and competency. Evaluating local initiatives must account for contextual, organisational, and procedural factors for design and delivery, to assess generalisability.

Methods

This study documented the implementation of an innovation (Best For You) in Northwest London to redesign paediatric emergency services – assessment, triage, treatment, facilities, and integrated care-planning. A formative, realist evaluation used the consolidated framework for implementation research (CFIR). The underlying programme theory was detailed, alongside the processes, facilitators and barriers of its planning and implementation. A mixed-methods synthesis of thirteen interviews with programme implementers and stakeholders, 49 observations of planning meetings, a population needs assessment using hospital episodes, plus quality improvement techniques (process mapping and programme theory), detailed the innovation, context, and implementation.

Results

Key innovation drivers were dissatisfaction with inappropriate facilities for managing behavioural risk in emergency care, a rise in service demand which was reflected in hospital statistics, and policy targets to improve care discrepancies for adolescent mental health emergencies. Key drivers formed a coherent vision between policy, providers, and patients to reduce emergency care use. Covid-19 caused implementation delays due to staff shortages and competing priorities. Unavailability of physical infrastructure for a new integrated care service and disagreements on financing staffing models caused further delays. However, high motivation, persistence and capability among the implementers and deliverers achieved implementation, which involved substantially adapting the initial innovation design.

Conclusions

Achieving improved mental health competency in acute care facilities and staffing required extensive planning, and availability of resources including physical space, clinical leadership and innovation, and capital costs and staffing. Real-time adaptations to the innovation contextualised implementation factors important for scalability. These findings are useful for policymakers, healthcare strategists, and clinical practice leaders, to identify innovations to meet local health policy targets.

Contributions to the Literature

- There is limited evidence for achieving integrated mental healthcare within emergency services to promote recovery of this increasing cohort of young people.
- Our novel evaluation reports initiation through to implementation of a new model of care (Best For You). We found that service innovation decisions were initiated jointly by lived experience service users, concerned staff, policy guidelines, and hospital statistics, which were powerful when in coherence. Innovation development and implementation required multidisciplinary expertise and commitment.
- The findings contribute an implementation plan, including barriers and facilitators, for other acute hospitals and policy organisations that are designing integrated mental healthcare innovations.

Background

Adolescence is a defining life stage, when identity, and relationships with the self and others are evolving. Half of all mental disorders onset by 14 years of age, and 75% by age 24 (1), highlighting the importance of early psychological intervention for this high-risk group. Adolescence is bio-psycho-socially turbulent, particularly in conjunction with a mental disorder, and even more so during unprecedented

scenarios such as the Covid-19 pandemic (2). The prevalence of probable mental disorders in England increased to 1 in 5, from 1 in 9, among those aged 8–25 years, since before the pandemic (3). Even preceding the pandemic, mental illness in young people had steadily risen, as had the number of adolescents attending emergency departments and hospitalisations to acute paediatric settings with life-threatening symptoms caused by mental illness (4). Emergencies due to self-harm, suicide attempts, drug or alcohol intoxication and eating disorders increased in the UK by 65% between 2012 and 2022. These incidents doubled for females aged 11-15-years during this decade, while emergency admissions for eating disorders increased fivefold.

Depleted social support due to the social restrictions used to curtail Covid-19 was only one of the many contributing factors to worsening adolescent mental health. Children and young people's (CYP) mental health services (CYPMHS) in the NHS suffered from chronic underfunding (5) and workforce deficits (6) predating the pandemic. Inadequate capacity and lengthy waiting times resulted in limited access to early intervention. Acute care clinicians reported the inadequacy of facilities in paediatric emergency departments (PEDs) and acute wards(7). Practitioners called for mental health competent facilities, and training on holistic care-planning and compassionate care for adolescents with complex behavioural needs.

To address these systemic problems, the UK's national Five Year Forward View (5) outlined plans for mental healthcare between 2016–2021, with the following key principles: integrated health and social care, shift services towards prevention, improve access and quality of care, and reduce stigma. Strategies included building parity of esteem between mental and physical healthcare, and workforce recruitment. Health Education England reported c.20,000 absent vacancies in specialist mental health services in England in 2017, especially nurses, occupational therapists, psychiatrists and peer support workers (6). The subsequent 2019 NHS long-term plan called for improved support for young people during a mental health crisis, 24-hours-a-day, 7-days-a-week, in specialist care, PEDs, and crisis community teams, to reduce avoidable delays in assessment, referral, and treatment, by 2029 (8).

Against this policy backdrop, national strategy was devolved to UK localities, via The Mental Health Implementation Plan (9). Many local initiatives began improving emergency services for adolescents experiencing mental distress. Examples include assessment and triage initiatives to prioritise admissions for high-acuity cases, improving comprehensive psychosocial assessment for holistic care-planning, embedding brief psychological intervention into acute care to address underlying health problems, establishing integrated pathways to specialist psychological care, and digital innovation for smoother care coordination and supplementary care (10). Evidence on such innovations is promising, albeit limited, demonstrating that comprehensive assessment, multidisciplinary triage, digital consultations, and brief psychological intervention in PEDs reduced emergency admissions; whilst integrated pathways to outpatient psychological interventions reduced readmissions. This relatively new yet expanding evidence base indicates that strengthening connections between acute, digital, outpatient and community care improves integrated care planning, cross-disciplinary communication, and triage prioritisation (7, 10).

New models of integrated mental-physical emergency care are gaining traction, as service providers adhere to policy targets. Implementing new services requires an ongoing cycle of evidence-driven reflection to understand what works (11, 12). Feedback loops using data such as patient outcomes and staff input help to identify when adjustments may be needed (13). Adaptation also provides an opportunity for co-design with local teams, increasing staff commitment during intervention spread. A lack of fit or tailoring to local contexts can impede innovation acceptability and sustainability. Scaling-up and sustaining innovations involves responding to funding and staffing infrastructures. Therefore, adaptation is necessary given resource availability, priority shifts, or emerging evidence (14–16). However, local adaptation of national policy can result in variability between localities and adaptations are often made without full assessment, making it difficult to determine if or how changes improve or hinder anticipated outcomes (17). Implementation science assesses the contextual, organisational, and preferential influences on innovation design, delivery and impact, evidencing scalability (18).

This study contributes to the growing evidence on implementing localised interventions addressing the national target of improving care coordination and facilities for young people attending PEDs with mental health problems. It reports on a new model of care in Northwest London, known as 'Best For You', which aims to improve assessment and triage procedures, creating new and improved facilities and mental health competency, and establish integrated pathways. Best For You has four components, i) redesigning the paediatric emergency services (the focus of this report), ii) a specialist day programme for high-acuity patients, iii) digital resources for navigating access to local services and self-management tools, and iv) community partnerships with alternative services. The aim of this paper was to explore the planning and implementation (including the main facilitators and barriers) of this innovation to improve the quality of paediatric emergency care for mental health crises in Northwest London, to provide implementation learning for future sites. Capturing and applying lessons from previous implementation experiences is critical to overcoming challenges, with the use of implementation learning being a key facilitator for sustaining and spreading healthcare innovations (19–21). Therefore, these factors

are increasingly relevant to other acute hospital sites interested in adopting similar improvement strategies. This evaluation investigated relationships between the innovation, organisational and contextual setting, population needs, and national policies, as well as the perspectives, capabilities and motivation of internal and external stakeholders.

Methods

Design

A process and implementation evaluation assessed the redesign of paediatric emergency hospital services, within the 'Best For You' model of care (phase 1 and 2 in our evaluation protocol (22)). This utilised a formative, mixed-methods, realist approach, using the consolidated framework for implementation research (CFIR) as an analytic framework (18), to outline the underlying programme theory and the process, facilitators and barriers of its planning and implementation.

Intervention and setting

The intervention was designed to improve care for adolescents aged 8–18 years experiencing emergencies related to mental distress and disorders. The intervention was located at a large, urban, acute care hospital in Northwest London, UK. The intervention and setting are detailed in our published evaluation protocol(22) and are outlined in the programme theory. The 'Best For You' model comprised integration of emergency care from the emergency department or other emergency care services, through hospital, outpatient experience and use of digital services. This study evaluates the reconfiguration of the paediatric emergency services and care coordination, which focussed on improving assessment, early response and triage, and integration with acute physical healthcare.

Data collection and recruitment

Data collection included observations of, interviews with, and description of the stakeholders involved, as well as obtaining documents from planning meetings between April 2020 to November 2024. Quality improvement techniques were used, involving process mapping, programme theory and population need assessment.

OBSERVATIONS OF PLANNING-GROUP MEETINGS: The formative evaluation team (MO, SB, SH) attended monthly planning meetings held by implementers (N = 49 meetings). Observations were recorded under CFIR domains. We applied inter-rater reliability for the first six months to establish reliable reporting standards of observations, with 90% agreement.

STAKEHOLDER INTERVIEWS: Purposive sampling was used to invite all stakeholders involved in the model planning and implementation for interview via email, along with study information and right to withdrawal. All participants completed an online consent form. The sampling matrix comprised, i) the internal clinical or implementation stakeholders, and external stakeholders, and ii) clinical leads, implementation leads, and healthcare staff. Interviews with five participants within each of the six matrices were sought, both before and after implementation. Thirteen interviews were conducted online over Teams, using video and transcript recording.

PROCESS MAPPING: On three occasions between March and July 2021, formative evaluators (SB and MO) held discussions with innovation implementers to elicit a shared understanding of the patient pathway, before any service changes were implemented, and to ascertain points along the pathway that needed to be improved.

PROGRAMME THEORY: The programme theory for the overall intervention, and one for each of the components were developed and adapted, via discussions with the implementers, facilitated by formative evaluators (SB/MO/SH). The theory was adapted iteratively between January 2020 and March 2023 via meetings held on ZOOM. Coproduced figures display the overall vision for service improvement and connections between the overall aim, interventions, causal mechanisms, and measures of success (see Figs. 1–2).

POPULATION NEEDS ASSESSMENT: Conducted using Hospital Episodes Statistics (HES) to explore paediatric emergencies related to mental illness, comprising 1) suicide attempt or intentional self-harm, 2) overdose from drugs and alcohol, 3) complications related to eating disorders, 4) unexplained medical symptoms, and 5) other psychiatric episode (including mood, anxiety, psychotic, psychosomatic, and conduct disorders). Diagnosis cohorts were identified using ICD-10 and Healthcare Resource Group (HRG) codes. Developmental disorders were distinguished from mental disorders. Unexplained medical symptoms were identified as 'nothing abnormal found' after investigation, which was routinely used clinically either if the underlying cause was unknown, or if no relevant code was available. Another subset not receiving any treatment or investigation after the initial consultation was identified as 'no

treatment provided'. Intentional self-harm was identified using variable 'A&E patient group'. A comorbid chronic illness identified a clinical diagnosis of a chronic disease, (e.g. asthma, cancer, cerebral palsy, Charcot Marie tooth disease, diabetes, epilepsy, encephalitis, heart failure, hypertension, hypothyroidism, nondiabetic hyperglycaemia, obesity, osteoporosis, palliative care, primary idiopathic dystonia, multiple sclerosis, muscular dystrophy, myasthenia gravis, or spina bifida and hydrocephalus).

DOCUMENTS were sourced from planning meeting email attachments, including presentation slides, summary documents and reports, and business cases.

Variables

Factors of process and implementation of programme design and delivery were extracted for all data sources, using the five CFIR domains:

1. Innovation: *innovation source, evidence, complexity and advantage.*
2. Outer setting: *external situation, perceptions, policies, and resources.*
3. Inner setting: *internal physical, technical and relational infrastructure; attitudes, culture, tension for change, and resources.*
4. Individuals: *roles and responsibilities, capability, motivation and behaviours, and population need.*
5. Processes of implementation: *teaming, designing, stakeholder engagement, and timeline.*

A table of sub-domains within each CFIR domain is presented in Table 1 (see supplementary table 1 for interview topic guide).

Analysis

Formative evaluators observed, recorded and interpreted factors and processes of implementation in real time, and longitudinally. This enabled a realist approach to monitor development of the model against the initial programme theory, identify factors of implementation, and cross-validating documentary evidence.

Interviews and planning-group observations were analysed in NVivo (Lumivero, version 14), using template analysis to identify CFIR factors for implementation. Interview and observation transcripts were analysed separately using Initial line-by-line coding of CFIR domains. Second, charting the coded text generated tabulated data under each domain. Last, mapping and interpretation identified a synthesis between participants, within domains, between domains, and between interviews and observations data, using a critical realist ontology to describe contextual influences, organisational mechanisms, and processes.

Hospital episodes data were analysed to count the incidence of emergency care visits, hospitalisations, and bed days, using all care spells between April 2015 and March 2023. Duplicate entries within one hospital care spell were omitted. Discrepancies in quality of care between mental and physical health emergencies in the financial year 2022/23 were compared using logistic regressions. Data were analysed in Stata 15, within a secure data server.

A mixed methods synthesis cross-validated all data sources, including the process map, programme theories, hospital data, interviews and observations, within the CFIR domains. The process map and programme theories contributed to the innovation domain; hospital data contributed to the outer setting assessing the population need; and both interviews and observations contributed to all domains. Results are presented under CFIR domains. We ensured research integrity by inviting implementers to approve findings, without removing detail.

Patient and public involvement

We employed two public partners as coinvestigators, MK and JS, who contributed to the development of research methods and materials, conducting and analysing interviews and planning group observations, overall interpretation, and review of the final manuscript. Their involvement enhanced the quality and depth of data, criticality of analysis, and clinical relevance of interpretation, by utilising collaborative reasoning.

Results

The enablers and mitigation of barriers occurring in the planning and early implementation phase of Best For You's reconfiguration of the paediatric emergency services are described (see also Table 1). Quotes from interviews with model implementers and clinical leads, plus 49 hours of observations from planning-meetings are presented in Table 2. Key quotes are used to substantiate findings in the narrative results. Diagrams produced from four focus groups detailing process mapping and iteratively adapting the programme theory are provided in Figs. 1 and 2 respectively.

The main facilitators for planning and implementation were i) innovation leadership from an NHS-affiliated healthcare innovation charity (CW+, named 'The Charity' hereon), plus, clinical leadership from multiagency and multidisciplinary staff coordinated through regular planning meetings, ii) strong mission alignment between national policy targets, negative patient and provider experience, and an increase in hospital episodes, which catalysed tension for change, and iii) engagement with young people and families with lived experience for service planning and codesign. The main barriers were i) delays due to lack of physical space to build a new unit, which meant it was necessary to redesign the model plan, ii) complexity in ringfenced commissioning processes, which were not conducive to integrated care, iii) increased refurbishment costs due to delays in implementation, and iv) lack of patient engagement in monthly planning meetings, due to a lengthy timeline.

Table 1

Table 1
Facilitators and barriers identified for each CFIR implementation domain

CFIR domain	Facilitators	Barriers/Mitigation
1. **Innovation**		
1.1 Innovation source	A conversation with a parent of an adolescent experiencing poor quality of care related to a mental health emergency prompted action. The monthly planning group established by the healthcare innovation charity ('The Charity') comprised multi-agency and multidisciplinary staff, which ensured clinical relevance, credibility and reputability, plus adherence to local and national policy targets.	The MDT planning group comprised clinical leads who occasionally were unable to attend due to clinical responsibilities, which meant the meetings were rescheduled. A lack of patient involvement in the early planning phase.
1.2 Evidence base	Formative evaluators synthesised the evidence base in a systematic review. A one-page summary was shared with the implementers to submit to the NHS oversight board of commissioners.	The evidence base was limited, with gaps in case-comparison evaluations and before-after intervention adjustments for confounders in temporal context and illness severity.
1.3 Relative advantage	Assessed by formative evaluators via coproduced process mapping and programme theory, identifying anticipated improvements to MDT assessment, triage, early intervention, integrated specialist care, reduced emergency admissions, and emergency care revisits, compared to usual care.	An empirical outcome evaluation could only be conducted a year after the innovation was implemented to assess for changes to the annual emergency care visits, admissions and length of stay (reported elsewhere).
1.4 Adaptability	The innovation plan was adapted to meet resource availability to reconfigure existing services (see figure 2), rather than acquire new physical space for a new unit.	Adaptability was only tested based on the availability of resources at The Hospital Site, which may limit generalisability.
1.5 Trialability	The innovation has now been implemented at The Hospital site, which provided insights to inform implementation at other sites.	It was not possible to trial the intervention before full implementation, given that the complexity of the innovation would make substantial changes to facilities and practice, as well as governance requirements before implementation.
1.6 Complexity	The MDT planning group detailed the complex design of the innovation, across multiple catchment areas, commissioning bodies, governance bodies, healthcare trusts, disciplines, facilities and staff. Formative evaluators recorded this complexity using process mapping and an initial and an iterative programme theory, which also established consensus.	The initial model design required additional physical space, which was deemed unfeasible due to physical resource constraints. Separate commissioning boards for mental and physical healthcare added complexity to how the integrated acute care model would be funded, which delayed the approval process.
2. **Outer Setting**		
2.1 Critical incidents	High familiarity with online meetings due to the recent digital shift due to Covid-19 social restrictions facilitated engagement with a wide range and geography of stakeholders in the planning groups.	Disease outbreaks (i.e., Covid-19 pandemic, and Strep A in winter 2021) delayed the innovation planning and implementation due to staff's additional clinical responsibilities, plus, restriction of face-to-face engagement for codesign due to social restrictions.
2.2 Local attitudes and conditions	A positive shared vision and commitment between communities and providers to improve care provision and suitability for adolescent mental health emergencies. Diversity of Northwest London population, with diverse availability of services and charities as local partners.	A concern that other hospitals in the area would perceive the new service as an opportunity to offload their own patient cohorts, which could over-burden the hospital with increased emergency care visits and admissions.

CFIR domain	Facilitators	Barriers/Mitigation
2.3 Partnerships and connections	Existing relationship with The Charity with expertise in innovation development and delivery collocated on-site. Shared vision supported by national policy, local ICB, mental health trust, and integrated paediatric network trust, which were represented by the planning group members. Planning group awareness of other acute hospitals in NWL informed careful messaging.	The multiagency involvement identified conflicts in whether physical or mental health trusts would fund integrated care staff. Existing referral pathways between neighbouring hospitals added a risk of encouraging over-referrals from other hospitals to the new services.
2.4 Policies	National and local government policy coherent with local policy and practice shared vision for innovation.	Implementing national policy was devolved locally, with minimal instruction. Separate commissioning boards for mental and physical healthcare delayed approval.
2.5 External Pressure	An NHS market pressure to reduce costs in emergency care, by embedding preventive healthcare into emergency settings to reduce repeat emergencies. Performance pressure to improve care performance in routine performance data in hospital episodes, which defined the target outcomes.	Despite NHS market pressure, there were limited financial NHS resources for innovation or increased staffing.
3. **Inner Setting**		
3.1 Physical infrastructure	The innovation was located at The Hospital site, a large, urban hospital that is a high-specification facility. Existing services were suitable for reconfiguration to provide competent facilities to care for adolescent mental health emergencies.	Restrictions on increasing the physical space delayed implementation, due to a lengthy iteration to the initial innovation design.
3.2 Technical infrastructure	An NWL-wide dataset called Whole Systems Integrated Care (WSIC) is routinely available for researchers, permitting access to hospital data for formative evaluators. Online training resources were created and distributed to staff via existing platforms.	Not all mental health trust data were integrated at the time of population need assessment, which may have underestimated demand.
3.3 Work infrastructure	Existing staffing teams, clinical leadership and governance responsibilities supported the innovation design and delivery.	Emergency and acute care staff were already working at full capacity, and in-reach crisis and community CAMHS staff availability was limited.
3.4 Relational connections	High-quality formal relationships existed between the hospital and CW+; the hospital and the ICB; the hospital site, The Charity and other trusts involved and the formative evaluators. New connections established between The Charity and local services.	Multiple actors and agencies complicated the governance and decision-making processes related to financing staff and clinical responsibilities. Clinical teams usually worked in silo, which required new working relationships to be established.
3.5 Culture and mission alignment	Strong mission alignment and culture of shared values between policy targets, provider's ambition, hospital performance data reports, and patient and practitioner experiences.	Codesigning facilities with competing clinical priorities required deliberation between all clinical disciplines.
3.6 Human-equality centeredness	Outcomes and mechanisms were centred on equality for young people receiving acute care, to improve care experience and health recovery.	Policy and commissioning were also driven by financial cost-saving targets.
3.7 Tension for change	Staff and patients expressed an intolerable current situation in care and facilities with lack of privacy, disturbing noise and activity pollution, and lack of facilities and training to manage behavioural risk.	Implementing refurbishments to facilities in the PED and acute ward resulted in these services operating with reduced clinical space; thus, this was scheduled to avoid the busiest times of year.

CFIR domain	Facilitators	Barriers/Mitigation
3.8 Relative priority	High priority for the innovation was informed by tension for change (3.7), shared vision and mission alignment (3.5), and available resources (3.8).	Competing priorities given that the PED was also responsible for children under 8 years old, and for physical health emergencies, which was further heightened during disease outbreaks.
3.8 Available resources	Substantial philanthropic fundraising was raised by The Charity for capital costs (reported elsewhere). Existing PED & ward was suitable to be reconfigured to meet model plan. Ward-based equipment (beds, fittings, and technology) was readily available to purchase to meet requirements for ligature free and mental health competency (https://www.medstrom.com/product/solomh-mental-health-bed/).	Initial plan to open a dedicated building for adolescent emergency care was not possible due to lack of physical infrastructure space.
4. **Individuals**		
4.1 Roles and responsibilities	A healthcare innovation Charity (CW+) and senior clinicians and managers provided expertise, strategic leadership and project management, engaging with clinical teams, local policy and service leads, patients, and formative evaluators. i. High-level leaders: The Charity established and managed planning meetings, innovation planning and business cases, and facilitating planning and implementation processes. ii. Opinion leaders: Clinical and local policy leads, and local service leads chaired planning meetings and informed clinical need and model design. iii. Implementation team: The Charity led on innovation management and implementation; clinical leads informed implementation and led on improving clinical practice, and formative evaluators documented implementation factors. iv. Patient engagement: Hosted by The Charity, involving patients and parents with lived experience of mental health emergencies. Limited to an initial consultation on service requirements and later, codesigning artwork and facilities. Lack of participation in planning meetings, given the frequency and timeline. v. Deliverers: Clinical staff in PED and acute ward. Recipients: Patients and families seeking care.	
4.2 Capability, Opportunity, Motivation and Behaviour	High motivation and expert capability in both implementers and clinical leads, with persistent behaviour to overcome barriers in staff financing and adapt the innovation design, to achieve implementation.	Lack of opportunity to engage young people and families with experience of mental illness emergencies, due to Covid-19 restrictions on face-to-face contact.
4.3 Population need	Business case compiled by The Charity. Formative evaluators assessed need using hospital data, which demonstrated inequalities in care for emergencies related to mental health compared to physical health, and emergency admissions for mental health cohorts were increasing in frequency and length of stay, since 2015.	Mental health emergencies were few compared to competing clinical cohorts, which meant that demonstrating the population need was limited to clinical severity and risk associated with mental health emergencies, service utilisation per capita, and patient and provider experiences.
5. **Processes**		
5.1 Teaming	A monthly MDT planning group was established by The Charity, comprised of multi-agency and multi-disciplinary staff and local services.	Dependency on clinical staff affected continuity in planning groups and caused cancellations.
5.2 Innovation recipients, context, and roles	Needs of patients and staff, plus factors for delivery and roles, were identified in the planning group by clinical leads and stakeholders.	Lack of patient representatives in planning meetings.
5.3 Engaging	A dedicated role for engaging with patients and families facilitated codesign of facilities and artwork.	Restricted to design of artwork and aesthetics, rather than innovation design.

CFIR domain	Facilitators	Barriers/Mitigation
5.4 Doing (stages and processes)	(See figure 5 for timeline of implementation.)	

Table 2

Table 2
Key quotes from interviews and observations for each CFIR implementation domain

CFIR domain	Interviews with leaders, implementers, and deliverers	Observations of planning meetings
1. **Innovation**		
1.1 Innovation source	Initiation by financial donors with lived experience approaching the charity, with stewardship from CEOs and The Charity: *"[After being approach by the financial donors with lived experience], the process gained momentum with executive input on the [hospital site]." (Implementer)* Involvement of lead clinicians: *"The key parts [were designed with input] from a medical perspective, lead consultant, and lead nurses for mental health." (Implementer)*	The planning meetings were frequently attended by a multidisciplinary and multiagency team who agreed on the need for rapid triage and assessment tools. The unit will manage mental and physical health patients as a single cohort, acknowledging the benefits of this approach but also mitigating any risks.
1.2 Evidence base	Normative evidence from staff to improve environmental safety: *"Given my experience on what would be helpful for us to make things better for us in terms of keeping myself and my nurses safe and keeping the patient safe." (Deliverer)* *"We [staff] got together and stated what was needed and wanted. So, there are certain little things that went in, so storage solutions and things like that are more beneficial to me now. Thinking of the nursing staff and what would work for them [was helpful]." (Deliverer)*	A paediatrician presented insights from other examples from nearby hospitals that had advantageous elements within their paediatric emergency services, namely, an inpatient paediatric mental health team, physical-mental dual-purpose acute beds, outpatient eating disorder service. Though, none had multiple services in one model.
1.3 Relative advantage	Alternatives to admission: *"The dialogue with other services has also been very useful. The default pathway is to an acute medical inpatient bed and trying to explore other options, be that the day unit, in the community or a social care package." (Leader)*	The unit will not be an extension of existing tier 4 services. It is designed as an innovative culture and patients driven unit to manage patients in a safe and secure setting and discharge them within 72 hours.
1.4 Adaptability	Adapting the initial design: *"We were talking about a separate adolescent unit of multiple beds, including some that were more secure." (Lead Deliverer)*	Adaptability was only tested based on the availability of resources at Chelsea and Westminster Hospital, which may limit generalisability.
1.5 Trialability	Learning from prior attempts: *"We looked at experiences from within the organisation on changing environments. Plus, at [a nearby hospital] there have been changes to some of the rooms to create more appropriate mental health spaces. We'd had some degree on the old [acute paediatric] ward as well and so there was not necessarily formal prototypes, they were de facto prototypes in things we've done in the last few years and have involved The Charity in a lot of that work. So, the learning was there from what we got right and what we got wrong from previous ideas." (Lead Deliverer)* *"The same is true around some of the educational offering. Again, there have been processes beforehand that have been picked up and so, we've learned from that." (Lead Deliverer)* *"The bigger aspect of the architectural design of the wards was the request for a staff room and that was listened to." (Deliverer)*	One suggested potential alternative was a set of test sites – to inform the development of the larger scales plan, though this was not conducted.
1.6 Complexity	Complex care needs: *"The model has helped to take steps forward, but the biggest area is still where you require input from social care, mental health, physical health for the same young person and it's managing to link those three areas. I mean [the model] has had a sort of focus towards the mental health, physical health interface." (Deliverer)*	To provide a new Adolescent Unit supporting both the mental and physical health needs of patients to ensure that they receive the highest quality and most appropriate care in a setting that best meets that need.
2. **Outer Setting**		
2.1 Critical incidents	Perceived impact of Covid-19 on demand: *"The incidents of presentations have not been static after a significant post pandemic surge, we've not seen returning, to mean we're still up on where we are a decade ago." (Deliverer)*	Some cancellations of meetings during COVID-19 outbreak.
2.2 Local attitudes and conditions	Communication limitations: *"focusing just on mental health patients, [the model] doesn't help resolve staffing of CAMHS and its interventions. Especially if I have a young person who is out of area, chasing and liaising with CAMHS teams is extremely difficult still, which hinders the patient stay, and doesn't make it as*	Commitment to aligning service delivery with government guidelines to achieve timely assessments.

CFIR domain	Interviews with leaders, implementers, and deliverers	Observations of planning meetings
	smooth as possible as it could be for them, because of a lack of communication." (Deliverer)	
2.3 Partnerships and connections	Shared vision between local policy and practice: *"We bring together paediatric consultants, acting as mental health leads from consultants across northwest London. It's been sort of funded by the ICB and starting to improve that dialogue with social care and with the sort of mental health providers just to make sure that we're on the sort of same page." (Implementer)* *"At a local level, it's about developing relationships and developing how we have a decision-making infrastructure and actually developing relationships with the different social services teams that sort of run across NW London and with a couple of mental health trusts that also cover the same patch." (Lead Implementer)*	[The Charity] lead confirmed a discussion with the Service lead at the local integrated paediatric network trust in which Best for You was seen as a potential model for [two local hospital sites]. Linking with CAMHS teams around discharge planning.
2.4 Policies	Financing constraints: *"The biggest barrier is that we've got separate pots of money for physical health, mental health and social care. And while you're doing that in such a cash strapped environment, it becomes very hard for that not to play a role in the decision making." (Lead Deliverer)* *"Social services department is almost being held to ransom by a private sector organisation charging fees that are a real struggle to pay, which leads to much negotiation, delay of moving on to the next stage in treatment." (Leader)* Adhering to targets: *"[We must establish] a clear escalation plan for how we manage if people are staying well beyond the 72-hour maximum target [in the PED]". (Deliverer)*	There is a push to align the new unit with current policy on mental health crisis intervention. [The Charity] lead questioned whether the cap would breach any policies or legislation about equality of access.
2.5 External Pressure	Media coverage: *"Post-pandemic, mental health has clearly been headline news and that led to some of the changes in the way that we've worked across the entire system." (Lead Deliverer)*	Commitment to aligning service delivery with government guidelines to achieve timely assessments.
3. **Inner Setting**		
3.1 Physical infrastructure	Suitability for reconfiguration of existing facilities: *"We have now looked at redevelopment of the general paediatric ward to still predominantly provide general paediatric care but with areas within it very appropriate for [mental health crises], but it has required reassessments." (Implementer)*	There is pushback from the oversight board that a new multidisciplinary assessment unit is needed. Concerns were raised about whether existing infrastructure could support additional capacity
3.2 Technical infrastructure	-	[The Charity] Lead started a conversation... fire alarm buttons must be easily accessible, and at the same time they should not be so easy as to allow patients to use them for escape.
3.3 Work infrastructure	Staffing constraints: "[Hiring staff is a challenge] *there are not many wards out there that are specific adolescence and especially mental health for paediatric nurses so it will capture a certain kind of person." (Lead Deliverer)*	Lead RMN had spoken to [The hospital site] security but had identified an agency that provided security staff specific for mental health units that have received prevention and management of violence and aggression (PMVA) training.
3.4 Relational connections	Formal relationships existed between Trusts: *"The lead nurse has encouraged us to be part of [Integrated paediatric network trust]'s committee meeting, where we would talk about [the model]." (Deliverer)*	The team discussed the existing patient pathways at [The hospital site] Trust, and improving cross-unit communication and data sharing mechanisms.
3.5 Culture and mission alignment	Mission alignment: "*It was a growing problem, getting media attention. And the local team had growing concern that we weren't getting it right, which coincided with The Charity being approached by donors who had similar ideas and were ready to start talking about how we can make changes." (Lead Deliverer)*	Readiness for change is demonstrated in the whole team effort to progress and action necessary initiatives to meet the target timetable.
3.6 Human-equality centeredness	Improving humanistic recovery: *"[We wanted to] allow them outside of their room with a safe space to be able to ponder, to be able to try and de-escalate." (Deliverer)* *"To make a more welcoming environment, so it has a less clinical feel and to have a calming effect, to create a safe space for them." (Lead Deliverer)*	Good for patient care if they have care continuity of faces between referral locations, i.e. having a shared role of a family therapist between day centre and rapid assessment unit.

CFIR domain	Interviews with leaders, implementers, and deliverers	Observations of planning meetings
	Promote staff wellbeing: *"What would be helpful for us to make things better for us in terms of keeping nurses safe and keeping the patient safe, as well as looking at education for staff." (Deliverer)*	
3.7 Tension for change	Intolerable previous situation: *"There was growing concern that we weren't getting it right, there potentially a lack of choices and then not having either the right resources or the right processes within the emergency department or the inpatient paediatric unit to provide them with the sort of care that they need." (Lead Deliverer)*	Lead deliverer described the current situation as 'firefighting.' Multiple experiences of healthcare staff on the unit having to deal with patients in crisis... two full-time security guards posted on the ward.
3.8 Relative priority	Better mental healthcare within existing context: *"[The hospital site is] not a mental health trust and does not have a mental health team. While it's appropriate that we have an environment for these young people, I don't think it's appropriate for us to say that we're becoming a mental health unit." (Lead Deliverer)*	[The previous paediatric acute ward] is at full capacity over the winter months, so reconfigurations cannot be completed during winter.
3.8 Available resources	Staff expertise: *"[We've] had multiple different roles, but the major part is regarding the refurb of [the ward], at what was needed from a medical perspective and a mental health perspective." (Deliverer)* Financing constraints: "W*e've been in a good position financially, despite that, even the funds were not sufficient for a [building a new facility]." (Implementer)*	Lead RMN setting up training for paediatric nurses – nearby university hospital colleagues coproduced training for paediatric nurses in mental health care.
4. **Individuals**		
4.1 Roles and responsibilities	vi. High-level leaders: The Charity project lead and CEO maintained motivation and focus: *"Right from the start, there's been chief exec involvement at various times, very much interested in how the project was developed. That support has always been very positive." (Implementer)* vii. Opinion leaders: The oversight board and service managers upheld aspirations and necessities: *"[Local service leads and financial] donors were experts in different areas who were able to challenge some of the decisions that we were making." (Implementer)* *"I [the clinical director for acute general paediatrics and paediatric surgery] have been the medical liaison to the model from its inception. It needs to be safe and secure." (Leader)* viii. Implementation team: [The Charity] communicated between the trusts and NHS oversight board. "*The Charity was influential for clinician involvement and managing the project throughout." (Leader)* ix. Patient engagement: Patients and a youth forum provided lived experience insights on pathway design: *"[In the actual design of the unit] we're trying to involve patients as much as we can and get their views." (Implementer).* x. Deliverers: Clinical staff were clinical decision makers to inform necessary facilities for improved care: *"The whole design of the ward, it did come to myself and our nurses to give feedback in how we would like that." (Deliverer)*	
4.2 Capability, Opportunity, Motivation and Behaviour	Overcoming barriers: [The Charity] are the facilitators of identifying locations that could be repurposed. Reflections on troubles with finding the right data to evidence demand for new service. Different data have different measures of 'success'.	
4.3 Population need	Normative insights: Massive increase in eating disorders... requiring a longer admission.	
5. **Processes**		
5.1 Teaming	Monthly MDT planning group comprised collaboration from RAID, paediatrics, and community CAMHS.	
5.2 Innovation recipients, context, and roles	Planning meetings discussed engagement strategy, engagement findings, presentations from people with lived experiences, insights from lead deliverers, example case review, and findings from hospital data. The adaptation stage consisted of resourcing and implementing plans.	
5.3 Engaging	A youth forum was established to codesign the new unit facilities and calming aesthetics.	
5.4 Doing (stages and processes)	New clinical processes were agreed on assessment, priory triage, MDT working, and discharge planning.	

1. Innovation

The *innovation source* was a conversation between a clinical lead and a parent whose child had experienced a mental health emergency. The parent asked to inform an innovation to improve facilities, which they had experienced as unsuitable for dignified and appropriate care during their child's incident. Subsequently, the innovation was designed by the MDT planning group, comprising multiple perspectives from clinical leads, policy leads, healthcare innovators, stakeholder engagement leads, and local organisations, which ensured that the innovation was clinically relevant, credible, and reputable:

"*There were different stakeholders across disciplines who helped to identify what the barriers are and the delays in admission, treatment, and discharge" (Implementer)*

The current services were deemed unsafe by clinicians due to environmental risk of ligature points, absconding, and high floors within the hospital that posed a safety risk. Formative evaluators detailed the *relative advantage* of the innovation using process mapping (Fig. 1), which identified the issues with existing services and five areas for improvement and established consensus on the innovation design. Process mapping also detailed the planning group's understanding of the patient pathway within existing services (Fig. 1) upon an emergency care visit for mental health crisis in the PED, through stages of triage, referral, transfer, admission and discharge. Discharge routes were immediate discharge, emergency admission to the acute ward for treatment, or transfer to another hospital. The innovation aimed to provide a more dignified care experience with privacy and calm:

"The *purpose is to create a designated area which allows appropriate mixing with people of the appropriate age ranges as well as providing support in a more secluded, quieter environment." (Lead Deliverer)*

Formative evaluators synthesised the *evidence base* by conducting a systematic review of relevant models of integrated care, and effects on reduction in emergency admission duration, frequency, and risk(10). Evidence from 22 comparable initiatives indicated moderate effects on reducing emergency admissions and length of stay. We presented a summary of this at the planning-group, plus a one-page document, which was shared with the oversight board as evidence for the proposed innovation. We designed our evaluation protocol based on the evidence gaps to conduct a before-after outcome analysis, adjusting for illness severity.

The initial business case was rejected for a number of reasons: firstly, identifying appropriate commissioning for a new staffing model (see supplementary table 2) was challenging due to distinct funding for mental versus physical health; and secondly, a lack of physical space to build a new integrated care assessment unit in a separate, adjoining building to the existing PED (also see inner setting):

"*The problem is that there is no space [for a new unit] without displacing another service." (Implementer)*

There were two *adaptations* to the model after the initial business case was rejected. This was a lengthy process due to coinciding with the COVID-19 pandemic second wave. Formative evaluators documented adaptations to the model by reviewing the programme theory in a planning meeting (Fig. 2). Instead of a new integrated care adolescent emergency department, triage and short-term admission, the adaptation involved reconfigurations to two existing services, the PED, and the acute paediatric ward. Details of the redesign are detailed in Figs. 2–3. The first adaptation was to reconfigure existing rooms as mental health competent facilities that were ligature free, secure, safe, ethical, private, soundproof, calming, and held dual-purpose for medical interventions, known by hospital staff as "mental health flexi-rooms". Two universal flexi-rooms were reconfigured from existing space in the PED and two on the acute ward. The second adaptation was to the process of emergency admission and care coordination. In the initial plan, adolescents would be directed to the new unit from the main or PED for assessment, treatment, and either admission or discharge. Instead, the adapted model made improvements to the existing triage process. Clinical leads from the acute paediatric ward designed training for emergency care staff (see supplementary table 3) on i) caring for young people with mental health emergencies (i.e., deescalation, restraint, and breakaway techniques, ii) mental health risk prioritisation for triage and admission, and iii) alternatives to admission. All emergency care staff received the training, which was then established as routine training for new starters. The aim was to reduce non-medical admissions to the ward and improve capacity to address social care problems and low-acuity mental disorders within the PED within a 72-hour timeframe, to adhere to local policy.

2. Outer setting

As outlined above, a major facilitator was *external pressure* from national policy targets for young people's mental healthcare, which informed the target outcomes; to improve quality of care experiences, reduce emergency care utilisation and costs, and integrate

preventive approaches in acute care. In response to the devolution of these targets, Trusts in Northwest London had already began integrating specialist and acute care, prior to the innovation. This enhanced established *partnerships* with a vested interest, including the mental health and general hospital NHS Trusts, and the Integrated Care Board that oversees commissioning of NHS services for the region. All partner Trusts were invited to planning meetings, which ensured adherence to local policy targets, resource allocation and identifying relative advantage of the innovation. An early planning activity included a presentation from a clinician who had visited national examples of innovation, informing the need for a place of safety and ligature-free facilities. Existing partners had complementary priorities within their care pathways, including improving data quality in emergency care, and preventive innovation in primary care for mental disorders. This did not detract from the design process, though were noted as potential confounders on changes in target outcomes.

There were three other acute hospitals in NWL which also have suboptimal facilities for mental health crises and shared *policy* targets to reduce emergency admissions and improve care. This had implications on the design and marketing of the model:

"We [hospital staff at the innovation site] won't have capacity to look after all young people with mental crisis in Northwest London, so we must be careful not to be seen as somewhere to refer patients from other hospitals… We are not creating more beds for emergency admission, we are creating a more suitable environment for when admission is unavoidable" (Lead Deliverer).

This distinction defined the purpose, vision, and mitigating circumstances of the innovation, to build a shared vision between *partners*. External messaging about the model was managed through existing networks in the planning group, who held joint roles in both inner and outer organisations.

The design element aimed at building integrated partnerships and pathways with local services was further facilitated by the range of services, charities and organisations in NWL. Local stakeholders attending the planning meetings established partnerships for integrated acute care, such as digital mental health services and community prevention and rehabilitation services. However, the design complexity was influenced by high population density in the geographical area (*local conditions)*, comprising high sociodemographic diversity and inequalities. This intensified the necessity to codesign services with local people with lived experience to ensure appropriate tailoring.

An unavoidable barrier that delayed implementation was a major *critical incident* of the COVID-19 pandemic. First, clinical leads' responsibilities to manage care for a heightened flow of patients during the pandemic prevented their attendance at planning groups due to staff shortages caused by redeployment, which delayed the model redesign. Second, cancellation of construction in clinical settings delayed the procurement of refurbishments, delaying implementation. Additionally, there was a season of Strep A in winter 2021, which overburdened the PED, meaning that in person planning groups were cancelled. Nonetheless, familiarity with online meetings due to the recent shift to virtual consultations meant that planning meetings were well attended.

3. Inner setting

The parent who initiated the innovation communicated to staff an interest in improving the facilities and care experience at the hospital. A major driver in progressing this wish was a *mission alignment* with national and local policy targets, and perspectives of staff on an increase in the frequency and severity of emergencies associated with mental disorders, even preceding the pandemic. Staff also recognised that patients who breached the maximum 72-hour length of stay in the PED, often had complex social care needs, delaying discharge. On the ward, an intolerable situation was described:

"We didn't have a suitable safe space, especially if you were dysregulated. It was four white walls, and you had to stay in those four white walls." (Care Deliverer)

These factors were a strong facilitator, especially the unsuitability of services to support dignified, safe and human-centred care, ensuring care is timely, responsive to needs, and effective. This tension for change was further confirmed in the population need assessment, conducted by formative evaluators using hospital episodes data (presented in Table 3). Whilst the annual incidence in physical health emergencies reduced during and after COVID-19 social restrictions (2019/20 N = 71,309; 2020/21 (during) N = 41,622; 2021/22 N = 55,627), among 2.4 million young population in NWL, mental-illness-related emergencies persisted (2019/20 N = 3,741; 2020/21 (during) N = 3,544; 2021/22 N = 2,958). Interestingly, a cohort with unexplained medical symptoms increased just before, during and after the pandemic (2018/19 N = 3871; 2019/20 N = 5,142; 2020/21 (during) N = 5,268 and 2021/22 N = 8,983), as did alcohol/drug intoxication (2018/19 N = 1,021; 2019/20 N = 1,681; 2020/21 (during) N = 1,594). Eating disorder emergency admissions were particularly affected, doubling in frequency during and after the pandemic (2019/20 N = 34; 2020/21N = 61; 2021/22 N = 64), and total

bed days (2019/20 N = 226; 2020/21N = 400; 2021/22 N = 601) (Fig. 4). Comparing physical and mental health emergencies identified discrepancies, demonstrating longer length of stay, higher hospitalisation, transfer, and readmission rates, and lower GP aftercare in mental crisis care compared to physical health care (Table 4). The higher rate of in-reach assessment and lower rate of PED treatment compared to physical emergencies emphasised the lack of mental health response capability. These statistics strengthened the second business case for the need to improve alternative pathways for emergencies related to eating disorders, as a relative priority.

Table 3. **Healthcare utilisation**

Table 3
Population Needs Assessment (emergency care visits, hospitalisations, and bed days) (2015–2021)

Financial year	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21[1]**	**2021/22**
Emergency care visits	**N (column %)**						
Physical emergencies	73,626 (95.8)	99,968 (96.6)	109,421 (96.7)	93,800 (96.9)	71,309 (95.0)	41,622 (92.2)	55,627 (95.0)
Unexplained symptoms	1,772 (2.3)	2,778 (2.7)	3,516 (3.1)	3,871 (4.0)	5,142 (6.9)	5,268 (11.7)	8,983 (15.3)
Social problem	242 (0.3)	321 (0.3)	341 (0.3)	260 (0.3)	377 (0.5)	268 (0.6)	375 (0.6)
All MIR emergencies	3,247 (4.2)	3,504 (3.4)	3,680 (3.3)	2,977 (3.1)	3,741 (5.0)	3,544 (7.8)	2,958 (5.0)
Eating disorder	-	-	-	-	-	-	-
Intoxication	833 (1.1)	943 (0.9)	1,082 (1.0)	1,012 (1.0)	1,681 (2.2)	1,594 (3.5)	1,256 (2.1)
Developmental disorder	-	-	-	-	-	-	-
Psychiatric condition	2,336 (3.0)	2,486 (2.4)	2,513 (2.2)	1,780 (1.8)	1,942 (2.6)	1,900 (4.2)	1,638 (2.8)
Intentional self-harm	78 (0.1)	75 (0.1)	85 (0.1)	185 (0.2)	118 (0.2)	50 (0.1)	64 (0.1)
Total care spells	78,887 (100)	106,571 (100)	116,958 (100)	100,908 (100)	80,569 (100)	50,702 (100)	67,943 (100)
No treatment provided	72,521 (47.9)	100,565 (48.6)	109,623 (48.4)	138,999 (57.9)	126,047 (61.0)	66,880 (56.9)	120,282 (63.9)
Total annual visits	151,408	207,136	226,581	239,907	206,616	117,582	188,225
Hospitalisation (Hosp)	**N (column %)**						
Physical emergencies	6286 (98.0)	7278 (97.3)	8332 (97.4)	8771 (97.3)	8684 (97.1)	6294 (96.3)	8271 (97.0)
Unexplained symptoms	0 (0)	0 (0)	35 (0.4)	42 (0.5)	33 (0.4)	37 (0.6)	26 (0.3)
All MIR emergencies	130 (2.0)	205 (2.7)	186 (2.2)	206 (2.3)	229 (2.6)	207 (3.2)	228 (2.7)
Eating disorder	9 (0.1)	16 (0.2)	25 (0.3)	37 (0.4)	34 (0.4)	61 (0.9)	64 (0.8)
Overdose/intoxication	42 (0.7)	46 (0.6)	42 (0.5)	49 (0.5)	37 (0.4)	47 (0.7)	39 (0.5)
Developmental disorder	7 (0.1)	33 (0.4)	23 (0.3)	17 (0.2)	24 (0.3)	25 (0.4)	24 (0.3)
Psychiatric episode	72 (1.1)	110 (1.5)	96 (1.1)	103 (1.1)	134 (1.5)	74 (1.1)	101 (1.2)
Total bed days	**N (column %)**						
Physical emergencies	8300 (91.4)	10525 (82.8)	11411 (90.0)	10915 (87.7)	11293 (81.7)	8254 (74.6)	13519 (90.9)
Unexplained symptoms	0 (0)	0 (0)	51 (0.4)	31 (0.2)	54 (0.4)	37 (0.3)	30 (0.2)
All MIR emergencies	785 (8.6)	2179 (17.2)	1216 (9.6)	1505 (12.1)	2479 (17.9)	2778 (25.0)	1318 (9.0)
Eating disorder	12 (0.1)	180 (1.4)	140 (1.1)	169 (1.4)	226 (1.6)	400 (3.6)	601 (4.0)
Overdose/intoxication	6 (0.1)	35 (0.3)	66 (0.5)	169 (1.4)	122 (0.9)	61 (0.6)	9 (0.1)
Developmental disorder	88 (0.1)	616 (4.8)	322 (2.5)	131 (1.1)	594 (4.3)	504 (4.6)	165 (1.1)
Psychiatric episode	679 (7.5)	1348 (10.6)	688 (5.4)	1036 (8.3)	1537 (11.1)	1813 (16.4)	543 (3.7)

Abbreviations: MIR, mental-illness-related.

Financial year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21[1]	2021/22

[1] Covid-19 social restrictions occurred between 26th Mar-10th May 2020, 5th Nov-2nd Dec 2020, and 6th Jan 2021-8th Mar 2021.

Table 4. **Discrepancies in care**

Table 4
Discrepancies in care between emergencies related to mental or physical illness in 2022/23

Healthcare utilisation	Emergencies related to mental illness	Emergencies related to physical illness	Discrepancy
	N (row %)		Risk ratio (95% CI)
Emergency hospitalisation	112.06 (44.34)	88.41 (42.43)	3.12 (3.01 to 3.23)*
Readmission (5 year)	198 (50.9)	3221 (44.8)	1.28 (1.04 to1.56)*
Yes	191 (49.1)	3963 (55.2)	
No			
Readmission (5 year) if chronic illness is present	34 (72.3)	766 (61.0)	1.67 (0.87 to 3.20)
Yes	13 (27.7)	490 (39.0)	
No			
Length of stay, days (mean)	6.38	1.67	4.71 (3.81 to 5.61)*
Hospital aftercare			
GP follow-up	3,380 (14.1)	151,511 (27.7)	0.55 (0.53 to 0.57)*
No aftercare	10,454 (43.6)	259,066 (47.3)	0.88 (0.86 to 0.90)*
PED clinic treatment	125 (0.5)	40,309 (7.4)	0.08 (0.06 to 0.09)*
Outpatient referral	766 (3.2)	24,645 (4.5)	0.77 (0.71 to 0.83)*
Hospital transfer	1,046 (4.4)	17,048 (3.1)	1.52 (1.42 to 1.62)*
In-reach assessment	2,709 (11.3)	9,626 (1.8)	6.97 (6.65 to 7.31)*
Refused care	437 (1.8)	3,123 (0.6)	3.47 (3.13 to 3.84)*
Unknown	138 (0.6)	3,290 (0.6)	1.04 (0.88 to 1.23)*

Key: CI=Confidence interval, CAMHS=child and adolescent mental health services, GP=general practitioner, A&E=accident and emergency department, GBP=Great British Pounds.

*=P < 0.001.

Another challenge was availability of physical infrastructure and resources within the hospital. A major facilitator to achieving change was the co-location of The Charity, which had prior experience of innovation procedures at the site. The Charity was appointed to direct and manage the innovation, with a team comprised of a programme director, fundraising lead, finance manager, marketing and communications lead, engagement manager, and healthcare innovation fellow. The Charity raised substantial finances to cover the capital infrastructure refurbishments of £2.8 million. However, the ongoing delivery finances for staffing models and running costs for facilities was dependent on sign-off from the healthcare Trusts involved. As above, a major barrier was the lack of physical space at the

hospital to establish a new integrated emergency care unit for paediatric emergencies, resulting in the lengthy process of adapting the model described above. Once the adapted model was approved, The Charity was experienced in sourcing and procuring necessary equipment, contractors and constructors to meet the specifications for mental health competent facilities, outlined in Fig. 3.

4. Individuals

Individuals involved in the planning and implementation of the innovation are documented in Table 1. Expert leadership was provided as healthcare innovation management and implementation by The Charity, and clinical leadership was provided by leads in paediatric acute care and acute mental health nursing to inform model design. Young people and families (*innovation recipients*) with lived experience were consulted during the initial planning stage, to inform on infrastructure requirement, including the need for private and quiet rooms, and at the implementation stage, to inform on the design and aesthetics of the reconfigurations and artwork. Despite delays in implementation caused by the pandemic and necessity to adapt the model, the positive attitude, *capability* and *motivation* was maintained by the shared vision, supported by national policy, and umbrella organisations within local healthcare systems represented in planning meetings.

5. Processes of implementation

The *implementation timeline*, presented in Fig. 5, involved five stages, from establishing teams through to launch. After the initial conversation with the parent of the adolescent patient, the clinician approached The Charity, to lead the innovation. The Charity established a planning group to codesign the innovation with multidisciplinary stakeholders; and approached author DN to design and lead the evaluation (*teaming*) which was undertaken within the Northwest London Applied Research Collaboration framework, with additional funding through The Charity. The planning group comprised paediatric clinicians, internal practice leads from acute and mental health trusts, local policy leads for paediatric mental health, and external representatives from local children's mental health services. Clinical leads at the hospital site were appointed as planning meeting chairs. The planning meetings were used to codesign a 'best-case', a 'middle-case', and a 'do nothing scenario'. The 'do nothing' scenario described issues with current services. The best-case scenario required substantial improvements to the facilities, staffing composition, and care coordination procedures. A business case was created to gain approval from NHS Trust board, outlining the case for change (policy and practice), reconfiguration scenarios, budget, cost-benefit predictions, risk mitigation, strategic alignment, success measures, timeline, implementation plan, responsibilities, and governance structures. After the initial case was rejected, the innovation was redesigned and a new business case was submitted, accepted and implemented.

Discussion

This evaluation documented the planning and implementation phases of an innovation to improve the quality of paediatric emergency care for mental health crises in Northwest London, which aimed to reduce emergency admissions, readmissions and length of stay. It is anticipated that future papers will focus on impacts. The innovation reconfigured existing services, trained staff in assessment, triage, treatment and transfer, and established smoother integrated care pathways. The innovation directly addressed the increase in emergency care utilisation for mental disorders among adolescents. The population needs assessment identified that increased demand was highest for eating disorders during and after the COVID-19 pandemic, likely associated with risk factors for internalised harmful behaviours (23, 24). Statistical needs assessment, alongside stakeholders codesigning the intervention were essential, initial steps for model development.

Implementation of the model was highly dependent on the inner setting, located at a large, high-specification, urban hospital, which provided access to specialist stakeholders, imperative for the design and delivery and The Charity who spearheaded fundraising, facilitated codesign and mediated relationships across the partner organisations. Whilst the initial design was unfeasible, it was possible to reconfigure existing services to meet the design specifications for private, safe and dignified care. Construction was completed during summer to avoid higher usage seasons. Delays in implementation resulted in increased capital reconfiguration costs, due to inflation. Consultations with previous patients and their families had important influence on specification and aesthetics of the new facilities; however, their exclusion from planning meetings was a limitation. Despite delays, high motivation and expertise in the implementers generated solutions for implementation. Necessary service adaptations were facilitated by the flexible innovation methods adopted and allowed for embedding new practices into existing services. The facilitators for planning and implementation aligned with previous literature on integrated care innovations(10).

Our mixed-methods evaluation of the pre-implementation stage of an NHS innovation in paediatric emergency medicine is a novel contribution to evidence, which provides insights into planning and implementation of national policy into local practice. The innovation was multifaceted across an integrated care pathway. A strength of this study is that it draws attention to the effort, time, resources, expertise, motivation, leadership, tenacity, integrity needed to reconfigure complex service provision, and the strength that can be drawn from involving relevant stakeholders in the planning and implementation of service innovation. Other evaluations specific to improving quality of care in CYPMHS include an implementation and outcome evaluation of mental healthcare reform in Manchester, which reported on the utility of the THRIVE framework to support services to self-assess and establish integrated pathways(25). Similar implementation factors were identified, involving the inner setting, including assessing i) decision-sharing between services, communication channels and information continuity, and staff relational qualities, and ii) existing processes and pathways, which improved patients' qualitative experiences of care. Another evaluation similarly applied quality improvement techniques, utilising Plan Do Study Act, which iteratively improved access and flow to CYPMHS services in East London and reduced waiting, by implementing a collaborative learning system between teams to improve efficiency(26). However, these evaluations were limited to enhancing relational partnerships and staff qualities, within the inner setting only.

Our role as formative evaluators was another key strength of the evaluation, which allowed longitudinal observation of real-time processes and permitted clarifications on decision-making processes and model complexity, including real-time recording of model adaptations. This provided key learning for other sites, provides enough contextual evidence to support scalability elsewhere. Another strength was recruitment of two public representatives as co-investigators throughout our evaluation, which grounded analysis, interpretation and dissemination in human-centeredness. All methods were informed by the CFIR, to adhere to standardised frameworks for implementation evaluation, preparing for adopting the model in other hospitals.

Our formative role was resource intensive over a long timeline spanning the planning phase, which may limit replication elsewhere. Other limitations were the small evidence base for effectiveness and cost-effectiveness, prior to implementing the innovation, which informed our evaluation protocol. The evaluation was limited to only one hospital in a unique geographical urban location, which may not be generalisable to low-resource facilities.

Implications for clinical practice and policy were considered throughout, with the aim of providing insights into adopting the model in other UK hospitals. Given that the model design was informed by national policy targets for improving adolescent mental health crisis support, the findings are clinically relevant across the UK and have already generated national and international interest via learning events, influencing a Danish adaptation named Best for Us. Other hospitals considering adoption are likely to benefit from implementation factors outlined within this study, including the importance of assessing population need in hospital episodes, engaging with clinical, policy and local service stakeholders, enlisting an experienced healthcare innovation charity or service, embedding quality implementation scientists, and consulting or preferably recruiting people with lived experience, to inform the model design and delivery. The design process may be lengthy, iterative and non-linear, and capital costs may require substantial fundraising. However, adopters may consider whether the initial model design for establishing a new integrated care unit for multidisciplinary assessment, early intervention, triage, and transfer is preferable, or whether reconfiguring existing service provision will best achieve competency for private, safe and dignified care during paediatric mental health emergencies, depending on organisational financial and infrastructural resources, drivers and competing demands. Future research should focus on adoption and adaptation to build evidence for generalisability. Codesigning adoption with service users is integral to quality improvement (27), and quality improvement strategies support providers to innovate effectively (28). An important and continuing policy consideration is whether commissioning structures permit and facilitate innovation and care delivery for integration of physical-mental healthcare, emergency-preventive care, and hospital-community care, to address the new NHS 10-year plan (29).

Abbreviations

CFIR Consolidated Framework for Implementation Research

CYPMHS Children and Young People's Mental Health Services

ICD International Classification of Disease

NHS National Health Service (UK)

MDT Multidisciplinary Team

PED Paediatric Emergency Department

Declarations

Ethics approval and consent to participate

Ethical approval was provided by the local NHS ethics committee (reference: 22/NW/0116) in accordance with the Declaration of Helsinki. All interviewees consented to participate and publish findings, with the right to withdraw data prior to analysis.

Consent for publication

All authors consent for publication.

Availability of data and materials

All data generated during this study are included in this published article and its supplementary information files.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

DN initiated the study and takes overall responsibility. MO, SB and SHG designed the study and conducted observations. ND and SW conducted and analysed interviews. SG and SC tabulated the observations. MO conducted statistical analysis, interpreted and synthesised the results, drafted the manuscript and is the guarantor. LL and DH were advisors. All authors read and approved the final manuscript.

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Figures

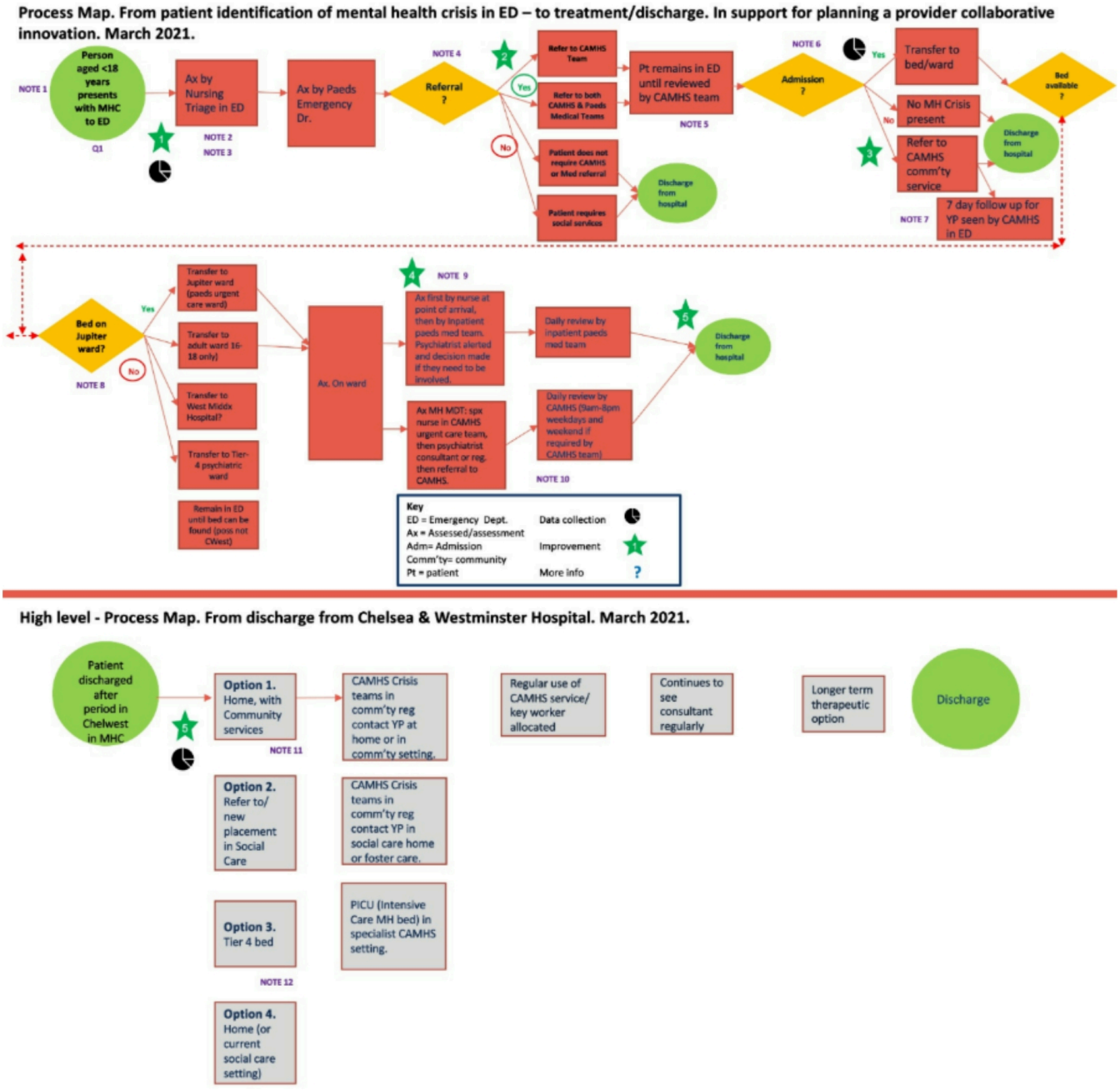


Figure 1

Process map of pre-existing service design from the arrival and discharge (circles), clinical intervention (squares), and decisions (diamonds). (Note: Stars identify innovation components as 1) appropriate assessment, 2) appropriate triage, 3) appropriate admission, 4) appropriate inpatient intervention, 5) appropriate discharge planning, and 6) appropriate onward care options. See supplementary table 4 for further detail.)

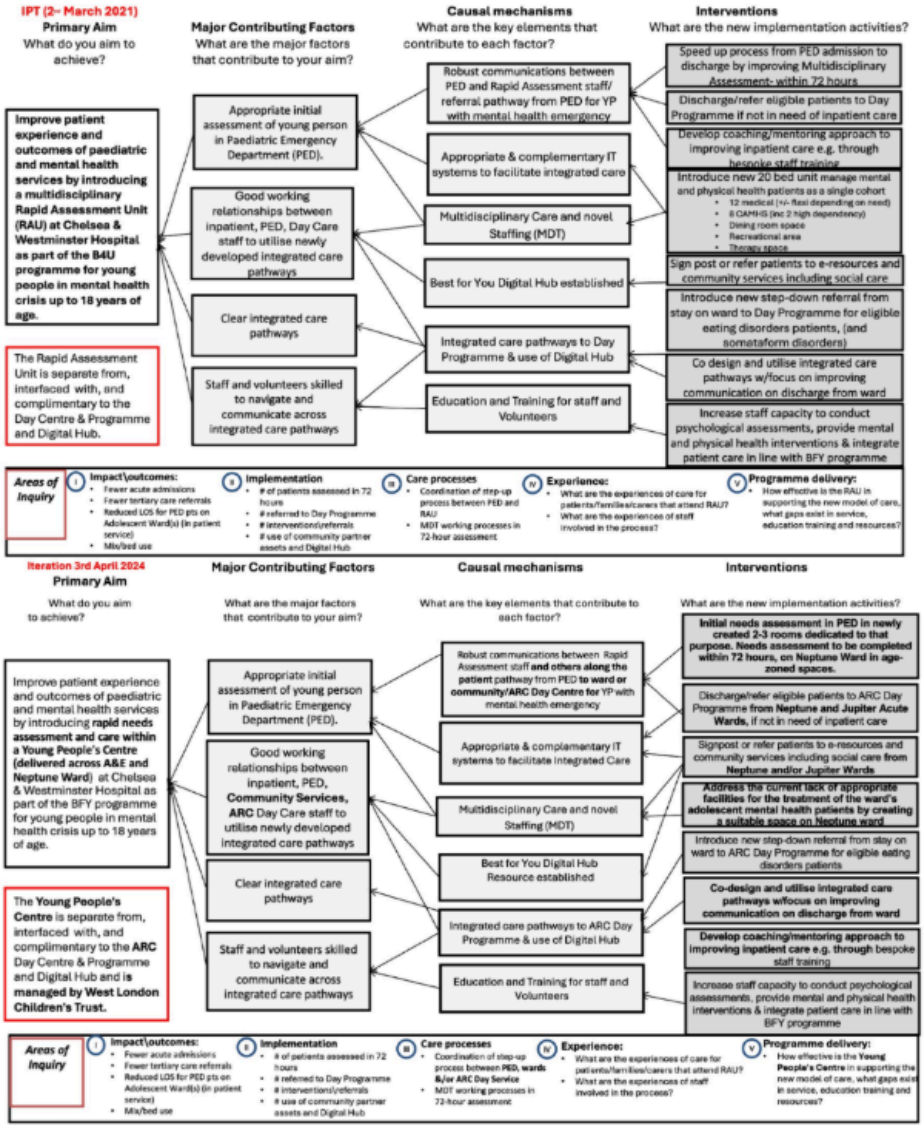


Figure 2

Programme theory (model adaptations in bold)



Figure 3

Facilities Before and After Innovation

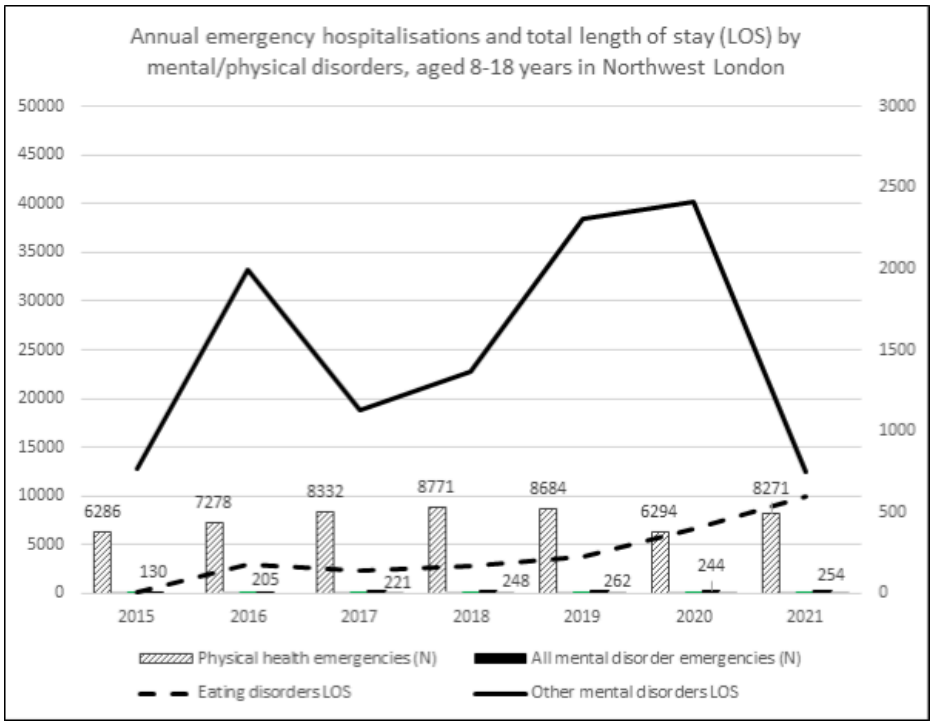


Figure 4

Emergency hospitalisations and length of stay

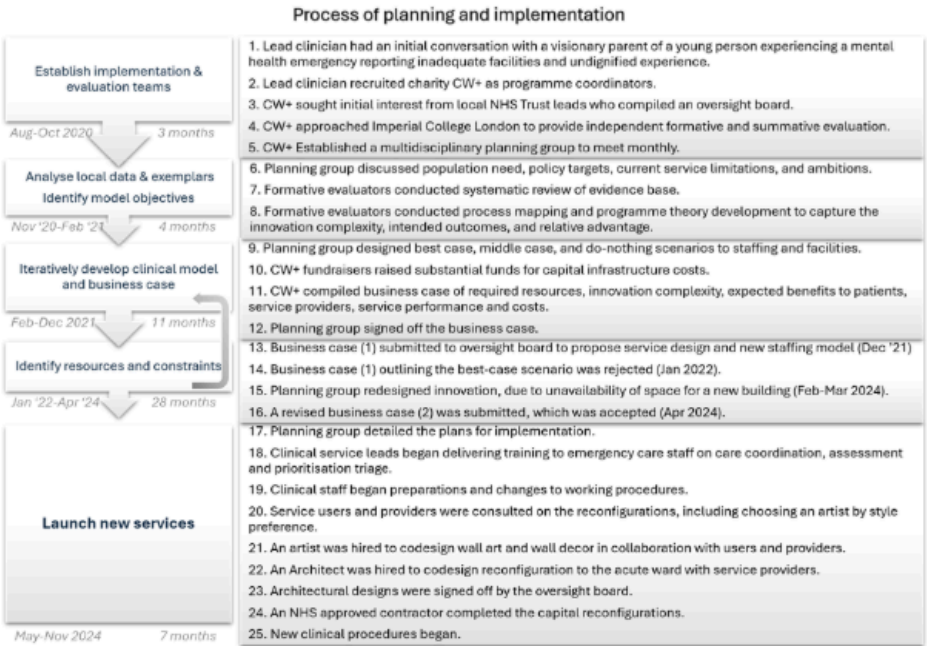


Figure 5

Implementation timeline

Supplementary Files

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- Supplementarytables.docx