BJMHR
British Journal of Medical and Health Research
Journal home page: www.bjmhr.com

Schools, Social Services, and Digital-Based Tools (Setting) in Early Detection and Intervention for Adolescent Mental Health Disorders in the UK.

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ABSTRACT

Mental health interventions encompass a broad-spectrum including promotion, prevention, early intervention, treatment, recovery, and maintenance. However, the specific roles of various social settings and tools—such as schools, social services, and digital platforms—remain inadequately understood or integrated. This systematic review aimed to establish evidence-based insights into the roles of these settings and tools in the early detection and intervention of adolescent mental health disorders in the United Kingdom (UK). A comprehensive search of six electronic databases was conducted between the 8th and 19th of April 2025, supported by policy documents and supplemented by reference list screening of included and review articles. The search strategy was guided by the PIOS framework. Out of 9,325 citations screened, 12 studies met the inclusion criteria. These studies, published between 2016 and 2023, focused on adolescents aged 8 to 25 years and addressed various disorders, including social anxiety disorder. There is need for integration and multidisciplinary collaboration to increase the extent and effectiveness of mental health interventions. Albeit digital tools or online delivery approach offers the opportunity to overcome many of the limitations associated with school-based tools. However, consistent data collection across the social service, health and education settings, an all-encompassing information can be generated to support the understanding of individuals' exposure to risk factors for mental health problems.

Keywords: Mental Health, Early Detection, Intervention, Schools, Social Services, Digital Technologies

*Corresponding Author Email: Adicokele@gmail.com
Received 02 June 2025, Accepted 24 July 2025

Please cite this article as: Adindu KN *et al*., Schools, Social Services, and Digital-Based Tools (Setting) in Early Detection and Intervention for Adolescent Mental Health Disorders in the UK. . British Journal of Medical and Health Research 2025.

INTRODUCTION

A noticeable proportion of children and adolescents are affected by mental health conditions, with some studies suggesting increased anxiety, depression, and self-injury in young people (9, 27, 29). It is estimated that 75% of adults who experience poor mental health in adulthood first experience difficulties before age 18 (29, 52, 54). Individuals that are impacted by mental health problems during this developmental window sacrifice more in respect to poorer educational and occupational outcomes, relationship challenges, and non-stop depression (20, 29, 62). This confirms the significance of early interventions, which support the promotion and maintenance of well-being, as well as the prevention and detection of mental health pre-clinical risk factors and early signs, for the growth and development of young people (5). Mental health interventions exist in a range, comprising of promotion, prevention, early intervention, treatment, recovery and maintenance (5, 35).

In England it is estimated that one in five (20.3%) of 8 to 16-year-olds have a probable mental health problem, with 50% of diagnosable mental health illnesses amongst adults having presented by the age of 14 and increasing to 75% by the age of 18 (53, 61, 64). However, despite this there is evidence of a disparity between the prevalence of mental health disorders, and the proportion of young people accessing treatment, with as much as 70% of young people who experience mental health difficulties, not receiving appropriate interventions at a sufficiently early stage (52, 61, 64). Mental health challenges amongst adolescents were exacerbated during the COVID-19 pandemic, with a recent report suggesting that poor mental health increased amongst 5 to 16-year-olds between 2017 and 2020 (51). Evidence pointed that the level of anxiety and depression are increasing among adolescent, specifically since the Covid-19 pandemic (3, 25, 33, 51, 56, 71). This situation has also been noticed among young women compared to young men (4, 51).

Early detection and intervention could minify the challenge of mental health problem for individuals and societies (3, 12, 44). The onset of mental health related issues is in adolescence stage and mostly extended, and continue through the lifetime, early detection and subsequent intervention has an even bigger impact in this age group (15, 44). Despite the high need, young peoples' help-seeking behaviour within the mental healthcare system is remarkably low (44, 54). The low help-seeking capacity of the adolescents could have influence the non-reducing burden of mental illness. Since the COVID era, the mental health services for adolescent and young adult have witnessed intense pressure and the increase in referrals to Child and Adolescent Mental health services (CAMHS) (39, 47). However, only limited group with poorest functioning and most complex psychiatric presentations have established connection with the mental health services by age eighteen (43, 47). Common

issue related to poor service delivery include missed diagnosis and poor early identification which further extend the social, health and occupational gap of the individual (19, 66). The advantage of early detection and prevention of adolescent mental illness are well-known; however, transferring the research outcome into achievable interventions remains a challenge. According to research by (19, 21, 22), this is somewhat due to the dissimilarities in diagnostic categorization and therapeutic models of service available among child and adult services.

Many of the early intervention models developed for mental health care have been developed to support onset of an individual's symptoms, focusing on problem prevention aiming to prevent problems from becoming more severe and long-term (20, 23). Such research focus is critical as studies have shown that depression or anxiety diagnoses during adolescence are in connection with school challenges, poorer academic and socioeconomic outcomes, such as unemployment in adulthood (16, 55, 63, 67). Also, poorer psychosocial outcomes such as low social support, loneliness, poorer family relationships, higher stress and alcohol/drug abuse have been identified in adults who experienced anxiety or depression in their youth (5, 16, 28, 55). Prevention and early intervention are acknowledged as the major actions for reducing the impact of any potentially serious health condition. Despite such action leading to undeniable success in promoting mental health, the aspect of early intervention in adolescent remains an aspect that has not witnessed the expected success (17). This is specifically valid for adolescent and young adult mental health. In fact, mental healthcare is originally positioned to offer health benefit to adult populations during crisis events and major emergencies (17, 45).

To meet the demand for early intervention into childhood and young adulthood mental health difficulties, it is important to parallel redesign prevention and early intervention services for adolescent groups, by promoting multidisciplinary collaborations between different specialized professionals that ensure integration and enhanced service extension to the primary care (17, 28). Studies have indicated that schools are the major social setting when the targeted group can obtain positive mental health and all-round emotional wellbeing, since schools are places where majority of the adolescent spend much of their time, easy accessibility to their family and opportunity to form community links (11, 15, 64). Considering the digital revolution of the present time, digital mental health intervention leveraging digital technologies, like mobile applications, web-based platforms, artificial intelligence (AI) and wearable devices, further enhance the promising solutions for the mental health demand of the adolescent and young adults (5). These interventions can over-come traditional barriers such as accessibility, affordability and stigma associated with face-to-face interventions (5, 70). This systematic review, therefore, seeks to fill this critical

research gap by synthesizing recent findings from quantitative studies on role of schools, social services, and digital-based screening tools in early detection and intervention for adolescent mental health disorders in the United Kingdom (UK).

METHOD

The current systematic review is intended to bring together evidence-based findings on role of schools, social services, and digital-based screening tools in early detection and intervention for adolescent mental health disorders in the United Kingdom (UK). Specifically, an all-encompassing literature search guided by the procedure of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (72) was carried to outline various evidence-based intervention approached that have been applied by schools, social services, and digital technology towards enhancing the mental healthcare outcome among adolescent in the UK.

Search Strategy

The search was carried out through six electronic databases (including MEDLINE via Ovid, Embase, PubMed, Web of Science, Scopus, and google scholar) which was conducted between 8th to 19th of April 2025. Searches of Title/Abstract and subject index headings were supported with relevant policies documents and additional studies were identified through screening reference lists and citations of included studies and relevant review articles. Search concept was developed based on PIOS (population, Intervention, outcome and study design) framework and terms used across all searches are presented in Table 1.

Supplementary data to:

Schools, Social Services, and Digital-Based Tools (Setting) in Early Detection and Intervention for Adolescent Mental Health Disorders in the UK

Supplement 1

Table 1: PIOS Framework and Search Concept

PIOS Element	Description	Keywords/Terms
Population (P)	Adolescents in the UK	"Adolescent" OR "Teenager" OR "Youth" OR "Young people" OR "Secondary school students" OR "High school students"
Intervention (I)	School-based Approach	"School-based" OR "School intervention" OR "Educational intervention" OR "School mental health services" OR "Guidance counselor" OR "Pastoral care"
	Social Services Approach	"Social services" OR "Child welfare" OR "Youth services" OR "Social work" OR "Family support services"
	Digital-based Screening Tools	"Artificial Intelligence" OR "AI" OR "Machine learning" OR "Digital health" OR "Digital screening" OR "Automated screening" OR "Mental health app" OR "Predictive analytics"

Outcome (O)	Early Detection and Intervention	"Early detection" OR "Early identification" OR "Early intervention" OR "Preventive intervention" OR "Screening" OR "Diagnosis"
Study Design (S)	All empirical studies and reviews on disparities	"qualitative study", "quantitative study", "empirical study", "mixed-method*", "observational study"

Eligibility Criteria

From the database search, the database engine is expected to give series of articles and other academic materials as feedback based on the keywords or phrases used. Therefore, the search result is subjected to a pre-defined inclusion/exclusion criterion as a means of sorting the academic material and obtain those that aim and research question of the study.

The inclusion criteria ensure that:

- **Population(s)/Participants**: Young people between 10-22 years (or mean sample age between ≤ 22 years) with or seeking support for various mental health problem.
- **Content:** All articles related to mental health (psychological disorder, depression, anxiety, mood disorder and behavioural disorder) early detection and intervention in respect to school-based, social service and digital-based approaches.
- **Context:** Study conducted in the United Kingdom, Scotland, Wales and Northern Ireland.
- **Publication Type**: peer-reviewed primary research studies (quantitative, qualitative, mixed methods)
- **Publication Year**: All articles published from 2015 to 2025
- **Publication Language:** English
- The Exclusion criteria ensure that:
- All adult and young people >22 years.
- All articles not related to mental health, early detection and intervention in respect to school-based, social service and digital-based approaches.
- All studies conducted in other countries and not in the United Kingdom.
- Review articles, letters, editorials, opinion pieces, study protocols, conference abstracts
- All articles published prior 2015 and in language other than English Language.

Study Screening and Quality Assessment

The initial search based on key terms returns feedback of 9,325 lists of articles which was immediately subjected to ineligibility based on automation tools and irrelevances and the search strategy was left with total of 294 citations. Through screening titles and abstracts, 294 full texts were assessed for eligibility, of which 8 papers were included in the review (Figure

1 for the PRISMA flow diagram). An additional 4 papers were also identified through citation checking. The quality assessment of the included articles was carried out using the Critical Appraisal Skills Programme (CASP) tool (see Table 3), which provides 10 questions to assess study quality in a checklist format (73).

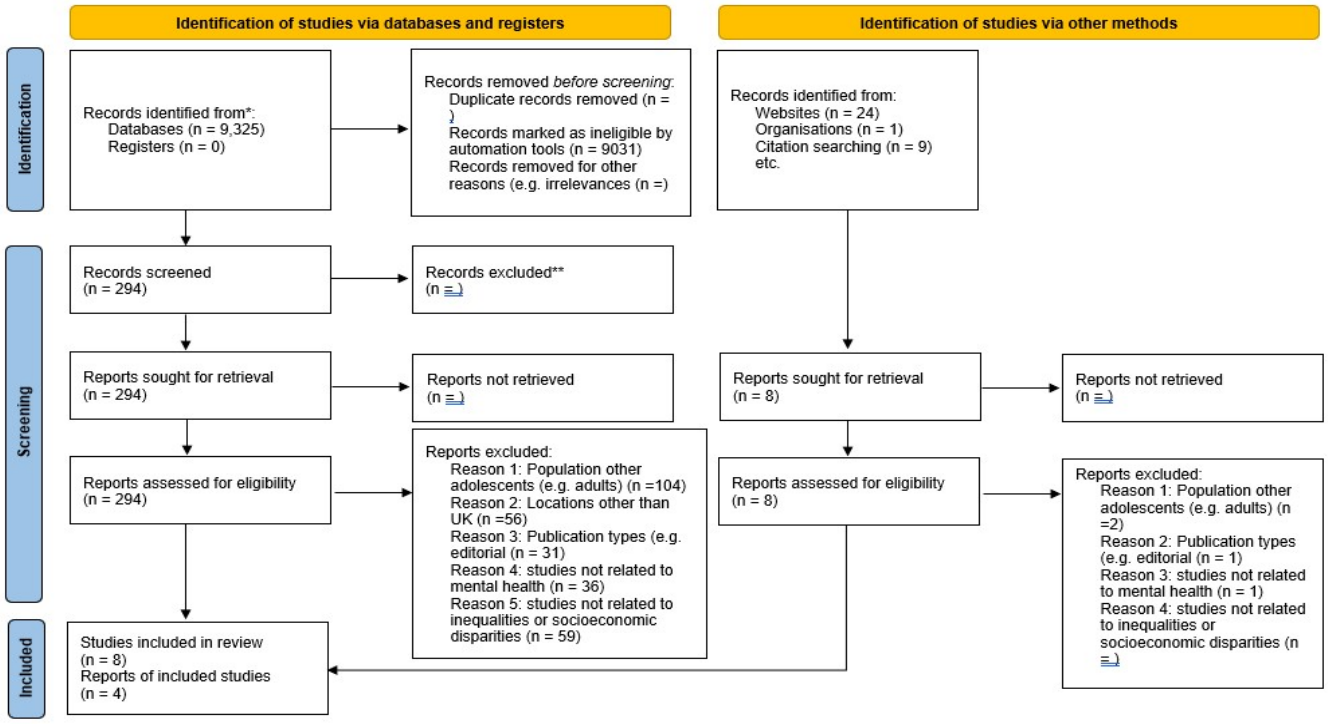


Figure 1: PRISMA 2020 flow diagram for the systematic review

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021; 372:n71. doi: 10.1136/bmj.n71

(PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses)

Supplement 4 (Quality assessment)

Table 3: CASP tool for appraising qualitative studies

Checklist	Williamson et al. (2022a)	Williamson et al. (2022b)	Jones et al. (2020)
1. Was there a clear statement of the aims of the research?	Yes	Yes	Yes
2. Is a qualitative methodology appropriate?	Yes	Yes	Yes
3. Was the research design appropriate to address the aims of the research?	Yes	Yes	Yes
4. Was the recruitment strategy appropriate to the aims of the research?	Yes	Yes	Yes
5. Was the data collected in a way that addressed the research issue?	Yes	Yes	Yes
6. Has the relationship between researcher and participants been adequately considered?	Yes	Yes	Yes
7. Have ethical issues been taken into consideration?	Yes	Yes	Yes
8. Was the data analysis sufficiently rigorous?	Yes	Yes	Yes
9. Is there a clear statement of findings?	Yes	Yes	Yes

10. How valuable is the research?	Highly valuable	Highly valuable	Highly valuable
Comment	Include	Include	Include

From Critical Appraisal Skills Programme (CASP), 2018.

RESULTS AND DISCUSSION

Attributes of the Included Studies

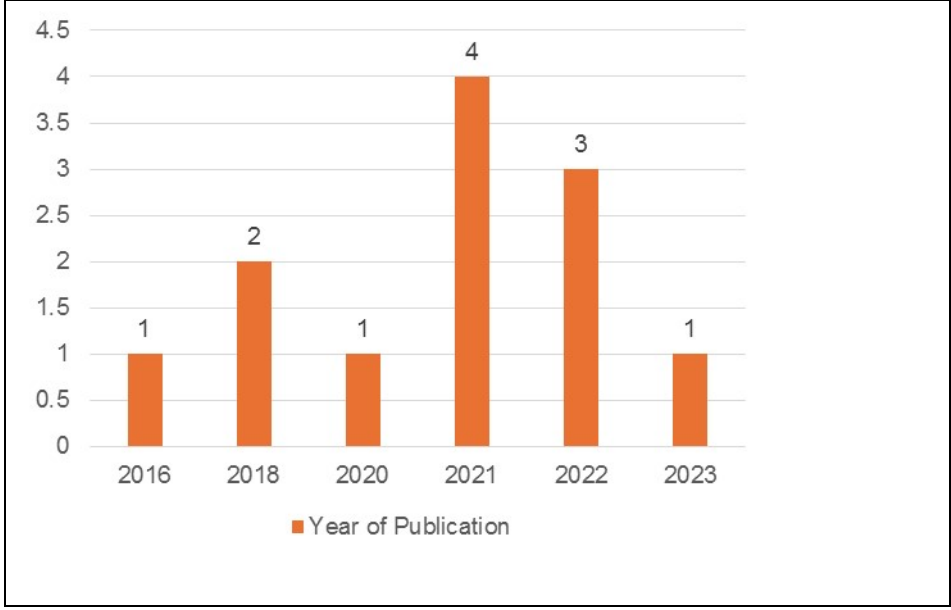
From the initially returned 9,325 citations, 12 full texts made the final review based on the inclusion/exclusion eligibility while the attributes of the selected studies were presented in Table 2 and Figure 2. From these studies, seven were randomized controlled trial (RCTs) (29, 40, 49, 74, 75, 76, 77) one was cluster RCT (14), three-arm RCT (49) and prodigy RCT (31). Also, some studies were based on co-design approach (40, 68, 77) while (69) and (6) are based on a mixed method and qualitative approach respectively.

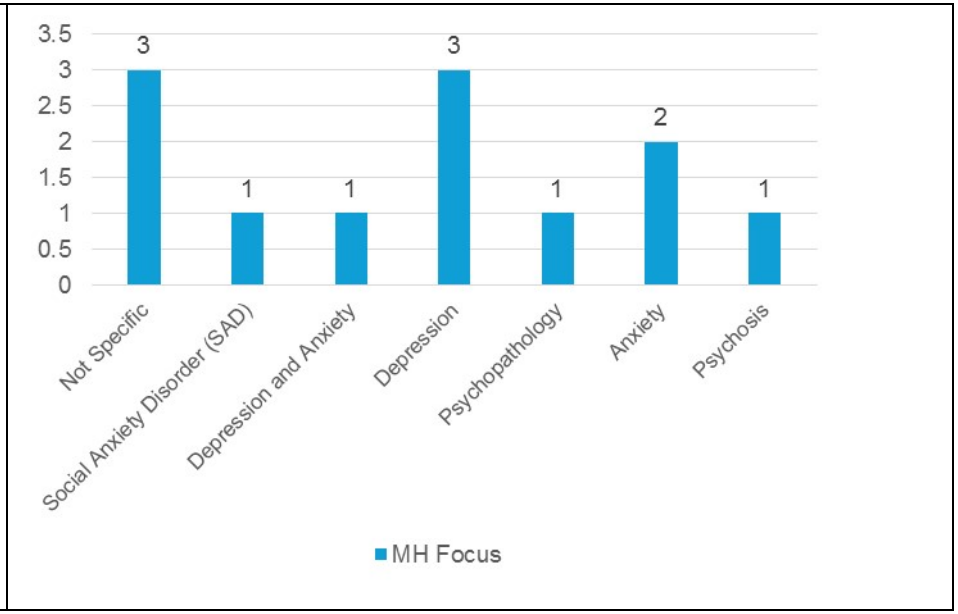
Table 2: The Attributes of the Selected Studies

Author/Year	Study Design	Early Detection Procedure	Intervention Procedure	Participants (Age Group)	Setting	Mental Health Focus	Application
Digital-Based Tools/Approach							
Hugh-Jones et al. (2022)	Co-design and Feasibility	NS	Yes: Early Intervention	n=31 (15-17 years)	Schools	NS	Co-Design: MindMate2 and Partner2U
Leigh & Clark (2023)	RCT	NS	Yes: Therapist-Assisted	n=43 (14-18years)	Schools	Social Anxiety Disorder (SAD)	Adolescent Social Anxiety Disorder (OSCA)
Cardamone-Breen et al. (2018)	RCT	NS	Yes: Web-based Psycho education	n= 349 (12-15years)	Community	Depression and Anxiety Disorder	Web-based Parenting Intervention
Jones et al. (2018)	Co-design and Development	NS	Yes: Web-based Psycho education	Averagely 13 years	CAMHS and EPAD	Depression	MoodHwb
Jones et al. (2020)	Mixed Methods	NS	Yes: Co-deigned Digital Intervention	n = 40 (Averagely 13 years)	School, Healthcare Providers, CAMHS, EPAD	Depression	MoodHwb
School-Based Tools/Approach							
Pile et al. (2021)	RCT	NS	Yes: Early Intervention	n =56 (16-18 years)	School	Depression	Imagery-based Cognitive Behavioural Intervention (ICBI)
Ford et al. (2021)	RCT	Yes: School-Level Factors	NA	n=26,885 (11-14 years)	School	Psychopathology, Depression and Well-being	MYRIAD Project
Chisholm et al. (2016)	Cluster RCT	NS	Yes: Intergroup Contact Intervention	n= 769 (12-13 years)	School	NS (Stigma Reduction)	Mental Health Knowledge Schedule (MAKS)
Williamson et al.	Codesign	Yes: School-	Yes: School-Based	n=979 (8-9	School	Anxiety	Therapist-Guided

(2022a)	Approach	based Screening	Intervention Program	years)			Parent-Delivered CBT
(69)	Qualitative	Yes: School-based Screening	Yes: School-Based Intervention Program	6-16 years	School	Anxiety	School-Based Screening/ Intervention Programme
Social Service Tools/Approach							
(49)	Three-arm RCT	NS	Yes: Antipsychotic Medication, Psychological Intervention or a Combination of Both	n= 61 (14-18 years)	EIP and CAMHS	Psychosis	Managing Adolescent first-episode Psychosis: a feasibility Study (MAPS)
(31)	Prodigy RCT	NS	Yes: CBT-Intervention	n =270 (16-25 years)	EIP and CAMHS	NS (Severe Mental Illness)	Social Recovery Therapy (SRT)

NS: Not Specified, EIP-Early Intervention in Psychosis Service,





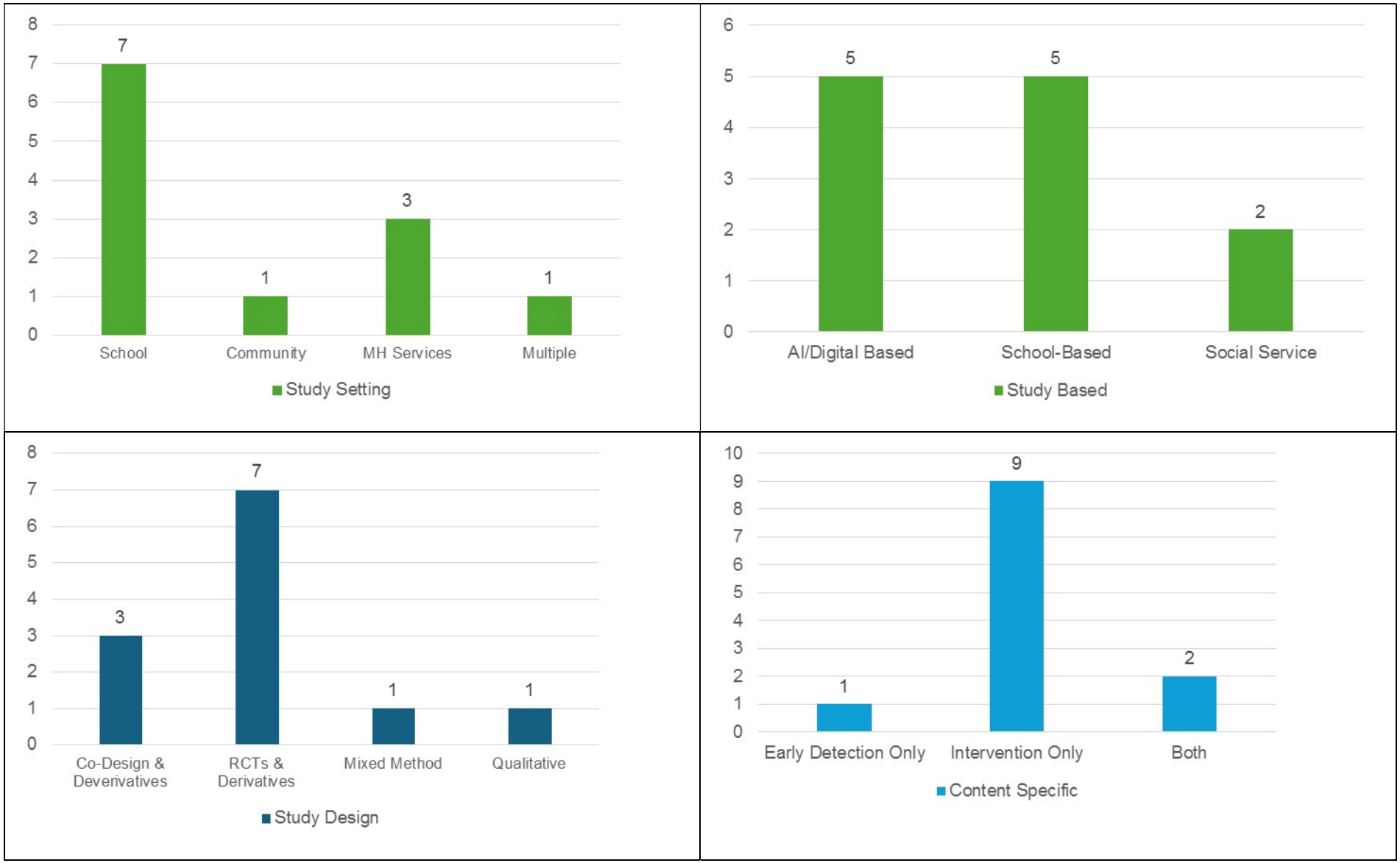


Figure 2: Bar charts showing attributes of the selected studies

Regarding the mental health focus, the cut across issue related to social anxiety disorder (SAD) (n=1), depression and anxiety (n=1), depression (n=3), Psychopathology, Depression and Well-being (n=1), anxiety (n=2) and psychosis (n=1). With respect to content specificity, the research (29), focused on early detection which was based on school-level factors, studies like (68) and (69), focused on early detection and intervention based on school-based screening and intervention program while the rest of the studies (n=9) focused solely on intervention. The study setting includes school (n =7), community (n=1), mental health services (n=3) and multiple settings (n=1). Based on the specific focus of the review, five studies focus on Digital-based approach (6, 40, 74, 76, 77), five studies focused on school-based approach (14, 29, 68, 69, 75) while two studies focus on social service based (29 and 49). Overall, the studies cover between the year 2016 to 2023 while age range between 8 to 25 years.

DISCUSSION

Early detection and intervention can counteract mental disorders and risk behaviours among adolescents; however, help-seeking rates are low (44). Early detection and intervention might reduce the burden of mental disorders for individuals and societies (10). Since many lifetimes mental disorders begin in childhood or adolescence and often continue through the life course, early detection and subsequent intervention has an even bigger impact in this age group (44) although, studies have shown that the extent of help-seeking behaviour among adolescent is obviously low (44, 54). The promotion and maintenance of well-being among adolescents has been linked with early intervention of mental health while mental health intervention consist of series of action including promotion, prevention, early intervention, treatment, recovery and maintenance (5, 35). Having focused on the mental health disorder among adolescent, the review has considered various evidence-based tools and approach adopted among UK-based schools, social services and digital technology in early detection and intervention of mental health disorder.

School-Based Tools in Early Detection and Intervention

Among the selected studies, (75) had indicated that evidence-based intervention based on school-setting for adolescent mental health is limited and required urgently. Their study focused on early intervention for depression through imagery-based cognitive behavioural intervention (ICBI). The outcome of the tool suggested that ICBI enhanced mood and strengthen those capacities associated with imagining and future planning. The research (24) suggested that long-term and complex outcome related with depression in adolescent can be preclude through early intervention. (15, 17, 29) explored school-level influence on adolescent mental health and suggested that characteristics of pupil population, and school

climate, explain a small but significant amount of variability in mental health of young people. This information might be used to identify schools that need more resources to support mental health of adolescent. Various mechanisms of school experience could influence mental wellbeing and considering the long-lasting and proximate universality provided through education, schools remain an important social setting that can ensure delivery of effective intervention to enhance well-being to ensure mental health disorder prevention and issues detection (26, 29). According to the research (14), education-alone approach was effective and offer more improvement in reducing stigma of mental disorder in adolescent that contact and education condition. (18 & 42) had previously suggested that education intervention is offers an effective intervention for minifying mental disorder stigma that contact intervention. Considering school-based screening and intervention delivery for anxiety challenges, (68) confirmed that a school-based programs that incorporate screening to identify those adolescents with potential of developing anxiety challenges and offer an intervention has the capacity to overcome some of the mental health disorders. The study by (5) posited that for such program to be initiated, it must effective, safe and reliable that is centrally focus on service user experience and stakeholder's acceptance. In the study of (69), school screening and intervention program for child mental health needs to consider attributes related to family attributes and ensure trustworthiness among parties.

Schools have been considered satisfactory and common setting for mental health prevention and intervention which offer supports through school-based health professionals (44, 59, 60). Several studies asserts that schools are most effective in providing safe spaces for after-school activities, establishing peer groups, building resilience and awareness, and supporting early diagnosis of mental health disorders (1, 33, 59, 60). (63 & 69) opined that school offer an important for overcoming the challenges associated with early detection and intervention. School-based early detection and intervention have been previously examined and was found to an effective setting for overcoming adolescent mental health illness (2, 36, 37). School-based early detection and intervention procedure may be cost effective and improve well-being and educational performance (9, 17). However, this approach is often hindered by low acceptance due to family concerns occasioned by increased stigmatization associated with early detection initiatives (18, 48, 64). These concerns buttressed the assertion of (9) on school-based tools and the need for acceptable delivery approach that can get all families engaged.

Social Service Tools in Early Detection and Intervention

The research (31) considered the efficacy of social recovery therapy intervention on the social disability and non-psychotic severe and complex mental health illness. The

intervention is an action-based therapy that is been executed social recovery therapy therapist. (49) considered the psychological, antipsychotic medication or a combined treatment as early intervention on first episode of psychosis (FEP) among adolescents. The studies could not entirely establish the effective of the intervention as (31) suggested no significant evidence of the intervention superiority to clinically available approach while (49) noted there were no serious adverse events related to the trial and one related adverse event. (7) had suggested the need for a national planning framework to ensure the delivery of assertive and integrative care across mental health, social care and educational/vocational services for young people with psychosis. The major feature of early intervention in psychosis (EIP) is embracing uncertainty about diagnosis in the early stage of psychosis (20, 21). National Institute for Health and Care Excellence (NICE) clinical guideline clearly outline family intervention (FI) to be delivered for all families of young people with psychosis and recommend working with families is an essential component of EIP (50). The non-psychotic severe and complex mental illness among adolescent that are socially disable are complicated which tends to be non-effective to a short-term evidence-based therapies for more discrete mental health problems, such as cognitive–behavioural therapy (CBT) for anxiety, depression and conduct disorder (23, 28. 31). (30) had suggested the adolescents of this group does not meet the criteria for FEP due to their social disability; hence not suitable for EIP services. For its suitability, EIP services are pro-active, individual-centred mental health services providing early detection and treatment in this critical 3-year period (32, 34, 39 52).

Digital Tools for Early Detection and Intervention

Digital mental health (DMH) interventions leveraging digital technologies, such as mobile applications, web-based platforms, artificial intelligence and wearable devices, have emerged as a promising avenue for addressing the mental health needs of young people. (76) 52approached social anxiety disorder (SAD) intervention through internet-delivered therapist-assisted cognitive therapy for adolescent (OSCA) which outperformed waitlist. Similar approach of Internet-delivered SAD-specific CBT for adolescents was assessed (52, 53, 57, 64). A digital intervention (mental health app) for adolescents showing early symptoms of deteriorating mental health was co-designed and tested for feasibility by (40). The study by (56) and (65) noted that there were over 22,000 mental health apps (MH apps) mostly focusing on adult anxiety, stress, panic, depression or well-being. Although, such application targeting adolescents and young people are coming up, mostly clinical based (43, 58). (74) developed a single-session, Web-based, tailored psychoeducation intervention to enhance parenting practices in supporting their adolescent with depression and anxiety issues.

Similarly, according to (77) through web-based psychoeducational intervention developed *MoodHwb* program for adolescent with or at high risk of depression. Such approach has been previously reported (38, 57, 58) and digital-based interventions are considered an important aspect for future clinical practice and research in depression in adolescents (6, 38). In continuation of their development, (6) assessed the feasibility, acceptability, and potential impact of MoodHwb program. MoodHwb was developed to support adolescents (and their family and caregiver) by using developmentally appropriate language, illustrations, animations, and interactive components aiming to enhance self-help, help-sourcing when required and social support. The research (13) used machine-learning prediction to predict the anxiety onset among adolescents (18 -25years) while developed ML-model have not been able to attain the performance level required for clinical adoption for adolescent' social care setting (16, 17, 22).

Implications of the Review

Early detection and intervention can mitigate mental health problem and risk behaviours among adolescents; however, help-sourcing level is minimal among the group (44) and without an effective procedure for early detection, adolescent and their families can witness long-term impact without effective mental health support (60). If accurate early identification tools could be developed, a timely and effective mental health service can be delivered (61). The systematic review has been able to consider various tools developed towards early detection and intervention of mental health problem among adolescents. The role of school-based, social services and digital tools were specifically considered as the three components that play a significant role in ensuring effective and timely support for mental health issues among adolescents.

Schools provide an obvious, conforming environment (Robinson et al., 2013) and promising tools for detection of risk for mental health problems and risk behaviour that are otherwise undetected (26, 44) and intervention that potentially increase the help-seeking behaviour (44, 60). Despite the opportunity provided by schools for offering effective early detection, interventions and prevention; there is still high variability in the mental health services among schools within as well as between countries and is a current policy focus in the United Kingdom, which traditionally has not had a strong school-based mental health service.

Findings have indicated that mental health promotion and prevention responsibility cannot be solely placed on mental health professionals (social service) only (28, 32, 58). There is need for integration and multidisciplinary collaboration to increase the extent and effectiveness of intervention and reduce the risk of poor long-term outcome, with also potential benefits in terms of healthcare system costs (17, 70). The mental health professionals have the scientific,

ethical, and moral responsibility to indicate the direction to all social and other healthcare provider involved in the process of meeting mental health needs adolescent group (17, 21). For instance, school-based mental health professionals are perceived helpful by high-school students (59).

School-based and social-related intervention (such as parenting intervention) can be effective but limitation such as time and scheduling constraints, geographical distance, childcare provision, and financial cost (29, 74, 40); the perception of being a "bad" parent, and stigma (35, 42, 46, 74) exist. Digital tools or online delivery approach offers the opportunity to overcome many of the limitations associated with school-based tools. Web-based tools minify locational, and time challenges, allows privacy and anonymous, and applied at low cost (74). Another aspect of digital tools is machine learning and other AI tools which offers a capacity to learn from available data on various risk factors associated with mental health problem with adolescents and discover patterns which are then used to predict the outcome of future observations. To develop accurate risk prediction models suitable for clinical implementation, there is need to develop an effective linkage of the risk factor data from social care, education and healthcare datasets to form the larger multi-agency data.

Strength and Limitation of the Study

Among others, long waiting list has been a major challenge of adolescent mental health problem for Child and Adolescent Mental Health Services (CAMHS) or not meeting the threshold for CAMHS support. The review covered both study that compare the effectiveness of the intervention against CAMHS approach and other traditional interventions and reported improvement in mental health outcome. Also, the review covers various mental health issues, age ranges, study designs and setting which indicated the extent of applicability of the study. The review highlights the critical role of schools, social service and digital tools in early detection and intervention in promoting the adolescents' mental health.

The limitations encountered from the review must be outlined. The overall quality of the evidence varied with many of the study focused on intervention with little or no attention on the early detection. Many of the reviews were not specific about the level of intervention and where it is mentioned, it was indicated interventions which may limit the generalizability of findings to other intervention levels, such as selective or universal approaches. These limitations should be considered by future studies by conducting all-encompassing research across various early detection procedures while incorporating the cost implications and their effectiveness.

CONCLUSION

In promoting the mental health and wellbeing among adolescents, school-based, social service and digital tools could play a critical role. With consistent data collection across the social service, health and education settings, an all-encompassing information can be derived to support the understanding of individuals' exposure to risk factors for mental health problems. Such data can further facilitate the prediction of effective mental health prevention and intervention procedure and inform policy accuracy.

Ethical approval:

This study did not require any consent of person, as it is not a primary study .

Study funding:

The authors declare that they did not receive any external funding for this project or any part of the process. Also, the authors did not get any funding/grant to aid with the production or completion of the project.

Conflict of Interest:

The authors declare that they have no conflict of interest.

Data availability:

This article is a systematic review and narrative synthesis; no new primary data were generated. All data analysed during this study are derived from previously published sources, which are cited in the reference list. The full search strategy, study selection flowchart, and extracted data tables are provided in the supplementary file.

Authors' Contribution

The manuscript came about through collaborative efforts of the authors, each contributing specific proficiency. Adeola Mary Oyelu, Musa Yahaya Muhammad, Treasure Akelachi Chinuokwu, and Kelechi Nelson Adindu were responsible for the conceptualisation of the study. Oluwafemi Abiola Adesina, Caleb V. Okwere, Oyetola F. Ekeria, and Tosin Fadil Sumaila developed the methodology. Adeola Mary Oyelu, Musa Yahaya Muhammad, Treasure Akelachi Chinuokwu, Chukwuedu Paul Nwali, Ayobami O. Adewole, and Ezinne Philias Kalu managed the data collection. The data extraction process was executed by Ayobami O. Adewole, Ezinne Philias Kalu, Nnaemeka Akubue, Adebowale Adelekan, Kelechi Nelson Adindu, and Adeola Mary Oyelu. Review writing was carried out by Musa Yahaya Muhammad, Treasure Akelachi Chinuokwu, Oluwafemi Abiola Adesina, and Kelechi Nelson Adindu. Caleb V. Okwere, Oyetola F. Ekeria, Tosin Fadil Sumaila, Chukwuedu Paul Nwali, Ayobami O. Adewole, and Kelechi Nelson Adindu contributed to manuscript edits. Finally, Oluwafemi Abiola Adesina, Caleb V. Okwere, Oyetola F. Ekeria, Tosin Fadil Sumaila, Chukwuedu Paul Nwali, Ayobami O. Adewole, Ezinne Philias Kalu,

Nnaemeka Akubue, Adebowale Adelekan, and Kelechi Nelson Adindu performed manuscript reviews.

Artificial Intelligence Usage

The authors declare that artificial intelligence tools were utilized strictly to enhance language clarity, formatting, referencing, and manuscript organization. However, all intellectual content, synthesis, analysis, and conclusions presented in this review, are entirely the original work of the authors.

Abbreviations

1. AI - Artificial Intelligence.
2. CAMHS - Child and Adolescent Mental Health Services.
3. CASP - Critical Appraisal Skills Programme.
4. CBT - Cognitive Behavioural Therapy.
5. COVID-19 - Coronavirus Disease 2019.
6. DMH - Digital Mental Health.
7. EIP - Early Intervention in Psychosis.
8. EPAD - Early Prevention of Adolescent Depression.
9. FEP - First Episode of Psychosis.
10. FI - Family Intervention.
11. ICBI - Imagery-based Cognitive Behavioural Intervention.
12. MH apps - Mental Health Applications.
13. ML - Machine Learning.
14. MYRIAD - My Resilience in Adolescence.
15. NHS - National Health Service.
16. NICE - National Institute for Health and Care Excellence.
17. OSCA - Online Social anxiety Cognitive therapy for Adolescents.
18. PIOS - Population, Intervention, Outcome, Study Design.
19. PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analysis.
20. RCT - Randomized Controlled Trial.
21. SAD - Social Anxiety Disorder
22. SRT - Social Recovery Therapy.
23. UK - United Kingdom.
24. WHO - World Health Organization.

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