Access to Psychological Interventions and the Associated Factors in Early Psychosis

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Doctoral Programme in Clinical Psychology

University of East Anglia

Faculty of Medicine and Health Sciences

March 2025

Word Count: 25,894

Thesis Portfolio Abstract

Early intervention in psychosis is crucial for improving outcomes. Sleep disturbances and socio-occupational functioning (SOF) are recognised as key factors in early psychosis and may influence treatment targets, yet their complex interplay remains underexplored in individuals with an At-Risk Mental State (ARMS) and First-Episode Psychosis (FEP). Furthermore, the COVID-19 pandemic disrupted mental health services worldwide, posing potential barriers to timely access to care. This thesis aims to examine both the association between sleep and SOF in early psychosis and the impact of the pandemic on access to psychological interventions across sociodemographic groups.

A systematic review synthesised evidence from 13 studies investigating the relationship between sleep disturbances and SOF in ARMS and FEP populations, as well as the potential benefits of psychological sleep interventions. An empirical study retrospectively analysed 7,920 de-identified electronic clinical records from the South London and Maudsley NHS Foundation Trust, assessing changes in access to psychological interventions before, during, and after the pandemic using a retrospective cohort study design and logistic regression analyses.

Findings indicate that sleep disturbances are significantly associated with socio-occupational impairment, and interventions targeting sleep may indirectly enhance functioning. Additionally, the pandemic led to a sustained reduction in access to psychological interventions, with individuals from minoritised ethnic groups and socioeconomically disadvantaged backgrounds disproportionately affected.

These results highlight the need for integrated mental health care that considers sleep as a modifiable target for improving socio-occupational outcomes in early psychosis. Furthermore, service adaptations and targeted strategies are necessary to address disparities in access to psychological support, ensuring equitable early intervention. Future research could explore long-term impacts and the development of tailored interventions to enhance both sleep and treatment accessibility in this population.

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Acknowledgements

I would like to thank my supervisors, Dr Sheri Oduola and Professor Richard Meiser-Stedman, for their invaluable support and guidance throughout the process of developing and completing the thesis portfolio. This would not have been possible without their expertise, thoughtful feedback and encouragement and I feel very fortunate to have had the opportunity to work with and learn from them both. I would also like to thank Hitesh Shetty and the CRIS team at SLaM for their support with my empirical paper.

I am very grateful to my amazing partner, friends and family for their support and patience, and for cheering me on throughout this journey. Additionally, I would like to thank my fellow trainees for their companionship and the experiences we have shared along the way.

In loving memory of Professor Bill Yule, whose wisdom, mentorship and passion for the field have guided and inspired me throughout my career. His commitment to improving the lives of children and families through teaching and research, clinical practice and humanitarian work, and his ability to bridge these realms will remain a guiding light for me and countless others.

Chapter One

Introduction

Word Count: 1,424

Chapter One: Introduction

The aim of this chapter is to introduce early psychosis, service and intervention guidelines, and potential barriers to accessing care. It also outlines the aims of the thesis portfolio, which includes both a systematic review and an empirical paper. Some of the text in this section may overlap with the previously submitted Thesis Proposal.

Introduction to Psychosis

Psychosis is characterised by hallucinations and delusions, impacting an individual's perception of reality and causing distress and disability for both the affected person and their family or caregivers (Rössler et al., 2005; Fusar-Poli et al., 2017). A longer duration of untreated psychosis is linked to poorer personal recovery, increased service use, and worse economic outcomes, with significant costs for society (NHS England, 2016). Consequently, ensuring rapid access to effective, evidence-based treatment is crucial for the estimated 0.7% of the UK population who experience or develop psychosis (Public Health England, 2016).

Early Psychosis, At-Risk Mental States and First-Episode Psychosis

Over recent decades, increasing evidence has indicated that many individuals who develop a diagnosable psychotic illness first experience a prodromal phase known as At-Risk Mental State (ARMS; Yung & McGorry, 1996). This phase can last from a few days to 18 months. Yung (2005, p. 965) defined ARMS as "a state that confers high, but not inevitable, risk of development of psychotic disorder in the near future". It is also commonly referred to as the Clinical High-Risk or Ultra High-Risk population.

The introduction of the ARMS paradigm has contributed to the development of the continuum model of psychosis, which suggests that unusual experiences are relatively common in the general population and can range from subjectively mild, non-distressing experiences to those of greater severity that require intervention such as FEP (van Os et al., 2009). Individuals with ARMS

present with psychosis-like symptoms of lesser intensity or shorter duration compared to a FEP, and therefore do not meet diagnostic criteria for psychosis. However, they share significant vulnerabilities, including deterioration in social and occupational functioning, which is a key indicator of early psychosis and the need for intervention (Fusar-Poli et al., 2013). Additionally, both present with similar co-occurring difficulties such as sleep disturbances, anxiety or low mood (Yung et al., 2005).

There is growing support for intervening during the prodromal phase to reduce the duration of untreated illness or prevent the onset of full psychosis, ultimately improving long-term outcomes (Fusar-Poli et al., 2013; Carrión et al., 2016; Zhang et al., 2019). Longer duration of untreated psychosis (DUP), the time between the onset of psychotic symptoms and initiation of treatment, is associated with poorer outcomes such as increased symptom severity, lower social functioning and reduced quality of life (Marshall et al., 2005; Penttilä et al., 2014). The rationale for combining ARMS and FEP into an "early psychosis" group aligns with the continuum model of psychosis, which challenges the traditional view of psychosis as a discrete category by proposing that both ARMS and FEP are part of a psychosis spectrum with varying duration and severity of illness (Fusar-Poli et al., 2013). The populations share significant characteristics and risk factors, such as genetic vulnerabilities (e.g. family history of schizophrenia) and environmental stressors (e.g. trauma, substance abuse; van Os et al., 2010; Fusar-Poli et al., 2012), supported by the Stress-Vulnerability Model (Zubig & Spring, 1977). This overlap reinforces the idea that ARMS and FEP are not entirely distinct phenomena but rather part of the psychosis spectrum where early identification and intervention of ARMS is aimed at preventing or delaying the transition to FEP, which can significantly impact outcomes. These shared processes and their possible implications for clinical practice highlight the advantages of studying ARMS and FEP more effectively together.

Research estimates the prevalence of ARMS at 1.7% in the general population and 19.2% in clinical populations (Salazar de Pablo et al., 2021). Studies indicate that young people at risk of

developing psychosis have approximately a 25% likelihood of transitioning to psychosis within three years (Catalan et al., 2021; Salazar de Pablo et al., 2021). However, whether they transition or not, ARMS individuals experience high levels of distress and poor outcomes (Addington et al., 2011; Lin et al., 2015). Only a small proportion of FEP patients would have access treatment during the prodromal phase (Ajnakina et al., 2017). The incidence of psychosis varies widely across different settings and locations (Jongsma et al., 2019). In England, the prevalence of FEP is estimated at one in 100 people, with most experiencing their first episode before the age of 35 (McManus et al., 2016).

Service and Intervention Guidelines

Significant investment has been made in Early Intervention in Psychosis (EIP) services in recent years, given the detrimental effects of treatment delays for psychosis on individuals and the economy (NHS England, 2016). EIP services provide substantial economic benefits, with estimated net cost savings of £7,972 per person within the first four years of full provision and £6,780 per person over the subsequent four to ten years. These savings primarily result from reduced reliance on crisis and inpatient services, improved employment outcomes, and a lower risk of future hospitalisation (NHS England, 2023).

EIP services are widely available across the country, offering support for young adults experiencing FEP or at risk of developing psychosis through standalone services or integrated teams with both FEP and ARMS pathways. The NHS England Early Intervention in Psychosis Access and Waiting Time Standard from 2016 outlined that people with first-episode psychosis should receive treatment from an EIP service within two weeks of referral, and extended the age of entry from 14-35 years to 14-65 years (NHS England, 2016). According to the standards, individuals experiencing FEP receive three to five years of support and those with ARMS up to two years of treatment followed by a monitoring period of up to one year. This model adopts a multidisciplinary approach, incorporating pharmacological and psychological interventions, family and social support, employment assistance, and physical health checks.

The National Institute for Health and Care Excellence (NICE) recommends individual Cognitive Behavioural Therapy (CBT) for psychosis, alongside family intervention (FI) for FEP and CBT with or without FI for ARMS (NICE, 2014). For individuals with co-existing mental health conditions, additional interventions for depression, anxiety, emerging personality disorder or substance use should be provided. These treatments have shown potential in preventing the onset of psychosis and are beneficial and cost-effective, regardless of whether transition to psychosis occurs (Ising et al., 2017; Wijnen et al., 2020). However, the effectiveness of these interventions depends on individuals actively seeking and engaging with mental health services. Recent research highlights significant barriers to help-seeking, access and engagement, including stigma surrounding psychosis, negative attitudes toward treatment, the impact of negative symptoms, and varying levels of social support (Becker et al., 2016; Ben-David et al., 2019; Leanza et al., 2020). Furthermore, identifying individuals with ARMS is particularly challenging, as they may initially seek help for non-specific symptoms such as anxiety or depression, delaying access to appropriate treatment (Fusar-Poli et al., 2013).

Findings from an EIP service suggest that one-fifth of referred individuals do not engage in treatment, and this population is more likely to be unemployed at the time of referral (Green et al., 2011). Moreover, delays in seeking help for psychosis are linked to social factors such as social capital, ethnicity, and urbanicity (Hodgekins et al., 2015; Schofield et al., 2017; Oduola et al., 2019; Allan et al., 2021). Specific sociodemographic factors, including female gender, older age, ethnicity, and living alone, have been associated with longer delays in accessing early psychosis care (Oduola et al., 2023). Additionally, inequality, deprivation, and social fragmentation contribute to the risk of developing psychosis (Burns & Esterhuizen, 2008; Richardson et al., 2018).

Thesis Aims and Overview

This thesis portfolio aims to contribute to the evidence base on factors influencing outcomes and access to psychological interventions in early psychosis. The findings are intended to enhance our understanding of the interplay between psychosis-related factors and guide intervention targets

and strategies for improving access to care in early psychosis populations. The next chapter, Chapter Two, presents a systematic review exploring the relationship between sleep and socio-occupational functioning, as well as the impact of sleep interventions on socio-occupational outcomes in individuals with ARMS and FEP. Chapter Three bridges the review's findings with the empirical study, introducing its background and rationale. Chapter Four details the empirical study, which analyses electronic records from EIP services in South London to examine the impact of COVID-19 on access to psychological interventions and disparities across sociodemographic groups. Finally, the concluding chapter summarises the key findings, discussing their strengths, limitations, and implications.

Chapter Two: Systematic Review

Relationship between Sleep and Socio-Occupational Functioning in Early Psychosis: A Systematic Review

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Formatted for submission to: *Early Intervention in Psychiatry*

(see Author Guidelines in Appendix A)

Word Count in line with the Journal Guidelines: 4,668

(excluding tables, figures, references)

Relationship between Sleep and Socio-Occupational Functioning in Early Psychosis: A Systematic Review

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Abstract

The interplay between sleep and mental health is well-documented in research across clinical and non-clinical populations. Sleep disturbances and poor socio-occupational functioning are both prevalent in early psychosis. Despite a growing body of literature addressing these domains in early psychosis populations, the complex nature and relationship between them warrants further investigation. This systematic review aims to synthesise and evaluate the current literature on the association between sleep disturbance and socio-occupational functioning in at-risk mental states (ARMS) and first-episode psychosis (FEP), focusing on two main research questions: 1) What is the relationship between sleep disturbance and socio-occupational functioning in early psychosis? and 2) Do psychological sleep interventions for people with early psychosis improve socio-occupational functioning?

A comprehensive search was conducted across the PsycINFO, CINAHL, MEDLINE, EMBASE and Scopus databases. Studies were included if they reported on the association between sleep and socio-occupational functioning in ARMS or FEP populations. Additionally, intervention studies targeting sleep were included if they met the above criteria. Study characteristics and findings were extracted for synthesis and analysis.

From an initial pool of 8,682 studies, 13 met the inclusion criteria. Most of these studies suggest that self-reported sleep disturbances are associated with socio-occupational functioning and that interventions targeting sleep may indirectly improve functioning. These findings have important implications for clinical care. However, the diversity and methodological heterogeneity of the reviewed studies require careful interpretation. Recommendations for future research are outlined to address these limitations and enhance the existing evidence base.

Keywords: at-risk mental state, first episode psychosis, sleep disturbance, socio-occupational functioning

Introduction

Sleep is a crucial component of both physical and mental health, and sleep disturbances have been identified as a significant risk factor for poor health outcomes (Grandner, 2017). Common sleep problems include insomnia, circadian rhythm sleep–wake disorders, sleep apnea, and sleep-related movement disorders. Sleep disturbances are prevalent across various mental health conditions and are particularly common among individuals with psychosis (Freeman et al., 2020). A recent meta-analysis reported a prevalence of 40–61% across the clinical stages of psychosis (Bagautdinova et al., 2023).

In early psychosis, encompassing at-risk mental states (ARMS) and first-episode psychosis (FEP), research increasingly identifies sleep disturbances as both a potential risk factor and a contributor to symptom severity. Disrupted sleep has been shown to increase vulnerability to attenuated symptoms (Lunsford-Avery et al., 2017a; Reeve et al., 2015), with such disturbances evident in the early stages of psychosis (Davies et al., 2017; Reeve et al., 2019). These difficulties include circadian desynchrony, reduced sleep quantity and poor subjective sleep quality (Goines et al., 2019; Lunsford-Avery et al., 2017a; Poe et al., 2017), with poor subjective sleep quality specifically linked to symptom domains such as paranoia and perceptual abnormalities (Kasanova et al., 2020) and vice versa, indicating a bidirectional cycle. Sleep disturbances in psychosis are frequently associated with worsening positive and negative symptoms, decreased quality of life and poorer clinical and functional outcomes (Benson et al., 2006; Lunsford-Avery et al., 2015).

The symptoms experienced in ARMS and FEP populations are often characterised by significant declines in functioning. Socio-occupational functioning (SOF) specifically refers to an individual's ability to engage in “self-care and activities of daily living, communication and interpersonal relations, instrumental living skills, and work” (Saraswat et al., 2006), all of which are commonly impaired in early psychosis groups. In these populations, socio-occupational difficulties often manifest as reduced engagement in work, education and social relationships, which may

further exacerbate psychosis symptoms (Fusar-Poli et al., 2012). Evidence suggests that a decline in SOF is both a predictor and a consequence of psychosis, with individuals experiencing deteriorating functioning over time at higher risk of transitioning to more severe stages than those whose functioning improves (Velthorst et al., 2013). Impaired SOF can negatively impact social interactions, work or academic performance, and overall quality of life. It is also associated with poorer long-term outcomes and higher rates of disability within this population (Addington & Addington, 2008).

Sleep disturbances can exacerbate psychotic symptoms and further impair SOF. Among individuals with psychosis, poor sleep has been linked to difficulties across multiple social domains including lower social functioning in community settings (Blanchard et al., 2020). A systematic review by Clarke and colleagues (2021) examining sleep disturbances, psychotic symptoms, functioning and quality of life in ARMS found an association between sleep disturbances and broader functioning, however, most studies lacked specific functioning assessment measures. Another review on sleep in early psychosis reported links between sleep disturbances, symptom severity and increased help-seeking, underscoring the need for further research into causal mechanisms between sleep and daytime functioning (Davies et al., 2017). Marin et al. (2023) reviewed sleep disturbances in ARMS and FEP, summarising existing pharmacological and non-pharmacological interventions. A more recent systematic review on sleep and SOF in serious mental illness identified sleep as a key target for assessment and treatment to protect, develop or restore SOF (Stafford et al., 2024). Additionally, feasibility studies on psychological sleep interventions in early psychosis populations have shown promising findings for improved functioning outcomes (Bradley et al., 2018; Taylor et al., 2022).

Given the established relationship between sleep and SOF in other mental health populations, along with the growing emphasis on sleep as a target for intervention in early psychosis, further research is warranted to explore these relationships and the existing literature specific to this population. To our knowledge, no systematic review has specifically examined the relationship between sleep and SOF in ARMS and FEP. Therefore, this review aims to investigate the association

between these variables within this population. Additionally, it will assess the impact of sleep interventions on improving SOF in early psychosis. The research questions are as follows:

1. What is the relationship between sleep disturbance and socio-occupational functioning in early psychosis?
2. Do psychological sleep interventions for people with early psychosis improve socio-occupational functioning?

Methods

The protocol for this systematic review was developed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009) and pre-registered with the International Prospective Register of Systematic Reviews (PROSPERO; registration no. CRD42024558403).

Inclusion and Exclusion Criteria

The study eligibility criteria are outlined in Table 1 using the PECO framework (Morgan et al., 2018). Qualitative, quantitative, and mixed-method studies published in English in a peer-reviewed journal for all available years were eligible. For feasibility reasons, unpublished review articles, conference abstracts, and case studies were not included. The primary criteria for studies to be included were: 1) At-Risk Mental State or First-Episode Psychosis populations aged between 14 and 65, 2) assessment of sleep and SOF, and 3) test of association between sleep and SOF measures in an intervention or non-intervention study.

Table 1

Inclusion and Exclusion Criteria

	Inclusion	**Exclusion**
Population	Individuals who meet criteria for ARMS based on the Comprehensive Assessment of At-Risk Mental States (CAARMS), Structured Interview for Prodromal Symptoms (SIPS), the Scale of Prodromal Symptoms (SOPS), the Positive Symptoms and Diagnostic Criteria for the CAARMS Harmonized with the SIPS (PSYCHS), *and* FEP based on clinical diagnosis of First Episode Psychosis according to DSM-IV, DSM-IV-TR, DSM-V and ICD-10 (i.e. F20-F29) criteria*	Individuals who do not meet criteria for ARMS or FEP, and studies where less than 50% of the sample involve ARMS or FEP populations
Exposure	Individuals experiencing sleep disturbance	Study populations where sleep disturbance is not reported
Comparison	Treatment as usual (TAU) and waitlist (WL) control groups for available intervention studies	N/A
Outcome	A qualitative or quantitative test of association between sleep and SOF	Studies without SOF measures or test of association between sleep and SOF

**In studies with a mixed schizophrenia spectrum population or not specified FEP, the early psychosis criteria is based on (1) timing since onset i.e. 3 years according to FEP pathway period, and (2) ARMS/FEP constituting more than 50% of the sample.*

Search Strategy

We searched the databases PsycINFO, CINAHL, MEDLINE, EMBASE, and Scopus from origin to 10th February 2025. The search strategy and search terms related to At-Risk Mental States, First-Episode Psychosis, sleep disturbance, and socio-occupational functioning applied to each database

are included in Appendix B. Advice on the search strategy and terms was sought from an expert librarian, informed by previously conducted and related reviews (Marin et al., 2023; Stafford et al., 2024) and finalised with the research team (SSM, RMS, SO).

Screening and Quality Appraisal

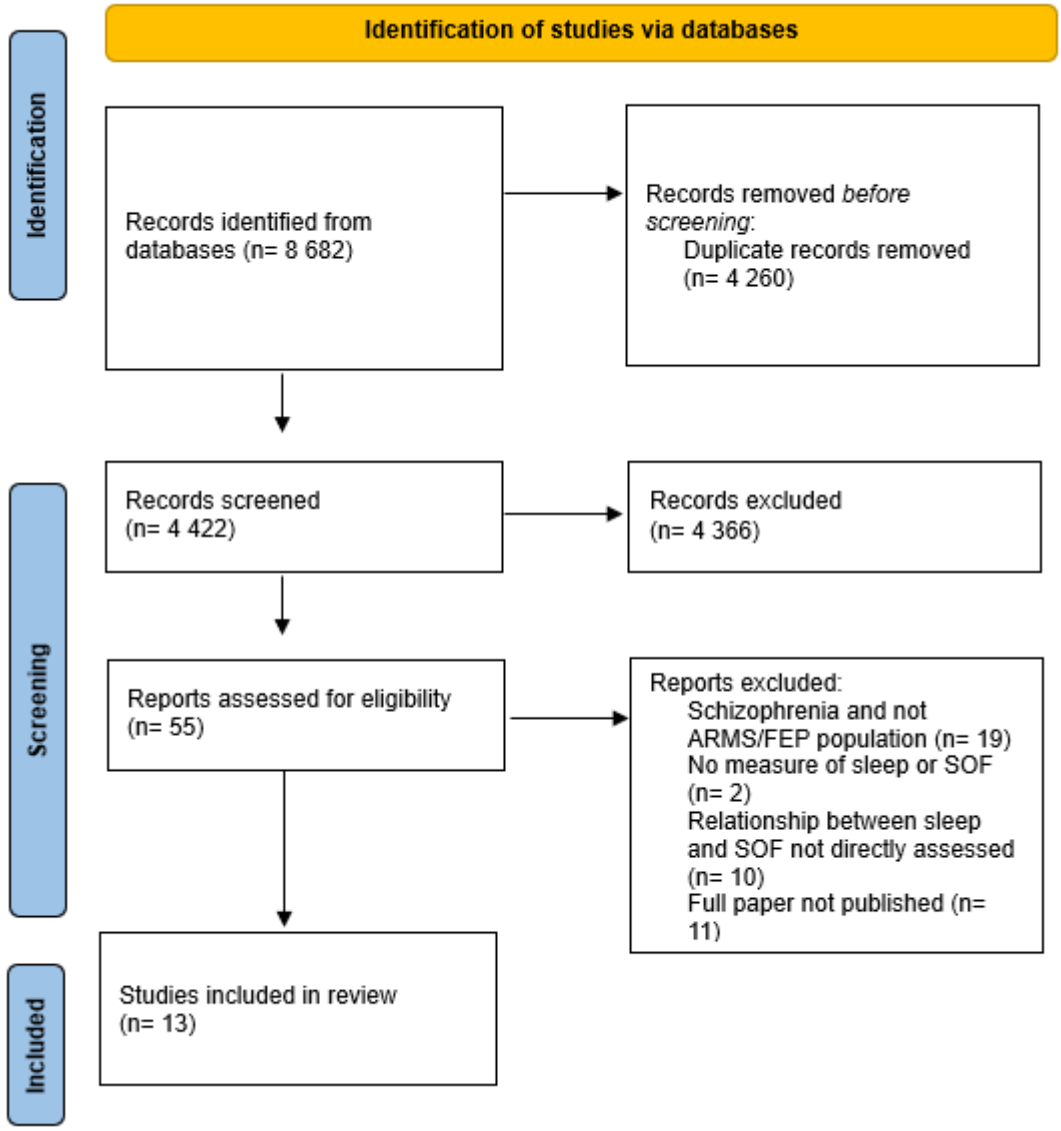
A total of 8,682 papers were identified across the included databases (PsycINFO = 895, CINAHL = 268, MEDLINE = 975, EMBASE = 3,633, Scopus = 2,911), and 4,260 duplicates were removed, leaving 4,422 papers for screening. The initial screening was carried out by SSM and facilitated by the screening tool Rayyan (Ouzzani et al., 2016). Full texts were retrieved and examined against the inclusion and exclusion criteria, with a proportion (20%) checked by an external second reviewer who was blinded to the research team's decisions. A total of 55 full-text papers were retrieved and reviewed for eligibility, of which 13 met the inclusion criteria and were included in the systematic review. Excluded studies were those that focused on broader schizophrenia spectrum disorders rather than the ARMS/FEP population, lacked measures of sleep or SOF, did not test a direct association between the two variables, or were not published as full papers (PRISMA Flowchart; Figure 1).

The Mixed Methods Appraisal Tool (MMAT) was used to assess the methodological quality of the included studies (Hong et al., 2018). The MMAT is a well-established and commonly used tool to appraise quality and assess bias in studies adopting quantitative, qualitative and mixed methodologies. The first part of the tool includes two generic screening questions to determine eligibility for rating, followed by five further questions depending on the type of study e.g.; qualitative, quantitative randomised controlled trials, non-randomised studies, quantitative descriptive and mixed method designs. Following the guidance from Gronholm and colleagues (2017), a score is obtained by calculating the sums of criteria met and converting it into a percentage, with higher percentages indicating better quality studies (ranging from 0% = no criteria met to 100%

= all criteria met). The MMAT was completed by the primary author (SSM) and issues were resolved among the research team.

Figure 1

PRISMA Flowchart Study Selection Process



Data Extraction and Narrative Synthesis

The following data were extracted from the included studies (N = 13): study location, participant characteristics (age, gender, ethnicity), number of participants, study design, sleep and

SOF measures, and relevant findings related to associations. For the available intervention studies, additional information about the intervention (name, duration, and features) was extracted, and relevant findings, including effect sizes, were reported. A narrative synthesis was conducted to summarise the findings, following the guidance proposed by Popay and colleagues (2006). By using a structured framework, critical variables were defined. Following this, the process involved categorisation of data and identification of patterns and common themes across the studies, examining consistencies and variations in the findings. Extracted data were categorised by population, characteristics, setting, design, sleep and SOF measures, and results were presented in a table before discussing relationships across study findings. A quality appraisal was carried out before initiating the narrative synthesis, in line with Popay et al.'s guidance. The quality ratings were used to contextualise the findings and ensure that conclusions were drawn based on the most reliable studies. The data were revisited to integrate any new and emerging patterns throughout the process to adjust the interpretation of the findings accordingly for a thorough synthesis of the information.

Results

Study Characteristics

General characteristics of all included studies (N= 13) are outlined in Table 2. All studies except for one (Waite et al., 2018) used quantitative methods. Among the studies, six utilised cross-sectional designs, three employed prospective cohort designs, and two adopted single-group designs (A-B or pilot feasibility). Furthermore, one randomised controlled trial and one qualitative study using thematic analysis were included. Seven studies included FEP populations and six CHR or UHR individuals, with four studies including healthy control groups for comparison. The sample sizes ranged from 11 to 795 participants, with a total of 2,326 participants (early psychosis= 1,931; healthy controls= 321; other mental health= 74) with a mean of 179.92 individuals across all studies. The average ages for study samples ranged from 16.90 to 35.57 years. Gender distributions varied, with

FEP cohorts generally comprising more males, while CHR/UHR cohorts demonstrated a more balanced or female-dominant gender distribution. The studies were conducted across five different countries: including the UK (5 studies), USA (4 studies), Australia (1 study), Singapore (2 studies) and Tunisia (1 study). Reporting on ethnicity was inconsistent; UK studies included a majority of White participants, US studies reported mixed ethnicities, Singaporean studies predominantly involved Chinese participants, and five studies reported no information about ethnicity.

Table 2

Study Characteristics and Outcomes

Study, Location	Population/ Setting	Participant characteristics (age, gender, ethnicity)	*N*	Study design	Sleep measures	SOF measures	Relevant findings	Sleep and SOF associated?
Bradley et al. (2018) **UK**	UHR; outpatient community sample	Age 15-22 years (mean= 18.27, SD= 1.95), 54.5% females, 90.9% White	11	Single-group A–B design, with assessments conducted at baseline, post-therapy, and one-month follow-up	SLEEP-50, ISI, PSQI, sleep diaries and actigraphy	WSAS	From pre- to post-therapy there were improvements in sleep quality, circadian rhythm disruption, and reductions in insomnia, also maintained at one-month follow-up. Improvements were also observed in SOF	Yes; ES change scores for SOF d = 0.7 (CI and p-value not reported)
Fekih-Romdhane et al. (2021) **Tunisia**	FEP; outpatient community sample with first-episode schizophrenia (*n*= 54), their non-affected siblings	Age 18-40 (FEP mean= 26.8, SD= 6.1; siblings mean= 28.6, SD= 4.8, HC mean= 27.9, SD=5.5), 75% males in FEP, 60.7%	171	Cross-sectional case-control study	PSQI, ESS, MEQr	GAF	FEP population had poorer sleep quality and higher daytime dysfunction compared to siblings and controls, and poorer sleep quality	Yes; poor sleep quality and daytime dysfunction in FEP significantly different from

	(*n*= 61) and healthy controls (HC; *n*= 61)	males in siblings, 72.1% males in HC), ethnicity not reported					was associated with lower SOF	siblings and controls (p < .001). Poorer sleep quality associated with lower GAF scores (r= -0.277, p< .05)
Gannon et al. (2023) **Australia**	FEP; outpatient community sample from the Physical Health Assistance in Early Psychosis (PHAsTER) study	Age 15-24 (mean= 19.4, SD= 3.1), 52.9 % males, ethnicity not reported	77	Prospective cohort design with 6-month follow-up	ISI, PSQI	SOFAS	At baseline, there was no significant association between SOF and insomnia or sleep quality. However, at six-month follow-up, clinical insomnia and poor sleep quality were associated with lower SOF	Yes; At follow-up, poor SOF was associated with insomnia; OR 0.92, 95% CI= 0.86-0.98, p= 0.013, and poor sleep quality; OR 0.80, 95% CI= 0.66-0.97, p= 0.024
Lunsford-Avery et al. (2017a)	CHR; community sample from the Adolescent	CHR: Age 12-21 (mean= 18.79, SD= 1.93), 44% males,	66	Longitudinal cohort design	Circadian rhythms based on 5 days of	GAF	Significant association between sleep disruptions and SOF,	Yes; At 1-year follow-up, poorer SOF

US	Development and Preventative Treatment (ADAPT; *n*= 34) and healthy controls (HC; *n*= 32)	ethnicity not reported HC: Age 12-21 (mean= 18.79, SD= 1.93), 50% males, ethnicity not reported		with 1-year follow-up	actigraphy and a sleep/activity diary		both cross-sectionally and longitudinally; significant associations between disrupted circadian rhythms (e.g., lower M10, Ac) and poorer SOF (lower GAF) at T2	was predicted for those with lower Diurnal activity (M10; p = 0.002), lower Relative Amplitude (RA; p = 0.01), lower Autocorrelation function (Ac; p < 0.001) and greater Intradaily Variability (IV; p < 0.001). Diurnal activity (M10), was correlated with SOF at a trend level (p < .10)
Lunsford-Avery et al. (2017b)	UHR; community sample	Age 13-22 (mean= 18.93, SD= 1.67), 60% male, ethnicity not reported	62	Cross-sectional design	PSQI	GAF	Global functioning in poor sleepers (PSQI > 8) did not differ from	No; N.s (F= 0.31, p= 0.58)

US							better sleepers (PSQI ≤ 8)	
Lunsford-Avery et al. (2021) **US**	CHR; sample from general population as part of the Multisite Assessment of Psychosis-Risk (MAP) study (*n*= 84), including individuals with depressive disorders (DD; *n*= 74) and healthy controls (HC; *n*= 101)	Age 16–30 (mean= 20.11, SD= 1.82), 78% female, largest ethnicity White (% not reported)	259	Cross-sectional design	rCSM	SFS	Eveningness preference trended toward an association with reduced social functioning	No; N.s (r= 0.22, p < 0.10)
Nuzum et al. (2021) **UK**	CHR; outpatient community sample	Age 13-36 (mean= 22.72, SD= 4.89), 43.65% females, ethnicity not reported	795	Retrospective cohort study	Experiences of disturbed sleep and/or insomnia using natural language	HoNOS	Sleep problems were significantly associated with higher scores on the HoNOS at follow-up	Yes; Mean Difference from baseline to follow-up: 2.26, 95% CI= 0.55–

					processing manually validated from clinical records			3.96, p < .05
Ong et al. (2020) **Singapore**	FEP; sample enrolled in an Early Psychosis Intervention Programme (same sample as Subramaniam et al. 2017 below)	Age 15-40 (mean= 25.8, SD= 6.2), 50.9% males, 71.3% Chinese	280	Secondary analysis of a cross-sectional study	PSQI	GAF, WHOQOL-BREF	Poor sleep quality and daytime dysfunction was associated with significantly lower scores in social relationships	Yes; Significant association between poor sleep quality and social relationships (B = -1.376, p = 0.003), as well as daytime dysfunction (B = -0.649, p = 0.010)
Poe et al. (2017) **USA**	CHR; outpatient community sample (*n*= 194) and healthy controls (HC; *n*= 66)	CHR: Age 13-30 (mean= 20.0, SD= 3.8), 73.2% males, 67% non-Hispanic HC: Age 13-30 (mean= 21.9, SD=	260	Prospective cohort design with 2.5-year follow-up	SIPS Sleep Disturbance Item G1	GAF, GFS-S, GFS-R	CHR patients were significantly more sleep disturbed and had lower overall functioning than healthy controls. Significant relationships were found between	Yes; Sleep Pattern Disruption negatively affected general functioning (B=−4.46, p <

		3.6), 63.6% males, 72.7% non-Hispanic					specific sleep disturbances and poorer SOF	0.01), and trends were observed for role functioning (B= −4.75, p = 0.051) and social functioning (B= −3.29, p = 0.072)
Subramaniam et al. (2017) **Singapore**	FEP; sample enrolled in an Early Psychosis Intervention Programme	Age 15-40 (mean= 25.8, SD= 6.2), 50.9% males, 71.3% Chinese	280	Cross-sectional design	ISI	GAF, WHOQOL-BREF	Insomnia was significantly associated with lower scores in four domains: physical health, psychological, social relationships, and environment, but no significant association between insomnia and functioning	No; N.s for GAF (p = 0.460). Insomnia associated with lower scores on WHOQOL-BREF; Social relationships: p < 0.001, Adjusted B = −3.06, CI = (−4.01, −2.12)

Taylor et al. (2022) **UK**	FEP (78.57%); outpatient community sample with psychosis spectrum diagnoses	Age 22-57 (mean= 35.57, SD= 10.88), 64.29% males, 42.86% Black/African/Caribbean/Black British	14	Single-group, feasibility and acceptability pilot study with pre- and post-intervention assessments	PSQI, ISI, Core Consensus Sleep Diary	WSAS	Improvements in sleep quality and insomnia severity coincided with non-significant trends toward better socio-occupational adjustment. No direct statistical tests of association between sleep and functioning were performed	No; N.s. Sleep quality: d = 0.83, CI = (0.91, 5.64); Insomnia severity: d = 1.02, CI = (2.64, 8.45); Socio-occupational adjustment: d = 0.27, CI = (-0.32, 6.32)
Waite et al. (2018) **UK**	UHR; outpatient community sample (same sample as Bradley et al. 2018)	Age 15-22 years (mean= 18.27, SD= 1.95), 54.5% females, 90.9% White	11	Qualitative study using thematic analysis	Semi-structured interviews; self-reported sleep problems, sleep disturbances and use of sleep diaries	Semi-structured interviews; self-reported impact on SOF	Participants reported improvements in sleep as linked with improvements in mood, functioning, and psychological wellbeing; a reciprocal relationship between sleep disturbance, mental	Yes; p-value, CI or ES not reported as qualitative study

							health problems, and daily functioning	
Waite et al. (2023) **UK**	UHR; outpatient community sample	Age 14–23 (mean= 16.9, SD= (2.5), 48% females, 48% males, 5% other, 80% White	40	Prospective, single-blind, randomised controlled feasibility trial with 3-month and 9-month follow-up	ISI, SLEEP-50 Circadian Rhythm Disruption subscale, sleep diaries, actigraphy	WSAS	The intervention significantly reduced insomnia severity and showed improvements in SOF measures (e.g. WSAS scores decreased over time)	Yes; improvements in sleep (ISI scores; ES d = -2.67 at 3 months, -1.91 at 9 months) and SOF (WSAS reductions; ES not reported)

ISI, Insomnia Severity Index; PSQI, Pittsburgh Sleep Quality Index; ESS, Epworth Sleepiness Scale; MEQr, Morningness-Eveningness Questionnaire; WSAS, Work and Social Adjustment Scale; GAF, Global Assessment of Functioning; SOFAS, Social and Occupational Function Assessment Scale; SFS, Social Functioning Scale; HoNOS, Health of the Nation Outcome Scale; WHOQOL-BREF, WHO Quality of Life-BREF; SIPS, Structured Interview for Psychosis-Risk Syndromes; GFS-S, Social Functioning: Global Functioning Social Scale; GFS-R, Role Functioning: Global Functioning Role Scale

Assessment Tools

Across the thirteen included studies, a variety of tools were employed to assess sleep disturbances and SOF. Among the sleep measures, the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) was the most frequently used tool, appearing in six studies. The Insomnia Severity Index (ISI; Bastien et al., 2001) was also widely utilised, featuring in four studies. Three studies used a combination of actigraphy and sleep diaries, providing both an objective and subjective assessment of sleep patterns. Other tools, such as the SLEEP-50 (Spoormaker et al., 2006), Morningness-Eveningness Questionnaire (MEQr; Horne & Östberg, 1976) and Reduced Composite Scale of Morningness (rCSM; Smith et al., 1989), were employed less frequently. Notably, most of the sleep measures, including the PSQI and ISI, are considered subjective self-report tools, despite the PSQI including sleep duration as part of its total score. Actigraphy was the primary objective measure in the studies.

For the assessment of SOF, the Global Assessment of Functioning (GAF; Piersma and Boes, 1997) was the most utilised measure rating psychological, social, and occupational elements, appearing in six studies. The Work and Social Adjustment Scale (WSAS; Mundt et al., 2002) was the second most frequently used, featuring in three studies. Other tools, such as the Social and Occupational Functioning Assessment Scale (SOFAS; Rybarczyk, 2011), Social Functioning Scale (SFS; Birchwood et al., 1990), and the Health of the Nation Outcome Scale (HoNOS; Wing et al., 1996), were each employed in one or two studies. Qualitative approaches, including semi-structured interviews, were also used to capture participants' self-reported experiences of the impact of sleep disturbances on functioning.

Quality Appraisal

The methodological quality and corresponding ratings in percentages for each study were calculated and outlined in the MMAT outcomes table below (Table 3). The MMAT scores ranged between 60% and 100%, with a mean of 81.5%. The higher-rated studies (Waite et al. 2018; Waite et

al. 2023) used rigorous methodologies with defined inclusion criteria, appropriate statistical analysis, and follow-up periods, resulting in greater internal validity and may therefore offer more reliable conclusions. Identified limitations across studies included the use of non-randomised, single-arm designs and small pilot studies, alongside a lack of adequate control measures and issues with retention and data completeness, such as loss to follow-up, missing data and low response rates in some studies (Subramaniam et al. 2017; Lunsford-Avery et al. 2017a; Gannon et al. 2023). Attempts to contact authors to request more information or clarification were made without success for some studies with CT-rated scores. Low response rates and lack of information about dropouts, alongside lack of adjustment for potential confounding variables were the most common limitations which may reduce representativeness and increase the risk of bias related to participant self-selection and nonresponse. As a result, the findings may be subject to bias, reducing the internal validity and comparability of the results, and limiting the robustness of the conclusions. Despite all studies being of acceptable quality and none being excluded based on the quality assessment outcomes, these limitations must be considered when interpreting the results.

Table 3

MMAT Quality Appraisal Outcomes

			Qualitative criterion					**Quantitative criterion**					**Quality percentage**
Study	**S1**	**S2**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**%**
Waite et al. (2018)	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	100
Bradley et al. (2018)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Taylor et al. (2022)	Y	Y						Y	Y	Y	CT	Y	80
Subramaniam et al. (2017)	Y	Y	-	-	-	-	-	Y	Y	Y	N	Y	80
Poe et al. (2017)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80

Ong et al. (2020)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Nuzum et al. (2021)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Lunsford-Avery et al. (2017a)	Y	Y	-	-	-	-	-	Y	CT	Y	N	Y	60
Lunsford-Avery et al. (2017b)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Gannon et al. (2023)	Y	Y	-	-	-	-	-	Y	Y	Y	N	Y	80
Fekih-Romdhane et al. (2021)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Lunsford-Avery et al. (2021)	Y	Y	-	-	-	-	-	Y	Y	Y	CT	Y	80
Waite et al. (2023)	Y	Y	-	-	-	-	-	Y	Y	Y	Y	Y	100

Y= Yes; CT= Can't Tell; N= No.

Relationship Between Sleep and SOF

The relationships between sleep and SOF across all included studies are summarised in Table 2. A variety of measurement tools were used to assess outcomes. Despite methodological and measurement variability as highlighted from the MMAT and above, the findings demonstrate a significant association between sleep disturbances and poorer SOF. Nine of the thirteen studies reported significant associations between sleep problems such as poor sleep quality, insomnia and disrupted circadian rhythms, and poorer SOF outcomes (Bradley et al., 2018; Fekih-Romdhane et al., 2021; Gannon et al., 2023; Ong et al., 2020; Lunsford-Avery et al., 2017a; Waite et al., 2018; Nuzum et al., 2021; Poe et al., 2017; Waite et al., 2023). Five of these studies reported significant effect sizes on relevant outcomes ranging from small to large, including both highest rated studies based on the MMAT. Four studies found no statistically significant associations (Lunsford-Avery et al., 2017b; Lunsford-Avery et al., 2021; Subramaniam et al., 2017; Taylor et al., 2022).

Studies assessing sleep quality, including those by Fekih-Romdhane et al. (2021), Gannon et al. (2023), Ong et al. (2020), Bradley et al. (2018) and Lunsford-Avery et al. (2017b) all reported significant findings except for Lunsford-Avery and colleagues. The initial three studies found a direct association between sleep quality (measured using the PSQI) and SOF, although they employed different tools to assess SOF (WSAS, GAF, SOFAS). Bradley et al. (2018) reported indirect associations, noting improvements in both sleep and SOF following a sleep therapy intervention. Additionally, Fekih-Romdhane et al. (2021) identified a significant relationship between sleepiness (measured using the ESS) and SOF, alongside the association with sleep quality. Lunsford-Avery et al. (2017b) examined sleep outcomes dichotomously, categorising participants as poor sleepers (PSQI > 8) or good sleepers (PSQI ≤ 8). They found no significant differences between the groups in global functioning, although a trend-level difference was observed in measures of negative symptoms.

Qualitative measures of sleep, such as sleep diaries, were employed in five studies (Bradley et al., 2018; Lunsford-Avery et al., 2017a; Taylor et al., 2022; Waite et al., 2018; Waite et al., 2023). For instance, Lunsford-Avery et al. (2017a) combined sleep diaries with actigraphy to assess circadian rhythms over five days. They found that circadian disruptions predicted the severity of psychosis symptoms and psychosocial impairment at a one-year follow-up among CHR youth.

Insomnia and its relationship with SOF were assessed in six studies (Bradley et al., 2018; Gannon et al., 2023; Nuzum et al., 2021; Subramaniam et al., 2017; Taylor et al., 2022; Waite et al., 2023). These studies included diverse designs: one cross-sectional study, two cohort studies, and three intervention studies. Across these studies, insomnia was consistently associated with poorer SOF.

Sleep Interventions

Table 4 summarises studies that examined sleep interventions and their association with socio-occupational functioning in early psychosis (n=3). The studies primarily employed adaptations of Cognitive Behavioural Therapy for Insomnia (CBTi) as the main intervention to address sleep disturbances in ARMS and FEP populations. These interventions were delivered in various formats,

including face-to-face therapy sessions (e.g., SleepWell CBT; Bradley et al., 2018; Waite et al., 2023) and a smartphone app-based approach (Taylor et al., 2022). Common features across interventions included psychoeducation about sleep, behavioural strategies for managing insomnia (e.g., stimulus control, sleep restriction), cognitive restructuring of maladaptive beliefs about sleep, and relapse prevention techniques (see Table 4). While Bradley et al. (2018) and Waite et al. (2023) involved structured, multi-session CBT protocols over 10 to 12 weeks, Taylor et al. (2022) offered a shorter, app-based intervention supplemented with minimal therapist contact. In all included studies, sleep outcomes were the primary measures, with SOF assessed as a secondary outcome.

Bradley et al. (2018) and Waite et al. (2023) focused on ARMS populations, while Taylor et al. (2022) primarily included participants with FEP. Findings from Bradley et al. (2018), an uncontrolled feasibility study, suggested that treating sleep problems in ARMS populations is feasible, acceptable, and may yield clinical benefits, including improvements in SOF. Waite et al. (2023), employing a randomised controlled trial (RCT), reported sustained improvements in both sleep and SOF at a nine-month follow-up, indicating the potential long-term benefits of targeted sleep interventions for this population. In contrast, Taylor et al. (2022) utilised a smartphone-based CBTi app for participants with psychosis spectrum diagnoses. While no significant improvements in SOF were observed, the study reported a trend toward improvement from pre- to post-intervention.

Other sleep intervention studies were identified during the review process, however, they were excluded as they did not specifically report on associations with SOF. Given the small number of studies and limited sample sizes (ranging from 11 to 40 participants), conducting a meta-analysis to pool effect sizes for the impact of sleep interventions was deemed unlikely to yield meaningful results. Similarly, a meta-analysis of studies reporting associations between sleep and SOF was not feasible due to methodological heterogeneity and the variety of measures used across studies.

Table 4

Findings from Intervention Studies

Study, Intervention Name, Location	**Duration of Intervention**	**Target Population**	**Participant characteristics (age, gender, ethnicity)**	**Features of Intervention**	***N***	**Control?**	**Sleep and SOF measures**	**Relevant findings and Effect size (ES)**
Bradley et al. (2018) **SleepWell CBT intervention for sleep problems** **UK**	10 weeks for up to eight sessions with one-month follow up	UHR; outpatient community sample	Age 15-22 years (mean= 18.27, SD= 1.95), 54.5% females, 90.9% white	Adapted CBT for sleep problems; psychoeducation, sleep hygiene, strategies, relapse prevention	11	Single-armed, no control	SLEEP-50, ISI, PSQI, sleep diaries and actigraphy WSAS	Improvements were observed in SOF at post-sleep intervention pointing at an indirect positive association between sleep and socio-occupational functioning. Improvements were maintained at one-month follow-up. ES change score SOF *d* = 0.7

Taylor et al. (2022) **CBTi** **UK**	Six weeks with up to 30 min of therapist contact offered weekly	Outpatient community sample with psychosis spectrum diagnoses (FEP= 78.57%)	Age 22-57 (mean= 35.57, SD= 10.88), 64.29% males, 42.86% Black/African/Caribbean/Black British	CBTi smartphone app intervention adapted for individuals with psychosis	14	Single-armed, no control	PSQI, ISI, Core Consensus Sleep Diary WSAS	Improvements in sleep quality and insomnia severity coincided with non-significant trends toward better socio-occupational adjustment from pre- to post-intervention. No direct statistical tests of association between sleep and functioning were performed.
Waite et al. (2023) **SleepWell CBT intervention for sleep problems** **UK**	Eight sessions over 12 weeks (3-month intervention period) with follow-ups at 3 and 9 months	UHR; outpatient community sample	Age 14–23 (mean= 16.9, SD= (2.5), 48% females, 48% males, 5% other, 80% White	Adapted CBT for sleep problems; psychoeducation, sleep hygiene, strategies, relapse prevention	40 (21 in intervention, 19 in control)	RCT; usual care as control group	ISI, SLEEP-50 Circadian Rhythm Disruption subscale, sleep diaries, actigraphy WSAS	Improvements in sleep (ISI scores; Cohen's d = -2.67 at 3 months, -1.91 at 9 months) and SOF (WSAS reductions; ES not reported)

Discussion

Main Findings

This systematic review examined the relationship between sleep disturbances and SOF in individuals with ARMS and FEP, as well as the impact of sleep interventions on SOF. Most studies reported significant associations between sleep disturbances and poorer SOF, reinforcing existing literature and highlighting these areas as potential therapeutic targets. Nine out of thirteen studies found significant associations, with effect sizes ranging from small to large, while four reported no significant links. Despite methodological variability, findings point to consistency across different measurement tools, demonstrating a link between poor sleep and impaired SOF. Intervention studies, particularly those using CBT for Insomnia, showed promising improvements in both sleep and SOF, with some evidence of sustained benefits over time. While results varied, the overall findings suggest that targeted sleep treatments may positively influence SOF in early psychosis populations.

Interpretation of Findings

Consistent with prior research on serious mental illness (Stafford et al., 2024), this review highlights the relationship between sleep disturbances and functional impairments in early psychosis. Sleep problems, such as insomnia, poor sleep quality and disrupted circadian rhythms, were associated with poorer SOF across most included studies. These findings align with theories suggesting that disrupted sleep contributes to cognitive and emotional dysregulation (Walker, 2010), which again may undermine an individual's ability to engage in for instance work, education and social roles (Grandner, 2017, Lollies et al. 2022; Marin et al., 2023). Conversely, socio-occupational challenges may perpetuate stress and exacerbate sleep disturbances, creating a self-reinforcing cycle of impairment (Lunsford-Avery et al., 2017a), impacting not only risk of transitioning but outcomes more broadly (Reeve et al., 2019; Clarke et al., 2021). Longitudinal studies in the review are

suggestive of these dynamics, with disrupted circadian rhythms and insomnia predicting poorer SOF outcomes over time (Lunsford-Avery et al., 2017a; Gannon et al., 2023). This is consistent with findings in broader mental health populations, where poor sleep quality is linked to functional decline (Kasanova et al., 2020). A few studies did not find significant associations, including both ARMS and FEP populations, which speaks to the complex nature and remaining questions regarding the possible underlying mechanisms for the link between sleep and poor functioning. Some of these were also limited by smaller sample sizes, varying measurement tools or methodological constraints, emphasising the need for further research in this area.

The review also highlights promising findings from psychological intervention studies employing sleep-focused CBT-based approaches. These studies demonstrated improvements in sleep quality and trends toward better SOF following intervention (Bradley et al., 2018; Waite et al., 2023). For example, the SleepWell CBT intervention not only improved sleep outcomes but also showed sustained functional improvements at nine month follow-ups (Waite et al., 2023). However, the limited statistical testing of direct associations between improved sleep and SOF in these studies calls for further exploration. Additionally, Marin and colleagues (2023) highlighted the need to consider the benefits of non-psychological interventions alongside this, for instance, medical treatments or interventions targeting areas such as physical exercise. Nevertheless, the potential scalability and adaptability of CBT-based sleep interventions, including app-based formats (Taylor et al., 2022), present opportunities to enhance access to therapies as seen in other clinician and non-clinical populations (Rathbone et al., 2017; Oliveira et al., 2021). These findings align with evidence in other mental health populations that targeted sleep interventions can provide benefits beyond sleep itself, supporting emotional regulation and overall functioning (Grandner, 2017).

Clinical Implications

The findings highlight the importance of routinely screening and assessing sleep disturbances in ARMS and FEP populations. Methods for measuring sleep and SOF in different

settings need to be carefully considered and tailored to diverse populations and contexts. Given the suggested association between sleep and SOF, a need for early and targeted interventions as an integrated part of standard care pathways is emphasised. Sleep and mental health are closely linked in a two-way relationship, where each may influence the severity of the other. Based on the findings of this review, it is suggested that tackling sleep issues could help reduce and even prevent the recurrence of difficulties in functioning, a significant characteristic in early psychosis. CBT-based sleep interventions appear to be feasible and effective, with the potential to improve both sleep and functional outcomes. The adaptability of CBT-based interventions to app formats warrants further investigation as it may offer promising opportunities for increasing accessibility and engagement, particularly for younger populations who may prefer digital solutions. Tailored interventions accounting for demographic factors, such as age and gender, and cultural contexts are necessary to enhance engagement and effectiveness. Additionally, the reciprocal relationship between sleep and SOF suggests that multi-faceted approaches addressing both domains may result in interactional benefits.

Strengths and Limitations

This review provides a comprehensive synthesis of the current literature on the relationship between sleep and SOF in ARMS and FEP populations. Given the increasing emphasis on sleep as both an intervention target and a potential factor in improving functional outcomes in early psychosis, the review also examines the outcomes of sleep interventions, highlighting key findings and proposing directions for future research. By addressing both theoretical and practical implications, this synthesis offers valuable insights into the role of sleep in early psychosis.

However, several limitations should be acknowledged. The variability in tools used to assess sleep disturbances and SOF across studies limits comparability and challenges the standardisation of findings, in addition to many studies not reporting on effect sizes, which further complicates its interpretation. Notably, SOF encompasses multiple domains, including work, education, social

relationships, daily living skills and self-care, and therefore are not uniformly defined, creating challenges in comparing and interpreting results with specific consideration to the choice of tools (e.g. subjective vs. objective) and cultural context (e.g. societal influence and conceptualisation).

Furthermore, reliance on self-reported measures introduces potential biases, such as recall or reporting inaccuracies, which may affect the validity of the results. Heterogeneity in study designs, sample sizes, and intervention formats further complicates the ability to draw definitive conclusions or conduct impactful meta-analytic synthesis. Additionally, the small sample sizes in the intervention studies reduce statistical power and limit the generalisability of their findings, and the exclusion of non-English articles and grey literature may have increased the risk of publication bias. Finally, the underrepresentation of ethnically and culturally diverse populations restricts the applicability of the results and the development of culturally sensitive interventions, highlighting the need for greater inclusivity in future research.

Overall, the review identified only 13 eligible studies, reflecting the limited research in this area and underscoring the need for further investigation in a field that is still developing. While variability in study design, participant characteristics and measurement tools limit the comparability of findings, the review provides a breadth of evidence supporting the association between sleep disturbances and SOF.

Directions for Future Research

Future research may consider further exploration of the use of standardised tools across different contexts to measure both sleep disturbances and SOF. This may enable better comparability across studies and facilitate meta-analytic approaches as a powerful tool to combine findings from individual studies (DerSimonian & Laird 1986). Longitudinal studies with robust designs are needed to clarify the causal pathways between sleep and functioning with particular emphasis on identifying potential mediators. Additionally, intervention studies exploring the impact of sleep interventions on SOF, with larger samples, are essential to continue building our understanding of the benefits of

sleep-focused therapy on improving SOF. The included intervention studies in this review were all CBT-based. Exploring alternative therapeutic approaches, such as mindfulness-based or integrated psychosocial strategies (Vignaud et al., 2019; Soneson et al., 2020), could expand the range of effective treatments available for early psychosis populations. In doing so, innovative delivery methods, such as technology-enhanced or app-based interventions, could be further developed and evaluated to improve accessibility and engagement, particularly for younger individuals, whilst also considering necessary measures to make services accessible for underserved populations (Bear et al., 2024). Lastly, given the limited representation of ethnically and culturally diverse populations in existing studies, future research should aim to be inclusive to account for variations in sleep and functioning across different cultural contexts.

Conclusion

This systematic review highlights the significant relationship between sleep disturbances and SOF in individuals with ARMS and FEP, reinforcing the importance of sleep as a therapeutic target in early psychosis. While variability in study designs and measures poses challenges to generalisability, the breadth of evidence highlights the pervasive impact of disrupted sleep on functional outcomes. Promising findings from intervention studies employing CBT-based approaches suggest that addressing sleep disturbances can lead to improvements in both sleep quality and SOF. These interventions demonstrate potential for scalability and adaptability, particularly with digital formats offering opportunities for broader accessibility. Ultimately, addressing sleep disturbances in early psychosis could play a pivotal role in improving both functional and overall outcomes for these individuals.

Author contributions

Sara Schjolberg Marques: conceptualisation, writing, methodology, investigation, analysis, project administration.

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Sheri Oduola: conceptualisation, review and editing, methodology, supervision, project administration.

Systematic Review Registration

The International Prospective Register of Systematic Reviews (PROSPERO) ID Registration Number: CRD42024558403.

Declaration of Interest

The authors have no competing interests to declare that are relevant to the content of this article. Data sharing is not applicable to this article as no new data were created or analysed.

Funding

This research did not receive any grant from funding agencies.

References

Addington, J., & Addington, D. (2008). Outcome after discharge from an early psychosis program. *Schizophrenia Research*, 106(2-3), 363–366. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2008.08.032

Bagautdinova, J., Mayeli, A., Wilson, J. D., Donati, F. L., Colacot, R. M., Meyer, N., Fusar-Poli, P., & Ferrarelli, F. (2023). Sleep Abnormalities in Different Clinical Stages of Psychosis: A Systematic Review and Meta-analysis. *JAMA Psychiatry*, 80(3), 202–210. https://doi-org.uea.idm.oclc.org/10.1001/jamapsychiatry.2022.4599

Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, 2(4), 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4

Bear, H. A., Ayala Nunes, L., Ramos, G., Manchanda, T., Fernandes, B., Chabursky, S., Walper, S., Watkins, E., & Fazel, M. (2024). The Acceptability, Engagement, and Feasibility of Mental Health Apps for Marginalized and Underserved Young People: Systematic Review and Qualitative Study. *Journal of Medical Internet Research*, 26, e48964. https://doi-org.uea.idm.oclc.org/10.2196/48964

Benson K. L. (2006). Sleep in schizophrenia: impairments, correlates, and treatment. *The Psychiatric clinics of North America*, 29(4), 1033–x. https://doi-org.uea.idm.oclc.org/10.1016/j.psc.2006.08.002

Birchwood, M., Smith, J., Cochrane, R., Wetton, S., & Copestake, S. (1990). The Social Functioning Scale: The development and validation of a new scale of social adjustment for use in family intervention programmes with schizophrenic patients. *The British Journal of Psychiatry*, 157(6), 853–859. https://doi.org/10.1192/bjp.157.6.853

Blanchard, J. J., Savage, C. L. G., Orth, R. D., Jacome, A. M., & Bennett, M. E. (2020). Sleep Problems and Social Impairment in Psychosis: A Transdiagnostic Study Examining Multiple Social Domains. *Frontiers in Psychiatry*, 11, 486. https://doi-org.uea.idm.oclc.org/10.3389/fpsyt.2020.00486

Bradley, J., Freeman, D., Chadwick, E., Harvey, A. G., Mullins, B., Johns, L., Sheaves, B., Lennox, B., Broome, M., & Waite, F. (2018). Treating Sleep Problems in Young People at Ultra-High Risk of Psychosis: A Feasibility Case Series. *Behavioural and Cognitive Psychotherapy*, 46(3), 276–291. https://doi-org.uea.idm.oclc.org/10.1017/S1352465817000601

Buysse, D. J., Reynolds, C. F., 3rd, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213. https://doi-org.uea.idm.oclc.org/10.1016/0165-1781(89)90047-4

Clarke, L., Chisholm, K., Cappuccio, F. P., Tang, N. K. Y., Miller, M. A., Elahi, F., & Thompson, A. D. (2021). Sleep disturbances and the At Risk Mental State: A systematic review and meta-analysis. *Schizophrenia Research*, 227, 81–91. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2020.06.027

Davies, G., Haddock, G., Yung, A. R., Mulligan, L. D., & Kyle, S. D. (2017). A systematic review of the nature and correlates of sleep disturbance in early psychosis. *Sleep Medicine Reviews*, 31, 25–38. https://doi-org.uea.idm.oclc.org/10.1016/j.smrv.2016.01.001

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Controlled Clinical Trials*, 7(3), 177-188. https://doi.org/10.1016/0197-2456(86)90046-2

Freeman, D., Sheaves, B., Waite, F., Harvey, A. G., & Harrison, P. J. (2020). Sleep disturbance and psychiatric disorders. *The Lancet Psychiatry*, 7(7), 628-637. https://doi-org.uea.idm.oclc.org/10.1016/S2215-0366(20)30136-X

Fusar-Poli, P., Bonoldi, I., Yung, A. R., Borgwardt, S., Kempton, M. J., Valmaggia, L., ... & McGuire, P. (2012). Predicting psychosis: meta-analysis of transition outcomes in individuals at high clinical risk. *Archives of General Psychiatry*, 69(3), 220-229. https://doi-org.uea.idm.oclc.org/10.1001/archgenpsychiatry.2011.1472

Goines, K. B., LoPilato, A. M., Addington, J., Bearden, C. E., Cadenhead, K. S., Cannon, T. D., Cornblatt, B. A., Mathalon, D. H., McGlashan, T. H., Perkins, D. O., Tsuang, M. T., Woods, S. W., & Walker, E. F. (2019). Sleep problems and attenuated psychotic symptoms in youth at clinical high-risk for psychosis. *Psychiatry Research*, 282, 112492. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2019.112492

Grandner M. A. (2017). Sleep, Health, and Society. *Sleep Medicine Clinics*, 12(1), 1–22. https://doi.org/10.1016/j.jsmc.2016.10.012

Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., ... & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285-291. https://journals-sagepub-com.uea.idm.oclc.org/doi/full/10.3233/EFI-180221

Horne, J. A., & Östberg, O. (1976). A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. *International Journal of Chronobiology*, 4(2), 97–110.

Kasanova, Z., Hajdúk, M., Thewissen, V., & Myin-Germeys, I. (2020). Temporal associations between sleep quality and paranoia across the paranoia continuum: An experience sampling study. *Journal of Abnormal Psychology*, 129(1), 122–130. https://doi-org.uea.idm.oclc.org/10.1037/abn0000453

Lollies, F., Schnatschmidt, M., Bihlmeier, I., Genuneit, J., In-Albnon, T., Holtmann, M., Legenbauer, T., & Schlarb, A. A. (2022). Associations of sleep and emotion regulation processes in childhood and adolescence - a systematic review, report of methodological challenges and future directions. *Sleep Science*, Sao Paulo, Brazil, 15(4), 490–514. https://doi.org/10.5935/1984-0063.20220082

Lunsford-Avery, J. R., LeBourgeois, M. K., Gupta, T., & Mittal, V. A. (2015). Actigraphic-measured sleep disturbance predicts increased positive symptoms in adolescents at ultra high-risk for psychosis: a longitudinal study. *Schizophrenia Research*, 164(1-3), 15-20. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2015.03.013

Lunsford-Avery, J. R., Gonçalves, B. D. S. B., Brietzke, E., Bressan, R. A., Gadelha, A., Auerbach, R. P., & Mittal, V. A. (2017a). Adolescents at clinical-high risk for psychosis: Circadian rhythm disturbances predict worsened prognosis at 1-year follow-up. *Schizophrenia Research*, 189, 37–42. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2017.01.051

Lunsford-Avery, J. R., Dean, D. J., & Mittal, V. A. (2017b). Self-reported sleep disturbances associated with procedural learning impairment in adolescents at ultra-high risk for psychosis. *Schizophrenia Research*, 190, 160–163. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2017.03.025

Lunsford-Avery, J. R., Pelletier-Baldelli, A., Korenic, S. A., Schiffman, J., Ellman, L. M., Jackson, L., & Mittal, V. A. (2021). Eveningness chronotype preference among individuals at clinical high risk for psychosis. *Schizophrenia Research*, 236, 3–8. https://doi.org/10.1016/j.schres.2021.07.034

Marin, L., Guàrdia, A., González-Rodríguez, A., Haba-Rubio, J., Natividad, M., Bosch, E., Domínguez, N., & Monreal, J. A. (2023). Sleep Disturbances in At-Risk Mental States and First Episode of Psychosis: A Narrative Review on Interventions. *Clocks & Sleep*, 5(2), 249–259. https://doi.org/10.3390/clockssleep5020020

Morgan, R. L., Whaley, P., Thayer, K. A., & Schünemann, H. J. (2018). Identifying the PECO: a framework for formulating good questions to explore the association of environmental and other exposures with health outcomes. *Environment International*, 121(Pt 1), 1027. https://doi-org.uea.idm.oclc.org/10.1016/j.envint.2018.07.015

Mundt, J. C., Marks, I. M., Shear, M. K., & Greist, J. H. (2002). The Work and Social Adjustment Scale: A simple measure of impairment in functioning. *The British Journal of Psychiatry*, 180(5), 461–464. https://doi.org/10.1192/bjp.180.5.461

Oliveira, C., Pereira, A., Vagos, P., Nóbrega, C., Gonçalves, J., & Afonso, B. (2021). Effectiveness of Mobile App-Based Psychological Interventions for College Students: A Systematic Review of the Literature. *Frontiers in Psychology*, 12, 647606. https://doi-org.uea.idm.oclc.org/10.3389/fpsyg.2021.647606

Ouzzani, M., Hammady, H., Fedorowicz, Z. & Elmagarmid, A. (2016). Rayyan—a Web and Mobile App for Systematic Reviews. *Systematic Reviews 5*. https://doi.org/10.1186/s13643-016-0384-4

Piersma, H. L., & Boes, J. L. (1997). The GAF and psychiatric outcome: a descriptive report. *Community Mental Health Journal*, 33(1), 35–41. https://doi-org.uea.idm.oclc.org/10.1023/a:1022413110345

Poe, S. L., Brucato, G., Bruno, N., Arndt, L. Y., Ben-David, S., Gill, K. E., ... & Girgis, R. R. (2017). Sleep disturbances in individuals at clinical high risk for psychosis. *Psychiatry Research*, 249, 240-243. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2016.12.029

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., Duffy, S. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews*. ESRC Methods Programme. DOI:10.13140/2.1.1018.4643

Rathbone, A. L., Clarry, L., & Prescott, J. (2017). Assessing the Efficacy of Mobile Health Apps Using the Basic Principles of Cognitive Behavioral Therapy: Systematic Review. *Journal of medical Internet research*, 19(11), e399. https://doi-org.uea.idm.oclc.org/10.2196/jmir.8598

Reeve, S., Sheaves, B., & Freeman, D. (2015). The role of sleep dysfunction in the occurrence of delusions and hallucinations: A systematic review. *Clinical Psychology Review*, 42, 96–115. https://doi-org.uea.idm.oclc.org/10.1016/j.cpr.2015.09.001

Reeve, S., Nickless, A., Sheaves, B., Hodgekins, J., Stewart, S. L. K., Gumley, A., ... & Freeman, D. (2019). Sleep duration and psychotic experiences in patients at risk of psychosis: a secondary

analysis of the EDIE-2 trial. *Schizophrenia Research*, 204, 326-333. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2018.08.006

Rybarczyk, B. (2011). Social and Occupational Functioning Assessment Scale (SOFAS). In J. S. Kreutzer, J. DeLuca, & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 2313-2313). New York, NY: Springer New York.

Saraswat, N., Rao, K., Subbakrishna, D. K., & Gangadhar, B. N. (2006). The Social Occupational Functioning Scale (SOFS): a brief measure of functional status in persons with schizophrenia. *Schizophrenia research*, 81(2-3), 301–309. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2005.09.008

Smith, C. S., Reilly, C., & Midkiff, K. (1989). Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *Journal of Applied Psychology*, 74(5), 728–738. https://doi.org/10.1037/0021-9010.74.5.728

Soneson, E., Russo, D., Stochl, J., Heslin, M., Galante, J., Knight, C., Grey, N., Hodgekins, J., French, P., Fowler, D., Lafortune, L., Byford, S., Jones, P. B., & Perez, J. (2020). Psychological interventions for people with psychotic experiences: A systematic review and meta-analysis of controlled and uncontrolled effectiveness and economic studies. *The Australian and New Zealand Journal of Psychiatry*, 54(7), 673–695. https://doi-org.uea.idm.oclc.org/10.1177/0004867420913118

Spoormaker, V. I., Verbeek, I., van den Bout, J., & Klip, E. C. (2006). Initial validation of the SLEEP-50 questionnaire. *Behavioral Sleep Medicine*, 3(4), 227–246. https://doi.org/10.1207/s15402010bsm0404_4

Stafford, A., Oduola, S., & Reeve, S. (2024). Sleep and socio-occupational functioning in adults with serious mental illness: A systematic review. *Psychiatry Research*, 339, 116111. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2024.116111

Taylor, K. M., Bradley, J., & Cella, M. (2022). A novel smartphone-based intervention targeting sleep difficulties in individuals experiencing psychosis: A feasibility and acceptability evaluation. *Psychology and Psychotherapy*, 95(3), 717–737. https://doi-org.uea.idm.oclc.org/10.1111/papt.12395

Velthorst, E., Nelson, B., Wiltink, S., de Haan, L., Wood, S. J., Lin, A., & Yung, A. R. (2013). Transition to first episode psychosis in ultra high risk populations: does baseline functioning hold the key?

Schizophrenia Research, 143(1), 132-137. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2012.10.025

Vignaud, P., Reilly, K. T., Donde, C., Haesebaert, F., & Brunelin, J. (2019). Clinical Effects of Mindfulness-Based Intervention in Patients With First Episode Psychosis and in Individuals With Ultra-High Risk for Transition to Psychosis: A Review. *Frontiers in Psychiatry*, 10, 797. https://doi-org.uea.idm.oclc.org/10.3389/fpsyt.2019.00797

Waite, F., Bradley, J., Chadwick, E., Reeve, S., Bird, J. C., & Freeman, D. (2018). The experience of sleep problems and their treatment in young people at ultra-high risk of psychosis: a thematic analysis. *Frontiers in Psychiatry*, *9*, 375. https://doi.org/10.3389/fpsyt.2018.00375

Waite, F., Černis, E., Kabir, T., Iredale, E., Johns, L., Maughan, D., Diamond, R., Seddon, R., Williams, N., Yu, L. M., Freeman, D., & SleepWell lived experience advisory group. (2023). A targeted psychological treatment for sleep problems in young people at ultra-high risk of psychosis in England (SleepWell): a parallel group, single-blind, randomised controlled feasibility trial. *The Lancet. Psychiatry*, 10(9), 706–718. https://doi-org.uea.idm.oclc.org/10.1016/S2215-0366(23)00203-1

Walker M. P. (2010). Sleep, memory and emotion. *Progress in Brain Research*, 185, 49–68. https://doi-org.uea.idm.oclc.org/10.1016/B978-0-444-53702-7.00004-X

Wing, J. K., Beevor, A. S., Curtis, R. H., Park, S. B. G., Hadden, S., & Burns, A. (1996). Health of the Nation Outcome Scales (HoNOS): Research and development. *The British Journal of Psychiatry*, 168(1), 11–18. https://doi.org/10.1192/bjp.168.1.11

Chapter Three

Bridging Chapter

Word Count: 591

Chapter Three: Bridging Chapter

This chapter summarises the findings of the systematic review and provides the background and rationale for the empirical paper.

Systematic Review Findings

The systematic review presented in Chapter Two explored the relationship between sleep disturbances and socio-occupational functioning (SOF) in early psychosis, focusing on individuals with an At-Risk Mental State (ARMS) and those experiencing First-Episode Psychosis (FEP). Additionally, it examined whether sleep interventions had an impact on SOF. A narrative synthesis of 13 studies was conducted, incorporating both qualitative and quantitative methodologies, and studies of different designs and measurement approaches.

The review identified a significant association between sleep disturbances and SOF in individuals with ARMS and FEP. Several studies suggested that poor sleep is linked to greater functional impairments, reinforcing the importance of addressing sleep as a treatment target in early psychosis as evidenced in previous studies (Marin et al., 2023). Furthermore, findings from intervention studies using CBT-based approaches targeting sleep highlighted promising improvements in SOF. These findings suggest that sleep-focused interventions could enhance functional and overall outcomes for individuals with early psychosis.

Despite these promising results, further research is needed to establish causal links and evaluate the effectiveness of different therapeutic approaches and delivery methods. This requires routine screening and assessment of sleep and SOF. Additionally, the review highlighted the need for more diverse samples to better understand variations in impact and treatment effectiveness to ensure that findings are generalisable.

Background and Rationale for Empirical Paper

Early intervention in psychosis is widely recognised as critical for reducing the risk of transition to more severe illness and for improving long-term outcomes (Bird et al., 2010; Ising et al., 2017; Wijnen et al., 2020). Understanding key risk factors, their impact on mental health trajectories and the effectiveness of interventions remains a priority in psychosis research. However, systemic barriers to accessing psychological care continue to pose significant challenges for early intervention services (Oduola et al., 2023).

Research has consistently highlighted disparities in access to psychological treatments, which were further exacerbated by the COVID-19 pandemic (Giuntella et al., 2021). The pandemic led to widespread disruptions in healthcare services, raising concerns about reduced service capacity, altered delivery methods and additional barriers to accessing psychological therapies (Moreno et al., 2020; Zhand & Joober, 2021). Given national guidelines and the importance of timely provided psychological support (i.e. CBT and family interventions), in improving outcomes for individuals with ARMS and FEP, investigating access to these treatments over time and across different sociodemographic groups is essential.

To our knowledge, no studies to date have examined how access to psychological interventions for early psychosis populations has changed before, during and after the pandemic and how these changes vary by type of intervention and across different sociodemographic groups. Understanding these patterns can inform care focus and strategies to best meet the changing needs of the population, ensuring mental health services are working to provide equitable and evidence-based care for individuals with different backgrounds at risk of or experiencing early psychosis.

The empirical paper in the following chapter aims to address this gap by investigating the impact of the pandemic on access to psychological interventions, specifically by examining changes in treatment access across three time periods (pre-, during and post-pandemic) and assessing disparities across sociodemographic groups. This study will use retrospective quantitative analysis of

anonymised electronic clinical records from early intervention in psychosis services in South London. The findings aim to provide insights into how service disruptions have affected treatment accessibility and to inform strategies for creating more equitable and effective models of care in early psychosis services.

Chapter Four: Empirical Research Project

Impact of COVID-19 on Access to Psychological Interventions for Young People and Adults with At-Risk Mental States and First-Episode Psychosis

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Formatted for submission to: *Social Psychiatry & Psychiatric Epidemiology*

(see Author Guidelines in Appendix C)

Word Count in line with the Journal Guidelines: 4,961

(excluding tables, figures, references)

Impact of COVID-19 on Access to Psychological Interventions for Young People and Adults with At-Risk Mental States and First-Episode Psychosis

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Abstract

Purpose: Psychosis profoundly impacts individuals and families, making early intervention essential for improving outcomes. The COVID-19 pandemic disrupted mental health services, potentially worsening access to psychological support for individuals with At-Risk Mental State (ARMS) and First-Episode Psychosis (FEP). This study examines the pandemic's effect on access to psychological interventions and related sociodemographic disparities.

Methods: De-identified data from a large South London mental health provider were analysed. Individuals actively receiving care from early intervention for psychosis services between January 2016 and December 2023 were identified and grouped into three time periods; pre-COVID, COVID and post-COVID. A retrospective cohort design using descriptive, inferential statistics and multivariable logistic regressions was employed to examine associations between time, sociodemographic factors and access to Cognitive Behavioural Therapy (CBT) and Family Intervention (FI).

Results: Among 7,920 participants (89.1% FEP, 10.9% ARMS), access to psychological interventions declined during and after the pandemic, with a sustained shift towards indirect delivery of care. Younger individuals, females, and those from less deprived areas were more likely to receive CBT, while Black African, Black Caribbean, and White non-British individuals, as well as those referred via the criminal justice system, had lower access to psychological interventions.

Conclusion: The pandemic intensified disparities in access to psychological intervention for individuals with ARMS and FEP. Targeted strategies and service adaptations are necessary to improve equity in early intervention. Future research should investigate long-term consequences and strategies to reduce inequalities in care.

Keywords: early psychosis, at-risk mental state, first-episode psychosis, access to psychological intervention, COVID-19

Introduction

Psychosis, characterised by hallucinations and delusions, impacts an individual's perception of reality and often causes significant distress and disability for both individuals and families [1, 2]. A longer duration of untreated psychosis (DUP) is linked to poorer personal recovery, increased service use, worse economic outcomes and significant societal costs [3]. This highlights the importance of early intervention and evidence-based treatment for individuals experiencing psychosis or at risk of developing it, a group comprising approximately 0.7% of the UK population [4].

Models of psychosis have identified a prodromal phase preceding the onset of psychosis, known as the At-Risk Mental State (ARMS) [5]. Individuals classified as ARMS (Clinical High-Risk; CHR or Ultra High-Risk; UHR) experience less intense psychosis-like symptoms, functional decline and often co-occurring conditions such as anxiety or low mood [6]. The prevalence of ARMS is estimated at 1.7% in the general population and up to 19.2% in clinical settings [7]. Around 25% of those with an ARMS transition to full psychosis within three years, while others still face distress and poor outcomes [8-10]. First-Episode Psychosis (FEP) marks the initial presentation of full psychotic symptoms with a higher risk of impairment.

Early Intervention in Psychosis (EIP) services aim to reduce treatment delays and improve outcomes for individuals with FEP or ARMS. NHS England's 2016 Access and Waiting Time Standards reinforced the necessity of rapid and evidence-based treatment, mandating care within two weeks of referral and tailored support for up to two years for ARMS and at least three for FEP [3]. In line with the National Institute for Health and Care Excellence (NICE) guidelines [11], the recommended interventions include individual Cognitive Behavioural Therapy (CBT) with or without family involvement for ARMS, shown to prevent psychosis onset and improve outcomes regardless of progression [12, 13]. For FEP, the recommendation is 16 sessions or more of Cognitive Behavioural Therapy for Psychosis (CBTp) and Family Intervention (FI), alongside antipsychotic medication [11].

EIP services have proven effective in reducing symptom severity, relapse risk and hospital admissions [14].

Nevertheless, disparities persist in accessing interventions in early psychosis. Sociodemographic factors across age, gender, ethnicity and living situation are associated with delays in help-seeking [15], with family involvement as an important factor [16]. Underrepresented ethnic groups are found to be 20–61% less likely to receive CBTp than White British service users in EIP services across England, particularly among Bangladeshi, Pakistani, Chinese and Black African groups [17]. Patterns of ethnic disparities in those offered compared to those who received interventions were broadly similar. Barriers to accessing care in this population are multifaceted and can involve stigma, impact of negative symptoms, low social support and the initial presentation of non-specific symptoms such as anxiety or depression which may delay appropriate diagnosis and care [18-20].

The COVID-19 pandemic impacted healthcare worldwide with strict public health measures and social distancing guidelines disrupting daily routines and employment, causing stress and uncertainty about the future [21]. It further exacerbated challenges in mental health provision by altering care delivery, increasing demand and exposing gaps in access for individuals at risk of developing psychosis [22, 23]. This population faced heightened exposure to risk factors such as stress, substance use and the negative impact of social isolation on early detection and timely intervention [24]. Furthermore, studies have reported reduced treatment efficacy from psychological interventions particularly for FEP symptoms [25]. Collectively, these factors may heighten vulnerability to psychosis, placing additional demands on EIP services and consequently provision of care.

There is limited understanding of how the pandemic has specifically affected access to psychological interventions in early psychosis populations and disparities in the type of interventions received across different sociodemographic groups. Given the critical role of psychological interventions in reducing symptom severity and improving long-term outcomes in early psychosis

(ARMS and FEP), it is essential to investigate patterns of care to develop further understanding of barriers to equitable access. Therefore, this study will investigate the following research questions:

- What proportion of EIP service users received psychological intervention and what type of psychological intervention did they access before, during and after the COVID-19 pandemic?
- Were there sociodemographic differences in the type of psychological intervention received?
- What was the impact of the COVID-19 pandemic (before, during and after) on access to and type of psychological intervention among EIP service users?
- What was the relationship between the type of psychological interventions accessed by individuals with ARMS and FEP before, during and after the pandemic?

Method

Design and Data Source

To investigate the impact of the COVID-19 pandemic, this study utilised a retrospective cohort design. Data were drawn from the South London and Maudsley (SLaM) NHS Trust de-identified electronic health records, known as the Biomedical Research Centre (BRC) Clinical Records Interactive Search (CRIS) system [16]. Data is available from the CRIS system in two formats: a) structured fields (e.g., demographic, diagnosis information) and b) unstructured fields (i.e., free text). We searched the CRIS system for demographic and clinical information using Structured Query Language [27]. Individuals who were actively receiving treatment from SLaM early intervention for psychosis services were identified and grouped into three COVID periods; before, during and after the pandemic.

Settings and Participants

The study utilised data from early intervention for psychosis services at SLaM providing care for individuals with ARMS and FEP. These services cover the boroughs of Lewisham, Lambeth,

Croydon and Southwark; a diverse urban region with an estimated population of 1.3 million [27], including significant minority ethnic communities (28.0% Black African, 15.7% Black Caribbean) [28]. The services accept self-referrals and referrals from health professionals and other statutory and community services or agencies. In accordance with the NHS Access and Wait Time Standards for Early Intervention in Psychosis services, the age eligibility criterion is 14–35 for ARMS and extended to 14–65 for FEP [3].

Study participants were selected based on the following inclusion criteria: 1. aged between 14 and 65 and receiving care from any SLaM EIP service during the study period (2016-2023), 2. living in the boroughs of Lambeth, Southwark, Croydon or Lewisham, and 3. meeting criteria for ARMS based on the Comprehensive Assessment of At-Risk Mental States (CAARMS) [6] or FEP (International Classification of Diseases - Tenth Revision [ICD-10] codes F20-F29) [29]. Individuals over 65 years were excluded.

An a priori power calculation using the chi-square test was conducted in G*Power 3.1 to ensure adequate statistical power, based on existing literature with aim of determining a minimum sample size required to detect a meaningful effect. The results indicated that a minimum sample size of N=194 was necessary to identify a Cohen's d effect size of 0.5 (considered medium) with a significance level (alpha) set at 0.05 and a desired statistical power (1-beta) of 0.80.

Ethics

Ethical approval had been granted by the Oxfordshire Research Ethics Committee (reference 23/SC/0257) as a secondary dataset for research, and we obtained SLaM/CRIS Oversight Committee approval for this study (reference: 23-055). Under UK law, service user consent was not required for this study.

Procedure and Study Variables

The CRIS team supported data extraction by searching the system for demographic and clinical information using Structured Query Language [27].

The study defined the dependent/outcome variables as access to care, encompassing received intervention, the type of interventions offered (CBT, Family Intervention), the mode of delivery (face-to-face, indirect/virtual, systems-based) and the number of sessions with a cut-off based on recommended guidelines (>16 or <16 sessions) [11].

The main independent/exposure variable in the study was time, divided into three time periods: pre-COVID (January 2016 - December 2019), during (January 2020 - December 2021) and post-COVID (January 2022 - December 2023). This categorisation reflects the timeline of reported initial COVID-19 cases and full UK lockdown announced early 2020, and the subsequent lifting of legal restrictions moving towards a 'Living with COVID-19' strategy by early 2022 [30].

Other independent variables were sociodemographic characteristics, including age, gender, ethnicity and neighbourhood characteristics. Sociodemographic data were coded using the Medical Research Council Socio-demographic Schedule (MRC-SDS) [31] to ensure consistent and standardised categorisation. Ethnic groups were classified using ethnic categories specified in the UK Office of National Statistics 2011 Census [32]. The 18 categories for ethnicity were further combined into seven categories for analysis, including White British, Black Caribbean (Black Caribbean, Other Black), Black African, Asian (Indian, Pakistani, Bangladeshi, Chinese), White Non-British (White Irish, White Gypsy, White Other), Other (Arab and Any Other Ethnic Group) and Mixed (all mixed ethnic groups) to align with those used in previous studies [33, 34]. The neighbourhood characteristics were measured by area-level deprivation based on individual residential postcodes on CRIS linked to the Index of Multiple Deprivation (IMD) [35]. The IMD measures relative deprivation for areas in England by ranking them in quintiles from one (most deprived) to five (least deprived).

To facilitate data organisation and analysis, an Excel document was populated to match the format of the measurement tools adapted for this project, ensuring data integrity and compatibility.

Data Analysis

Data analysis was performed using STATA 18.0 software [36]. The statistical analyses performed to address each of the research questions (RQ) are outlined below.

RQ1: What proportion of EIP service users received psychological intervention and what type of psychological intervention did they access before, during and after the COVID-19 pandemic?

Descriptive statistics were used to quantify receipt of psychological interventions across three time periods (pre-COVID, COVID, post-COVID). Frequencies and proportions were calculated for interventions (CBT, Family Intervention), number of sessions (<16, >16 sessions) and modes of delivery (face-to-face, indirect, systems-based). Chi-square tests were used to assess differences in the categorical variables and one-way ANOVA was used for age.

RQ2: Were there sociodemographic differences in the type of psychological intervention received?

Chi-square tests were utilised to explore sociodemographic differences and compare categorical variables (gender, ethnicity, marital status, referral source, IMD) across interventions received. One-way ANOVA was used to compare the mean age between participants who did and did not receive an intervention with Cohen's d effect sizes.

RQ3: What was the impact of the COVID-19 pandemic (before, during and after) on access to and type of psychological intervention among EIP service users?

Data were stratified into pre-COVID, COVID and post-COVID groups to explore changes over time. Logistic regression analyses (both unadjusted and adjusted for covariates including age, gender, ethnicity, marital status, referral source and IMD) were performed to estimate the odds of accessing interventions across the time periods. Given that individuals receiving care during the study period may be present across the timepoints, COVID period clustering was controlled for in the logistic regression models using the cluster (*period*) command in STATA. This approach provides robust

estimates of standard errors. Additional chi-square tests compared differences in modes of delivery and number of sessions across these periods.

RQ4: What was the relationship between the type of psychological interventions accessed by individuals with ARMS and FEP before, during and after the COVID-19 pandemic?

Logistic regression analyses were conducted for ARMS and FEP across the three time periods. Odds ratios (95% confidence intervals) were calculated to determine differences in the likelihood of receiving CBT or Family Intervention between the two subgroups, and adjusted for as above.

Apart from the descriptive statistics reported in Table 1, all other analyses were conducted with complete data.

Results

Sample Characteristics

The study sample consisted of 7,920 individuals with a mean age of 30.74 years (SD = 11.44) and an age range from 14 to 65 years (Table 1). Age distribution was examined to assess the assumption of normality and a histogram showing a normal distribution with slight skewness is illustrated in Figure 1 (Appendix D). The majority of participants presented with FEP (89.1%) and 10.9% with ARMS, were male (58.8%) and the most common ethnic groups were White British (18.9%), Black African (18.7%) and Black British (17.4%). Most participants were single (53.4%), referred by either A&E (32.2%) or their GP (23.0%), and the sample was skewed towards the most and second most deprived IMD quintiles (26.6 and 44.5%).

Treatment offered by the services included CBT and family intervention. 71.3% did not receive CBT and of the 28.7% who did, the majority received fewer than 16 sessions (80.0%). Family intervention was provided to 13.4% of the sample, with predominantly fewer than 16 sessions (95.9%). Modes of delivery for interventions were primarily face-to-face (90.0%) and indirect/virtual contact (10.0%).

Table 1

Sample Characteristics

	N= 7920	**Range**
Mean age (SD)	30.74 (11.44)	14 - 65
	n	**%**
EI status		
FEP	7060	89.1
ARMS	860	10.9
Gender[1]		
Male	4658	58.8
Female	3242	40.9
Not recorded	20	0.3
Ethnicity[2]		
White British	1499	18.9
White non-British	694	8.8
Mixed	419	5.3
Asian/South Asian	608	7.7
Black African	1481	18.7
Black Caribbean	674	8.5
Black British	1379	17.4
Other	583	7.4
Not recorded	583	7.4
Marital status		
Single	4227	53.4
Married/ in partnership	481	6.1
Divorced/ separated	236	3.0
Widowed	19	0.2
Not recorded	2957	37.3
Referral source[3]		
GP	1823	23.0
Other healthcare professional	1123	14.2
A&E	2546	32.2
CJS	627	7.9
Other	1765	22.3
Not recorded	36	0.5
IMD quintile[4]		
1st most deprived	2105	26.6
2nd most deprived	3525	44.5
3rd most deprived	1401	17.7
4th most deprived	418	5.3
5th least deprived	125	1.6
Not recorded	346	4.4

CBT intervention		
No	5644	71.3
Yes	2276	28.7
< 16 sessions	1821	80.0
> 16 sessions	445	20.0
Family intervention		
No	6861	86.6
Yes	1059	13.4
< 16 sessions	1016	95.9
> 16 sessions	43	4.1
Mode of delivery		
F2F	1605	90.0
Indirect	178	10.0
Systems-based	1	0.1

Missing data: 1 = 20, 2 = 583, 3 = 33, 4 = 346.
EI = Early Intervention; FEP = First-Episode Psychosis; ARMS = At-risk Mental State; GP = General Practitioner, A&E = Accident and Emergency department; CJS = Criminal Justice System; IMD = Index of Multiple Deprivation; CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; F2F = Face to Face.

Differences across study variables by COVID time period (RQ1)

Comparisons between the sociodemographic variables and across the COVID time periods are summarised in Table 2, pointing to differences identified in age, EI status, ethnicity, marital status, and across type and mode of intervention. Individuals seen by the service were more likely to be older during and after the pandemic compared to pre-COVID times (Pre-COVID: 28.56 years, COVID: 31.86 years, Post-COVID: 32.19 years; F= 77.17, p<0.001). The distribution of EI status also varied, with a lower proportion of ARMS cases observed during COVID (7.9%) compared to pre-COVID (13.2%, p<0.001), as well as ethnic distribution, with a notable increase in the proportion of Black African and Black Caribbean individuals during COVID and post-COVID (p<0.001). There were no differences found between genders (p= 0.554), referral source (p= 0.066) or IMD (p= 0.640) across time, and marital status was observed to have an increased proportion of unrecorded information.

Table 2

Differences in sample characteristics before, during and after the COVID-19 pandemic (N= 6973)

Characteristics	Pre-COVID *N* = 2702 (%)	COVID *N* = 2097 (%)	Post-COVID *N* = 2174 (%)	Statistic	*df*	*p*
Mean age (SD) years	28.56 (10.23)	31.86 (11.93)	32.19 (12.13)	F = 77.17 ES (η2) = .0217, 95% CI (.0153, .0287)	2	0.001
EI status				X^2 = 47.68	2	0.001
FEP	2346 (86.8)	1931 (92.1)	1995 (91.8)			
ARMS	356 (13.2)	166 (7.9)	179 (8.2)			
Gender				X^2 = 1.82	2	0.554
Male	1613 (59.7)	1221 (58.2)	1274 (58.6)			
Female	1089 (40.3)	876 (41.8)	900 (41.4)			
Ethnicity				X^2 = 116.77	7	0.001
White British	604 (22.4)	410 (19.6)	422 (19.4)			
White non-British	230 (8.5)	202 (9.6)	210 (9.7)			
Mixed	131 (4.9)	123 (5.9)	147 (6.8)			
Asian/South Asian	226 (8.4)	173 (8.3)	176 (8.1)			
Black African	470 (17.4)	436 (20.8)	504 (23.2)			
Black Caribbean	186 (6.9)	212 (10.1)	238 (11.0)			
Black British	630 (23.3)	382 (18.2)	309 (14.2)			
Other	225 (8.3)	159 (7.6)	168 (7.7)			
Marital status				X^2 = 602.06	4	0.001
Single	1929 (71.4)	1086 (51.8)	933 (42.9)			
Married/in partnership	210 (7.8)	143 (6.8)	104 (4.8)			
Divorced/separated	99 (3.7)	68 (3.2)	60 (2.8)			
Widowed	7 (0.3)	6 (0.3)	6 (0.3)			
Not recorded	457 (16.9)	794 (37.9)	1071 (49.3)			
Referral source				X^2 = 14.65	4	0.066
GP	673 (24.9)	486 (23.2)	483 (22.2)			
Other healthcare professional	366 (13.6)	309 (14.7)	283 (13.0)			
A&E	873 (32.3)	713 (34.0)	737 (33.9)			
CJS	225 (8.3)	152 (7.3)	160 (7.4)			
Other	565 (20.9)	437 (20.8)	511 (23.5)			
IMD quintile				X^2 = 6.06	4	0.640
1st most deprived	746 (27.6)	591 (28.2)	637 (29.3)			
2nd most deprived	1248 (46.2)	977 (46.6)	1012 (46.6)			
3rd most deprived	519 (19.2)	379 (18.1)	371 (17.1)			
4th most deprived	142 (5.3)	111 (5.3)	123 (5.7)			
5th least deprived	47 (1.7)	39 (1.9)	31 (1.4)			

CBT intervention				X^2 =	2	0.001
No	1681 (62.2)	1576 (75.2)	1651 (75.9)	141.67		
Yes	1021 (37.8)	521 (24.9)	523 (24.1)			
< 16 sessions	785 (29.1)	438 (20.9)	426 (19.6)			
> 16 sessions	236 (8.7)	83 (4.0)	97 (4.5)			
CBT mode of delivery				X^2 =	4	0.001
F2F	1020 (99.9)	241 (73.9)	344 (78.7)	269.90		
Indirect	0 (0.0)	85 (26.1)	93 (21.3)			
Systems based	1 (0.1)	0 (0.0)	0 (0.0)			
FI				X^2 = 20.29	2	0.001
No	2253 (83.4)	1825 (87.0)	1901 (87.4)			
Yes	449 (16.6)	272 (13.0)	273 (12.6)			
< 16 sessions	416 (15.4)	266 (12.7)	269 (12.4)			
> 16 sessions	33 (1.2)	6 (0.3)	4 (0.2)			
FI mode of delivery				X^2 =	4	0.001
F2F	441 (98.2)	75 (47.5)	119 (54.6)	278.02		
Indirect	0 (0.0)	82 (51.9)	98 (45.0)			
Systems based	8 (1.8)	1 (0.6)	1 (0.5)			

FEP = First-Episode Psychosis; ARMS = At-risk Mental State; SD = Standard Deviation; GP = General Practitioner, A&E = Accident and Emergency department; CJS = Criminal Justice System; IMD = Index of Multiple Deprivation; CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; F2F = Face to Face.

Access to CBT across study variables (RQ2)

Descriptive comparisons between those who received and did not receive CBT are summarised in Table 3. There were differences in age, EI status, gender, ethnicity, marital status, referral source and IMD. Those who received CBT were younger (28.98 vs 31.40 years, p<0.001) and more likely to be female than male (female: 32.4% vs male: 27.7%, p<0.001), noting that the majority across both genders were most likely to not have received CBT intervention. The chi-square test revealed that individuals with ARMS were more likely to receive CBT compared to the FEP population (ARMS: 52.6% vs FEP: 27.0%, p<0.001). Additionally, individuals who did not receive CBT were more likely to be of Black African (BA), Black Caribbean (BC) or White non-British (WNB) backgrounds compared with their White British (WB) counterparts (BA: 76.5% vs BC: 75.3% vs WNB: 73.1% vs. WB 64.4%, p<0.001). In terms of marital status, most of those receiving CBT were single, although it is important to note that information about marital status was not recorded for a large part of the

sample (*n* = 2957). Those referred by the criminal justice system were less likely to receive CBT (CJS: 79.2%), while individuals referred by 'Other' and 'Other healthcare professionals' were most likely to receive CBT (31.4% and 31.1% respectively, *p*= 0.015). Individuals in the most deprived groups (1st: 28.0% and 2nd: 29.4%) were less likely to receive CBT compared to those in the least deprived groups (4th: 33.8% and 5th: 37.6%, *p*<0.05).

The comparisons for FI also revealed differences across age, EI status, ethnicity, marital status, referral source and IMD, but not gender (Table 3). Individuals who received FI were younger than those who did not (28.04 vs 31.13 years, *p*<0.001). The majority of individuals did not receive FI in both ARMS and FEP groups, with ARMS individuals being less likely to receive it (ARMS: 92.6% vs FEP: 85.0%, *p*<0.001). No differences in received FI were observed by gender (*p*= 0.226). Across ethnic groups, individuals of Asian/South Asian, White British and mixed backgrounds were more likely to receive FI compared to those of Black African, Black Caribbean and White non-British backgrounds (*p*<0.001). Differences in marital status were noted, although a high proportion of participants did not have this information recorded. Additionally, individuals referred by 'Other' and 'Other healthcare professionals' were most likely to receive FI (87.8% and 87.4%, *p*= 0.018). Finally, individuals in the most deprived groups were less likely to receive FI than those in the least deprived (1st: 12.4% vs 5th: 23.1%, *p*<0.001).

Table 3

Access to psychological intervention across study variables

	CBT		**Statistics (*p*)**	**FI**		**Statistics (*p*)**
	No (n= 4908)	***Yes (n= 2065)***		***No (n= 5979)***	***Yes (n= 994)***	
Mean age (SD)	31.40 (11.84)	28.98 (10.43)	F = 65.57 (0.001) Cohen's d = 0.21, 95% CI (0.161, 0.264)	31.13 (11.63)	28.04 (10.22)	F = 62.05 (0.001) Cohen's d = 0.27, 95% CI (0.203, 0.337)
EI status (*n*, %)			X^2 (1) = 198.22			X^2 (1) = 29.80 (0.001)
FEP	4576 (73.0)	1696 (27.0)	(0.001)	5330 (85.0)	942 (15.0)	
ARMS	332 (47.4)	369 (52.6)		649 (92.6)	52 (7.4)	
Gender (*n*, %)			X^2 (1) = 45.13			X^2 (1) = 1.47 (0.226)
Male	2971 (72.3)	1137 (27.7)	(0.001)	3505 (85.3)	603 (14.7)	
Female	1937 (67.6)	928 (32.4)		2474 (86.4)	391 (13.7)	
Ethnicity (*n*, %)			X^2 (7) = 69.25			X^2 (7) = 37.36 (0.001)
White British	925 (64.4)	511 (35.6)	(0.001)	1205 (83.9)	231 (16.1)	
White non-British	469 (73.1)	173 (27.0)		570 (88.8)	72 (11.2)	
Mixed	267 (66.6)	134 (33.4)		327 (81.6)	74 (18.5)	
Asian/South Asian	396 (68.9)	179 (31.1)		467 (81.2)	108 (18.8)	
Black African	1078 (76.5)	332 (23.6)		1229 (87.2)	181 (12.8)	
Black Caribbean	479 (75.3)	157 (24.7)		563 (88.5)	73 (11.5)	
Black British	892 (67.5)	429 (32.5)		1124 (85.1)	197 (14.9)	
Other	402 (72.8)	150 (27.2)		494 (89.5)	58 (10.5)	
Marital status (*n*, %)			X^2 (4) = 39.34			X^2 (4) = 25.63 (0.001)
Single	2665 (67.5)	1283 (32.5)	(0.001)	3324 (84.2)	624 (15.8)	
Married/in partnership	324 (70.9)	133 (29.1)		383 (83.8)	74 (16.2)	
Divorced/separated	166 (73.1)	61 (26.9)		203 (89.4)	24 (10.6)	

Widowed	14 (73.7)	5 (26.3)		18 (94.7)	1 (5.3)	
Not recorded	1739 (74.9)	583 (25.1)		2051 (88.3)	271 (11.67)	
Referral source (*n*, %)			X^2 (4) = 12.29			X^2 (4) = 11.89 (0.018)
GP	1153 (70.2)	489 (29.8)	(0.015)	1387 (84.5)	255 (15.5)	
Other healthcare professional	660 (68.9)	298 (31.1)		837 (87.4)	121 (12.6)	
A&E	1648 (70.9)	675 (29.1)		1967 (84.7)	356 (15.3)	
CJS	409 (79.2)	128 (23.8)		459 (85.5)	78 (14.5)	
Other	1038 (68.6)	475 (31.4)		1329 (87.8)	184 (12.2)	
IMD (*n*, %)			X^2 (4) = 9.74 (0.045)			X^2 (4) = 19.31 (0.001)
1st most deprived	1421 (72.0)	553 (28.0)		1730 (87.6)	244 (12.4)	
2nd most deprived	2284 (70.6)	953 (29.4)		2767 (85.5)	470 (14.5)	
3rd most deprived	881 (69.4)	388 (30.6)		1086 (85.6)	183 (14.4)	
4th most deprived	249 (66.2)	127 (33.8)		306 (81.4)	70 (18.6)	
5th least deprived	73 (62.4)	44 (37.6)		90 (76.9)	27 (23.1)	

FEP = First-Episode Psychosis; ARMS = At-risk Mental State; SD = Standard Deviation; GP = General Practitioner, A&E = Accident and Emergency department; CJS = Criminal Justice System; IMD = Index of Multiple Deprivation; CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; F2F = Face to Face; OR = Odds Ratio.

Type of intervention delivered across the time periods (RQ3)

As summarised in Table 2, the proportion of individuals receiving CBT decreased from pre-COVID (37.8%) to COVID (24.9%) and remained lower post-COVID (24.1%, p<0.001). A shift in CBT delivery was observed, with indirect delivery emerging during COVID (26.1%) and persisting post-COVID (21.3%, p<0.001). Similar findings were observed in FI, with a decreasing proportion of individuals receiving FI over time (pre-COVID: 16.6%, COVID: 13.0%, post-COVID: 12.6%, p<0.001). The number of sessions received declined during COVID and remained low post-COVID for both CBT (p<0.001) and FI (p<0.001). A smaller proportion received more than 16 sessions of CBT over time (pre-COVID: 8.7%, COVID: 4.0%, post-COVID: 4.5%, p<0.001), equally seen in FI (pre-COVID: 1.2%, COVID: 0.3%, post-COVID: 0.2%, p<0.001).

Associations between COVID time periods and access to CBT and FI (RQ4)

Access to CBT declined during the COVID and post-COVID periods compared to pre-COVID levels (Table 4). In the unadjusted model, the probabilities of accessing CBT were lower during COVID (OR = 0.54, 95% CI: 0.54-0.54, p<0.001), with the effect persisting after adjusting for clustering by COVID periods, sociodemographic factors and sample characteristics (adj. OR= 0.60, 95% CI: 0.59-0.61, p<0.001). This pattern was consistent in the post-COVID period, suggesting a sustained reduction in access even after pandemic restrictions eased.

For FI, access was also lower during the COVID and post-COVID periods, though the decline was slightly less pronounced than for CBT (Table 4). The odds of receiving FI were reduced in the unadjusted model (COVID OR = 0.75, 95% CI: 0.75-0.75, p<0.001) and after adjusting for sociodemographic factors, the strength of association was present but marginally reduced (adj. OR = 0.85, 95% CI: 0.78-0.93, p<0.01). A similar trend was observed post-COVID, indicating that reductions in FI access may by slightly influenced by demographic and referral factors in comparison to CBT, although primarily by the pandemic.

Findings on the associations between COVID periods and access to psychological interventions, stratified by ARMS and FEP, are presented in Table 5. Access to CBT declined during and after the pandemic for both ARMS (adj. COVID OR = 0.50, CI: 0.44-0.57, $p<0.001$; post-COVID OR = 0.49, CI: 0.42-0.57, $p<0.001$) and FEP (adj. COVID OR = 0.83, CI: 0.77-0.90. $p<0.001$; post-COVID OR = 0.86, CI: 0.76-0.96, $p<0.01$). For FI, differences in access across periods were similar to those for CBT, across both ARMS and FEP.

Table 4

Unadjusted and adjusted odds ratios of associations between COVID time periods and access to CBT and FI

	CBT			**FI**		
	OR (95% CI) Model 1	***OR (95% CI) Model 2***	***OR (95% CI) Model 3***	***OR (95% CI) Model 1***	***OR (95% CI) Model 2***	***OR (95% CI) Model 3***
COVID	.54 (.54-.54)***	.58 (.57-.59)***	.60 (.59-.61)***	.75 (.75-.75)***	.81 (.78-.84)***	.85 (.78-.93)**
Post-COVID	.52 (.52-.52)***	.57 (.55-.58)***	.59 (.57-.61)***	.72 (.72-.72)***	.79 (.75-.82)***	.86 (.76-.98)**

Significance level: *<0.05, **<0.01, ***<0.001. Comparison group = Pre-COVID. Model 1: unadjusted. Model 2: adjusted for age, gender, ethnicity. Model 3: adjusted for age, gender, ethnicity, marital status, referral source, IMD.

CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; OR = Odds Ratio; CI = Confidence Intervals.

Table 5

Unadjusted and adjusted odds ratios of associations between COVID time periods and access to psychological intervention, stratified by ARMS and FEP

		ARMS			**FEP**		
CBT		***OR (95% CI) Model 1***	***OR (95% CI) Model 2***	***OR (95% CI) Model 3***	***OR (95% CI) Model 1***	***OR (95% CI) Model 2***	***OR (95% CI) Model 3***
	COVID	.55 (.55-.55)***	.57 (.56-.57)***	.50 (.44-.57)***	.57 (.57-.57)***	.60 (.59-.61)***	.63 (.61-.66)***
	Post-COVID	.54 (.54-.54)***	.56 (.55-.57)***	.49 (.42-.57)***	.54 (.54-.54)***	.58 (.57-.59)***	.63 (.60-.67)***
FI							
	COVID	.65 (.65-.65)***	.67 (.62-.74)***	.71 (.67-.75)***	.73 (.73-.73)***	.80 (.77-.82)***	.83 (.77-.90)***
	Post-COVID	.32 (.32-.32)***	.33 (.30-.35)***	.44 (.39-.50)***	.72 (.72-.72)***	.79 (.76-.83)***	.86 (.76-.96)**

Significance level: *<0.05, **<0.01, ***<0.001. Comparison group = Pre-COVID. Model 1: unadjusted. Model 2: adjusted for age, gender, ethnicity. Model 3: adjusted for age, gender, ethnicity, marital status, referral source, IMD.

FEP = First-Episode Psychosis; ARMS = At-risk Mental State; CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; OR = Odds Ratio; CI = Confidence Intervals.

Discussion

Main Findings

This study examined the impact of the COVID-19 pandemic on access to psychological interventions among individuals with early psychosis, alongside sociodemographic disparities in treatment access. The findings indicate a significant decline in access to CBT and FI during and after the pandemic among both ARMS and FEP groups, with a shift towards indirect modes of delivery. Individuals with ARMS were more likely to receive CBT and less likely to receive FI compared to those with FEP. Sociodemographic differences were evident, with younger individuals, females, and those from less deprived areas more likely to receive CBT. Individuals of Black African, Black Caribbean, and White non-British backgrounds were less likely to receive psychological interventions. Furthermore, those referred via the criminal justice system had lower access to CBT compared to other referral sources.

Interpretation of Findings

Access to psychological interventions

Both CBT and FI were largely unavailable, with only a small proportion of individuals receiving interventions, also observed in existing literature [17]. Younger age appears to facilitate access to both CBT and FI, which may be explained by EIP services, particularly ARMS, focusing on younger individuals, typically with an increased role of family and caregiver involvement, highlighted as supporting help-seeking [15]. Gender differences were identified in CBT access but not FI, suggesting potential differing needs or barriers to service provision [37]. Disparities within ethnicity, with individuals from Black African, Black Caribbean and White non-British backgrounds facing reduced access to both interventions may reflect structural inequalities, cultural barriers or systemic

issues within pathways to care [18]. Different conceptualisations of mental health, cultural stigma and language and mistrust of healthcare services may play a role [38]. Furthermore, inequitable pathways to care can result in a longer DUP and delays in treatment, missing a window during which psychological interventions are most effective in early psychosis [39]. Here, lack of tailored interventions that consider cultural difference and language may further exacerbate inequal access to care and engagement issues [40].

The lower likelihood of individuals referred by the CJS receiving CBT may suggest barriers within forensic pathways and considerations to treatment timing and suitability within services [41]. Furthermore, individuals from more deprived backgrounds faced lower access to psychological interventions, which may reflect digital exclusion, service engagement difficulties, or socioeconomic challenges which disparities have been consistently related to reduced access to interventions [42], raising concerns about the reach of psychological services to the most disadvantaged groups. These findings can be understood through the lens of the Behavioural Ecological Model, a framework for conceptualising the multifaceted factors influencing access to care [43]. The model suggests that health behaviours, such as service utilisation, are shaped by interactions across multiple levels: individual, interpersonal, organisational, community and societal. This highlights how personal characteristics may interact with external environmental factors, including healthcare systems and social policies. The observed patterns in the findings, such as individuals from more deprived areas having lower access to interventions, may be related to material and social resources, such as availability of transport, social support or competing life demands, which can limit the ability to engage with services. The findings highlight the importance of recognising intersectionality and related challenges in service access, emphasising the need for targeted policy and service-level

interventions, such as outreach programmes, to reduce disparities and ensure equitable provision of psychological support across different population groups.

Impact of COVID-19 on access to psychological interventions

The impact of the COVID-19 pandemic on access to care was profound with notable shifts in service provision and demographic patterns. Individuals accessing services during and post-pandemic were older compared to pre-pandemic cohorts, suggesting that younger individuals may have faced additional barriers, or it taking longer to access care during this period. This may also explain the significant reduction in the proportion of ARMS seen during COVID, potentially a consequence of lockdown measures and service restrictions disrupting early identification and referral pathways for this group. The decline in access to psychological interventions during the pandemic aligns with previous research highlighting the disruptions in mental health service provision [22, 23].

Ethnic disparities were reversed during and after the pandemic, with an increased proportion of Black African and Black Caribbean individuals accessing services and a decreasing proportion of White British and Black British. This may reflect the disproportionate psychological impact of COVID-19 on different racial and ethnic minority groups [44]. The increased representation of Black African and Black Caribbean in accessing services may reflect either higher mental health needs or improved service accessibility for these groups.

The mode of psychological intervention delivery also evolved throughout the periods, likely due to pandemic-related restrictions. A significant reduction in face-to-face sessions was observed, with a corresponding rise in virtual delivery. While digital adaptations facilitated service continuity, the overall decline in treatment uptake suggests that virtual modalities may not have been equally

accessible or effective for all individuals and sustained lower access post-pandemic may point to ongoing barriers to care [25, 45].

The regression analyses pointed to a significant decline in access to CBT during and post-COVID, with individuals being considerably less likely to receive CBT compared to pre-pandemic levels. These effects remained significant even after adjusting for sociodemographic factors, indicating a direct impact of the pandemic on psychological treatment provision. The sustained reduction post-pandemic suggests that disruptions in the service setup and workforce capacity may have had lasting effects, reinforcing the need for efforts to restore pre-pandemic access levels [46]. These align with the Behavioural Ecological Model, with the COVID-19 pandemic serving as a significant external factor, disrupting service delivery modes and influencing both access and engagement with psychological interventions.

In contrast, access to FI also declined but was more strongly influenced by sociodemographic variables rather than the direct impact of COVID-19. While the unadjusted model indicated lower odds of receiving FI during the pandemic, these effects were attenuated after adjusting for demographic factors. This suggests that reductions in FI access were likely driven by broader systemic inequalities or differences rather than pandemic-specific disruptions. Given the already low uptake of FI pre-pandemic, these findings highlight the need to focus efforts on understanding and improving the role of and access to family-based interventions within early intervention in psychosis services in a changing environment [47, 48].

Strengths and Limitations

A key strength of this study is its large sample size using de-identified electronic clinical records from a large mental health provider in South London, providing a representative sample of

the local population. The use of clinical records for research offers several benefits, including access to large, real-world datasets that reflect actual clinical practice and patient demographics. This approach reduces selection bias and enhances the generalisability of findings. Additionally, it is an ethical and non-intrusive method, as it makes use of existing information. The substantial sample size ensured statistical power and enabled stratification not only by the psychological interventions accessed but also by sociodemographic factors across both ARMS and FEP populations.

Nevertheless, there are several limitations to the study. Firstly, the reliance on routinely collected clinical data introduces the possibility of missing or incomplete records, as was the case for variables such as ethnicity and marital status. The classification of psychological interventions (CBT or FI) may not fully capture the nuances of individual treatment plans, including treatment offer, engagement or adherence. Additionally, the study employs an operationalised measure of area-level deprivation [35] to assess relative deprivation at a specific geographical scale. While small-area indicators are widely used in research, they are prone to the ecological fallacy, as they assume all residents of a deprived area experience deprivation or poverty. Furthermore, although adjustments were made for key confounders, unmeasured variables such as individual symptom severity, service capacity and clinician availability may have influenced the findings, particularly given the context of the pandemic. The study does not establish causality in disparities identified across sociodemographic groups and further exploration of the underlying mechanisms of these patterns and relationships is warranted.

Clinical Implications

The findings highlight the need for targeted strategies to enhance equitable access to psychological support within early intervention services. Disparities in access to CBT and FI based on

ethnicity and deprivation emphasise the importance of developing culturally sensitive, accessible mental health services and promoting tailored interventions. Outreach initiatives aimed at improving engagement with underrepresented groups, alongside measures to address barriers such as digital exclusion, are essential for ensuring equitable service provision. Moreover, given the sustained decline in access to psychological interventions post-pandemic, increasing service capacity through additional funding and the development of innovative delivery models is critical to mitigating long-term gaps in care. Addressing these disparities requires targeted policy and service-level interventions to ensure equitable access to psychological interventions across diverse demographic and socioeconomic groups.

Directions for Future Research

Future research could explore the qualitative insights into service user experiences of individuals with ARMS and FEP to gain a deeper understanding of the barriers and facilitators to accessing care within this service context. Further studies examining the impact of service adaptations, such as digital interventions, on treatment engagement are also warranted. Additionally, longitudinal research assessing long-term recovery trajectories among those who did and did not receive psychological interventions during the pandemic would provide valuable evidence for service planning. Investigating other factors, such as education level and employment status, in relation to functioning within this population could further enhance understanding.

This study includes a sample from a specific area in London, where the population is likely to be more diverse than in other regions of the UK. Future research could analyse anonymised datasets from different parts of the country to determine whether these findings are replicated. Moreover, evaluating the effectiveness of targeted engagement strategies for underrepresented or

disadvantaged groups could inform policies aimed at reducing health inequalities in early intervention for psychosis care.

Conclusion

This study highlights the significant impact of the COVID-19 pandemic on access to psychological interventions for individuals with ARMS and FEP, with a sustained reduction in access to psychological intervention post-pandemic. Sociodemographic disparities in treatment access underscore persistent inequalities, necessitating targeted interventions to promote equitable mental health care. Strengthening early intervention services, addressing barriers to engagement, and enhancing culturally responsive care are critical steps towards improving outcomes for individuals at risk of psychosis. Future research should further investigate strategies to mitigate disparities and evaluate the long-term impact of service disruptions on recovery trajectories.

Acknowledgements

We sincerely thank the members of the CRIS research team for their collaboration and invaluable support in data collection which was essential in making this study possible.

Author contributions

Sara Schjolberg Marques: conceptualisation, writing, methodology, analysis, project administration.

Richard Meiser-Stedman: review and editing, methodology, supervision.

Sheri Oduola: conceptualisation, methodology, analysis, review and editing, supervision, project administration.

Statements and Declarations

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

1. Rössler W, Salize HJ, van Os J, Riecher-Rössler A (2005) Size of burden of schizophrenia and psychotic disorders. European Neuropsychopharmacology: The Journal of the European College of Neuropsychopharmacology, 15(4), 399–409. https://doi.org/10.1016/j.euroneuro.2005.04.009
2. Fusar-Poli P, McGorry PD, Kane JM (2017) Improving outcomes of first-episode psychosis: an overview. World Psychiatry, 16(3), 251-265. https://doi-org.uea.idm.oclc.org/10.1002/wps.20446
3. NHS England (2016) Implementing the early intervention in psychosis access and waiting time standard: Guidance. https://www.england.nhs.uk/mentalhealth/wp-content/uploads/sites/29/2016/04/eip-guidance.pdf Accessed 12 January 2025
4. Public Health England (2016) Psychosis Data Report - Describing variation in numbers of people with psychosis and their access to care in England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774680/Psychosis_data_report.pdf Accessed 8 January 2025
5. Yung AR, McGorry PD (1996) The prodromal phase of first-episode psychosis: past and current conceptualizations. Schizophrenia bulletin, 22(2), 353–370. https://doi.org/10.1093/schbul/22.2.353
6. Yung AR, Yuen HP, McGorry PD, Phillips LJ, Kelly D, Dell'Olio M, Francey…, Buckby J (2005) Mapping the onset of psychosis: the Comprehensive Assessment of At-Risk Mental States. The Australian and New Zealand journal of psychiatry, 39(11-12), 964–971. https://doi.org/10.1080/j.1440-1614.2005.01714.x
7. Salazar de Pablo G, Woods SW, Drymonitou G, de Diego H, Fusar-Poli P (2021) Prevalence of Individuals at Clinical High-Risk of Psychosis in the General Population and Clinical Samples: Systematic Review and Meta-Analysis. Brain sciences, 11(11), 1544. https://doi.org/10.3390/brainsci11111544
8. Catalan A, Salazar de Pablo G., Vaquerizo Serrano J, Mosillo P, Baldwin H, Fernández-Rivas A, Moreno C…, Fusar-Poli P (2021) Annual Research Review: Prevention of psychosis in adolescents - systematic review and meta-analysis of advances in detection, prognosis and

intervention. Journal of Child Psychology and Psychiatry, and Allied Disciplines, 62(5), 657–673. https://doi-org.uea.idm.oclc.org/10.1111/jcpp.13322

9. Addington J, Cornblatt BA, Cadenhead KS, Cannon TD, McGlashan TH, Perkins DO…, Woods SO (2011) At clinical high risk for psychosis: outcome for nonconverters. American Journal of Psychiatry, 168(8), 800-805. https://doi:10.1176/appi.ajp.2011.10081191
10. Lin A, Wood SJ, Nelson B, Beavan A, McGorry P, Yung AR (2015) Outcomes of nontransitioned cases in a sample at ultra-high risk for psychosis. American Journal of Psychiatry, 172(3), 249-258. https://doi:10.1176/appi.ajp.2014.13030418
11. National Institute for Health and Care Excellence (2020) Psychosis and schizophrenia in adults: Prevention and management (NG181). NICE. https://www.nice.org.uk/guidance/ng181 Accessed 5 January 2025
12. Ising HK, Lokkerbol J, Rietdijk J, Dragt S, Klaassen RM..., van der Gaag M (2017) Four-Year Cost-effectiveness of Cognitive Behavior Therapy for Preventing First-episode Psychosis: The Dutch Early Detection Intervention Evaluation (EDIE-NL) Trial. Schizophrenia Bulletin, 43(2), 365–374. https://doi-org.uea.idm.oclc.org/10.1093/schbul/sbw084
13. Wijnen BFM, Thielen FW, Konings S, Feenstra T, Van Der Gaag M, Veling W..., Lokkerbol J (2020) Designing and Testing of a Health-Economic Markov Model for Prevention and Treatment of Early Psychosis. Expert review of pharmacoeconomics & outcomes research, 20(3), 269–279. https://doi.org/10.1080/14737167.2019.1632194
14. Bird V, Premkumar P, Kendall T, Whittington C, Mitchell J, Kuipers E (2010) Early intervention services, cognitive-behavioural therapy and family intervention in early psychosis: systematic review. The British Journal of Psychiatry: the journal of mental science, 197(5), 350–356. https://doi.org/10.1192/bjp.bp.109.074526
15. Oduola S, Craig TKJ, Iacoponi E, Macdonald A, Morgan C (2023) Sociodemographic and clinical predictors of delay to and length of stay with early intervention for psychosis service: findings from the CRIS-FEP study. Social Psychiatry and Psychiatric Epidemiology, 10.1007/s00127-023-02522-z. Advance online publication. https://doi-org.uea.idm.oclc.org/10.1007/s00127-023-02522-z
16. Allan SM, Hodgekins J, Beazley P, Oduola S (2021) Pathways to care in at-risk mental states: A systematic review. Early Intervention in Psychiatry, 15(5), 1092–1103. https://doi-org.uea.idm.oclc.org/10.1111/eip.13053

17. Schlief M, Rich N, Rains LS, Baldwin H, Rojas-Garcia , Nyikavaranda P, Persaud K, Dare C, French P, Lloyd-Evans B, Crawford M, Smith J, Kirkbride JB, Johnson S (2023) Ethnic differences in receipt of psychological interventions in Early Intervention in Psychosis services in England - a cross-sectional study. Psychiatry Research, 330, 115529. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2023.115529
18. Becker KD, Buckingham SL, Rith-Najarian L, Kline ER (2016) The Common Elements of treatment engagement for clinically high-risk youth and youth with first-episode psychosis. Early Intervention in Psychiatry, 10(6), 455–467. https://doi-org.uea.idm.oclc.org/10.1111/eip.12283
19. Fusar-Poli P, Borgwardt S, Bechdolf A, Addington J, Riecher-Rössler A, Schultze-Lutter F, Keshavan M, Wood S, Ruhrmann S, Seidman LJ, Valmaggia L, Cannon T, Velthorst E, De Haan L, Cornblatt B, Bonoldi I, Birchwood M, McGlashan T, Carpenter W, McGorry P,… Yung A (2013) The psychosis high-risk state: a comprehensive state-of-the-art review. JAMA Psychiatry, 70(1), 107–120. https://doi-org.uea.idm.oclc.org/10.1001/jamapsychiatry.2013.269
20. Fusar-Poli P, Spencer T, De Micheli A, Curzi V, Nandha S, McGuire P (2020) Outreach and support in South-London (OASIS) 2001-2020: Twenty years of early detection, prognosis and preventive care for young people at risk of psychosis. European neuropsychopharmacology: the journal of the European College of Neuropsychopharmacology, 39, 111–122. https://doi.org/10.1016/j.euroneuro.2020.08.002
21. Giuntella O, Hyde K, Saccardo S, Sadoff S (2021) Lifestyle and mental health disruptions during COVID-19. Proceedings of the National Academy of Sciences, 118(9), e2016632118. https://doi.org/10.1073/pnas.2016632118
22. Moreno C, Wykes T, Galderisi S, Nordentoft M, Crossley N, Jones N, Cannon…, Arango C (2020) How mental health care should change as a consequence of the COVID-19 pandemic. The Lancet. Psychiatry, 7(9), 813–824. https://doi.org/10.1016/S2215-0366(20)30307-2
23. Zhand N, Joober R (2021) Implications of the COVID-19 pandemic for patients with schizophrenia spectrum disorders: narrative review. BJPsych open, 7(1), e35. https://doi.org/10.1192/bjo.2020.157
24. Jauhar S, Lai S, Bonoldi I, Salazar de Pablo G, di Forti M, Alameda L, Donocik J, Iacoponi E, Spencer T, Haege B, McLaughlan D, Taylor D, Young AH, Thornicroft G, Gaughran F, MacCabe

JH, Murray RM, McGuire P, Fusar-Poli P (2021) Early intervention in psychosis during the COVID-19 pandemic: Maudsley recommendations. European Neuropsychopharmacology: The Journal of the European College of Neuropsychopharmacology, 47, 130–135. https://doi.org/10.1016/j.euroneuro.2021.02.005

25. Cotter SJ, Smith CL, Gao CX, Khanna R, O'Donoghue B, Brown E, Thompson A (2024) What impact did the COVID-19 pandemic have on psychosis and the delivery of early intervention psychosis services?. Schizophrenia Research, 272, 79–88. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2024.08.013
26. Stewart R, Soremekun M, Perera G, Broadbent M, Callard F, Denis M, Hotopf M, Thornicroft G, Lovestone S (2009) The South London and Maudsley NHS Foundation Trust Biomedical Research Centre (SLAM BRC) case register: Development and descriptive data. BMC Psychiatry, 9, Article 51. https://doi-org.uea.idm.oclc.org/10.1186/1471-244X-9-51
27. Perera G, Broadbent M, Callard F, Chang CK…, Stewart R (2016) Cohort profile of the South London and Maudsley NHS Foundation Trust Biomedical Research Centre (SLaM BRC) Case Register: current status and recent enhancement of an Electronic Mental Health Record-derived data resource. BMJ open, 6(3), e008721. https://doi-org.uea.idm.oclc.org/10.1136/bmjopen-2015-008721
28. Office for National Statistics (2021) Population estimates for London boroughs: Lambeth, Southwark, Lewisham, and Croydon. UK ONS. https://www.ons.gov.uk/visualisations/censuspopulationchange/ Accessed 3 January 2025
29. World Health Organization (1993) International statistical classification of diseases and related health problems (10th revision). https://www.who.int/classifications/icd/en/
30. UK Government (2022, February 24) COVID-19 response: Living with COVID-19. https://assets.publishing.service.gov.uk/media/621400ede90e0710b73fd459/COVID-19_Response_-_Living_with_COVID-19.pdf Accessed 2 January 2025
31. Mallett R (1997) MRC Sociodeomgraphic Schedule. Institute of Psychiatry, King's College London: Section of Social Psychiatry.
32. Office for National Statistics (2011) Official labour market statistics. UK ONS. https://www.nomisweb.co.uk/reports/lmp/la/1946157253/report.aspx?c1=2013265927&c2=1946157256 Accessed 3 January 2025

33. Fearon P, Kirkbride JB, Morgan C, Dazzan P, Morgan K, Lloyd T, Hutchinson G, Tarrant J, Fung WL, Holloway J, Mallett R, Harrison G, Leff J, Jones PB, Murray RM, AESOP Study Group (2006) Incidence of schizophrenia and other psychoses in ethnic minority groups: results from the MRC AESOP Study. Psychological medicine, 36(11), 1541–1550. https://doi.org/10.1017/S0033291706008774
34. Oduola S, Das-Munshi J, Bourque F, Gayer-Anderson C, Tsang J, Murray RM, Craig TKJ, Morgan C (2021) Change in incidence rates for psychosis in different ethnic groups in south London: findings from the Clinical Record Interactive Search-First Episode Psychosis (CRIS-FEP) study. Psychological Medicine, 51(2), 300–309. https://doi.org/10.1017/S0033291719003234
35. Noble S, McLennan D, Noble M, Plunkett E, Gutacker N, Wright M (2019) Statistical release: The English indices of deprivation 2019. Ministry of Housing, Communities & Local Government. https://assets.publishing.service.gov.uk/media/5d8e26f6ed915d5570c6cc55/IoD2019_Statistical_Release.pdf
36. StataCorp LLC (2023) Stata Statistical Software: Release 18. https://www.stata.com
37. Ferrari M, Flora N, Anderson KK, Haughton A, Tuck A, Archie S, Kidd S, McKenzie K, ACE Project Team (2018) Gender differences in pathways to care for early psychosis. Early Intervention in Psychiatry, 12(3), 355–361. https://doi-org.uea.idm.oclc.org/10.1111/eip.12324
38. Snowden LR, Yamada AM (2005) Cultural differences in access to care. Annual Review of Clinical Psychology, 1, 143–166. https://doi-org.uea.idm.oclc.org/10.1146/annurev.clinpsy.1.102803.143846
39. Harrigan SM, McGorry PD, Krstev H (2003) Does treatment delay in first-episode psychosis really matter?. Psychological Medicine, 33(1), 97–110. https://doi-org.uea.idm.oclc.org/10.1017/s003329170200675x
40. Cabassa LJ, Baumann AA (2013) A two-way street: bridging implementation science and cultural adaptations of mental health treatments. Implementation Science: IS, 8, 90. https://doi-org.uea.idm.oclc.org/10.1186/1748-5908-8-90
41. Morgan C, Mallett R, Hutchinson G, Bagalkote H, Morgan K, Fearon P, Dazzan P, Boydell J, McKenzie K, Harrison G, Murray R, Jones P, Craig T, Leff J, AESOP Study Group (2005)

Pathways to care and ethnicity. 2: Source of referral and help-seeking. Report from the AESOP study. The British Journal of Psychiatry: The Journal of Mental Science, 186, 290–296. https://doi-org.uea.idm.oclc.org/10.1192/bjp.186.4.290

42. Fonagy P, Luyten P (2021) Socioeconomic and sociocultural factors affecting access to psychotherapies: the way forward. World psychiatry: official journal of the World Psychiatric Association (WPA), 20(3), 315–316. https://doi-org.uea.idm.oclc.org/10.1002/wps.20911
43. Hovell MF, Wahlgren DR & Gehrman CA (2002) The behavioural ecological model: Integrating public health and behavioural science. San Francisco: Jossey-Bass.
44. McKnight-Eily LR, Okoro CA, Strine TW, Verlenden J, Hollis ND, Njai R, Mitchell EW, Board A, Puddy R, Thomas C (2021) Racial and Ethnic Disparities in the Prevalence of Stress and Worry, Mental Health Conditions, and Increased Substance Use Among Adults During the COVID-19 Pandemic - United States, April and May 2020. MMWR. Morbidity and Mortality Weekly Report, 70(5), 162–166. https://doi-org.uea.idm.oclc.org/10.15585/mmwr.mm7005a3
45. Lal S, Abdel-Baki A, Lee H (2023) Telepsychiatry services during COVID-19: A cross-sectional survey on the experiences and perspectives of young adults with first-episode psychosis. Early Intervention in Psychiatry, 17(4), 368–377. https://doi-org.uea.idm.oclc.org/10.1111/eip.13332
46. Gourret Baumgart J, Kane H, El-Hage W, Deloyer J, Maes C, Lebas MC, Marazziti D, Thome J, Fond-Harmant L, Denis F (2021) The Early Impacts of the COVID-19 Pandemic on Mental Health Facilities and Psychiatric Professionals. International journal of environmental research and public health, 18(15), 8034. https://doi.org/10.3390/ijerph18158034
47. Camacho-Gomez M, Castellvi P (2020) Effectiveness of Family Intervention for Preventing Relapse in First-Episode Psychosis Until 24 Months of Follow-up: A Systematic Review With Meta-analysis of Randomized Controlled Trials. Schizophrenia Bulletin, 46(1), 98–109. https://doi-org.uea.idm.oclc.org/10.1093/schbul/sbz038
48. O'Keeffe D, Marshall D, Wheeler A, Allen E, Ronan H, Buckley A, Counihan E, Clarke M (2023) Through COVID-19 and beyond: developing a multidisciplinary telehealth family intervention in first episode psychosis. Irish Journal of Psychological Medicine, 40(3), 503–507. https://doi-org.uea.idm.oclc.org/10.1017/ipm.2021.79

Chapter Five

Discussion and Critical Evaluation

Word Count: 2,156

Chapter Five: Discussion and Critical Evaluation

This final chapter provides a summary of the findings from the systematic review and the empirical paper, evaluates the strengths and limitations of the research portfolio, and considers clinical and theoretical implications and recommendations for future research. Additionally, the researcher's reflections on the process are included below.

Researcher Reflections

Throughout this project, I have developed a deeper understanding and appreciation of the various stages of research, from the initial idea to the final paper. I have gained new knowledge and perspectives in the field of early psychosis. My interest in this area was shaped by a previous clinical training placement where I gained experience working within an early intervention service. This, combined with my longstanding interest in understanding disparities in access to care and the influence of both individual and systemic factors, helped sustain my motivation during the more challenging phases of the project. One of the most difficult but also valuable aspects of this experience was developing the skills necessary to conduct a rigorous systematic review. Synthesising a diverse range of studies and findings required careful evaluation, critical thinking and a lot of patience. This process expanded my appreciation for evidence synthesis and the complexities of drawing meaningful conclusions from existing literature. Additionally, conducting the empirical study using retrospective patient records provided valuable insights into navigating service contexts and identifying systemic barriers to care. In hindsight, greater collaboration with the Early Intervention for Psychosis teams and Patient and Public Involvement groups could have further strengthened the study.

Summary of Findings

The systematic review and empirical study provide complementary insights into key factors influencing outcomes for individuals with ARMS and FEP.

The systematic review explored the association between sleep disturbances and SOF in early psychosis and examined the impact of psychological sleep interventions on improving SOF. The findings pointed to a relationship between poor sleep and impaired SOF, with interventions such as CBT for insomnia (CBTi) demonstrating potential benefits for both sleep quality and functional outcomes. The studies identified in the review presented variability across study designs and measures used to assess both variables, with methodological heterogeneity and small sample sizes limiting definitive conclusions, although the variety across studies served as a finding in itself. Despite study limitations, the overall evidence suggests that addressing sleep disturbances could lead to improvements in both functional and clinical outcomes in early psychosis.

The empirical study examined the impact of the COVID-19 pandemic on access to psychological interventions among individuals with ARMS and FEP, alongside sociodemographic disparities in treatment access. The findings indicate a significant decline in access to CBT and FI during and after the pandemic, with a shift towards indirect modes of delivery. Sociodemographic differences were also evident, with younger individuals, females, and those from less deprived areas more likely to receive CBT. Individuals of Black African, Black Caribbean and White non-British backgrounds were significantly less likely to receive psychological interventions. Additionally, those referred via the criminal justice system were less likely to receive CBT compared to individuals referred through other sources.

Considered collectively, both studies contribute to a broader understanding of factors affecting outcomes in early psychosis. The systematic review highlights sleep as a key factor influencing functional impairment, while the empirical study underscores systemic barriers in access to psychological interventions. Together, the studies illustrate the interplay between individual and systemic factors in shaping outcomes in early psychosis. The overlapping findings across ARMS and FEP populations support the continuum model of psychosis, highlighting both shared vulnerabilities and distinct needs within these groups (van Os et al., 2009).

Strengths and Limitations

This research contributes to an expanding body of literature on early psychosis, particularly regarding the role of sleep in functional outcomes and disparities in access to psychological care across COVID-19. While the systematic review synthesised a diverse range of studies, and the empirical study utilised a robust dataset, several limitations need to be acknowledged.

Systematic Review

A significant limitation of the systematic review was methodological heterogeneity. The included studies employed varying research designs and assessment tools, which limited comparability and precluded a meta-analytic approach, mirroring findings in previous studies (Stafford et al., 2024). However, despite these differences, a consistent pattern of results emerged, supporting the relationship between sleep disturbances and poor SOF.

Defining SOF posed a challenge throughout the process as it encompasses multiple domains, including employment, education and social participation. Many studies relied on subjective measures, such as the GAF and SOFAS, which may be influenced by contextual factors and rater bias (Hilsenroth et al., 2000; Aas, 2011). Additionally, these measures may lack sensitivity to specific

subdomains (Searle et al., 2022). Although the inclusion criteria were designed to capture studies explicitly measuring SOF, alternative conceptualisations and assessments of functioning could have been considered. Findings from a recent review indicate that global measures of SOF tend to show smaller effect sizes for change compared to those with a more specific focus (Cowman et al., 2024), suggesting that future research may benefit from using more targeted measures.

Furthermore, only one qualitative study was included, limiting the depth of insight into valuable lived experiences. The review highlighted that even within quantitative research, subjective measures of sleep and functioning can differ significantly in nature, with evidence suggesting that they do not necessarily align with objective measures, such as actigraphy (Chung et al., 2020). This raises questions about validity and what may be the best way to evaluate these factors. The studies included in the systematic review were conducted in five different countries, contributing to the diversity of perspectives and ensuring representation from varied backgrounds. At the same time, it would be valuable to further explore and better understand the cultural perceptions of psychosis within the specific groups and perhaps how it may shape targets for intervention.

Empirical Paper

A key strength of this empirical study was the use of a large dataset spanning over multiple years, enabling an analysis of long-term trends in access to psychological interventions, stratified by COVID-19 lockdown periods. To facilitate comparisons across time periods, cut-off dates were established to approximate pre-, during- and post-COVID phases. However, in reality, the transition back to normality was more complex than the easing of lockdown restrictions alone, reflecting a more gradual and multifaceted process.

This study leveraged electronic patient records which provided ethical advantages by being non-invasive and reducing biases associated with demand characteristics, as well as facilitating an examination of real-world service delivery. However, reliance on clinician-recorded data introduced certain limitations, as documentation practices may vary across services and teams. Moreover, as data are primarily recorded for clinical rather than research purposes, the completeness and consistency of the information could be affected.

One of the consequences of the availability of structured data within the CRIS system being restricted was that psychological intervention data were limited to CBT and FI. This prevented differentiation between alternative therapeutic approaches or specific treatment targets, such as CBT for sleep difficulties, which could provide a more nuanced understanding of intervention use. The findings could not comment on the shift to online interventions and assess recognised barriers to digital access, such as the lack of necessary technology (Borghouts et al., 2021). Additionally, the dataset did not distinguish between intervention offers and actual uptake, limiting the ability to contextualise findings within the broader literature on service access barriers and user engagement (Ben-David et al., 2019; Leanza et al., 2020). Furthermore, it did not fully capture broader interventions, such as system working and liaison, which are integral to early psychosis care (O'Connell et al., 2021) and often missed as not commonly reported on records in a structured way. These limitations highlight areas for further research to enhance understanding and integration of service use data.

Missing data posed another challenge and efforts to fill the gaps using free-text searching were not pursued due to the large sample size and time constraints. In hindsight, information from the clinical records system, particularly regarding socio-occupational functioning, i.e. employment

and education, could have been explored further. Moreover, while the sample was diverse, the findings may not generalise beyond the South London context and future research could explore whether similar findings are replicable across other NHS Trusts and regions in the UK.

Clinical Implications

Findings from this thesis have important implications for clinical practice in early intervention services.

From the systematic review, the described association between sleep disturbances and SOF suggests that routine sleep assessments should be integrated into early intervention services. Sleep difficulties may be overlooked in mental health assessments and addressing them could have a significant impact on functional recovery. If sleep problems are not routinely assessed and subsequently remain undetected, a critical factor that bidirectionally impacts mental health may be missed, resulting in lost opportunities for timely and effective intervention. Given the growing evidence base of the effectiveness of sleep interventions for early psychosis (Marin et al., 2023), services may consider incorporating structured sleep interventions (e.g. CBTi) into treatment pathways for individuals with ARMS and FEP.

The empirical study further reveals systemic barriers to accessing psychological interventions during COVID-19, particularly for individuals from minoritised ethnic groups and disadvantaged backgrounds. These findings underscore the need for further exploration of the underlying causes and the development of targeted outreach strategies and culturally sensitive adaptations to improve engagement and ensure equitable access to care. Additionally, the shift towards indirect/virtual therapy during the pandemic introduced new considerations to accessibility. While online interventions offer flexibility, they may not be suitable for individuals without reliable access to

technology, highlighting the need for adaptable and inclusive service delivery. Digital exclusion should therefore be carefully addressed when implementing remote therapy options to prevent exacerbating disparities in early psychosis care.

Furthermore, the increase in referral rates following the transition to age-inclusive services (NHS England, 2016) and the growing pressures on secondary and specialist mental health services have further strained resources (British Medical Association, 2021). Factors such as funding constraints, staff shortages and rising service demands may significantly affect access to care. These structural challenges, while not directly examined in this study, remain crucial to acknowledge given the current NHS climate. It is therefore essential to advocate for services to have adequate funding, staffing and resources to meet the growing demand and ensure the sustainable and equitable provision of psychological interventions.

Research Implications

Several research priorities emerge from this thesis. Based on the systematic review, future studies should employ prospective designs to establish causal relationships between sleep disturbances and SOF. The need to improve routine assessment of both sleep and SOF remains a consistent message, highlighting the importance of integrating these measures into research and the evaluation of interventions. Further trials building on feasibility studies are required to assess the effectiveness of sleep interventions in improving functional outcomes in early psychosis, particularly in diverse populations and across different settings.

From the empirical study, future research could explore the long-term impact of the COVID-19 pandemic on access to interventions and clinical outcomes. Investigating differences in access across NHS Trusts would provide a more comprehensive understanding of national disparities.

Additionally, studies are needed to identify the most effective outreach strategies for engaging underrepresented groups in early intervention services, particularly those less likely to access interventions even after initial contact. Greater patient and public involvement in research design is also essential to ensure that interventions are culturally relevant and accessible (Maraj et al., 2023).

Theoretical Implications

Overlapping findings between individuals with ARMS and FEP support to the continuum model of psychosis, which suggests that early psychosis is not a categorical state but exists along a spectrum with common underlying vulnerabilities (van Os et al., 2009). This work implies that theoretical frameworks should address both shared and unique factors across different stages to facilitate early identification and tailored interventions.

Dissemination

Both the systematic review and empirical papers will be submitted for publication in the selected journals (*Early Intervention in Psychiatry; Social Psychiatry & Psychiatric Epidemiology*). The findings from the empirical paper will also be shared with Early Intervention for Psychosis services and professional platforms. Additionally, the papers will be considered for submission to relevant conferences for presentation where appropriate. Alternative dissemination strategies will also be explored to maximise the impact of the research, such as engaging with professional networks, producing summary reports and sharing key findings through online platforms or public engagement initiatives.

Conclusions

In conclusion, this thesis portfolio consists of a detailed exploration of the association between sleep and socio-occupational functioning in early psychosis populations, and the impact of sleep interventions on socio-occupational outcomes. Additionally, empirical research was conducted on the impact of COVID-19 on access to psychological interventions for individuals with ARMS and FEP, and disparities across sociodemographic groups. Addressing sleep routinely and improving equitable access to psychological interventions are key priorities for enhancing functional recovery and long-term outcomes in early psychosis. Future research should focus on developing and evaluating integrated, accessible and equitable intervention strategies to mitigate the negative impact of sleep disturbances and systemic disparities in early psychosis and mental health care more broadly.

Portfolio References List

Aas I. H. (2011). Guidelines for rating Global Assessment of Functioning (GAF). *Annals of General Psychiatry*, 10, 2. https://doi.org/10.1186/1744-859X-10-2

Addington, J., & Addington, D. (2008). Outcome after discharge from an early psychosis program. *Schizophrenia Research*, 106(2-3), 363–366. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2008.08.032

Addington, J., Cornblatt, B. A., Cadenhead, K. S., Cannon, T. D., McGlashan, T. H., Perkins, D. O… Woods, S. W. (2011). At clinical high risk for psychosis: outcome for nonconverters. American Journal of Psychiatry, 168(8), 800-805. https://doi:10.1176/appi.ajp.2011.10081191

Ajnakina, O., Morgan, C., Gayer-Anderson, C., Oduola, S., Bourque, F., Bramley, S., Williamson, J., MacCabe, J. H., Dazzan, P., Murray, R. M., & David, A. S. (2017). Only a small proportion of patients with first episode psychosis come via prodromal services: a retrospective survey of a large UK mental health programme. *BMC Psychiatry*, 17(1), 308. https://doi-org.uea.idm.oclc.org/10.1186/s12888-017-1468-y

Allan, S. M., Hodgekins, J., Beazley, P., & Oduola, S. (2021). Pathways to care in at-risk mental states: A systematic review. *Early Intervention in Psychiatry*, 15(5), 1092–1103. https://doi-org.uea.idm.oclc.org/10.1111/eip.13053

Bagautdinova, J., Mayeli, A., Wilson, J. D., Donati, F. L., Colacot, R. M., Meyer, N., Fusar-Poli, P., & Ferrarelli, F. (2023). Sleep Abnormalities in Different Clinical Stages of Psychosis: A Systematic Review and Meta-analysis. *JAMA Psychiatry*, 80(3), 202–210. https://doi-org.uea.idm.oclc.org/10.1001/jamapsychiatry.2022.4599

Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, 2(4), 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4

Bear, H. A., Ayala Nunes, L., Ramos, G., Manchanda, T., Fernandes, B., Chabursky, S., Walper, S., Watkins, E., & Fazel, M. (2024). The Acceptability, Engagement, and Feasibility of Mental

Health Apps for Marginalized and Underserved Young People: Systematic Review and Qualitative Study. *Journal of Medical Internet Research*, 26, e48964. https://doi-org.uea.idm.oclc.org/10.2196/48964

Becker, K. D., Buckingham, S. L., Rith-Najarian, L., & Kline, E. R. (2016). The Common Elements of treatment engagement for clinically high-risk youth and youth with first-episode psychosis. *Early Intervention in Psychiatry*, 10(6), 455–467. https://doi-org.uea.idm.oclc.org/10.1111/eip.12283

Ben-David, S., Cole, A., Brucato, G., Girgis, R. R., & Munson, M. R. (2019). Mental health service use decision-making among young adults at clinical high risk for developing psychosis. *Early Intervention in Psychiatry*, 13(5), 1050–1055. https://doi.org/10.1111/eip.12725

Benson K. L. (2006). Sleep in schizophrenia: impairments, correlates, and treatment. *The Psychiatric clinics of North America*, 29(4), 1033–x. https://doi-org.uea.idm.oclc.org/10.1016/j.psc.2006.08.002

Bird, V., Premkumar, P., Kendall, T., Whittington, C., Mitchell, J., & Kuipers, E. (2010). Early intervention services, cognitive-behavioural therapy and family intervention in early psychosis: systematic review. *The British Journal of Psychiatry: the journal of mental science*, 197(5), 350–356. https://doi.org/10.1192/bjp.bp.109.074526

Birchwood, M., Smith, J., Cochrane, R., Wetton, S., & Copestake, S. (1990). The Social Functioning Scale: The development and validation of a new scale of social adjustment for use in family intervention programmes with schizophrenic patients. *The British Journal of Psychiatry*, 157(6), 853–859. https://doi.org/10.1192/bjp.157.6.853

Blanchard, J. J., Savage, C. L. G., Orth, R. D., Jacome, A. M., & Bennett, M. E. (2020). Sleep Problems and Social Impairment in Psychosis: A Transdiagnostic Study Examining Multiple Social Domains. *Frontiers in Psychiatry*, 11, 486. https://doi-org.uea.idm.oclc.org/10.3389/fpsyt.2020.00486

Borghouts, J., Eikey, E., Mark, G., De Leon, C., Schueller, S. M., Schneider, M., Stadnick, N., Zheng, K., Mukamel, D., & Sorkin, D. H. (2021). Barriers to and Facilitators of User Engagement With

Digital Mental Health Interventions: Systematic Review. *Journal of Medical Internet Research*, 23(3), e24387. https://doi.org/10.2196/24387

Bradley, J., Freeman, D., Chadwick, E., Harvey, A. G., Mullins, B., Johns, L., Sheaves, B., Lennox, B., Broome, M., & Waite, F. (2018). Treating Sleep Problems in Young People at Ultra-High Risk of Psychosis: A Feasibility Case Series. *Behavioural and Cognitive Psychotherapy*, 46(3), 276–291. https://doi-org.uea.idm.oclc.org/10.1017/S1352465817000601

British Medical Association (2021). *Mental health workforce report.* Retrieved online: https://www.bma.org.uk/advice-and-support/nhs-deliveryandworkforce/workforce/mental-health-workforce-report

Burns, J. K., & Esterhuizen, T. (2008). Poverty, inequality and the treated incidence of first-episode psychosis. *Social Psychiatry and Psychiatric Epidemiology*, 43(4), 331-335. https://doi.org/10.1007/s00127-008-0308-2

Buysse, D. J., Reynolds, C. F., 3rd, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213. https://doi-org.uea.idm.oclc.org/10.1016/0165-1781(89)90047-4

Camacho-Gomez, M., & Castellvi, P. (2020). Effectiveness of Family Intervention for Preventing Relapse in First-Episode Psychosis Until 24 Months of Follow-up: A Systematic Review With Meta-analysis of Randomized Controlled Trials. *Schizophrenia Bulletin*, 46(1), 98–109. https://doi-org.uea.idm.oclc.org/10.1093/schbul/sbz038

Carrión, R. E., Demmin, D., Auther, A. M., McLaughlin, D., Olsen, R., Lencz, T… Cornblatt, B. A. (2016). Duration of attenuated positive and negative symptoms in individuals at clinical high risk: associations with risk of conversion to psychosis and functional outcome. *Journal of Psychiatric Research*, 81, 95-101. https://doi:10.1016/j.jpsychires.2016.06.021

Catalan, A., Salazar de Pablo, G., Vaquerizo Serrano, J., Mosillo, P., Baldwin, H., Fernández-Rivas, A., Moreno, C… & Fusar-Poli, P. (2021). Annual Research Review: Prevention of psychosis in adolescents - systematic review and meta-analysis of advances in detection, prognosis and intervention. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 62(5), 657–673. https://doi-org.uea.idm.oclc.org/10.1111/jcpp.13322

Chung, K. F., Poon, Y. P. Y., Ng, T. K., & Kan, C. K. (2020). Subjective-Objective Sleep Discrepancy in Schizophrenia. *Behavioral Sleep Medicine*, 18(5), 653–667. https://doi.org/10.1080/15402002.2019.1656077

Clarke, L., Chisholm, K., Cappuccio, F. P., Tang, N. K. Y., Miller, M. A., Elahi, F., & Thompson, A. D. (2021). Sleep disturbances and the At Risk Mental State: A systematic review and meta-analysis. *Schizophrenia Research*, 227, 81–91. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2020.06.027

Cotter, S. J., Smith, C. L., Gao, C. X., Khanna, R., O'Donoghue, B., Brown, E., & Thompson, A. (2024). What impact did the COVID-19 pandemic have on psychosis and the delivery of early intervention psychosis services?. *Schizophrenia Research*, 272, 79–88. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2024.08.013

Cowman, M., Godfrey, E., Walsh, T., Frawley, E., Fowler, D., Alvarez-Jimenez, M., O'Connor, K., Wykes, T., Birchwood, M., & Donohoe, G. (2024). Measures of Social and Occupational Function in Early Psychosis: A Systematic Review and Meta-analysis. *Schizophrenia bulletin*, 50(2), 266–285. https://doi.org/10.1093/schbul/sbad062

Davies, G., Haddock, G., Yung, A. R., Mulligan, L. D., & Kyle, S. D. (2017). A systematic review of the nature and correlates of sleep disturbance in early psychosis. *Sleep Medicine Reviews*, 31, 25–38. https://doi-org.uea.idm.oclc.org/10.1016/j.smrv.2016.01.001

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Controlled Clinical Trials*, 7(3), 177-188. https://doi.org/10.1016/0197-2456(86)90046-2

Fearon, P., Kirkbride, J. B., Morgan, C., Dazzan, P., Morgan, K., Lloyd, T., Hutchinson, G., Tarrant, J., Fung, W. L., Holloway, J., Mallett, R., Harrison, G., Leff, J., Jones, P. B., Murray, R. M., & AESOP Study Group (2006). Incidence of schizophrenia and other psychoses in ethnic minority groups: results from the MRC AESOP Study. *Psychological medicine*, 36(11), 1541–1550. https://doi.org/10.1017/S0033291706008774

Fonagy, P., & Luyten, P. (2021). Socioeconomic and sociocultural factors affecting access to psychotherapies: the way forward. *World psychiatry: official journal of the World Psychiatric Association* (WPA), 20(3), 315–316. https://doi-org.uea.idm.oclc.org/10.1002/wps.20911

Freeman, D., Sheaves, B., Waite, F., Harvey, A. G., & Harrison, P. J. (2020). Sleep disturbance and psychiatric disorders. *The Lancet Psychiatry*, 7(7), 628-637. https://doi-org.uea.idm.oclc.org/10.1016/S2215-0366(20)30136-X

Fusar-Poli, P., Bonoldi, I., Yung, A. R., Borgwardt, S., Kempton, M. J., Valmaggia, L., ... & McGuire, P. (2012). Predicting psychosis: meta-analysis of transition outcomes in individuals at high clinical risk. *Archives of general psychiatry*, *69*(3), 220-229. doi:10.1001/archgenpsychiatry.2011.1472

Fusar-Poli, P., Cappucciati, M., Borgwardt, S., Woods, S. W., Addington, J., Nelson, B., ... & McGuire, P. K. (2016). Heterogeneity of psychosis risk within individuals at clinical high risk: a meta-analytical stratification. *JAMA Psychiatry*, 73(2), 113-120. https://doi:10.1001/jamapsychiatry.2015.2324

Fusar-Poli, P., McGorry, P. D., & Kane, J. M. (2017). Improving outcomes of first-episode psychosis: an overview. *World Psychiatry*, 16(3), 251-265. https://doi-org.uea.idm.oclc.org/10.1002/wps.20446

Fusar-Poli, P., Spencer, T., De Micheli, A., Curzi, V., Nandha, S., & McGuire, P. (2020). Outreach and support in South-London (OASIS) 2001-2020: Twenty years of early detection, prognosis and preventive care for young people at risk of psychosis. *European neuropsychopharmacology: the journal of the European College of Neuropsychopharmacology*, 39, 111–122. https://doi.org/10.1016/j.euroneuro.2020.08.002

Giuntella, O., Hyde, K., Saccardo, S., & Sadoff, S. (2021). Lifestyle and mental health disruptions during COVID-19. *Proceedings of the National Academy of Sciences*, 118(9), e2016632118. https://doi.org/10.1073/pnas.2016632118

Goines, K. B., LoPilato, A. M., Addington, J., Bearden, C. E., Cadenhead, K. S., Cannon, T. D., Cornblatt, B. A., Mathalon, D. H., McGlashan, T. H., Perkins, D. O., Tsuang, M. T., Woods, S. W., & Walker, E. F. (2019). Sleep problems and attenuated psychotic symptoms in youth at clinical high-risk for psychosis. *Psychiatry Research*, 282, 112492. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2019.112492

Gourret Baumgart, J., Kane, H., El-Hage, W., Deloyer, J., Maes, C., Lebas, M. C., Marazziti, D., Thome, J., Fond-Harmant, L., & Denis, F. (2021). The Early Impacts of the COVID-19 Pandemic on Mental Health Facilities and Psychiatric Professionals. International journal of environmental research and public health, 18(15), 8034. https://doi.org/10.3390/ijerph18158034

Grandner M. A. (2017). Sleep, Health, and Society. *Sleep Medicine Clinics*, 12(1), 1–22. https://doi.org/10.1016/j.jsmc.2016.10.012

Green, C., McGuire, P., Ashworth, M., & Valmaggia, L. (2011). Outreach and Support in South London (OASIS). Outcomes of non-attenders to a service for people at high risk of psychosis: The case for a more assertive approach to assessment. *Psychological Medicine,* 41(2), 243-250. https://doi:10.1017/S0033291710000723

Hilsenroth, M. J., Ackerman, S. J., Blagys, M. D., Baumann, B. D., Baity, M. R., Smith, S. R., Price, J. L., Smith, C. L., Heindselman, T. L., Mount, M. K., & Holdwick, D. J., Jr (2000). Reliability and validity of DSM-IV axis V. *The American Journal of Psychiatry*, 157(11), 1858–1863. https://doi-org.uea.idm.oclc.org/10.1176/appi.ajp.157.11.1858

Hodgekins, J., Birchwood, M., Christopher, R., Marshall, M., Coker, S., Everard, L… & Fowler, D. (2015). Investigating trajectories of social recovery in individuals with first-episode psychosis: a latent class growth analysis. *The British Journal of Psychiatry: the Journal of Mental Science*, 207(6), 536–543. https://doi-org.uea.idm.oclc.org/10.1192/bjp.bp.114.153486

Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., ... & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285-291. https://journals-sagepub-com.uea.idm.oclc.org/doi/full/10.3233/EFI-180221

Horne, J. A., & Östberg, O. (1976). A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. *International Journal of Chronobiology*, 4(2), 97–110.

Hovell, M. F., Wahlgren, D. R., & Gehrman, C. A. (2002). *The behavioural ecological model: Integrating public health and behavioural science.* San Francisco, CA: Jossey-Bass.

Ising, H. K., Lokkerbol, J., Rietdijk, J., Dragt, S., Klaassen, R. M... & van der Gaag, M. (2017). Four-Year Cost-effectiveness of Cognitive Behavior Therapy for Preventing First-episode Psychosis: The Dutch Early Detection Intervention Evaluation (EDIE-NL) Trial. *Schizophrenia Bulletin*, 43(2), 365–374. https://doi-org.uea.idm.oclc.org/10.1093/schbul/sbw084

Jongsma, H. E., Turner, C., Kirkbride, J. B., & Jones, P. B. (2019). International incidence of psychotic disorders, 2002-17: a systematic review and meta-analysis. *The Lancet.* Public health, 4(5), e229–e244. https://doi-org.uea.idm.oclc.org/10.1016/S2468-2667(19)30056-8

Kasanova, Z., Hajdúk, M., Thewissen, V., & Myin-Germeys, I. (2020). Temporal associations between sleep quality and paranoia across the paranoia continuum: An experience sampling study. *Journal of Abnormal Psychology*, 129(1), 122–130. https://doi-org.uea.idm.oclc.org/10.1037/abn0000453

Kessler, R. C., Amminger, G. P., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Ustün, T. B. (2007). Age of onset of mental disorders: a review of recent literature. *Current Opinion in Psychiatry*, 20(4), 359–364. https://doi-org.uea.idm.oclc.org/10.1097/YCO.0b013e32816ebc8c

Lal, S., Abdel-Baki, A., & Lee, H. (2023). Telepsychiatry services during COVID-19: A cross-sectional survey on the experiences and perspectives of young adults with first-episode psychosis. *Early Intervention in Psychiatry*, 17(4), 368–377. https://doi-org.uea.idm.oclc.org/10.1111/eip.13332

Leanza, L., Studerus, E., Mackintosh, A. J., Beck, K., Seiler, L., Andreou, C., & Riecher-Rössler, A. (2020). Predictors of study drop-out and service disengagement in patients at clinical high risk for psychosis. *Social Psychiatry and Psychiatric Epidemiology*, 55(5), 539–548. https://doi-org.uea.idm.oclc.org/10.1007/s00127-019-01796-6

Lin, A., Wood, S. J., Nelson, B., Beavan, A., McGorry, P., & Yung, A. R. (2015). Outcomes of nontransitioned cases in a sample at ultra-high risk for psychosis. American Journal of Psychiatry, 172(3), 249-258. https://doi:10.1176/appi.ajp.2014.13030418

Lollies, F., Schnatschmidt, M., Bihlmeier, I., Genuneit, J., In-Albnon, T., Holtmann, M., Legenbauer, T., & Schlarb, A. A. (2022). Associations of sleep and emotion regulation processes in childhood and adolescence - a systematic review, report of methodological challenges and future

directions. *Sleep Science*, Sao Paulo, Brazil, 15(4), 490–514. https://doi.org/10.5935/1984-0063.20220082

Lunsford-Avery, J. R., LeBourgeois, M. K., Gupta, T., & Mittal, V. A. (2015). Actigraphic-measured sleep disturbance predicts increased positive symptoms in adolescents at ultra high-risk for psychosis: a longitudinal study. *Schizophrenia Research*, 164(1-3), 15-20. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2015.03.013

Lunsford-Avery, J. R., Gonçalves, B. D. S. B., Brietzke, E., Bressan, R. A., Gadelha, A., Auerbach, R. P., & Mittal, V. A. (2017a). Adolescents at clinical-high risk for psychosis: Circadian rhythm disturbances predict worsened prognosis at 1-year follow-up. *Schizophrenia Research*, 189, 37–42. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2017.01.051

Lunsford-Avery, J. R., Dean, D. J., & Mittal, V. A. (2017b). Self-reported sleep disturbances associated with procedural learning impairment in adolescents at ultra-high risk for psychosis. *Schizophrenia Research*, 190, 160–163. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2017.03.025

Lunsford-Avery, J. R., Pelletier-Baldelli, A., Korenic, S. A., Schiffman, J., Ellman, L. M., Jackson, L., & Mittal, V. A. (2021). Eveningness chronotype preference among individuals at clinical high risk for psychosis. *Schizophrenia Research*, 236, 3–8. https://doi.org/10.1016/j.schres.2021.07.034

Mallett, R. (1997). Sociodemographic schedule. *Section of Social Psychiatry, Institute of Psychiatry*, *183*, 35.

Maraj, A., Ferrari, M., MacDonald, K., Peters, M., Joober, R., Shah, J. L., & Iyer, S. N. (2023). Engaging with care in an early intervention for psychosis program: The role of language, communication, and culture. *Transcultural Psychiatry*, 13634615231167067. Advance online publication. https://doi.org/10.1177/13634615231167067

Marin, L., Guàrdia, A., González-Rodríguez, A., Haba-Rubio, J., Natividad, M., Bosch, E., Domínguez, N., & Monreal, J. A. (2023). Sleep Disturbances in At-Risk Mental States and First Episode of Psychosis: A Narrative Review on Interventions. *Clocks & Sleep*, 5(2), 249–259. https://doi.org/10.3390/clockssleep5020020

Marshall, M., Lewis, S., Lockwood, A., Drake, R., Jones, P., & Croudace, T. (2005). Association between duration of untreated psychosis and outcome in cohorts of first-episode patients: a systematic review. *Archives of General Psychiatry*, 62(9), 975–983. https://doi-org.uea.idm.oclc.org/10.1001/archpsyc.62.9.975

McKnight-Eily, L. R., Okoro, C. A., Strine, T. W., Verlenden, J., Hollis, N. D., Njai, R., Mitchell, E. W., Board, A., Puddy, R., & Thomas, C. (2021). Racial and Ethnic Disparities in the Prevalence of Stress and Worry, Mental Health Conditions, and Increased Substance Use Among Adults During the COVID-19 Pandemic - United States, April and May 2020. MMWR. *Morbidity and Mortality Weekly Report*, 70(5), 162–166. https://doi-org.uea.idm.oclc.org/10.15585/mmwr.mm7005a3

McManus, S., Bebbington, P., Jenkins, R., & Brugha, T. (2016). Mental health and wellbeing in England: Adult psychiatric morbidity survey 2014. *NHS Digital*. https://files.digital.nhs.uk/pdf/q/3/mental_health_and_wellbeing_in_england_full_report.pdf

Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., Cannon… Arango, C. (2020). How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet. Psychiatry*, 7(9), 813–824. https://doi.org/10.1016/S2215-0366(20)30307-2

Morgan, R. L., Whaley, P., Thayer, K. A., & Schünemann, H. J. (2018). Identifying the PECO: a framework for formulating good questions to explore the association of environmental and other exposures with health outcomes. *Environment International*, 121(Pt 1), 1027. https://doi-org.uea.idm.oclc.org/10.1016/j.envint.2018.07.015

Mundt, J. C., Marks, I. M., Shear, M. K., & Greist, J. H. (2002). The Work and Social Adjustment Scale: A simple measure of impairment in functioning. *The British Journal of Psychiatry*, 180(5), 461–464. https://doi.org/10.1192/bjp.180.5.461

National Institute for Health and Care Excellence. (2014). *Psychosis and schizophrenia in adults: prevention and management*. NICE. Retrieved from: https://www.nice.org.uk/guidance/cg178

National Institute for Health and Care Excellence. (2020*). Psychosis and schizophrenia in adults: Prevention and management* (NG181). NICE. Retrieved from: https://www.nice.org.uk/guidance/ng181

NHS England. (2023). *Implementing the early intervention in psychosis access and waiting time standard: Guidance*. Retrieved from: https://www.england.nhs.uk/wp-content/uploads/2023/03/B1954-implementing-the-early-intervention-in-psychosis-access-and-waiting-time-standard.pdf

NHS England. (2016). *Implementing the early intervention in psychosis access and waiting time standard: Guidance*. Retrieved from: https://www.england.nhs.uk/mentalhealth/wp-content/uploads/sites/29/2016/04/eip-guidance.pdf

O'Connell, N., O'Connor, K., McGrath, D., Vagge, L., Mockler, D., Jennings, R., & Darker, C. D. (2021). Early Intervention in Psychosis services: A systematic review and narrative synthesis of the barriers and facilitators to implementation. *European Psychiatry: the Journal of the Association of European Psychiatrists*, 65(1), e2. https://doi-org.uea.idm.oclc.org/10.1192/j.eurpsy.2021.2260

Oduola, S., Craig, T. K. J., Das-Munshi, J., Bourque, F., Gayer-Anderson, C., & Morgan, C. (2019). Compulsory admission at first presentation to services for psychosis: does ethnicity still matter? Findings from two population-based studies of first episode psychosis. *Social Psychiatry and Psychiatric Epidemiology*, 54(7), 871–881. https://doi-org.uea.idm.oclc.org/10.1007/s00127-019-01685-y

Oduola, S., Das-Munshi, J., Bourque, F., Gayer-Anderson, C., Tsang, J., Murray, R. M., Craig, T. K. J., & Morgan, C. (2021). Change in incidence rates for psychosis in different ethnic groups in South London: findings from the Clinical Record Interactive Search-First Episode Psychosis (CRIS-FEP) study. *Psychological Medicine*, 51(2), 300–309. https://doi.org/10.1017/S0033291719003234

Oduola, S., Craig, T. K. J., Iacoponi, E., Macdonald, A., & Morgan, C. (2023). Sociodemographic and clinical predictors of delay to and length of stay with early intervention for psychosis service: findings from the CRIS-FEP study. *Social Psychiatry and Psychiatric Epidemiology*,

10.1007/s00127-023-02522-z. Advance online publication. https://doi-org.uea.idm.oclc.org/10.1007/s00127-023-02522-z

Office for National Statistics (2011). *Official labour market statistics*. UK ONS. Retrieved from: https://www.nomisweb.co.uk/reports/lmp/la/1946157253/report.aspx?c1=2013265927&c2=1946157256

Office for National Statistics (2021). *Population estimates for London boroughs: Lambeth, Southwark, Lewisham, and Croydon.* UK ONS. Retrieved from https://www.ons.gov.uk/visualisations/censuspopulationchange/

O'Keeffe, D., Marshall, D., Wheeler, A., Allen, E., Ronan, H., Buckley, A., Counihan, E., & Clarke, M. (2023). Through COVID-19 and beyond: developing a multidisciplinary telehealth family intervention in first episode psychosis. *Irish Journal of Psychological Medicine*, 40(3), 503–507. https://doi-org.uea.idm.oclc.org/10.1017/ipm.2021.79

Oliveira, C., Pereira, A., Vagos, P., Nóbrega, C., Gonçalves, J., & Afonso, B. (2021). Effectiveness of Mobile App-Based Psychological Interventions for College Students: A Systematic Review of the Literature. *Frontiers in Psychology*, 12, 647606. https://doi-org.uea.idm.oclc.org/10.3389/fpsyg.2021.647606

Ouzzani, M., Hammady, H., Fedorowicz, Z. & Elmagarmid, A. (2016). Rayyan—a Web and Mobile App for Systematic Reviews. *Systematic Reviews 5*. https://doi.org/10.1186/s13643-016-0384-4

Penttilä, M., Jääskeläinen, E., Hirvonen, N., Isohanni, M., & Miettunen, J. (2014). Duration of untreated psychosis as predictor of long-term outcome in schizophrenia: systematic review and meta-analysis. *The British journal of psychiatry : the journal of mental science*, 205(2), 88–94. https://doi.org/10.1192/bjp.bp.113.127753

Perera, G., Broadbent, M., Callard, F., Chang, C. K… A., & Stewart, R. (2016). Cohort profile of the South London and Maudsley NHS Foundation Trust Biomedical Research Centre (SLaM BRC) Case Register: current status and recent enhancement of an Electronic Mental Health Record-derived data resource. *BMJ open*, 6(3), e008721. https://doi-org.uea.idm.oclc.org/10.1136/bmjopen-2015-008721

Piersma, H. L., & Boes, J. L. (1997). The GAF and psychiatric outcome: a descriptive report. *Community Mental Health Journal*, 33(1), 35–41. https://doi-org.uea.idm.oclc.org/10.1023/a:1022413110345

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., Duffy, S. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews*. ESRC Methods Programme. DOI:10.13140/2.1.1018.4643

Public Health England. (2016). *Psychosis Data Report - Describing variation in numbers of people with psychosis and their access to care in England*. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774680/Psychosis_data_report.pdf

Rathbone, A. L., Clarry, L., & Prescott, J. (2017). Assessing the Efficacy of Mobile Health Apps Using the Basic Principles of Cognitive Behavioral Therapy: Systematic Review. *Journal of medical Internet research*, 19(11), e399. https://doi-org.uea.idm.oclc.org/10.2196/jmir.8598

Reeve, S., Sheaves, B., & Freeman, D. (2015). The role of sleep dysfunction in the occurrence of delusions and hallucinations: A systematic review. *Clinical Psychology Review*, 42, 96–115. https://doi-org.uea.idm.oclc.org/10.1016/j.cpr.2015.09.001

Reeve, S., Nickless, A., Sheaves, B., Hodgekins, J., Stewart, S. L. K., Gumley, A., ... & Freeman, D. (2019). Sleep duration and psychotic experiences in patients at risk of psychosis: a secondary analysis of the EDIE-2 trial. *Schizophrenia Research*, 204, 326-333. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2018.08.006

Richardson, L., Hameed, Y., Perez, J., Jones, P. B., & Kirkbride, J. B. (2018). Association of environment with the risk of developing psychotic disorders in rural populations: findings from the social epidemiology of psychoses in East Anglia study. *JAMA Psychiatry*, 75(1), 75-83. https://doi.org/10.1001/jamapsychiatry.2017.3582

Rössler, W., Salize, H. J., van Os, J., & Riecher-Rössler, A. (2005). Size of burden of schizophrenia and psychotic disorders. *European Neuropsychopharmacology: The Journal of the European College of Neuropsychopharmacology*, 15(4), 399–409. https://doi.org/10.1016/j.euroneuro.2005.04.009

Rybarczyk, B. (2011). Social and Occupational Functioning Assessment Scale (SOFAS). In J. S. Kreutzer, J. DeLuca, & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 2313-2313). New York, NY: Springer New York.

Salazar de Pablo, G., Woods, S. W., Drymonitou, G., de Diego, H., & Fusar-Poli, P. (2021). Prevalence of Individuals at Clinical High-Risk of Psychosis in the General Population and Clinical Samples: Systematic Review and Meta-Analysis. *Brain sciences*, 11(11), 1544. https://doi.org/10.3390/brainsci11111544

Saraswat, N., Rao, K., Subbakrishna, D. K., & Gangadhar, B. N. (2006). The Social Occupational Functioning Scale (SOFS): a brief measure of functional status in persons with schizophrenia. *Schizophrenia research*, 81(2-3), 301–309. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2005.09.008

Schofield, P., Thygesen, M., Das-Munshi, J., Becares, L., Cantor-Graae, E., Pedersen, C., & Agerbo, E. (2017). Ethnic density, urbanicity and psychosis risk for migrant groups - A population cohort study. *Schizophrenia research*, 190, 82–87. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2017.03.032

Searle, A., Allen, L., Lowther, M., Cotter, J., & Barnett, J. H. (2022). Measuring functional outcomes in schizophrenia in an increasingly digital world. *Schizophrenia research. Cognition*, 29, 100248. https://doi-org.uea.idm.oclc.org/10.1016/j.scog.2022.100248

Smith, C. S., Reilly, C., & Midkiff, K. (1989). Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *Journal of Applied Psychology*, 74(5), 728–738. https://doi.org/10.1037/0021-9010.74.5.728

Soneson, E., Russo, D., Stochl, J., Heslin, M., Galante, J., Knight, C., Grey, N., Hodgekins, J., French, P., Fowler, D., Lafortune, L., Byford, S., Jones, P. B., & Perez, J. (2020). Psychological interventions for people with psychotic experiences: A systematic review and meta-analysis of controlled and uncontrolled effectiveness and economic studies. *The Australian and New Zealand Journal of Psychiatry*, 54(7), 673–695. https://doi-org.uea.idm.oclc.org/10.1177/0004867420913118

Spoormaker, V. I., Verbeek, I., van den Bout, J., & Klip, E. C. (2006). Initial validation of the SLEEP-50 questionnaire. *Behavioral Sleep Medicine*, 3(4), 227–246. https://doi.org/10.1207/s15402010bsm0404_4

Stafford, A., Oduola, S., & Reeve, S. (2024). Sleep and socio-occupational functioning in adults with serious mental illness: A systematic review. *Psychiatry Research*, 339, 116111. https://doi-org.uea.idm.oclc.org/10.1016/j.psychres.2024.116111

Stewart, R., Soremekun, M., Perera, G., Broadbent, M., Callard, F., Denis, M., Hotopf, M., Thornicroft, G., & Lovestone, S. (2009). The South London and Maudsley NHS Foundation Trust Biomedical Research Centre (SLAM BRC) case register: Development and descriptive data. *BMC Psychiatry*, 9, Article 51. https://doi-org.uea.idm.oclc.org/10.1186/1471-244X-9-51

Taylor, K. M., Bradley, J., & Cella, M. (2022). A novel smartphone-based intervention targeting sleep difficulties in individuals experiencing psychosis: A feasibility and acceptability evaluation. *Psychology and Psychotherapy*, 95(3), 717–737. https://doi-org.uea.idm.oclc.org/10.1111/papt.12395

van Os, J., Linscott, R. J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychological Medicine*, 39(2), 179–195. https://doi-org.uea.idm.oclc.org/10.1017/S0033291708003814

van Os, J., Kenis, G., & Rutten, B. P. (2010). The environment and schizophrenia. *Nature*, *468* (7321), 203-212. https://doi-org.uea.idm.oclc.org/10.1038/nature09563

van Os, J., & Guloksuz, S. (2017). A critique of the “ultra-high risk” and “transition” paradigm. *World Psychiatry*, 16(2), 200-206. https://doi:10.1002/wps.20423

Velthorst, E., Nelson, B., Wiltink, S., de Haan, L., Wood, S. J., Lin, A., & Yung, A. R. (2013). Transition to first episode psychosis in ultra high risk populations: does baseline functioning hold the key? *Schizophrenia Research*, 143(1), 132-137. https://doi-org.uea.idm.oclc.org/10.1016/j.schres.2012.10.025

Vignaud, P., Reilly, K. T., Donde, C., Haesebaert, F., & Brunelin, J. (2019). Clinical Effects of Mindfulness-Based Intervention in Patients With First Episode Psychosis and in Individuals With Ultra-High Risk for Transition to Psychosis: A Review. *Frontiers in Psychiatry*, 10, 797. https://doi-org.uea.idm.oclc.org/10.3389/fpsyt.2019.00797

Waite, F., Bradley, J., Chadwick, E., Reeve, S., Bird, J. C., & Freeman, D. (2018). The experience of sleep problems and their treatment in young people at ultra-high risk of psychosis: a thematic analysis. *Frontiers in Psychiatry*, *9*, 375. https://doi.org/10.3389/fpsyt.2018.00375

Waite, F., Černis, E., Kabir, T., Iredale, E., Johns, L., Maughan, D., Diamond, R., Seddon, R., Williams, N., Yu, L. M., Freeman, D., & SleepWell lived experience advisory group (2023). A targeted psychological treatment for sleep problems in young people at ultra-high risk of psychosis in England (SleepWell): a parallel group, single-blind, randomised controlled feasibility trial. The lancet. Psychiatry, 10(9), 706–718. https://doi-org.uea.idm.oclc.org/10.1016/S2215-0366(23)00203-1

Walker M. P. (2010). Sleep, memory and emotion. *Progress in Brain Research*, 185, 49–68. https://doi-org.uea.idm.oclc.org/10.1016/B978-0-444-53702-7.00004-X

Wijnen, B. F. M., Thielen, F. W., Konings, S., Feenstra, T., Van Der Gaag, M., Veling, W... & Lokkerbol, J. (2020). Designing and Testing of a Health-Economic Markov Model for Prevention and Treatment of Early Psychosis. *Expert review of pharmacoeconomics & outcomes research,* 20(3), 269–279. https://doi.org/10.1080/14737167.2019.1632194

Wing, J. K., Beevor, A. S., Curtis, R. H., Park, S. B. G., Hadden, S., & Burns, A. (1996). Health of the Nation Outcome Scales (HoNOS): Research and development. *The British Journal of Psychiatry*, 168(1), 11–18. https://doi.org/10.1192/bjp.168.1.11

Yung, A. R., & McGorry, P. D. (1996). The prodromal phase of first-episode psychosis: past and current conceptualizations. *Schizophrenia bulletin,* 22(2), 353–370. https://doi.org/10.1093/schbul/22.2.353

Yung, A. R., Yuen, H. P., McGorry, P. D., Phillips, L. J., Kelly, D., Dell'Olio, M., Francey… & Buckby, J. (2005). Mapping the onset of psychosis: the Comprehensive Assessment of At-Risk Mental

States. *The Australian and New Zealand journal of psychiatry*, 39(11-12), 964–971. https://doi.org/10.1080/j.1440-1614.2005.01714.x

Zhand, N., & Joober, R. (2021). Implications of the COVID-19 pandemic for patients with schizophrenia spectrum disorders: narrative review. *BJPsych open*, 7(1), e35. https://doi.org/10.1192/bjo.2020.157

Zhang, T., Xu, L., Tang, Y., Cui, H., Tang, X., Wei, Y., . . . Liu, X. (2019). Relationship between duration of untreated prodromal symptoms and symptomatic and functional recovery. *European Archives of Psychiatry and Clinical Neuroscience*, 269(8), 871-877. https://doi:10.1007/s00406-018-0917-z

Zubin, J., & Spring, B. (1977). Vulnerability: A new view of schizophrenia. *Journal of Abnormal Psychology*, 86(2), 103. https://doi-org.uea.idm.oclc.org/10.1037/0021-843X.86.2.103

Appendices

Appendix A

Systematic Review Journal Guidelines

Early Intervention in Psychiatry - Author Guidelines

Sections

1. SUBMISSION

Thank you for your interest in *Early Intervention in Psychiatry*. Authors should kindly note that submission implies that the content has not been published or submitted for publication elsewhere except as a brief abstract in the proceedings of a scientific meeting or symposium.

Once the submission materials have been prepared in accordance with the Author Guidelines, manuscripts submissions should be made via the Research Exchange submission portal. You may check the status of your submission at any time by logging on to submission.wiley.com and clicking the "My Submissions" button. For technical help with the submission system, please review our FAQs or contact submissionhelp@wiley.com. For any queries regarding submission, please contact eip.eo@wiley.com.

This journal accepts articles previously published on preprint servers.

Early Intervention in Psychiatry will consider for review articles previously available as preprints. You may also post the submitted version of a manuscript to a preprint server at any time. You are requested to update any pre-publication versions with a link to the final published article.

By submitting a manuscript to or reviewing for this publication, your name, email address, and affiliation, and other contact details the publication might require, will be used for the regular operations of the publication, including, when necessary, sharing with the publisher (Wiley) and partners for production and publication. The publication and the publisher recognize the importance of protecting the personal information collected from users in the operation of these services, and have practices in place to ensure that steps are taken to maintain the security, integrity, and privacy

of the personal data collected and processed. You can learn more at https://authorservices-wiley-com.uea.idm.oclc.org/statements/data-protection-policy.html

We look forward to your submission.

2. AIMS AND SCOPE

Early Intervention in Psychiatry publishes original research articles and reviews dealing with the early recognition, diagnosis and treatment across the full range of mental and substance use disorders, as well as the underlying epidemiological, biological, psychological and social mechanisms that influence the onset and early course of these disorders. The journal provides comprehensive coverage of early intervention for the full range of psychiatric disorders and mental health problems, including schizophrenia and other psychoses, mood and anxiety disorders, substance use disorders, eating disorders and personality disorders. Papers in any of the following fields are considered: diagnostic issues, psychopathology, clinical epidemiology, biological mechanisms, treatments and other forms of intervention, clinical trials, health services and economic research and mental health policy. Special features are also published, including hypotheses, controversies and snapshots of innovative service models.

In contrast with mainstream healthcare, early diagnosis and intervention has come late to the field of psychiatry. *Early Intervention in Psychiatry* creates a common forum for researchers and clinicians with an interest in the early phases of a wide range of disorders to share ideas, experience and data. This journal not only fills a gap, but also creates a new frontier in academic and clinical psychiatry.

3. MANUSCRIPT CATEGORIES AND REQUIREMENTS

Articles reporting original work that embodies scientific excellence in psychiatry and advances in clinical research (suggested word count for text 3000; abstract maximum 250);

Reviews which synthesize important information on a topic of general interest to early intervention in psychiatry (suggested word count for text 5000; abstract maximum 250);

Brief Reports which present original research that makes a single point, or negative studies of important topics (suggested word count for text 1500; abstract maximum150);

Early Intervention in the Real World, a special features section which focuses on issues such as service descriptions and delivery, and clinical practice guidelines (suggested word count for text 3000; abstract maximum 250);

Editorials or Hypotheses. Please contact the editorial office before writing an Editorial or Hypotheses article for the journal (suggested word count for text 1000);

4. PREPARING THE SUBMISSION

Wiley Author Resources

Manuscript Preparation Tips: Wiley has a range of resources for authors preparing manuscripts for submission available here. In particular, authors may benefit from referring to Wiley's best practice tips on Writing for Search Engine Optimization.

Article Preparation Support: Wiley Editing Services offers expert help with English Language Editing, as well as translation, manuscript formatting, figure illustration, figure formatting, and graphical abstract design – so you can submit your manuscript with confidence. Also, check out our resources for Preparing Your Article for general guidance about writing and preparing your manuscript.

Free Format submission

EIP now offers Free Format submission for a simplified and streamlined submission process. Before you submit, you will need:

- Your manuscript: this should be an editable file including text, figures, and tables, or separate files – whichever you prefer. All required sections should be contained in your manuscript, including abstract, introduction, methods, results, and conclusions. Figures and tables should have legends. Figures should be uploaded in the highest resolution possible. References may be submitted in any style or format, as long as it is consistent throughout the manuscript. Supporting information should be submitted in separate files. If the manuscript, figures or tables are difficult for you to read, they will also be difficult for the editors and reviewers, and the editorial office will send it back to you for revision. Your manuscript may also be sent back to you for revision if the quality of English language is poor.
- An ORCID ID, freely available at https://orcid.org. (Why is this important? Your article, if accepted and published, will be attached to your ORCID profile. Institutions and funders are increasingly requiring authors to have ORCID IDs.)
- The title page of the manuscript, including:

o Your co-author details, including affiliation and email address. (Why is this important? We need to keep all co-authors informed of the outcome of the peer review process.)

o Statements relating to our ethics and integrity policies, which may include any of the following (Why are these important? We need to uphold rigorous ethical standards for the research we consider for publication):

o data availability statement

o funding statement

o conflict of interest disclosure

o ethics approval statement

o patient consent statement

o permission to reproduce material from other sources

o clinical trial registration

Main Text File

Manuscripts can be uploaded either as a single document (containing the main text, tables and figures), or with figures and tables provided as separate files. Should your manuscript reach revision stage, figures and tables must be provided as separate files. The main manuscript file can be submitted in Microsoft Word (.doc or .docx).

Your main document file should include:

· A short informative title containing the major key words. The title should not contain abbreviations;

· The full names of the authors with institutional affiliations where the work was conducted, with a footnote for the author's present address if different from where the work was conducted;

· Acknowledgments;

· Abstract structured (intro/methods/results/conclusion) or unstructured; Original Article, Review, Brief Report, *Early Intervention in the Real World* submissions must have an abstract that states in 250 words (150 words for Brief Reports) or fewer the purpose, basic procedures, main findings and principal conclusions of the study. The abstract should not contain abbreviations or references.

· Up to seven keywords; for the purposes of indexing, keywords should be supplied below the abstract, in alphabetical order, and should be taken from those recommended by the US National Library of Medicine's Medical Subject Headings (MeSH) browser list at http://www.nlm.nih.gov.uea.idm.oclc.org/mesh/meshhome.html.

· Practitioner Points (optional) Authors will need to provide no more than 3 'key points', written with the practitioner in mind, that summarize the key messages of their paper to be published with their article;

· Main body: preferably formatted as introduction, materials & methods, results, discussion, conclusion;

· References;

· Tables (each table complete with title and footnotes);

· Figure legends: Legends should be supplied as a complete list in the text.

5. FORMATTING FOR REVISED MANUSCRIPT

Style

Spelling. The journal uses UK spelling and authors should therefore follow the latest edition of the Concise Oxford Dictionary.

Units. All measurements must be given in SI or SI-derived units. Please go to the Bureau International des Poids et Mesures (BIPM) website at http://www.bipm.fr for more information about SI units.

Abbreviations. Abbreviations should be used sparingly – only where they ease the reader's task by reducing repetition of long, technical terms. Initially use the word in full, followed by the

abbreviation in parentheses. Thereafter use the abbreviation only.

Trade names. Drugs should be referred to by their generic names. If proprietary drugs have been used in the study, refer to these by their generic name, mentioning the proprietary name, and the name and location of the manufacturer, in parentheses.

Acknowledgments

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. Financial and material support should also be mentioned. Thanks to anonymous reviewers are not appropriate.

References

Preferably, references should be prepared according to the Publication Manual of the American Psychological Association (6th edition). This means in text citations should follow the author-date method whereby the author's last name and the year of publication for the source should appear in the text, for example, (Jones, 1998). The complete reference list should appear alphabetically by name at the end of the paper.

A sample of the most common entries in reference lists appears below. Note that for journal articles, issue numbers are not included unless each issue in the volume begins with page one, and a DOI should be provided for all references where available.

Journal article

Beers, S. R. , & De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *The American Journal of Psychiatry*, *159*, 483–486. doi:10.1176/appi.ajp.159.3.483

Book

Bradley-Johnson, S. (1994). *Psychoeducational assessment of students who are visually impaired or blind: Infancy through high school* (2nd ed.). Austin, TX: Pro-ed.

Internet Document

Norton, R. (2006, November 4). How to train a cat to operate a light switch [Video file]. Retrieved from http://www.youtube.com/watch?v=Vja83KLQXZs

Tables

Tables should be self-contained and complement, not duplicate, information contained in the text. They should be supplied as editable files, not pasted as images. Legends should be concise but comprehensive – the table, legend, and footnotes must be understandable without reference to the text. All abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, ¶, should be used (in that order) and *, **, *** should be reserved for P-values. Statistical measures such as SD or SEM should be identified in the headings.

Figure Legends

Legends should be concise but comprehensive – the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Figures

Although authors are encouraged to send the highest-quality figures possible, for peer-review purposes, a wide variety of formats, sizes, and resolutions are accepted. Click here for the basic figure requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

Supporting Information

Supporting information is information that is not essential to the article, but provides greater depth and background. It is hosted online and appears without editing or typesetting. It may include tables, figures, videos, datasets, etc.

Click here for Wiley's FAQs on supporting information.

Note: if data, scripts, or other artefacts used to generate the analyses presented in the paper are available via a publicly available data repository, authors should include a reference to the location of the material within their paper.

Appendix B

Systematic Review Search Strategy

The review searched the databases PsycINFO, CINAHL, MEDLINE, EMBASE and Scopus in 10th February 2025 using the following search strategy across all the databases:

“at-risk mental state" OR "clinical high risk" OR "ultra-high risk" OR "prodrom" OR “high risk N3 psychosis” OR “early psychosis” OR “schizo*” OR “schizotyp” OR “psychoti*” OR “first episode psychosis” OR “delus*” OR “hallucinat*”*

AND

"sleep" OR "insomnia" OR "nightmare" OR “REM sleep” OR “slow wave sleep” OR “dream” OR “parasomnia” OR “circadian”*

AND

"social occupational functio" OR "social functio*" OR "occupational functio*" OR “functioning” OR “work productivity” OR “activity leve*” OR “quality of life” OR “HRQoL” OR "The Personal Social Performance" OR "Adult Social Relationships Scales" OR "Specific Levels of Functioning Scale" OR "UCSD Performance-Based Skills Assessment" OR "UPSA-B" OR "Work Productivity and Activity Impairment Questionnaire" OR "WPAI" OR "Work and Social Adjustment Scale" OR "International Physical Activity Questionnaire" OR "IPAQ" OR "Sheehan Disability Scale" OR "Time Use Survey" OR "Social and Occupational Functioning Assessment Scale" OR “SOFS” OR "Occupational Functioning Scale" OR "Social functioning questionnaire" OR "Social functioning schedule" OR "Social functioning scale" OR "Social Adjustment Scale Self-Report" OR "SAS-SR" OR "Social Adjustment Scale" OR "The Structured and Scaled Interview to Assess Maladjustment" OR "SSIAM" OR "Social Behaviour Assessment Schedule" OR "Interview Schedule for Social Interaction" OR "Katz Adjustment Scale" OR "EQ-5D” OR "Health of the Nation Outcome Scales" OR "HoNOS" OR "Assessment of Occupational Functioning" OR "Global Assessment of Functioning" OR "Functioning Assessment Short Test" OR "Range of Impaired Functioning Tool" OR "Longitudinal Interval Follow-up Evaluation" OR "LIFE-RIFT" OR "Personal and Social Performance scale" OR "Specific Level of Functioning Scale"*

Appendix C

Empirical Research Project Journal Guidelines

Social Psychiatry & Psychiatric Epidemiology – Author Guidelines

Instructions for Authors

Types of Papers

- Papers must be written in English.
- Accepted article types: Research, Review, Brief Report, Editorial, Comment, Correspondence, and Study Protocol.
- Research papers or Reviews should not exceed 4,500 words, not including references, plus 5 tables or figures. An abstract (150 to 250 words) and 4-6 keywords are required (please see also section 'title page').
- Submissions for Study Protocols are welcome which describe the rationale, the design, procedures, and sample characteristics of large epidemiological studies in the context of existing research. Papers should not exceed 4,500 words. An abstract (150 to 250 words) and 4-6 keywords are required.
- Brief Reports should not contain more than 1,500 words plus 1 figure or table. Please submit a short abstract of max. 100 words and 4-6 keywords.
- Editorials and Correspondence articles will be considered for publication; they should not contain more than 1,500 words.
- Comments should not contain more than 10,000 characters and less than 10 references. Please do not include an abstract or keywords.
- Exceptions to the word limits can be made only with the agreement of the Editor-in-Chief.
- Authors are required to state the word count of their paper when submitting the manuscript.

Editorial procedure

Single-blind peer review

This journal follows a single-blind reviewing procedure.

Manuscript Submission

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute

where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

Permissions

Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

Online Submission

Please follow the hyperlink “Submit manuscript” and upload all of your manuscript files following the instructions given on the screen.

Source Files

Please ensure you provide all relevant editable source files at every submission and revision. Failing to submit a complete set of editable source files will result in your article not being considered for review. For your manuscript text please always submit in common word processing formats such as .docx or LaTeX.

Submitting Declarations

Please note that Author Contribution information and Competing Interest information must be provided at submission via the submission interface. Only the information submitted via the interface will be used in the final published version. Please make sure that if you are an editorial board member and also a listed author that you also declare this information in the Competing Interest section of the interface.

Please see the relevant sections in the submission guidelines for further information on these statements as well as possible other mandatory statements.

Title Page

Please make sure your title page contains the following information.

Title

The title should be concise and informative.

Author information

- The name(s) of the author(s)
- The affiliation(s) of the author(s), i.e. institution, (department), city, (state), country
- A clear indication and an active e-mail address of the corresponding author
- If available, the 16-digit ORCID of the author(s)

If address information is provided with the affiliation(s) it will also be published.

For authors that are (temporarily) unaffiliated we will only capture their city and country of residence, not their e-mail address unless specifically requested.

Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs. Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript. The use of an LLM (or other AI-tool) for "AI assisted copy editing" purposes does not need to be declared. In this context, we define the term "AI assisted copy editing" as AI-assisted improvements to human-generated texts for readability and style, and to ensure that the texts are free of errors in grammar, spelling, punctuation and tone. These AI-assisted improvements may include wording and formatting changes to the texts, but do not include generative editorial work and autonomous content creation. In all cases, there must be human accountability for the final version of the text and agreement from the authors that the edits reflect their original work.

Abstract

Please provide a structured abstract of 150 to 250 words which should be divided into the following sections:

- Purpose (stating the main purposes and research question)
- Methods
- Results
- Conclusion

For life science journals only (when applicable)

- Trial registration number and date of registration for prospectively registered trials
- Trial registration number and date of registration followed by “retrospectively registered”, for retrospectively registered trials

Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

Statements and Declarations

The following statements should be included under the heading "Statements and Declarations" for inclusion in the published paper. Please note that submissions that do not include relevant declarations will be returned as incomplete.

- **Competing Interests:** Authors are required to disclose financial or non-financial interests that are directly or indirectly related to the work submitted for publication. Please refer to

"Competing Interests and Funding" below for more information on how to complete this section.

Please see the relevant sections in the submission guidelines for further information as well as various examples of wording. Please revise/customize the sample statements according to your own needs.

Text

Text Formatting

Manuscripts should be submitted in Word.

- Use a normal, plain font (e.g., 10-point Times Roman) for text.
- Use italics for emphasis.
- Use the automatic page numbering function to number the pages.
- Do not use field functions.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Manuscripts with mathematical content can also be submitted in LaTeX. We recommend using Springer Nature's LaTeX template.

Headings

Please use no more than three levels of displayed headings.

Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

Footnotes

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

References

Citation

Reference citations in the text should be identified by numbers in square brackets. Some examples:

1. Negotiation research spans many disciplines [3].

2. This result was later contradicted by Becker and Seligman [5].

3. This effect has been widely studied [1-3, 7].

Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text.

The entries in the list should be numbered consecutively.

If available, please always include DOIs as full DOI links in your reference list (e.g. “https://doi-org.uea.idm.oclc.org/abc”).

- Journal article

Gamelin FX, Baquet G, Berthoin S, Thevenet D, Nourry C, Nottin S, Bosquet L (2009) Effect of high intensity intermittent training on heart rate variability in prepubescent children. Eur J Appl Physiol 105:731-738. https://doi-org.uea.idm.oclc.org/10.1007/s00421-008-0955-8

Ideally, the names of all authors should be provided, but the usage of “et al” in long author lists will also be accepted:

Smith J, Jones M Jr, Houghton L et al (1999) Future of health insurance. N Engl J Med 965:325–329

- Article by DOI

Slifka MK, Whitton JL (2000) Clinical implications of dysregulated cytokine production. J Mol Med. https://doi-org.uea.idm.oclc.org/10.1007/s001090000086

- Book

South J, Blass B (2001) The future of modern genomics. Blackwell, London

- Book chapter

Brown B, Aaron M (2001) The politics of nature. In: Smith J (ed) The rise of modern genomics, 3rd edn. Wiley, New York, pp 230-257

- Online document

Cartwright J (2007) Big stars have weather too. IOP Publishing PhysicsWeb. http://physicsweb.org/articles/news/11/6/16/1. Accessed 26 June 2007

- Dissertation

Trent JW (1975) Experimental acute renal failure. Dissertation, University of California

Always use the standard abbreviation of a journal's name according to the ISSN List of Title Word Abbreviations, see

ISSN.org LTWA

If you are unsure, please use the full journal title.

Authors preparing their manuscript in LaTeX can use the bibliography style file sn-basic.bst which is included in the Springer Nature Article Template.

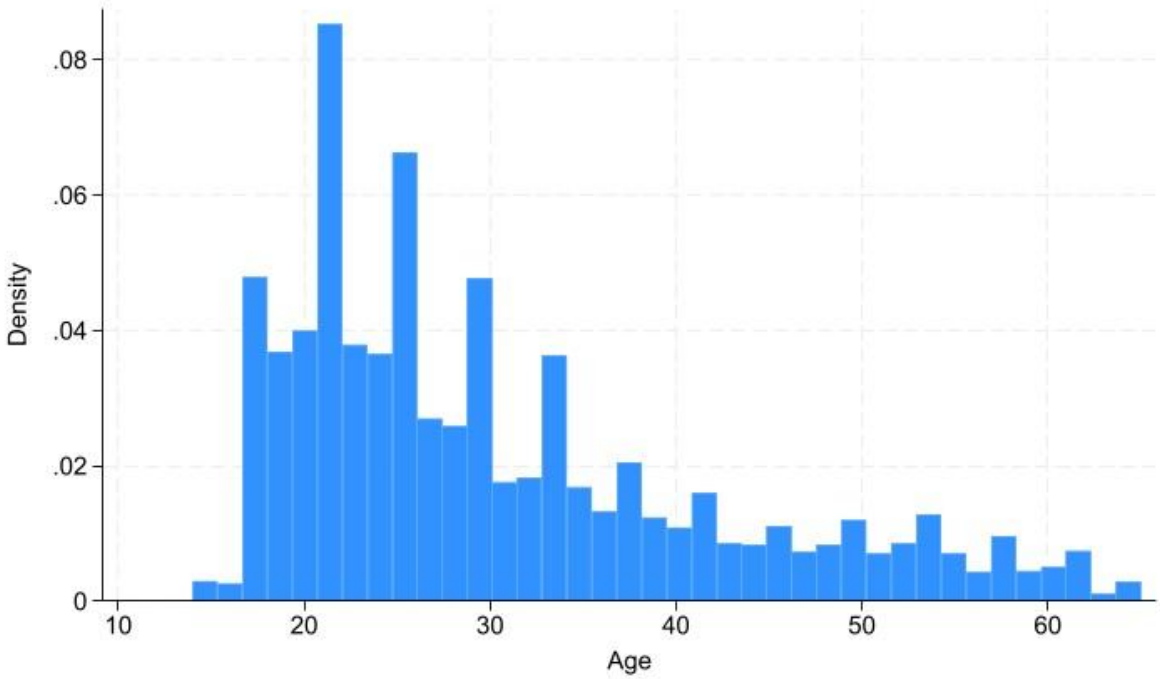
Tables

- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

Appendix D

Empirical Research Project Figure 1

Age Distribution



Appendix E

Empirical Research Paper Supplementary Table 1

Effect sizes, Odds ratios and 95% confidence intervals for access to psychological intervention across study variables

	CBT		**FI**	
	Statistics (*p*)	**ES Cohen's d**	**Statistics (*p*)**	**ES Cohen's d**
Mean age	F = 65.57 (0.001)	-0.21	F = 62.05 (0.001)	-0.27
	Statistics (*p*)	**CBT OR (95% CI)**	**Statistics (*p*)**	**FI OR (95% CI)**
EI status	X^2 (1) = 198.22		X^2 (1) = 29.80	
ARMS	(0.001)	2.73 (2.27-3.28)	(0.001)	0.45 (0.32-0.64)
Gender	X^2 (1) = 45.13		X^2 (1) = 1.47	
Female	(0.001)	1.25 (1.13-1.39)	(0.226)	0.92 (0.80-1.05)
Ethnicity	X^2 (7) = 69.25		X^2 (7) = 37.36	
White non-British	(0.001)	0.67 (0.54-0.82)	(0.001)	0.66 (0.48-0.89)
Mixed		0.91 (0.72-1.15)		1.19 (0.89-1.60)
Asian/South Asian		0.82 (0.67-1.01)		1.22 (0.93-1.58)
Black African		0.56 (0.47-0.66)		0.75 (0.59-0.94)
Black Caribbean		0.60 (0.48-0.75)		0.66 (0.49-0.90)
Black British		0.87 (0.72-1.04)		1.06 (0.85-1.32)
Other		0.74 (0.59-0.92)		0.58 (0.41-0.81)
Marital status	X^2 (4) = 39.34		X^2 (4) = 25.63	
Married/in partnership	(0.001)	0.86 (0.68-1.10)	(0.001)	1.03 (0.78-1.36)
Divorced/separated		0.77 (0.55-1.07)		0.62 (0.40-0.97)
Widowed		0.75 (0.24-2.34)		0.28 (0.04-2.04)
Not recorded		0.71 (0.63-0.81)		0.72 (0.62-0.83)
Referral source	X^2 (4) = 12.29		X^2 (4) = 11.89	
Other healthcare	(0.015)	1.05 (0.86-1.28)	(0.018)	0.79 (0.63-0.99)

professional				
A&E		0.97 (0.83-1.14)		0.97 (0.82-1.14)
CJS		0.74 (0.57-0.95)		0.93 (0.71-1.22)
Other		1.07 (0.90-1.28)		0.78 (0.64-0.95)
IMD	X^2 (4) = 9.74		X^2 (4) = 19.31	
2nd most deprived	(0.045)	1.07 (0.93-1.23)	(0.001)	1.04 (0.91-1.19)
3rd most deprived		1.12 (0.94-1.33)		1.02 (0.85-1.21)
4th most deprived		1.26 (0.96-1.64)		1.40 (1.07-1.84)
5th least deprived		1.54 (0.98-2.41)		1.83 (1.18-2.82)

FEP = First-Episode Psychosis; ARMS = At-risk Mental State; SD = Standard Deviation; GP = General Practitioner, A&E = Accident and Emergency department; CJS = Criminal Justice System; IMD = Index of Multiple Deprivation; CBT = Cognitive-Behavioural Therapy; FI = Family Intervention; F2F = Face to Face; ES = Effect Size; OR = Odds Ratio; CI = Confidence Intervals.

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