

## Research Article

# Integrated Services for Children and Young People with Neurodevelopmental and Co-Morbid Mental Health Disorders: Review of the Evidence

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Received: June 22, 2020; Accepted: July 16, 2020;

Published: July 23, 2020

## Abstract

Children and Young People (CYP) with neurodevelopmental disorders often have several unmet Mental Health (MH) needs. These unmet needs could be addressed by integrating Child and Adolescent Mental Health (CAMH) Services and Community Child Health (CCH) Services. This paper provides an overview of the literature on some of the crucial factors required for the successful integration of CAMH and CCH Services.

Eight databases (Pubmed, PMC, CINAHL, Embase, PsycINFO, Database of Abstracts and Review, and the Cochrane Database of Systematic reviews) were systematically searched from inception to 2019. Published articles related to integrated services for CYP with MH and Neurodevelopmental Disorders (NDDs) were identified. The following combination of search terms were used: "Integrat\*", "childhood", "behavio\*r", "mental health", "psychiatric", "disorders" or "problems".

The search identified the following themes: rationale for integrating CCH and CAMH services, challenges and barriers to effective services integration, advantages of community-based integrated CAMH and CCH Services, users, parents and carers' perspectives, overlapping role of paediatricians and child/adolescent mental health professionals, innovative service funding for sustainability of integrated CAMH and CCH Services, examples of Integrated services from other specialties, use of technology and other desirable characteristics to enhance services integration.

The paper argues that the inclusion of mental health professionals in multidisciplinary CCH teams should be the norm, rather than the exception to provide optimal holistic care to all CYP with wider range of neurodevelopmental, behavioural and emotional problems. The paper makes recommendations on frameworks for the integration of CAMH and CCH Services, focusing mainly on the UK context.

**Keywords:** Neurodevelopmental Disorders; Mental Health Problems; Childhood; Young People; Service Integration; Community Child Health; Behavioural Disorder

## Abbreviations

MH: Mental Health; NDD: Neurodevelopmental Disorders; CYP: Children and Young People; CCH: Community Child Health; CAMH: Child and Adolescent Mental Health; ADHD: Attention-Deficit/Hyperactivity Disorder; CD: Conduct Disorder; ASD: Autism Spectrum Disorders; MCN: Managed Clinical Network; EBDD: Emotional, Behavioural and Developmental Disorders; NDBED: Neurodevelopmental, Behavioural and Emotional Disorder

## Introduction

The World Health Organization (WHO) defined "integrated care" as "health services organised and managed so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money" [1]. Integrated care often involves overcoming the breakdown in communication

and collaboration that can arise between different parts of the system and different groups of professionals. An important feature of integrated care is moving beyond pathways for specific diseases [2,3]. Two dimensions of integrated care relevant to the management of childhood Mental Health (MH) problems include: (i) at the horizontal level, linking health and education and social care for a whole approach to child care and (ii) at the longitudinal level, linking services across the life course stages for smooth transitions [4].

Evidence from many developed countries suggest that many Children and Young People (CYP) have several unmet Mental Health (MH) needs. Indeed, only 20%-25% of children suffering from diagnosable mental illness in developed countries receive treatment [5]. Additionally, there is long delay between onset of symptoms and biopsychosocial intervention for CYP, an average of 8 to 10 years, occurring during critical developmental years in the life of a child [6].

With rising health care costs and a global trend of health care budgets facing deepening cuts, integrating Child health and MH services, also known as Systems Of Care (SOC) have the potential to be more cost-effective and offer significant savings to the public, requiring lower intensity services and substantially lower emergency room and in-patient psychiatry beds, compared to the “usual care” services [7].

This narrative review which is based on a systematic evaluation of the literature focuses on integrated services for CYP with neurodevelopmental disorders and comorbid mental health problems. After providing an overview of the prevalence of neurodevelopmental disorders and mental health problems in children and young people, we present the current picture of Community Child Health (CCH) and Child and Adolescent Mental Health (CAMH) services in the UK and discuss the rationale for integrating CCH and CAMH services, challenges and barriers to effective services integration, advantages of community-based integrated CAMH and CCH Services, users', parents' and carers' perspectives on integrated services, overlapping role of paediatricians and child/adolescent mental health professionals, innovative service funding for sustainability of integrated CAMH and CCH Services, examples of Integrated services from other specialties, use of technology to enhance services integration, and desirable characteristics of integrated services. Finally, we recommend frameworks for the integration of child mental health into paediatric services, focusing mainly on the UK context.

## Method

We conducted a systematic search of the following electronic databases; Pubmed, PMC, CINAHL, Embase, PsycINFO, Ovid, Database of Abstracts and Review, and the Cochrane Database of Systematic reviews, with no limitations in terms of language and date of publication. Search terms included a combination of the following: “Integrat?”, “childhood”, “behavio\*r”, “mental health”, “psychiatric”, “disorders” or “problems”. The relevant publications were summarised and the emerging themes are presented in this narrative review.

## Results

### Prevalence of neurodevelopmental disorders and mental health problems in children and young people

A recent UK survey of 18,029 CYP aged 5-19 years based on triangulated information from young people, their parents and teachers found a 12.8% prevalence of MH Disorders including 4.6% of CYP with Behavioural Disorders (e.g. oppositional defiant disorder), 8.1% with Emotional Disorders such as anxiety and depression, and 1.6% with Attention Deficit and Hyperactivity Disorder (ADHD) [8]. The survey found that while the rates of behavioural disorders and ADHD remained stable compared with previous surveys in 1999 and 2004, the prevalence of emotional disorders increased by 4.2% compared with 2004 [8]. A similar survey in the US between 2005 and 2011, involving 78,042 households, indicated that 4.6% of CYP aged 3-17 years had a history Disruptive Behaviour Disorders (DBD) (including ADHD and Conduct Disorder), with the prevalence being twice among boys compared to girls (6.2% vs 3.0%). The US Survey also found prevalence rates of 4.7% for Anxiety, 3.9% for Depression, and 1.1% for Autism Spectrum disorders (ASD) [9]. Other studies

from the United States have shown prevalence rates for Disruptive Mood Dysregulation disorder to be in the range of 0.8% to 3.3% with the highest rate in pre-schoolers [10]. About 5% of CYP suffer from depression at any given point in time, and it is more prevalent among girls [11]. A survey among Primary Care Paediatricians in North Carolina (USA) estimated that an average of 15% of the CYP in their practices presented with a behavioural disorder, including ADHD, requiring non-medication interventions such as supportive counselling, psychoeducation, behaviour modification, and/or stress management [12].

Worldwide prevalence for each Neurodevelopmental Disorder (NDD) varies widely due to differences in study methodology and definitions used. The commonest childhood NDDs are ADHD, ASD, Tic disorders (TD)/Tourette's Syndrome (TS), Learning Disorders (LD), developmental delay and Developmental Coordination Disorder (DCD). Various combinations of genetic predisposition and adverse environmental factors increase the risk of developing any of the NDD and MH disorders [13]. ADHD is the commonest childhood neuro-behavioural disorder, affecting up to 5% of school-age children. Various studies have estimated the prevalence of other NDDs among CYP as 1% for ASD, 1.5% for LD and 1% for TD/TS [14]. The prevalence of DCD ranges from 1.5% to 20% depending on how it is defined [15].

Co-existence of NDDs and sharing of symptoms across other disorders (comorbidity) is the rule rather than the exception. Most affected children present with impairments in various domains of general development, communication and language, social relationships, motor coordination, attention, activity, behaviour, mood, and sleep [16].

Some authors have introduced the concept of ESSENCE (Early Symptomatic Syndromes Eliciting Neurodevelopmental Clinical Examinations), recognising the norm for co-morbidity of a wide range of neurodevelopmental disorders, requiring multidisciplinary evaluations and long-term follow-up by CCH paediatricians, psychologists, Nurses, Social Workers, Education specialists, speech therapists and other allied healthcare professionals [17,18]. Some authors have introduced a much wider terminology of Neurodevelopmental, Emotional, Behavioural and Intellectual Problems (NDEBIP), emphasising the overlap and common co-morbidity between Neurodevelopmental and Mental Health disorders [19-21].

### Current picture of CCH and CAMH services in the UK

Despite the high prevalence of co-occurring mental disorders in CYP with NDD and intellectual disorders, the involvement of psychiatric and psychological professionals in the provision of support for the MH problems comorbid with NDDs is not consistent throughout the UK and other High Income Countries (HIC) [22].

The scope and provision of Community Child Health (CCH) is complex and varies across the UK with each service unique in the range of statutory and non-statutory functions they provide. Each CCH service provides an average of 11 out of 21 different types of clinics and services [23]. The RCPCH Workforce Census 2013 revealed a decline in regular joint educational meetings with CAMHS from 15.4% in 2011 to 12.8% in 2013, a reduction in ad hoc meetings

with CAMHS from 42% to 26.8% and an increase from 11.7% to 15% of services that have no direct contact with their local CAMHS [24]. A recent report from the UK highlighted two CAMHS that do not provide access to children with ADHD or Autism [25].

### **Rationale for integrating CCH and CAMH services**

In the UK, there has been a rapid policy change designed to provide integrated services to children, young people and their families, linking education, social care, health, youth and community, criminal justice and other professions [26]. Several recent government policies and documents have focused on giving high priority to an integrated approach to physical and mental healthcare service provision for children, including the National Service Framework, 'Every Child Matters' [27], Five Year Forward View [28] and CAMHS National review [29], Future in Mind [30], Five Year Forward View for Mental Health [31] and Review of children's and young people's mental health services [32]. A recent Green paper [33] confirmed the UK Government's commitment to increasing MH service funding for CYP, including creation of dedicated MH support teams in schools/colleges, signalling a priority for a whole system approach.

There is a need to engage service development, commissioning and service managers to address primary care involvement and define service models that will enable effective management of people with ADHD [34].

Previous surveys of both psychiatric and paediatric practitioners have suggested that joint working between the two disciplines is needed to provide a holistic approach to ADHD, in order to identify and manage any co-existing mental health, physical and developmental problems [35]. Management of ADHD often combines psychosocial, medical and educational intervention, requiring joint approach between child psychiatry, paediatrics, psychology and education providers [35,36].

It has been recommended that people with long-term physical health conditions should receive support for the psychological aspects of their condition as a standard part of their care, including routinely providing psychological education and support as part of developmental and other self-management programmes; making full use of peer support groups (locally or online); and embedding clinical psychologists within multidisciplinary teams around neurodevelopmental clinics to allow skills transfer in both directions [37].

### **Challenges and Barriers to effective integration of services**

There are a number of barriers that impede the Paediatricians' capability to deliver MH services, including insufficient time, training, knowledge of local resources, and access to CAMH specialists [38].

Traditional organizational systems and service configurations can militate against joint working. Integration of such disparate services such as CCH, Psychiatrists, Psychologists, Social Services, Educationists and Allied Therapists needs to embrace various research principles such as technology transfer and behaviour change [39,40]. These system changes are essential to integration because the services are traditionally provided by separate Agencies with limited interaction between them [41].

Some authors have argued that the cost of providing the most

efficient services for CYP within integrated pathways are still not extensively explored and researched. A common constraint limiting the development of integrated approaches is the fact that mental and physical health services have traditionally been funded and commissioned separately, with diverse budgets, payment systems, and management teams [37]. There is a possibility that integrated working may compromise the joint capacity of the integrated services, due to inadequate costing and funding of their functions, especially as there are still no national tariffs for CAMHS. National guidelines are now increasingly being published in the UK to support funding of integrated care services [42,43].

There are still major problems with accessing appropriate adult specialist services for older adolescents as highlighted in a recent Government paper - Closing the Gap [44] and research [45]. Excessive demand on some of the specialist staff for the amount of resources available can lead to intra and inter agency conflicts, which can be distressing for the professionals [46]. Professionals may also inadvertently undermine one another by offering conflicting messages at various clinical encounters with the patients and their carers.

The nature of integrated approaches could make it methodologically difficult to attribute improved outcomes with certainty to the specific services providing care for the CYP. The Royal College of Psychiatrists has published a framework of outcome measures for liaison psychiatry designed to help with this difficulty [47]. Some services have used information from 'softer' outcomes such as the views of other staff on the value of the services, to measure the positive impact of the integrated clinical approaches introduced [37]. However, this type of outcome metric may not be considered robust enough by service commissioners [4].

Another common stumbling block for integrated care is the existence of barriers to the sharing of information about patients as a result of incompatible IT systems in different parts of the health and social care system. In many parts of the UK, mental health providers, acute trusts, general practices and other health and social care providers use mutually incompatible systems. Furthermore, while basing integrated teams in the same premises can help enormously with their ability to work together, this may not always be feasible.

### **Advantages of community-based integrated MH services for CYP with MH and Comorbid NDDs**

Advantages of inter-disciplinary cooperation among multi-professional teams have been well documented in several paediatric, medical and surgical conditions, including reduced length of hospital admission and improved quality of life [37,48]. Early and regular multidisciplinary interventions among children with Down's syndrome have been shown to significantly improve rates of school attendance [49]. A meta-analysis of trials of integrated medical and behavioural care demonstrated evidence of several improved outcomes [50,51].

Drawing on the findings from a 3-year qualitative study, Abbott and colleagues concluded that whilst professionals felt that they were able to offer families a more efficient service, there was concern that the overall impact of multi-agency working on disabled children and their families could be limited. The professionals also spoke highly of

their multi-agency working experiences and found it rewarding [52].

Shared use of scarce resources can lead to an overall more cost-effective service provision. For example, Integrated Database can help to avoid duplication of administrative costs for each isolated service. It also helps to reduce other costs related to implementation of clinical audit and research projects [53]. Substantial savings can be achieved in public expenditures on other service sectors for CYP including inpatient hospitalization, the juvenile justice system, the child welfare system, and the special education system [54]. For example, early identification of psychiatric, developmental, and substance abuse problems coupled with ready access to MH services offer the promise of decreasing the utilization of high intensity services by CYP. This would also reduce the impact of such disorders on the CYP's ability to function in their developmentally appropriate roles, and decrease the future cost burden on their family and wider society, such as lost productivity at work [38].

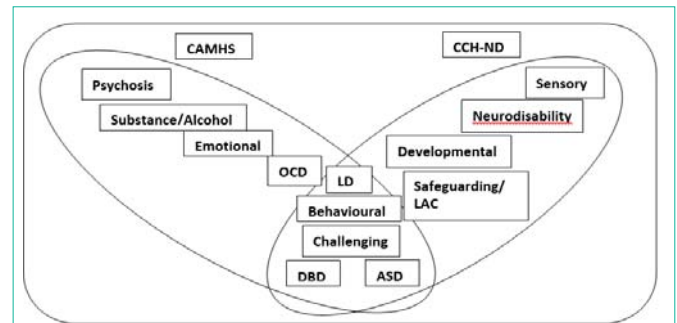
On the other hand, earlier studies of integrated services have yielded less positive results. For example, Peck et al. (2002) [55] found that partnership working led to some negative and adverse effects on staff in MH services. In the USA, network-based healthcare integration strategies were reported to have met with mixed financial success [56].

### Service users', parents' and carers' perspectives

Research has identified several barriers that families face in MH service utilization, including stigmatizing attitudes towards mental illness and limited service availability [57]. Focus groups and interviews with people who have experienced concurrent and overlapping problems with their mental and physical health identified the need for a more integrated approach, with emergence of six major themes: (i) preferences for professionals taking a 'whole person' perspective; (ii) effective communication skills with non-judgemental and supportive attitudes; (iii) provision of care co-ordination (iv) proactive care; (v) peer support and self-management skills, and (vi) support for family and careers [37]. The management of MH problems in community-based settings such as CCH clinic/General Practitioner surgery has been reported to be cost-effective and also offer several desirable characteristics that makes it more acceptable to the CYP such as less stigma, proximity to home, and receipt of care from familiar providers [58].

Studies in different areas of child health have pointed to the role of children and families in any effective service delivery system, emphasising the critical need for the service to be responsive to the needs and values of the families it is designed to serve [59]. Compared with the general population, people with substantial caring responsibilities have higher levels of stress and depression and lower levels of subjective wellbeing, as well as poorer physical health [60,61]. There is increasing evidence that integrated inter-agency collaborative practices can reduce the stress levels in these at-risk populations with caring responsibilities [62].

Integrated models of MH service delivery for children and families, known as Systems Of Care (SOC) need to strive to be child-centred, family-focused, community-based, and culturally competent [63].



**Figure 1:** Showing a schematic representation of the overlap between neurodevelopmental, behavioural, emotional and psychiatric disorders with an overlap between CAMHS and CCH.

ASD: Autism Spectrum Disorder; DBD: Disruptive Behaviour Disorder; CAMHS: Child & Adolescent Mental Health Service; CCH-ND: Community Child Health/Neurodevelopmental Pediatrics; LAC: Looked-After-Children; LD: Learning Disability; OCD: Obsessive Compulsive Disorder

### Overlapping roles of paediatricians and Child/Adolescent Mental Health (CAMH) professionals

CCH or Neurodevelopmental Specialty is the branch of Paediatrics that deals with childhood neurodevelopmental-behavioural problems, such as ADHD, ASD, developmental delays, LD, behavioural and emotional disorders (NDBED, and other behavioural issues (Figure 1). CCH Paediatricians work as part of an integrated holistic team with the education, social care and voluntary sector [17,64]. Most children with NDDs will be seen by a wide range of professionals including MH specialists such as Psychiatrists, Psychologists, Neurophysiologists and other practitioners [14].

In the UK, CCH is also the largest paediatric sub-specialty focusing on the care of the most vulnerable children and families, including children with long-term complex health needs, and those with safeguarding concerns, who are "Looked After" or being adopted [23]. This population of CYP is often at increased risk of several NDBEDs and co-morbid MH problems, but they are also the group most likely to face many barriers to accessing evidence-based prevention or treatment services [65,66]. Close integration of preventive and therapeutic MH into traditional CCH services accessible to these high-risk children and families is the best way to provide them with optimal holistic care they need [67].

There is strong evidence that children with NDD and intellectual disorders have three to four-fold increase in the prevalence of co-occurring mental disorders into adulthood [68-70]. A study of patients with NDD followed up through a registry in Philadelphia identified significant direct associations between NDD and MH disorders, even after adjusting for sociodemographic correlates, and other physical and mental disorders [71].

There is therefore a wide overlap between the roles of CCH Paediatricians and Mental Health Practitioners (Figure 1). For example, while ADHD was originally the remit of CAMHS, CCH services have played an increasingly important role in managing this condition. This is shown by the fact that 63% of CCH services managed ADHD in 2016 compared to only 15% in 2006 [23].

CCH Paediatricians often encounter CYP with MH and behavioural problems through their work with Child Safeguarding

services or CYP with neurodevelopmental and neurodisability conditions with comorbid MH disorders. However, the CCH clinicians are not usually trained to assess and treat MH and behavioural difficulties. Effective management of these CYP with MH and behavioural difficulties requires access to psychological therapies and sometimes, psychotropic medications, which most CCH/ND Paediatricians are not trained to use [23]. These conditions are best seen and treated within a comprehensive integrated CCH/CAMH service.

### **Innovative service funding for sustainability of integrated child psychiatry and the paediatric services**

Well intentioned desire for integration and collaboration among different isolated child health services is often countered by competition for funding and high service demands [41]. Reports of innovative integrated services have shown that the innovators faced significant challenges both to obtain initial funding to cover the costs of change, and then to secure a sustainable source of funding for the longer term [37].

The American Academy of Child and Adolescent Psychiatry (AACAP) recommends that sustainable funding strategies be developed for integrating child psychiatry into paediatric services. Innovative and flexible financing models need to be developed that will reimburse and incentivize non-face to face consultations, joint multi-professional consultations, care coordination, and community-based systems of care for optimal effectiveness [34,38, 86].

Recent guidance from UK healthcare regulatory body (Monitor) encourages commissioners to develop new payment approaches for MH services, including using capitated and year-of-care models [43,72]. These approaches could be used to support integrated commissioning of CCH and CAMH services. The Scottish Health & Social Care Directorates have taken the initiative to create a small amount of pump-priming funding made available for encouraging the development of Managed Clinical Networks (MCN) across Scotland [42].

In the UK, successful examples of integrated CCH and CAMH Services such as The Peterborough Integrated Neurodevelopmental Service appear to benefit from having joint or overlap funding and Organisational responsibility for both paediatrics and CAMHS [41]. Such integrated services have the advantage of structured parental behaviour support and the provision of effective psycho-education training programmes for parents of children with neurodevelopmental disorders [36].

### **Examples of Integrated services from other Specialties**

Managed Clinical Networks (MCN) have been set up in Scotland for a variety of Specialties. A MCN is defined as “linked groups of health professionals and organisations from primary, secondary and tertiary care, working in a co-ordinated manner, unconstrained by existing professional and (regional) Health Board boundaries, to ensure equitable provision of high quality clinically effective services”. This was envisaged to ensure that existing health service resources and staff are allowed to focus on patients and their difficulties which is what matters. This focus on patients is further emphasised by having direct involvement of patients in these networks [73]. MCNs have been successfully set up to manage Diabetes, Cancers, Heart diseases

and Stroke [42,74].

A number of other innovations in the UK and elsewhere are giving primary care an enhanced role at the interface between mental and physical health, in particular for people with long-term conditions through evidence-based “Collaborative Care” approach. It involves case management delivered by specially trained psychological wellbeing practitioners, who receive regular supervision meetings with a MH Specialist, and includes use of standardised treatment protocols by the case manager [37,75]. A similar approach could be used to integrate CCH services with the tertiary level MH services for CYP.

Liaison psychiatry (or psychology) services have existed in many CCH departments for several decades, but with increasing shortage of CAMH professionals, lack of statutory underpinning laws and inadequate resource allocations, provision of the liaison services currently remains highly variable across the country [76].

Community-based multidisciplinary teams have been successfully set up for co-ordinating the care provided to people with multiple or complex chronic diseases. For example, inclusion of a MH professional in multidisciplinary teams is increasingly common in Diabetes care. A successful example of integration at this level is the 3 Dimensions of care for Diabetes (3DfD) service in South London, which provides integrated care for the physical, mental and social aspects of Diabetes, having a wide range of MH professionals fully integrated in the team and also including social support workers [37].

NHS England has produced some guidelines for creating and effectively running Managed Clinical Networks (MCN) for dental services [77]. A multidisciplinary group of paediatricians and child psychiatrists have produced a set of appropriate consensus statements that would define the ideal structure and direction of integrated multidisciplinary ADHD services in the UK. Forty statements were agreed, covering ten topics, ranging from joint commissioning to optimization of the care pathway [34].

### **Use of technology to enhance services integration**

Technological advances such as using Video Teleconferencing (VTC) to deliver clinical services in real time allows patient interactions that approximate an in-person visit. CAMH Service may be well suited to delivery through VTC because of the comparatively less need for clinical procedures that require face-to-face interactions. Telepsychiatry offers one model to rectify the disparities in children’s access to MH care by redistributing the workforce, disseminating evidence-based interventions to the community, and supporting primary care providers’ efforts at MH treatment [78].

The literature on Telemedicine in MH management shows strong and consistent evidence of its feasibility, acceptance by intended users, as well as uniform indication of improvement in symptomology and quality of life among patients across a broad range of demographic and diagnostic groups. Positive trends in cost savings have also been demonstrated [79].

Digital technologies have also been used in a number of ways to facilitate integration of physical and mental health services in the UK, such as the use of Tablet-based digital screening tools to identify hospital patients who may need referral for MH support [37].

**Table 1:** Showing various levels of Paediatric care involvement in CYP Mental Health Problems.

Levels of care	Levels of Specialty responsibility
Level 0 (Preventive and Screening) is applicable to all patients being seen in a primary care practice, to prevent and detect mental health problems, requiring minimal psychiatry involvement.	Paediatrician: High
	MH Team: Minimal
Level 1 (Early Intervention & Routine Care Provision) is applicable for patients and families with relatively uncomplicated, high prevalence behavioural problems. Assessment and management is typically performed by the PCP, with support available from a consulting Psychiatrist.	Paediatrician: High
	MH Team: Low
Level 2 (Specialty Consultation, Treatment & Coordination) is applicable for patients with defined behavioural disorder at intermediate level of risk, complexity or severity, requiring enhanced specialist consultation or intervention. Management Involves a negotiated role between PCPs and child and adolescent psychiatrists.	Paediatrician: Moderate
	MH Team: Moderate
Level 3 (Intensive Mental Health Services for Complex Clinical Problems) is applicable for patients with a defined behavioural disorders at high level of risk, complexity or severity, requiring specialist consultation and intervention that may include multisystem service teams.	Paediatrician: Low
	MH Team: High

CYP: Children and Young Persons; MH: Mental Health;  
Source: AACAP, 2012 [38].

The recent Covid-19 pandemic prompted many Services to quickly adopt tele-medicine in order to continue providing care for their users while movements were restricted to reduce transmission of the Coronavirus. This led to several rapid innovations in remote MH care provision and development of a plethora of digital platforms that support this new way of working. Many Organisations are currently reflecting on the lessons learnt from this new experience of widespread digital service provision with a view to retaining some aspects of remote care delivery after Covid-19. Some of the advantages that organisations are seeking to retain include patient preference, savings in time and travel costs for both patients and staff, and reduction in environmental pollution [80].

### Desirable characteristics of integrated services

Effective leadership at the most senior management levels and introduction of national policies that allow for local solutions providing improvements are indispensable requirements to successful integrated care services [81]. Clinical Networks / Integrated services need to be carefully managed by a lead clinician or manager rather than left to drifting, to nurture and develop identity, involve the less-connected members so as to increase the connectedness and therefore effectiveness of the network. This requires essential leadership skills of relationship-maintenance, diplomacy, consultation and negotiation [82]. In most cases, innovative integrated services have often been led by a small number of individuals, who were committed to service improvement and who persevered in the face of a number of challenges, dedicated to designing the innovation, influencing commissioners, board members and other colleagues [37].

Another important ingredient for effective service integration is fit-for-purpose service design and planning, with regular evaluation to avoid duplication of work and optimize scarce resources [35]. The AACAP recommends implementing strategies to evaluate the effectiveness of collaborative care services in order to determine that they are meeting the established goals. Performance can be measured through the analysis of various care process variables (such as the number and characteristics of consultations and collaborative work), patient follow-up studies to examine specific clinical outcomes, child and family satisfaction, and cost analysis [38].

Some practical service arrangements for effective implementation of integrated services include identification of common frameworks for diagnosis thresholds such as using international standards (ICD

10 or DSM), and enabling children and their families to pass freely through the system of several inter-agency networks without re-diagnosis at each point. Issues of confidentiality addressed with the families at the earliest possible stage of their contact with any of the specialist services, would help facilitate essential information sharing among the services. Innovative multi-agency and multidisciplinary training courses covering a wide range of NDBED and MH topics would ensure facilitation of common approaches to holistic assessment and management of all CYP presenting across different areas over their entire involvement with the integrated services.

Integrated service models require all health and care professionals being willing and able to take a 'whole person' perspective and having the necessary skills to do so. They need to adapt to service models that support skills transfer and shifting notions of who is responsible for what [37].

An integrated care pathway for specific MH problems would involve training programmes for various schools and health professionals, raising awareness of the features of NDD and MH problems in CYP, and covering appropriate management strategies [83].

Support from local and national commissioning agencies for integrated multi-agency health care pathways are paramount and indispensable to successful implementation [41]. National guidance is required on different aspects of integration including workforce development and training, leadership skills for strategy and planning, relationship-maintenance, diplomacy, consultation and negotiation, and development of quality assurance, governance and research procedures, patient and carer Involvement, Information Technology and statutory funding support.

### Recommended frameworks for the integration of child Mental Health into Child Health services

Twenty-five percent of CYP seen in the primary care setting and about half of all paediatric office visits involve NDBEDs, psychosocial, and/or educational concerns [38,84]. This recognition of the significant role of primary care Paediatricians (PCPs) in identifying and treating CYP with NDBEDs, who refer about 75% of the CAMH cases, has led the American Academy of Paediatrics (AAP) and AACAP to advocate the integration of many elements of MH care into the paediatric health services.

The AACAP recommends that MH prevention and screening, triage, diagnosis, early intervention, routine assessment and treatment, specialty consultation, specialized treatment, coordination of services, and monitoring among CYP should be done in active collaboration with child Psychiatrists and/or allied MH providers, as needed, to improve service outcomes for children with mental illnesses [58]. The allocation of these components across the CCH and MH services will vary according to the severity, chronicity, and complexity of mental health problems for individual patients. The AACAP [38] has proposed four levels of care with varying degrees of psychiatric and paediatric professional involvement, with indispensable partnership with patients and families. The lowest level of MH complexity corresponds to preventive and screening while the highest level entails the intensive MH services for complex clinical problems (Table 1).

Other promising models of integrated Paediatric/MH services have been researched and implemented in recent years, including facilitating consultation by CAMH specialists, on-site care coordination, and co-location of PCP and MH services [85].

The contributions of the CAMH specialists will include provision of education regarding the use and interpretation of screening tools, assisting in defining decisions of when to enhance level of intervention and resource choices, provision of on-demand verbal consultations, behavioural recommendations, the role of psychopharmacology, and treatment monitoring, availability for consultation appointments with parent and child. Paediatricians will be able to provide regular screening for MH, substance abuse, developmental and family psychosocial problems, promote parent/youth self-management skills to enhance self-sufficiency and help prevent the onset of illness, and/or to prevent relapse for those in recovery, provide behavioural recommendations and psychopharmacological treatments as appropriate, collaborate with the CAMH specialists to develop a care plan for ongoing monitoring of the child's condition and the efficacy of the interventions, and agree when to resume primary care role over time with improvement in the child's acuity and/or complexity of clinical needs.

## Conclusion

Integrated care has traditionally focused on bridging the gaps between health and social care, or between primary and secondary care. Different levels and models of integration in MH service provision for CYP are now being promoted in many HIC [37]. Many recent healthcare reviews and government policies have consistently argued for increased level of integration between MH and other physical or NDD in CYP.

Integration of child and adolescent mental health care into paediatric care is essential to ensuring access to appropriate, high quality care for children with mental and behavioural health needs. Innovative mechanisms for financing the integration of CAMHS within the CCH are needed for its effectiveness. The process needs to be inclusive and take into account the unique characteristics of the community and its stakeholders.

It can be argued that inclusion of MH professionals in multidisciplinary CCH teams (such as a Child Development

Centre), represented by at least a Clinical Psychologist or a liaison Child/Adolescent Psychiatrist, should be the norm, rather than the exception, in all parts of the UK, to provide optimal holistic care to all CYP with a wider range of Neurodevelopmental, Behavioral and Emotional Problems (NDBED).

## Key Messages

### What is known

Children and Young People (CYP) with Neurodevelopmental and intellectual disorders have three to four-fold increase in prevalence of co-occurring mental disorders into adulthood.

There is evidence of unmet mental health needs among CYP with neurodevelopmental disorders.

Integrated care involves overcoming the breakdown in communication and collaboration arising between different parts of the Healthcare system and different groups of professionals.

The current picture of integration between Community Child Health (CCH) and Child and Adolescent Mental Health (CAMH) services in the UK is mixed and complex.

### What is new

The rationale and advantages for integrating CCH and CAMH services are discussed

The overlapping roles of Paediatricians and Child and Adolescent Mental Health Professionals are highlighted.

### Direct relevance of the reported work to clinical practice

The frameworks discussed provide practical guidance for clinicians and policy makers on the successful integration of CAMH and CCH Services.

## Author Contributions

Ogundele MO and Ayyash HA conceived the idea, performed the literature review and prepared the draft manuscript. Ani C conducted a critical revision of the manuscript.

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