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Do Psychological Interventions Reduce Paranoia in Adolescents? A Systematic Review

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Abstract

Research suggests that paranoia is common in adolescents and can contribute to impaired wellbeing and psychological difficulties. Although best practice recommendations endorse early preventative intervention as the favoured treatment option, interventions targeting paranoia in adolescence are under-developed. This systematic review aimed to synthesise and appraise psychological interventions that measure changes in paranoia in adolescents. Seven databases were searched up to January 2026 for relevant studies. Included studies were those that evaluated a psychological intervention for adolescents (≤ 25 years old) and measured at least pre-post changes in paranoia using a validated measure/subscale. A total of 30 studies were included, which comprised 10 RCTs, 13 single arm studies and seven case designs. Although many of the interventions were associated with improvements in paranoia, most did not target paranoia as their primary outcome. Cognitive behavioural therapy-based interventions evidenced the most promising effects. Conclusions were limited by the weak methodological quality of many of the reviewed studies. Future research would benefit from developing targeted paranoia interventions for adolescents using rigorous, well-controlled methods.

Keywords Paranoia · Adolescents · Psychological therapy · Early intervention

Introduction

Paranoia describes an exaggerated belief that others intend to cause one harm (Freeman & Garety, 2014). The commonly endorsed continuum model proposes that paranoia exists along a spectrum of severity, ranging from common experiences of mistrust in the general population, to rarer, clinically significant persecutory delusions. Importantly, this continuum appears to be hierarchically structured, such

that severe paranoia builds upon normative social evaluative concerns (Bird et al., 2019; Freeman et al., 2005). Research suggests that paranoia often emerges in adolescence, a developmental stage when self-awareness and sensitivity to peer evaluation are heightened (Blakemore, 2008; Dominguez et al., 2011).

General population studies suggest that paranoia in adolescence is common and impairing. Approximately 6–15% of adolescents will experience moderate to high levels of paranoia with higher rates in females relative to males (Bird et al., 2019; Catone et al., 2025; Kingston et al., 2024; Schlier et al., 2024; Sousa et al., 2015). Elevated paranoia has been shown to contribute to various behavioural problems in adolescents, including social isolation and peer difficulties (Bird et al., 2017; Hennig et al., 2020; Kasanova et al., 2020; Kingston et al., 2022). This is concerning, given the critical role of adolescent social relationships in determining their overall self-worth and in promoting healthy transition into adulthood (Blakemore, 2008; Ford et al., 2017). Furthermore, heightened paranoia may elevate the risk of not only psychotic disorders (Freeman & Garety, 2014), but also psychological disorders such as social anxiety and

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depression (Bird et al., 2019; Kingston et al., 2024). Studies suggest that adolescents seeking support for these disorders present with double the rate of paranoia compared to the general population (Bird et al., 2021). Taken together, these findings highlight the transdiagnostic nature of paranoia in adolescents and the importance of developing targeted preventative treatments for these populations.

Adult intervention research has predominantly focused on the treatment of psychosis, targeting delusions alongside a range of other symptoms including hallucinations, negative psychosis symptoms and functioning (e.g., Cognitive Behavioural Therapy for psychosis (CBTp)) (Wykes et al., 2008). However, several reviews indicate that the effectiveness of these interventions typically varies across symptoms, showing small-medium effects for reducing delusions, with initial benefits often not persisting at follow-up (Berendsen et al., 2024; Gergov et al., 2022; Masterson et al., 2020; Turner et al., 2020). Studies also suggest that distinct causal mechanisms may underpin different symptoms, indicating that treatment outcomes could be enhanced through targeting specific symptoms (Bentall et al., 2014; Bloomfield et al., 2021; Ronald et al., 2014). Further, there is increasing acknowledgement that paranoia and other symptoms of psychosis are commonly experienced by adults with a range of mental health diagnoses (Ashford et al., 2022). Accordingly, treatments focusing on paranoia and persecutory delusions, such as The Feeling Safe Programme, have been of increasing interest, with promising results when targeting paranoia maintaining processes (e.g., worry, sleep, reasoning biases, negative self- and other- beliefs) (Freeman et al., 2016, 2021a, 2021b, 2025). Other paranoia-focused treatments with an emerging evidence base include: mindfulness (Collip et al., 2013; Saber et al., 2025; Shore et al., 2018); imagery-based approaches (Forkert et al., 2022; Newman-Taylor et al., 2021; Taylor et al., 2020); and digital paranoia interventions that integrate VR (Bird et al., 2024; Monaghesh et al., 2022). In further recognition of the transdiagnostic nature of paranoia, some frameworks aim to target paranoia via common mental health provision. For instance, TYPPEX (“Tailoring evidence-based psychological therapy for People with common mental disorders including Psychotic EXperiences”) is an emergent UK-based framework that seeks to equip therapists with a tailored training package for supporting adults presenting in primary care services with psychotic experiences (including paranoia), alongside a common mental disorder (Ashford et al., 2022).

While interventions for paranoia are well established in adult populations, treatments targeting adolescents with elevated paranoia are relatively under-developed. This is a key area of future research, given that mental health experts endorse early preventative intervention as best practice in preventing progression to long-term psychological disorders

and in limiting the chronicity, social impact, and economic cost associated with delayed treatment (Colizzi et al., 2020; Stelmach et al., 2022; Tsiachristas et al., 2016). In addition, considering that even subclinical paranoia is shown to be distressing and is robustly associated with impaired social functioning and peer problems in adolescents (Bird et al., 2019, 2022; Lindgren & Therman, 2024), specific, targeted intervention is also warranted to address these more immediate difficulties.

In this review, we aimed to systematically examine the effect of psychological interventions on paranoia outcomes in adolescents. Although, to our knowledge, there are currently few established treatments targeting elevated paranoia in adolescence, paranoia commonly occurs transdiagnostically across various mental health difficulties (Bird et al., 2021). Consequently, there is a developing evidence base that speaks to the impact of psychological treatments on adolescent paranoia in the context of treating other primary conditions (e.g., treatments for anxiety or depression). Reviewing this broader body of literature may provide novel insights into potential processes and mechanisms of change, as well as potentially promising treatment components to inform future targeted interventions for paranoia. This review thus includes studies that assess paranoia as a secondary outcome alongside primary treatment targets. Specifically, we aimed to: provide an overview of the impact of the interventions on paranoia; describe key study characteristics and intervention features; and summarise the quality of the existent research.

Methods

This review was conducted in line with the Recommendations for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The review protocol is preregistered on PROSPERO and accessible using the following code: CRD42024589239.

Search Strategy

A systematic search was conducted on seven electronic databases: EBSCO (PsycExtra, Medline, PsychInfo, PsychArticles, Academic Search Complete), Web of Science, and Scopus. Search terms formed three grouped categories: (i) intervention types, (ii) sample—adolescents, and (iii) paranoia. Prior to conducting a systematic search of the literature, a preliminary search was performed as well as consultation with other researchers and a librarian, to pilot and refine search terms (see Table 1). Search term categories were linked using the Boolean operator “AND”. Searches were applied to titles, abstracts, and keywords. Given the

Table 1 Study search terms

Intervention terms	Therap* OR Intervention* OR Treatment OR Psychotherap* OR program* OR Group* OR Counsell* OR Module OR Training OR CBT OR IPT OR ACT OR psychodynamic OR experiment* OR RCT OR trial OR mindfulness OR meditat* OR self-help OR behavioural OR gestalt OR prevent* OR psychoeducation
Young people terms	young OR "early childhood" OR preschool OR kindergarten or "early years" OR child* OR school or paediatric OR pediatric OR preadolescent OR prepubescent OR adolescent* OR teen* OR youth OR "college student*" OR "emerging adult*" OR juvenile
Paranoia terms	paranoid OR paranoia OR "paranoid thoughts" OR "paranoid ideation" OR "persecutory delusions" OR suspicious* OR "suspicious thoughts" OR suspicion

absence of systematic reviews on this topic, no restrictions were performed on study publication dates across searches. Searches were undertaken up to 10th January 2026. Information about the number of studies identified, screened and assessed for eligibility that are included in the review, as well as the number of papers excluded and reasons for exclusion, were recorded and presented on the PRISMA flow chart.

Eligibility Criteria

Studies were included if they met the following criteria: (a) the study used a validated measure or subscale designed to measure paranoia, paranoid ideation, suspiciousness, or persecutory delusions; (b) paranoia was measured before and after the intervention (at a minimum); (c) study participants were adolescents defined as individuals ≤ 25 years of age as determined through the sample age range (Patton et al., 2016). Where only the mean age and standard deviation age are reported, the mean age $\pm$ the standard deviation must be less than 25; (d) studies examined the effect of psychological interventions, defined as: psychologically informed methods designed to improve symptomology through strategies that elicit changes in a person's cognitions, emotions, and/or behaviours in accordance with psychological theory, as defined by Arnberg et al. (2013); (e) studies employed quantitative designs which include randomised control trials (RCT), uncontrolled trials, and quantitative case studies/case series; (f) studies were published in English. Exclusion criteria were: (a) designs where no quantitative data was collected i.e., qualitative studies, literature reviews, systematic reviews, or intervention protocol studies, and (b) studies with medical components where results pertaining to outcomes were not disaggregated across intervention methods.

Review Process and Procedure

All eligible papers were stored and managed in EndNote 2025. Screening was conducted in three stages. First, duplicates were removed using EndNote's duplicate removal function and through manually scanning article titles plus authors. Second, the lead researcher independently screened

all titles plus abstracts against eligibility criteria. A second reviewer then independently screened 20% of titles plus abstracts. Papers deemed ineligible based on title plus abstract screening were excluded. Third, the lead researcher and second reviewer repeated this process for full texts of the remaining articles. Full texts were retrieved through EndNote's automatic search; a physical search of the literature, or through a university library request form. The inter-rater reliability between reviewers was determined using Cohen's Kappa (κ). Agreement at title and abstract stage was good ($k \approx 0.65$) (98%) and agreement at full text stage was perfect ($k \approx 1$) (100%). Any disagreements regarding selected studies were resolved through consensus.

Data Extraction and Synthesis

An extraction sheet was established by the first author using Microsoft Excel (see Table 2). Findings regarding paranoia were summarised using the following statistics: means and standard deviation; between-groups effect sizes for RCTs; within-groups effect sizes for single arm studies (i.e., Cohen's d); and 95% confidence intervals with effect sizes of 0.2 indicating a small effect, 0.5 a moderate effect, and 0.8 a large effect (Cohen, 1988). If effect sizes were not reported, these were calculated from available study data, where possible. In RCTs, post-test Cohen's d values were calculated by dividing the difference between group means by the pooled standard deviation. In single arm studies, pre-post Cohen's d values were calculated by dividing the mean change score by the standard deviation of the change scores. In single arm studies reporting paired t -values, Cohen's d was calculated via $\frac{t}{\sqrt{N}}$. In single arm studies reporting pre-post means and standard deviations but not pre-post correlations required to calculate Cohen's d , a conservative estimate of $r = 0.5$ was adopted (Lakens, 2013; Morris & DeShon, 2002). These approximate Cohen's d values are demarcated in the results with an asterisk. In studies that omitted confidence intervals, these were calculated via R software. In case studies, percentage change is commonly used in clinical outcome research as a descriptive index of improvement (Austevoll et al., 2019; Hurst & Bolton, 2004). Percentage changes were calculated from pre-post scores to capture changes by

Table 2 Study characteristics

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Bradley et al. (2018)	Case series	UK NHS early intervention	CBT sleep (CBT-I)	N/A	11	18.5 (1.9)	M=5 F=7	Ultra-high risk (UHR) psychosis	Up to 8 one hr weekly sessions	One-to-one In-Person	Feasibility and sleep	Green Paranoid Thoughts Scale (GPTS) (Green et al., 2008)	Pre: $M = 71.6$ (22.7) Post: $M = 58.3$ (24.1) F/U: $M = 58.9$ (21.3) Effect sizes: <i>pre-post:</i> $d = 0.60$ <i>pre-F/U:</i> $d = 0.80^*$
Denis et al. (2020)	RCT	UK 3 Universities	CBT-I	Puzzles	199	20 (5)	All F	Sub threshold insomnia	6 weekly sessions	One-to-one Digital	Feasibility and sleep	Specific Psychotic Experiences Questionnaire: paranoia subscale (Ronald et al., 2014)	Pre: Intervention: $M = 6.66$ (5.76) Control: $M = 6.43$ (5.20) Post: Intervention: $M = 4.59$ (5.77) Control: $M = 6.07$ (5.92) F/U Intervention: $M = 4.69$ (5.53) Control: $M = 6.25$ (5.66) Sig plus effect sizes Post: $p = 0.041$, $d = 0.25$ F/U: $d = 0.28$
Díaz-González et al. (2018)	RCT	Spain Regional mental health clinics	Mindfulness Based Stress Reduction (MBSR) + treatment as usual (TAU)	TAU	80	14.6 (1.11) [13–16]	All F	Various including anxiety, depression, adjustment, behaviour	Eight 90-min sessions	Group In-person	Mindfulness, self-esteem, stress, anxiety and general symptoms	The Symptom Checklist 90-Revised: paranoid ideation subscale (SCL-90-R)	Pre: Intervention: $M = 9.78$ (5.67) Control: $M = 8.25$ (5.27) Post: Intervention: $M = 8$ (5.84) Control: $M = 7.89$ (5.54) Sig plus effect sizes: $p = .16$, $d = 0.02$

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Donohue et al. (2022)	Single case study	US Schools and agencies	Family therapy sport & mental health program	N/A	1	16	All F	Social anxiety	Twelve 1 h sessions	Family In-person	Feasibility	SCL-90-R	Pre: 72 Post: 49 1 month F/U: 49% Changes Pre-post: 39.14% change Pre-F/U: 39.14% change
Falkenström (2010)	Single arm	Sweden Mental health centre	Psychodynamic	N/A	101	19 (1.8)	M=18 F=83	Adult outpatients	Varied-based on client needs	One-to-one In-person	Overall psychological health	SCL-90	Pre: $M = 1.3 (0.9)$ Post: $M = 0.6 (0.6)$ 1 Year F/U: $M = 0.5 (0.5)$ Sig plus effect sizes Pre-post: $p < .001, d = 0.63^*$ Pre-F/U: $p < .001, d = -0.58$
Fan et al. (2024)	RCT	China Mental health hospital	Mindfulness+ Mentalization based Family therapy (MBFT)	MBFT	80	15.8 [14–17]	M=19 F=61	Teens with depression and suicidal ideation	Four 2 h sessions of MBFT and 8 2 h sessions of mindfulness	Family In-Person	Suicidal ideation	Middle School Student Mental Health scale (MssMHs) paranoia subscale	Pre: (Mann–Whitney U test) Intervention: $M = 3 (3,4)$ Control: $M = 3 (3,4)$ Post: Intervention: $M = 1 (0,1)$ Control: $M = 2 (1.25,3)$ Sig plus effect sizes at post: $p < 0.001, d = 0.95$
Feng and Li (2020)	Within-subjects exp design	China University	Music therapy	N/A	12	21 [20–22]	M=5 F=7	No stated conditions	Sixteen, 90–120 min for 8 weeks	Group In-person	Self- and inter-personal acceptance	SCL-90	Pre: $M = 1.72 (0.43)$ Post: $M = 1.50 (0.32)$ Sig plus effect size: $p = 0.12, d = 0.51$

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Fleischhaker et al. (2011)	Single arm	Germany Adolescent outpatient Mental health clinic (CAMHS)	Dialectical Behavioural Therapy for Adolescents (DBT-A) program	N/A	12	[13–19]	All F	Teens with non-suicidal self-injury &/or suicidal with BPD	16–24 weeks with weekly 1 h 1:1 therapy & weekly 2 h multi-family skills	One-to-one and family In-Person	Suicidal and/or non-suicidal self-injurious behaviour	SCL-90-R	Pre: $M = 0.54$ (0.32) Post: $M = 0.52$ (0.37) F/U: $M = 0.32$ (0.32) Sig plus effect size Pre-F/U: $p = 0.233$, $d = 0.58$
Fowler et al. (2021)	RCT	UK Early intervention MH services	Social recovery	TAU	270	20.1 (2.4) [16–25]	M=150 F=120	Social withdrawal, non-psychotic complex mental health and at risk of long-term disability and mental illness	Minimum 6 sessions	On-to-one In-Person	Structured activity	Schizotypal Symptoms Inventory (Hodgekins et al., 2012)	Pre: Social recovery therapy (SRT) plus enhanced standard care (ESC): $M = 10.69$ (6.37) ESC: $M = 10.44$ (7.18) Post SRT plus EHC: $M = 7.31$ (6.48) ESC: $M = 8.61$ (6.49) Effect sizes Post: $d = 0.20$ F/U: $d = 0.02$
Gavrilova et al. (2017)	Single case study	US University	Family therapy sport & mental health program	N/A	1	Early 20 s	F=1	Without pathology	12 sessions	Family In-Person	Mental health and sports performance	SCL-90-R	Pre score: 1 ($t = 63$), Post score: 0.17 ($t = 49$) F/U: 0.17 ($t = 48$) % change Pre-post: 83%
Haglund et al. (2014)	Single case study	US Early psychosis mental health centre	CBT for social anxiety	N/A	1	20	M=1	Social anxiety, at risk of psychosis	12 sessions over 9 months	One-to-one In-Person	Social anxiety	Scale of prodromal symptoms (SOPS) suspiciousness subscale (Miller et al., 2003)	Pre score: 3 Post score: 0 % change: 100%

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Hjeltnes et al. (2017)	Single arm	Norway University counselling centre	Mindfulness Based Stress Reduction (MBSR) course	N/A	45	23.1 (1.42) [19–25]	M=17 F=28	Social anxiety	Eight, 2–3 h weekly class meetings 1 all-day seminar	Group In-Person	Social anxiety	SCL-90-R	Pre score: $M = 0.88$ (0.72) Post score: $M = 0.61$ (0.60) Sig and effect sizes: $t^{(49)} = 4.05$, $p < .001$, $d = 0.40$
Ikononopoulos et al. (2015)	Case series	US Juvenile boot camp facility	Narrative	N/A	8	16 (0.75) [15–17]	M=6 F=2	Clinically significant needs	Ten 50-min sessions	One-to-one In-Person	Clinically relevant psychological symptoms	Brief Symptoms Inventory (BSI): paranoid ideation subscale (Derogatis & Melisaratos, 2009)	Clinically relevant scores: in 3/8 participants
Inchausti et al. (2022)	Single case study	Spain Child and Adolescent Mental Health Service (CAMHS) by primary care provider	Metacognitive Interpersonal Group Therapy	N/A	1	16	All F	Avoidant personality disorder	Ten 1:1 sessions 2 psychoed group sessions; 16 weekly group-sessions 5 group sessions for caregiver	One-to-one, group and family. In-Person	General psychological problems via SCL-90-R	SCL-90-R	Pre score: 3.00 Post score: 1.33 F/U: 0.70% changes Pre-post: 55.67% reduction Pre-F/U: 76% reduction
Jeong et al. (2005)	RCT	South Korea Volunteers from secondary schools	Dance movement	Waiting list	40	16	All F	Mild depression	Thirty-six 45-min sessions	Group In-person	Depression	SCL-90-R	Pre Intervention: $M = 56.5$ (15.2) Control: $M = 45.7$ (7.6) Post Intervention: $M = 51.7$ (13.2) Control: $M = 46.1$ (7.3) Sig plus effect sizes at post: $p = .001$, $d = 0.53$

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Landa et al. (2016)	Single arm	US Early detection clinics	Group and family CBT for youth at risk of psychosis	N/A	6	19.5 (1.52) [16–21]	M=2 F=4	UHR psychosis	15 weeks (not clear)	One-to-one, group and family In-person	Feasibility for youth at risk for psychosis	Positive and Negative Syndrome Scale (PANSS) P6 (persecutory delusions) (Kay et al., 1987)	Pre: <i>M</i> = 3.50 (1.76) Post: <i>M</i> = 2.00 (1.10) F/U: <i>M</i> = 1.80 (0.84) Pre-post sig plus effect size: <i>p</i> = .003, <i>d</i> = 1.02 Pre-F/U sig plus effect size: <i>p</i> = 0.01, <i>d</i> = 1.23
Liberman and Robertson (2005)	RCT	US Secondary schools	Psychosocial skills	Not stated	33	High school students (age not stated)	Not stated	High on schizotypal traits	Eight 2 h sessions	Group In-person	Schizotypal traits	Schizotypal Personality Questionnaire “suspiciousness subscale” (Raine, 1991)	Decrease in suspiciousness subscale of the SPQ (<i>p</i> = .004) post treatment
Liu (2019)	Within-subjects exp design	China Volunteers from universities	Mindfulness	N/A	81	20.4 (1.35) [18–23]	M=14 F=67	No mental health issues	Eight 2.5 h sessions	Group In-person	Overall mental health	SCL-90	Pre: <i>M</i> = 1.59 (0.54) Time 2: <i>M</i> = 1.50 (0.51) Time 3: <i>M</i> = 1.49 (0.55) Post: <i>M</i> = 1.23 (0.33) Pre-post sig plus effect size: <i>p</i> < .01, <i>d</i> = 0.83*
McAusland and Addington (2018)	Single arm	Canada Not clear from where they were recruited	Biofeedback + psychoeducation	N/A	20	16.7 (2.30) [13–22]	M=6 F=14	High-risk psychosis + anxiety	4 weeks	Individual Remote self-administered	Efficacy and feasibility	SOPS	Pre: <i>M</i> = 2.00 (1.81) Mid: <i>M</i> = 1.74 (1.63) Post: <i>M</i> = 1.65 (1.41) Effect sizes Pre to mid: <i>d</i> = 0.15* Pre to Post: <i>d</i> = 0.21*,

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
McKie et al. (2017)	Within-subjects exp design	UK Adverts at university	Ruminative self-focus followed by mindful self-focus	N/A	32	19.3 (1.22) [18–23]	M=9 F=23	Elevated paranoia	One 16 min session	One-to-one In-person	State paranoia	GPTS	Pre (mindful self-focus): $M = 530.66$, (225.65) Post: $M = 364.37$, (175.45) Sig plus effect size: $p < .001$, $d = 1.70$
O’Sullivan et al. (2024)	Single arm	Australia Two youth mental health services	Transdiagnostic (eOrygen)	N/A	33	19.5 (2.84) [15–25]	M=12 F=21	First episode psychosis and BPD	Varied	Individual Hybrid	Feasibility, acceptability and safety	Brief Psychiatric Rating Scale-suspiciousness subscale (Overall & Gorham, 1962)	EPPIC participants: Pre: $M = 2.72$ (1.64) Post: $M = 0.94$ (3.78)
Parker and Kingston (2022)	RCT	UK Secondary schools	Values-based	Essay writing	90	14.5 (.52) [14–16]	M=25 F=65	High non-clinical paranoia	One 30-min session	Individual Remote, self-directed	State paranoia	Paranoia Scale (Fenigstein & Vanable, 1992)	Pre Intervention: $M = 64.26$ (9.20) Control: $M = 61.29$ (8.31) Post: Intervention: $M = 59.70$ (13.49) Control: $M = 58.40$ (11.70) Sig: $p = .034$ F/U: Intervention: $M = 57.51$ (12.19) Control: $M = 60.17$ (11.73) Effect size: $d = -0.64$

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Rauschenberg et al. (2021)	Single arm	Netherlands Secondary mental health services	Compassion focused imagery	N/A	10	20.3 (3.8) [14–25]	M=3 F=7	Help-seeking with psychotic, depressive/anxiety symptoms	3 face-to-face sessions and a 3-week EMI via phone app	Hybrid Digital self-directed with therapist involvement	Feasibility and safety	GPTS	Pre-post sig plus effect size: $p = .05$, $d = -1.54$; Pre-F/U sig plus effect size: $p = .10$, $d = -1.32$; Post-F/U sig plus effect size: $p = .05$; $d = -2.57$
Scherer et al. (1994)	Single arm	UK Community	Multisystemic Family Preservation Therapy	TAU	55	15.2 [12–17]	M=45 F=10	Chronic/violent offender at risk for incarceration	Once weekly for approx. 3.5mnths	Family In-Person	Family function and problem behaviour	BSI	Tests for the paranoid ideation not significant ($p > .05$)

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Waite et al. (2023)	RCT	UK NHS mental health services	CBT-I plus TAU	TAU	40	16·9 (2·5) [14–23]	M=19 F=19 Other N=2	UHR psychosis + sleep problems	Approximately 8, 1 h sessions	One-to-one Delivery mode varied across participants	Feasibility, acceptability & sleep	Revised Green Paranoid Thoughts Scale (R-GPTS) (Freeman et al., 2021a, 2021b)	Ideas of reference: Intervention: Pre: $M = 18·7$ (8·9) Post: $M = 13·2$ (8·9) F/U: $M = 10·4$ (9·5) Control: Pre: $M = 17·6$ (9·5). Post: $M = 15·9$ (11·1) F/U: $M = 11·5$ (15·5) Persecution: Intervention: Pre: $M = 18·9$ (11·7) Post: $M = 14·4$ (11·7) F/U: $M = 10·3$ (10·1) Control: Pre: $M = 14·7$ (11·9) Post: $M = 14·15$ (13·3) F/U: $M = 15·5$ (15·5) Effect sizes Post Ideas of ref: $d = -0·52$ Persecution: $d = -0·38$ F/U Ideas of ref: $d = -0·65$ Persecution: $d = -0·65$ Pre: 44 Post: 25% Change: 43.18%
Williams et al. (2015)	Single case study	US Referred for mental health treatment for anxiety	CBT for social anxiety	N/A	1	22yrs	Male	Social anxiety & paranoid schizophrenia	20 sessions	One-to-oneIn-Person	Social anxiety disorder (SAD), schizophrenia, and depression	Inventory of Hostility and Suspiciousness (IHS) (Rawlings & Freeman, 1996)	

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Williams et al. (2020)	Single arm	US Recruited from Juvenile Detention centres	Mindfulness- for teens in juvenile detention	N/A	17	17.1 (0.86) [16–18]	All Male	No reported disorders	Four 1 h sessions, plus 10 min daily mind-fulness practice	Group In-Person	Various mental health symptoms	BSI	Slope of change in paranoia at baseline, mid & post) $M = 0.21$ (0.43), $t = -2.00$, $d = -0.49$, $CI = -0.99, 0.01$, $p < .05$
Yang et al. (2020)	RCT	China Recruited from a university	Zhong-Yong thinking based DBT group skills training	Support-ive group therapy or wait-list	97	19.2 (0.75) [17–21]	M=42 F=55	High-risk of suicide	Twelve 2 h sessions	Group In-person	Suicide risk	SCL-90-R	Pre: DBT: $M = 1.46$ (0.93) Supportive: $M = 1.60$ (0.97) Control: $M = 1.59$ (0.83) Post: DBT: $M = 1.28$ (0.89) Supportive: $M = 1.44$, (0.96) Control: $M = 1.61$, (0.85) Follow Up: DBT: $M = 1.32$ (0.90) Support-ive: $M = 1.52$ (0.98) Group differences: Intervention vs supportive post: $d = 0.17$, $p = .336$ Inter-vention vs con-trol post: $d = 0.38$, $p = .336$ Intervention vs supportive F/U $d = 0.21$ $CI = -0.28, 0.7$, $p = .390$

Table 2 (continued)

Author	About		Conditions		Participants			Intervention			Outcomes and Findings		
	Design	Country & Setting	Intervention	Control	N	Age: M (SD) [range]	Sex	Presenting Problem	Duration	Format	Primary outcome (s)	Paranoia outcome measure	Paranoia findings (SD)
Zetterqvist et al. (2021)	Single arm	Sweden child and adolescent psychiatric clinics	CBT-based sleep intervention (CBTI)	N/A	22	16.5 [13–17]	F=19 M=3	Insomnia plus psychiatric condition	7 modules over 6 weeks	Individual Digital self-directed	Feasibility and insomnia	SCL-90	Baseline: $M = 1.31$ (0.95) Post: $M = 1.06$ (1.03) F/U: $M = 0.75$ (0.85) Sig plus effect sizes Pre-F/U: $d = -0.62$, $p = .001$
Zhang and Wang (2025)	RCT	China Second level schools	“Life Education”	Traditional mental health course	887	15.4 (0.83)	M=455 F=452	No stated condition	Three 35 min sessions fortnightly	Group In-person	SCL-90 scores and depression	SCL-90	Pre Intervention: $M = 1.68$ (0.74) Control: $M = 1.65$ (0.69) Post: Intervention: $M = 1.45$ (0.53) Control: $M = 1.58$ (0.67) Sig plus effect sizes: Between-group $d = 0.22^*$ $p = .02$

BPD borderline personality disorder, *BSI* Brief Symptoms Inventory, *CBT(-I)* cognitive behavioural therapy (for insomnia), *DBT-A* dialectical behavioural therapy for adolescents, *EMI* ecological momentary intervention, *F* female, *(R)GPTS* (Revised) green paranoid thoughts scale, *HIS* inventory for hostility and suspiciousness, *M* male, *MBFT* mindfulness based family therapy, *MBSR* mindfulness based stress reduction, *MssMHs* middle school mental health scale, *PANSS* positive and negative syndrome scale, *RCT* randomised control trial, *SAD* social anxiety disorder, *SOPS* scale of prodromal symptoms, *SCL-90(-R)* the symptom checklist 90 (Revised), *TAU* treatment as usual, *UHR* ultra high risk

the following formula: $\frac{(\text{postscore} - \text{prescore})}{\text{prescore}} * 100$. For studies where this data was not reported, the lead researcher attempted to contact correspondent authors to retrieve these omitted details.

Consistent with review aims, key study characteristics, including populations and settings were reported, followed by quality assessment and an overview on the impact of interventions on paranoia. Findings were grouped by therapeutic modality to capture theoretical and practical differences between the various modalities and to enable exploration of potential differences in intervention effectiveness across modalities. Within groupings, details regarding study design, participant presenting problems, delivery mode, and study quality ratings were also described.

Analytic Procedure

We pre-specified that a meta-analysis would be conducted if there was sufficient homogeneity across studies to support this (e.g., if a sufficient number of studies applied comparable intervention modalities and measured paranoia using similar measures). However, due to substantial heterogeneity across studies owing to differing outcome measures,

populations, intervention characteristics, and controls, a meta-analysis was not seen as appropriate. Synthesis Without Meta-Analysis (SWiM) (Campbell et al., 2020) was applied to analyse the data, given its suitability as a rigorous and transparent alternative to synthesis where diverse study methods preclude the use of meta-analysis. Accordingly, reporting of results was guided by the nine items listed in SWiM guidelines. This includes presenting results in a structured summary table (see Table 2). Forest plots were also used to support exploration of trends across study findings (Campbell et al., 2020).

Quality Assessment

The “Quality Assessment Tool for Quantitative Studies” developed by the Effective Public Health Practice Project (2009) was used to assess study risk of bias. Consistent with EPHPP guidelines, each study was rated against six overarching “components”, each comprising several subcomponents, on a scale of 1 (strong) to 3 (weak) (see Appendix A). The number of “weak” ratings for each study was then used to calculate a “global rating” which captures the overall quality of a given study. Where no components were rated as weak for a given study, the global rating was considered “strong”. Where one component was rated as weak, the global rating was considered “moderate”, and where two or more components were rated as weak, the global rating was considered “weak”. Some subcomponents were rated as ‘N/A’ where a specific subcomponent was not applicable to a respective study design. All ratings were made independently by the lead researcher with a second researcher independently repeating the assessment on 10% of papers to ensure inter-rater reliability. Where study ratings differed between raters, consensus was achieved through rereading respective studies, discussing discrepancies, and resolving disagreements.

Results

The PRISMA flowchart depicts the study selection process (see Fig. 1). Searches produced a total of 65,312 articles with an additional two articles found through a preliminary search, which was conducted before the systematic search to refine and confirm search terms. Once duplicates were removed, 46,073 were identified for title and abstract screening, 616 for full text screening and 30 for inclusion in the review. Forest plots capturing within-subjects effect sizes for single arm studies and between-subjects differences for between-subjects studies are displayed below (see Figs. 2 and 3).

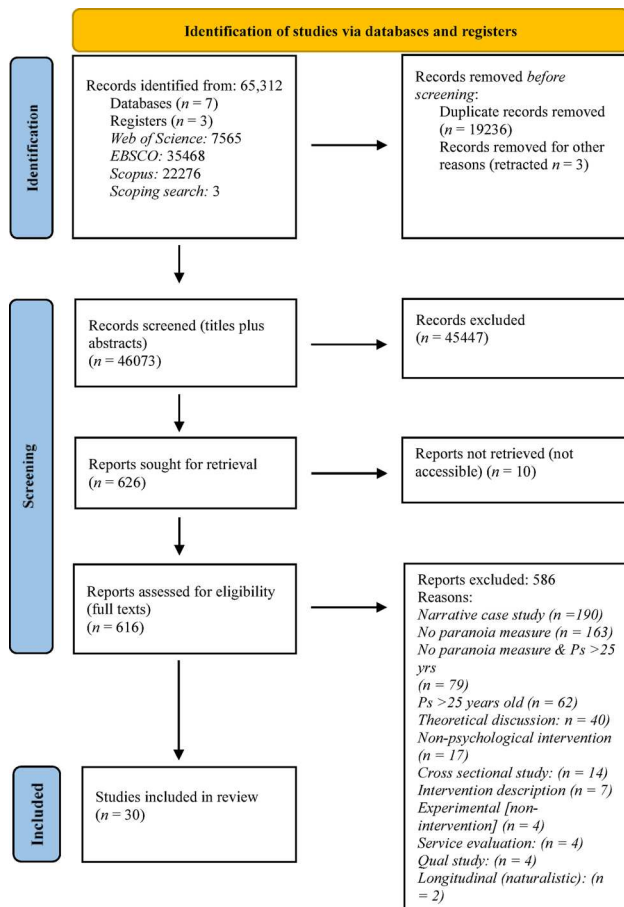


Fig. 1 Prisma flow chart

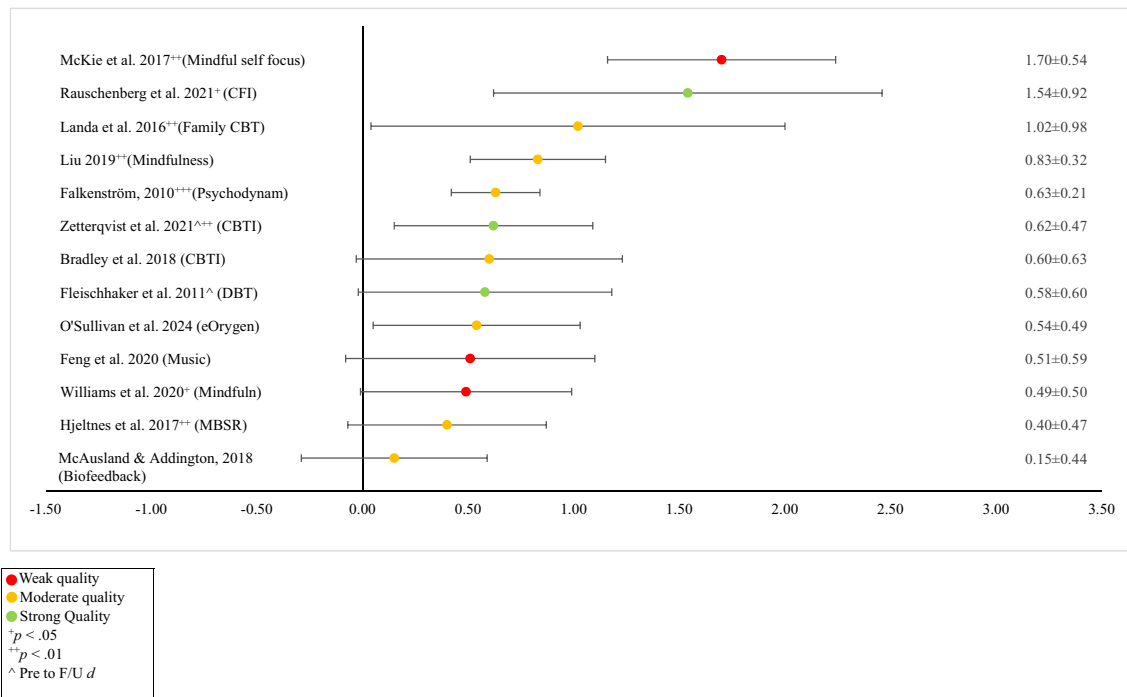


Fig. 2 Forest plot of single arm Cohen's d scores (pre-post effect sizes)

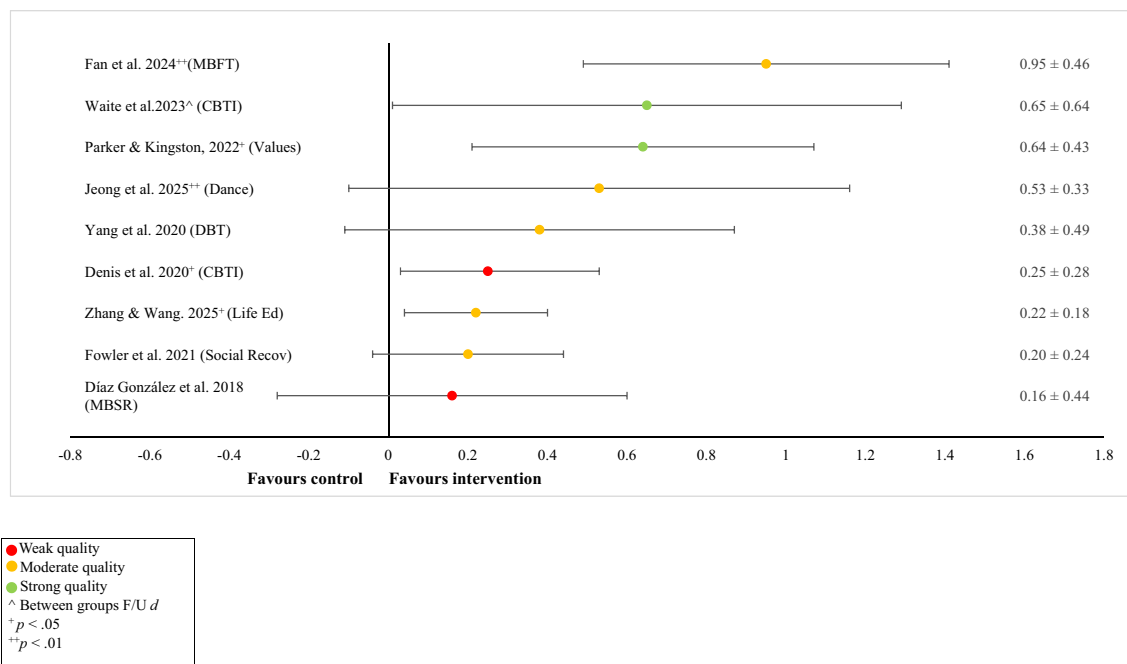


Fig. 3 Forest plot of RCT Cohen's d scores (intervention vs control effect sizes)

Description of Study Characteristics

Of these 30 studies, 10 were randomised control trials (Denis et al., 2020; Díaz-González et al., 2018; Fan et al., 2024; Fowler et al., 2021; Jeong et al., 2005; Liberman & Robertson, 2005; Parker & Kingston, 2022; Waite et al.,

2023; Yang et al., 2020; Zhang & Wang, 2025); 13 were pre-post designs with no control group, i.e. single arm studies (Falkenström, 2010; Feng & Li, 2020; Fleischhaker et al., 2011; Hjeltne et al., 2017; Landa et al., 2016; Liu, 2019; McAusland & Addington, 2018; McKie et al., 2017; O'Sullivan et al., 2024; Rauschenberg et al., 2021; Scherer & Brondino, 1994; Williams et al., 2020; Zetterqvist et al.,

2021); and seven were single-case studies/series (Bradley et al., 2018; Donohue et al., 2022; Gavrilova et al., 2017; Haglund et al., 2014; Ikonopoulou et al., 2015; Inchausti et al., 2022; Williams et al., 2015).

Studies were mostly conducted in North America (USA: $n = 10$; Canada: $n = 1$), followed by Europe (UK: $n = 6$; Spain: $n = 2$; Sweden: $n = 2$; Germany: $n = 1$; Netherlands: $n = 1$; Norway: $n = 1$), and then Asia (China: $n = 4$; South Korea: $n = 1$) and Australia ($n = 1$). Most studies were conducted in mental health/hospital settings ($n = 14$), followed by university ($n = 8$) and secondary school settings ($n = 4$), juvenile environments ($n = 2$), community ($n = 1$), and for one study the setting was unclear (see Table 2). Study publication dates ranged from 1994 (Scherer & Brondino, 1994) to 2025 (Zhang & Wang, 2025).

The total number of participants across studies was 2285. The total number of participants ranged from one (Donohue et al., 2022; Gavrilova et al., 2017; Haglund et al., 2014; Inchausti et al., 2022; Williams et al., 2015) to 887 (Zhang & Wang, 2025). The age range was 11–25 years with an (approximate) mean age of 17.14.¹ Twelve interventions exclusively recruited adolescents under 18 years old (Díaz-González et al., 2018; Fan et al., 2024; Fleischhaker et al., 2011; Ikonopoulou et al., 2015; Inchausti et al., 2022; Jeong et al., 2005; Liberman & Robertson, 2005; Parker & Kingston, 2022; Scherer & Brondino, 1994; Williams et al., 2020; Zetterqvist et al., 2021; Zhang & Wang, 2025); seven recruited university students (Denis et al., 2020; Donohue et al., 2022; Feng & Li, 2020; Gavrilova et al., 2017; Liu, 2019; McKie et al., 2017; Yang et al., 2020); seven recruited adolescents with various specified age ranges including 14–24 (Bradley et al., 2018), 14–25 (Rauschenberg et al., 2021; Waite et al., 2023), 15–25 (O'Sullivan et al., 2024), 16–21 (Landa et al., 2016), 18–25 (Fowler et al., 2021) and 19–25 (Hjeltne et al., 2017); while four described recruiting “young people” generally without specifying a target age range (Falkenström, 2010; Haglund et al., 2014; McAusland & Addington, 2018; Williams et al., 2015). Most participants were female (62%), followed by male (39%), and then individuals identifying as “other” (0.1%).

Study participants were recruited based on various psychological symptoms/diagnoses including having ultra-high risk (UHR) psychosis/sleep issues ($n = 5$) (Bradley et al., 2018; Denis et al., 2020; Landa et al., 2016; McAusland & Addington, 2018; Waite et al., 2023); a psychiatric condition plus sleep issues ($n = 1$) (Zetterqvist et al., 2021); elevated paranoia ($n = 2$) (McKie et al., 2017; Parker & Kingston, 2022); schizotypal traits ($n = 1$) (Liberman & Robertson, 2005); social anxiety/social anxiety plus paranoid schizophrenia ($n = 4$) (Donohue et al., 2022; Haglund et al., 2014;

Hjeltne et al., 2017; Williams et al., 2015); various psychological disorders/symptoms ($n = 4$) (Díaz-González et al., 2018; Falkenström, 2010; Fowler et al., 2021; Rauschenberg et al., 2021); students with no stated emotional difficulties ($n = 3$) (Feng & Li, 2020; Gavrilova et al., 2017; Liu, 2019); first episode psychosis plus borderline personality disorder (BPD) ($n = 1$) (O'Sullivan et al., 2024); avoidant personality disorder ($n = 1$) (Inchausti et al., 2022); suicidality plus depression ($n = 2$) (Fan et al., 2024; Yang et al., 2020); self-harm plus BPD ($n = 1$) (Fleischhaker et al., 2011); depression/depression plus psychiatric symptoms ($n = 2$) (Jeong et al., 2005; Zhang & Wang, 2025); and juveniles/adolescents at risk of incarceration ($n = 3$) (Ikonopoulou et al., 2015; Scherer & Brondino, 1994; Williams et al., 2020).

Intervention feasibility and/or acceptability were the primary focus across eight studies (Bradley et al., 2018; Denis et al., 2020; Donohue et al., 2022; Landa et al., 2016; O'Sullivan et al., 2024; Rauschenberg et al., 2021; Waite et al., 2023; Zetterqvist et al., 2021). The remaining studies aimed to reduce: general psychological problems ($n = 10$) (Díaz-González et al., 2018; Falkenström, 2010; Feng & Li, 2020; Gavrilova et al., 2017; Ikonopoulou et al., 2015; Inchausti et al., 2022; Liu, 2019; Williams et al., 2015; Williams et al., 2020; Zhang & Wang, 2025); suicidality ($n = 3$) (Fan et al., 2024; Fleischhaker et al., 2011; Yang et al., 2020); social anxiety ($n = 3$) (Haglund et al., 2014; Hjeltne et al., 2017; McAusland & Addington, 2018); paranoia ($n = 2$) (McKie et al., 2017; Parker & Kingston, 2022); schizotypal traits ($n = 1$) (Liberman et al., 2005); sleep problems ($n = 2$) (Waite et al., 2023²; Zetterqvist et al., 2021²); depression/depression plus self-harm ($n = 3$) (Fleischhaker et al., 2011; Jeong et al., 2005; Zhang & Wang, 2025²); problem behaviour ($n = 1$) (Scherer & Brondino, 1994); and increase structured activity ($n = 1$) (Fowler et al., 2021).

Regarding intervention delivery, twenty-four interventions were delivered in-person; two were remotely self-administered (i.e., involving self-administered therapeutic materials) (McAusland & Addington, 2018; Parker & Kingston, 2022); two were digital (i.e., involving the use of internet devices) (Denis et al., 2020; Zetterqvist et al., 2021), and two were hybrid (i.e., involving both remote digital and in-person components) (O'Sullivan et al., 2024; Rauschenberg et al., 2021). Nine studies examined one-to-one interventions (Bradley et al., 2018; Denis et al., 2020; Falkenström, 2010; Fowler et al., 2021; Haglund et al., 2014; Ikonopoulou et al., 2015; McKie et al., 2017; Waite et al., 2023; Williams et al., 2015); nine examined group interventions (Díaz-González et al., 2018; Feng & Li, 2020; Hjeltne et al., 2017; Jeong et al., 2005; Liberman & Robertson, 2005; Liu, 2019; Williams et al., 2020; Yang et al., 2020; Zhang

¹ Mean age not provided in three studies and estimated from age range.

² Study had more than one primary outcome.

& Wang, 2025); and four examined family interventions (Donohue et al., 2022; Fan et al., 2024; Gavrilova et al., 2017; Scherer & Brondino, 1994). Three studies examined “multimodal” interventions (involving family, group, and one-to-one sessions) (Fleischhaker et al., 2011; Inchausti et al., 2022; Landa et al., 2016); three examined self-directed interventions with some therapist involvement (O’Sullivan et al., 2024; Rauschenberg et al., 2021; Zetterqvist et al., 2021); and two remotely self-directed interventions (Parker & Kingston, 2022; McAusland & Addington, 2018). Session numbers varied from one to 36 sessions ($M = 10.90$, $SD = 9.10^3$). Based on the 16 studies that specified session duration, this varied from one 16-minute session (McKie et al., 2017) to approximately 180-min sessions (Hjeltne et al., 2017) ($M = 89.75$, $SD = 50.48$) (Table 4).

Quality Assessment

Five studies were rated as strong, 12 as moderate, and 13 as weak (see Appendix A). The primary reason for weak quality ratings was selection bias, as many studies were evaluated as lacking a representative sample. The high volume of case studies being reviewed (7 out of 30 studies) also contributed to low ratings across various quality assessment components. The “quality of data collection tools” was the component most consistently rated as strong given the consistent use of validated, reliable measures across studies. A second independent reviewer assessed a random sample of 10% of studies ($n = 3$) to evaluate consistency in ratings. Inter-rater reliability was calculated using Cohen’s Kappa (κ), which indicated substantial to almost perfect agreement between raters ($\kappa \approx 0.80$). There was a total of four disagreements, and these were resolved through joint discussion regarding differing interpretations of four subcomponents which led to the second reviewer reconsidering and revising their ratings for said subcomponents. In this way, the standards applied by the second rater for the 10% of studies they reviewed were consistent with the standards applied by the lead researcher across the remaining 27 studies.

Intervention Outcomes/Groupings

Study outcomes were grouped according to seven identified treatment modalities. These modalities were: cognitive behavioural therapy (CBT) ($n = 9$); family/systemic interventions ($n = 7$); mindfulness/acceptance interventions ($n = 6$); creative/expressive therapies ($n = 2$); dialectical behavioural therapy (DBT) ($n = 2$); psychodynamic therapy ($n = 1$); and miscellaneous ($n = 3$). Studies grouped as “CBT” were further divided into three subcategories: CBT for

insomnia; CBT for anxiety; and CBT “other”. Examples of therapeutic strategies which exemplify these modalities within the reviewed studies are displayed in Table 3. Study groupings, alongside details on (i) study quality ratings, (ii) study design, (iii) participant presenting problem, (iv) delivery format (v) significance, and (vi) effect size, are also displayed in a subsequent table, to give a broader picture of studies across their designated groupings (see Table 4).

CBT-Based Interventions ($n = 9$)

CBT for Insomnia (CBTI) ($n = 4$). One digital RCT examining adolescents with UHR psychosis plus insomnia (rated strong), showed a small improvement on the persecution subscale ($d = -0.38$) and a medium improvement on the ideas of reference subscale ($d = -0.52$) of the RGPTS post-intervention compared to TAU, with further improvements on both subscales at 9-month F/U ($d = 0.65$) [p value unreported] (Waite et al., 2023). Another digital intervention (rated weak) which similarly investigated adolescents with insomnia, showed a significant, small improvement in paranoia post-intervention, compared to an active control ($d = 0.25$), with further significant gains at 6-month F/U ($d = 0.28$) (Denis et al., 2020). A further single arm study (rated strong) examining a digital, self-directed intervention in adolescents with insomnia plus a mental health disorder, found a significant, medium, uncontrolled improvement in paranoia from pre to F/U ($d = -0.62$) [post intervention effects not reported] (Zetterqvist et al., 2021), while a case series (rated moderate) examining CBTI for UHR psychosis showed a moderate, uncontrolled improvement in paranoia from pre-post intervention ($d = 0.60$) (Bradley et al., 2018).

CBT for Anxiety ($n = 2$). Two single-case studies (both rated weak) examined one-to-one CBT interventions in adolescents with social anxiety plus UHR psychosis/paranoid schizophrenia, with one showing an uncontrolled reduction in paranoia from moderate (pre) to absent (post) (Haglund et al., 2014) and a second showing a 43.18% reduction in paranoia from pre-post intervention (Williams et al., 2015).

CBT Other ($n = 3$). Of the three studies classed as “other”, one RCT (rated strong) examining a self-directed, values-based intervention, with paranoia improvement as its primary aim, detected a significant, medium improvement post-intervention relative to an active control ($d = 0.64$) (Parker & Kingston, 2022). A further RCT (rated moderate) examining one-to-one social recovery therapy plus enhanced care in adolescents at high risk of long-term social disability showed a small improvement in paranoia compared to enhanced care alone at intervention completion ($d = 0.20$) [p-value unreported] (Fowler et al., 2021). The one single arm study, a hybrid, transdiagnostic intervention delivered to adolescents with first episode psychosis plus a

³ Estimated mean and SD-session numbers not specified for two studies.

Table 3 Intervention groupings description

Intervention grouping	Examples of therapeutic strategies	# of Studies
Cognitive Behavioural Therapy (CBT)	Cognitive restructuring. Exposure to social situations. CBT sleep techniques for insomnia and circadian rhythm. Worry reduction strategies. Psychoeducation. Values based approaches. Modular approaches. Individualised formulations	9
Family/Systemic	Structured, goal focused and collaborative engagement of family/significant others. Skills training. Strengths identification. Goal setting. Positive reinforcement, Attention to relational dynamics. Behavioural rehearsal/ homework to apply skills	7
Mindfulness/Acceptance	Meditation, body-scan, mindful movement/ yoga. Present moment awareness and nonjudgmental attention. Compassion focused imagery. Breathing and grounding techniques. Reflection and self-awareness. Home practice	6
Creative/Expressive	Music movement. Bodily awareness. Music relaxation. Use of imagination and symbolism. Improvisation. Introspection via music/dance	2
Dialectical Behavioural Therapy (DBT)	Interpersonal effectiveness. Mindfulness. Distress tolerance. Emotion regulation Family skills. DBT integrated with “ZhongYong” philosophy-focused on striking balance between extremes in life	2
Psychodynamic	Tailored to youth. Building therapeutic alliance. Reflective listening. Clarification, confrontation, and interpretation. Transference and countertransference monitored	1
Miscellaneous	Blended humanistic–existential and cognitive approaches. Interpersonal practical skills. Mind–body treatments	3

personality disorder (rated moderate), reported a medium, uncontrolled improvement in suspiciousness post intervention (O’Sullivan et al., 2024),

Family/Systemic Interventions ($n = 7$)

One family therapy RCT (rated moderate) examining symptom changes in adolescents with suicidality following mindfulness therapy plus mentalisation-based family therapy (MBFT) showed a significant, large improvement in paranoia post intervention, relative to the control receiving MBFT alone ($d = 0.95$) (Fan et al., 2024), while one of the two single arm studies, a multimodal⁴ CBT intervention (rated moderate) delivered to UHR adolescents, reported a significant, large, uncontrolled improvement in paranoia ($d = 1.02$) with gains maintained at F/U ($d = 1.23$) (Landa et al., 2016).

One case series (rated weak) examining the effect of one-to-one narrative therapy on clinically significant symptoms in juveniles with various mental health disorders reported a significant improvement in paranoia in three out of eight participants (Ikonomopoulos et al., 2015). All three single-case studies (all rated weak) reported uncontrolled reductions in paranoia. Gavrilova et al. (2017) who examined the effect of a family sports and mental health intervention designed for college athletes reported an 86% reduction from baseline to intervention completion. Donohue et al. (2022), examined the same intervention in an adolescent with social anxiety, reporting a 39.14% reduction with reductions maintained at F/U. A further study investigating the effect of a multimodal metacognitive interpersonal intervention on a young person with avoidant personality disorder, reported a 55.67% reduction from pre-post with further gains at F/U (Inchausti et al., 2022).

Mindfulness and Acceptance-Based Interventions ($n = 6$)

Five studies investigated the effects of mindfulness-based interventions. Of these studies, two examined nonclinical student populations. One single arm study (rated moderate) reported a significant, large, uncontrolled improvement in paranoia ($d = 0.83$) (Liu, 2019), while a within-subjects experimental study (rated weak), examining mindful self-focus on paranoia in students with elevated paranoia, reported a similarly significant, large improvement ($d = 1.70$) (McKie et al., 2017). A single arm study (rated moderate) examining group mindfulness stress reduction in adolescents with social anxiety disorder detected a significant, medium, uncontrolled improvement in paranoia from pre-post intervention ($d = 0.40$) (Hjeltmes et al., 2017).

⁴ Integrated individual, family, and group intervention.

Table 4 Groupings for synthesis with significance values

		Design				Presenting Problem	Delivery (number of hours/sessions)	Significance		Effect size (Cohen's d)	
Author	Interventions	RCT	Exp Withi n	Single arm	Case Study			Post	F/U	Post	F/U
CBT (3● 3● 3●)											
CBT for Sleep											
Waite et al. 2023	CBTI ●	⊕				Insomnia + UHR psychosis	1:1 (8 hrs)	-	-	Ideas of ref: -0.52 Persecutio n: -0.65	Ideas of ref: -0.65 Persecutio n: -0.65
Denis et al. 2020	CBTI ●	⊕				Insomnia	1:1 (6 hrs)	p = .041	-	0.25	0.28
Zetterqvist et al. 2021	CBTI ●			⊕		Insomnia+ Psychiatric condition	Self-directed (12 hrs)	-	p = .001 (pre to F/U)	-	-0.62 (pre to F/U)
Bradley et al. 2018	CBTI ●				⊕ series	UHR psychosis	1:1 (8 hrs)	-	-	0.6	0.80*
CBT For Social Anxiety											
Haglund et al. 2014	CBT for social anxiety ●				⊕	Social anxiety; UHR psychosis	1:1 (12 sessions)	100% ↓	-	-	-
Williams et al. 2015	CBT for social anxiety ●				⊕	Social anxiety; Paranoid Schizophrenia	1:1 (20 sessions)	43% ↓	-	-	-
CBT Other											
Parker & Kingston 2022	Values intervention ●	⊕				Elevated paranoia	Self-directed (30 minutes)	p = .034	-	0.64	-
Fowler et al. 2021	Social recovery ●	⊕				Complex MH issues plus high-risk of social disability	1:1 (min 6 sessions)	-	-	0.20	0.02
O'Sullivan et al. 2024	eOrygen ● + 🧑🏻 + 🧑🏻			⊕		Psychosis + personality disorder	Self-direct + 1:1 (varied)	-	-	0.54*	-
Systemic/Family (2● 5●)											
Fan et al. 2024	MBFT ●	⊕				Suicidality, depression	Family (24 hrs)	p < .001	-	0.95	-
Landa et al. 2016	Family CBT for UHR youth ●			⊕		UHR psychosis	Fam+group+1:1 (15 weeks)	p = .003	p = .010 (pre-F/U)	1.02	1.23 (pre-F/U)
Scherer & Brondino, 1994	Family Preservation ●			⊕		Juvenile offenders	Family (approx. 14 sessions)	✖	-	-	-
Ikonomopoulos et al. 2015	Narrative Therapy ●				⊕ series	Juvenile offenders	1:1 (8.3hrs)	Clinically significant improvement in 3/8 Ps	-	-	-
Inchausti et al. 2022	Metacognitive Group ●				⊕	Avoidant Personality	Family+Group+1:1 (33 sessions)	56% ↓	76.8% ↓ (pre-F/U)	-	-
Gavrilova et al. 2017	Fam therapy sport MH ●				⊕	None	Family (12 sessions)	83% ↓	100%↓ (pre-F/U)	-	-
Donohue et al. 2022	Fam therapy sport MH ⁴ ●				⊕	Anxiety disorder	Family (12hrs)	32% ↓	→ (pre-F/U)	-	-
Mindfulness/Accept. (1● 2● 3●)											
Díaz González et al. 2018	MBSR ●	⊕				Various	Group (12hrs)	✖	-	-0.02	-
McKie et al. 2017	Mindful self-focus ●		⊕			Elevated paranoia	1:1 (0.25hrs)	p =.001	-	1.70	-
Williams et al. 2020	Mindfulness group ●			⊕		Juveniles (no stated condition)	Group (4hrs)	p = .05	-	0.49	-
Hjeltnes et al. 2017	MBSR ●			⊕		Social anxiety disorder	Group (approx. 32hrs)	p < .001	-	0.40	-
Liu 2019	Mindfulness ●			⊕		None	Group (20hrs)	p < .01	-	0.83*	-
Rauschenberg et al. 2021	Compassion Imagery ● + 🧑🏻 + 🧑🏻			⊕		Various	Self-direct+1:1 (6 sessions)	p < .05	p < .05 (post-F/U)	-1.54	-0.79 (post-F/U)
Creative/Expressive											
Jeong et al. 2005	Dance ●	⊕				None	Group (27hrs)	p = .001	-	0.53	-

Table 4 (continued)

Feng et al. 2020	Music Therapy •	⊕	Depression	Group (24-32hrs)	×	-	0.51	-
DBT								
Yang et al. 2020	Zhong DBT •	⊕	Suicidality, self-harm	Group (24hrs)	×	×	<i>Vs active control: 0.17</i> <i>Vs waiting list: 0.38</i>	<i>Vs Active control: 0.21</i>
Fleischaker et al. 2011	DBT-A •	⊕	Suicidality	Fam+1:1 (48-72hrs)	×	×	0.06*	0.58
Psychodynamic								
Falkenström, 2010	Psychodynamic Intervention •	⊕	Various	1:1 (varied)	$p < .001$	$p < .001$ (pre-F/U)	0.63*	0.58* (pre-F/U)
Miscellaneous (2 • 1 •)								
Liberman & Robertson, 2005	Psychosocial Skills Training •	⊕	Schizotypal traits	Group (16hrs)	$p = .004$	-	-	-
Zhang & Wang, 2025	Life Education •	⊕	Mental health symptomology	Group (1.75hrs)	$p = .02$	-	0.22*	-
McAusland et al. 2018	Biofeedback training •	⊕	UHR Psychosis + anxiety	Self-directed (4 sessions)	×	-	0.21*	-

↓ Percentage reduction in paranoia
 → Paranoia percentage unchanged
 - No value reported
 × No significant change
 Ⓜ Digital Intervention
 Ⓜ + Ⓜ Hybrid intervention
 • Weak quality
 • Moderate quality
 • Strong Quality
 *Approximate Cohen's d based on $r = 0.5$

Likewise, a single arm study (rated weak), examining group mindfulness reported a significant, medium improvement ($d = -0.49$ at post) (Williams et al., 2020). One single arm study categorised as acceptance-based (Rauschenberg et al., 2021), examined a hybrid compassion focused imagery intervention in adolescents attending secondary mental health services (rated strong) with findings revealing a significant, large, uncontrolled improvement in paranoia ($d = -1.54$) from pre-post intervention.

Dialectical Behaviour Therapy (DBT) Informed Interventions ($n = 2$)

Neither of the DBT interventions, both of which investigated the effect of group-based interventions on suicidality, reported improvements in paranoia. Yang et al. (2020) who conducted a RCT (rated moderate) comparing Zhong Yong DBT to supportive therapy and a control found no difference between groups post-intervention in paranoia, while a single arm study (rated strong) examining adolescent DBT found no change in paranoia from pre-post intervention (Fleischhaker et al., 2011).

Creative or Expressive Therapies ($n = 2$)

Of the two interventions categorised as creative/expressive therapies, a RCT (rated moderate) examining group dance therapy in adolescents with depression, reported a significant, medium improvement post-intervention ($d = 0.53$)

(Jeong et al., 2005) while a single arm study (rated weak) examining group music therapy in students with no stated conditions reported no improvement (Feng & Li, 2020).

Psychodynamic Therapy ($n = 1$)

Only one psychodynamic intervention study was examined (Falkenström, 2010). This single arm study (rated moderate) examining one-to-one psychodynamic therapy in young adult outpatients with various mental health disorders revealed a significant, medium, uncontrolled improvement in paranoia from pre-post intervention ($d = 0.63^*$), with gains maintained at 1-year follow up ($d = 0.58^*$).

Miscellaneous Interventions ($n = 3$)

Three psychoeducation-based interventions were reviewed. One RCT examining a group, skills-based intervention (rated weak) for school-going adolescents with elevated schizotypal traits detected a significant improvement in suspiciousness [effect size not calculable] (Liberman & Robertson, 2005), while a RCT examining a group, "life education" intervention (rated moderate) delivered to school students, detected a small, significant improvement in paranoia post intervention compared to the control ($d = 0.22^*$) (Zhang & Wang, 2025). A further single arm study (rated moderate) examining the effect of self-directed biofeedback and psychoeducation in UHR adolescents reported no changes in paranoia (McAusland et al., 2018).

Discussion

This review evaluated the literature examining changes in paranoia following psychological interventions in adolescents. Two studies directly targeted paranoia (McKie et al., 2017; Parker & Kingston, 2022) and the remaining 28 studies targeted other presenting difficulties. Overall, the findings provide tentative evidence that psychological interventions, particularly CBT, may reduce paranoia in adolescents.

The results suggest that many interventions reduced paranoia, with 24 of 30 studies providing evidence for improvements in paranoia. This is promising, indicating that paranoia is an experience that is modifiable with psychological intervention. It also suggests that paranoia can be reduced by treatments that do not directly target it. A possible explanation is that many of the interventions targeted symptoms and/or processes shown to contribute to paranoia symptomology in adolescents, such as sleep difficulties, other psychotic symptoms (e.g., perceptual anomalies and hallucinations), anxiety, and depression (Bird et al., 2017, 2019; Hennig & Lincoln, 2018; Kingston et al., 2024). This could suggest that by successfully targeting and reducing these difficulties, paranoia was also reduced. Another explanation is that several interventions adopted common therapeutic methods, including behavioural techniques (e.g., behavioural activation, reinforcement, social skills training), self-regulation strategies (e.g., worry reduction, distress tolerance, present moment awareness, mindful movement), and skill rehearsal. Many of these techniques have been shown to reduce paranoia in adults, particularly within targeted CBT and mindfulness interventions (Freeman et al., 2016, 2017; Saber et al., 2025). In light of emerging evidence that adolescent and adult paranoia share common mechanisms (e.g., affective reactivity, perceptual anomalies and negative self-beliefs), it is plausible that these techniques would also be beneficial in reducing paranoia in adolescents (Bird et al., 2017; Catone et al., 2025).

Across modalities, CBT was most commonly investigated and produced the strongest signal of benefit, with mindfulness and family/systemic approaches also yielding some promising findings. Creative- and DBT-based interventions were less well represented, limiting the ability to determine their effectiveness. Outcomes pertaining to CBT are consistent with the adult research, with CBT being the most common and empirically supported treatment for adult paranoia (Amirpour et al., 2019; Freeman et al., 2025; Gerjets et al., 2020; Lincoln & Peters, 2019). The promising findings detected across many CBT studies may be partly attributed to their targeting of processes such as cognitive biases, negative beliefs, and poor emotion regulation, implicated in both adult and adolescent paranoia (Bird et al., 2017, 2019; Freeman & Garety, 2014). However, it should

be noted that several CBT studies focused on improving sleep difficulties, which are shown to directly contribute to paranoia in adolescents, raising the question of whether some outcomes are attributable to improved sleep specifically rather than CBT more broadly (Bird et al., 2019; Hennig & Lincoln, 2018).

The findings from mindfulness studies also reflect the adult literature, with mindfulness interventions demonstrating an emerging evidence base for the treatment of paranoia (Ellett et al., 2020; Saber et al., 2025; Shore et al., 2018). These interventions are shown to reduce paranoia by fostering emotional regulation, and reducing rumination and self-judgment mechanisms, which are also linked to adolescent paranoia. (Carvalho et al., 2019; Udachina & Bentall, 2013; Zheng et al., 2025). By contrast, family interventions have not been developed for adult paranoia, although several studies have demonstrated their effectiveness in reducing positive symptoms of psychosis in youth (Mei et al., 2021; Miklowitz et al., 2014; Van der Gaag, 2015). There is also strong evidence that family factors such as insecure attachment, parental paranoia, and parental abuse can foster paranoia in adolescents (Brown et al., 2021; Schöning et al., 2024; Sood et al., 2022; Udachina & Bentall, 2013), indicating that family interventions may address important developmental risk pathways feeding paranoia in adolescents.

Although this review primarily considered paranoia as an intervention outcome, the role of paranoia within treatment outcomes may be more complex and nuanced. Baseline paranoia could indicate greater clinical severity or complexity, predict poorer engagement, worsen outcomes (Ashford et al., 2022; DeVlyder et al., 2014), or moderate response to specific interventions. It may also operate within reciprocal maintenance processes with associated factors such as worry, anxiety, negative beliefs, avoidance or sleep (Kuijpers et al., 2019; Panayi et al., 2025; Schöning et al., 2026). As such, therapies targeting these factors may indirectly reduce paranoia. In a treatment context, reduced paranoia may also increase trust, social engagement and participation in treatment, thereby improving wider outcomes. However, because most included studies were not designed to test these possibilities, concurrent changes in paranoia and other symptoms cannot establish evidence of mediation, moderation or mechanism. Future studies should assess paranoia repeatedly during treatment and examine whether baseline levels predict engagement or outcome, interact with treatment condition, or mediate changes in outcomes.

Study findings should be considered in light of some limitations. Some relate to the review process. Firstly, although a PsychExtra search was conducted to capture grey literature, broader grey literature databases such as ProQuest were not searched, increasing the risk of publication bias (Bellefontaine & Lee, 2013). Secondly, because

many databases did not permit whole text searches, relevant studies may have been overlooked, given that secondary measures such as paranoia may be mentioned only in the body of some papers. Nonetheless, a wide range of search terms were used, reflected in the large number of records screened. Thirdly, the substantial heterogeneity across studies in intervention duration, age range and paranoia measures, alongside some imprecision in modality groupings due to the inclusion of integrative therapeutic modalities (e.g., family-based CBT) (Landa et al., 2016), lessened the comparability of findings across their groupings. Fourthly, because paranoia was not the primary target across most studies, some participants may have had low baseline paranoia, potentially obscuring benefits through floor effects. Findings may also underestimate the capacity of reviewed modalities (e.g., CBT) to reduce paranoia, as most interventions were not designed to target it. Tailored paranoia interventions may produce more robust effects (Freeman et al., 2021a, 2021b). Finally, estimated effect sizes calculated post hoc may be inflated, particularly for studies comprising underpowered samples (Sullivan & Feinn, 2012), although these approximate effect sizes were clearly demarcated in such instances.

Limitations are also evident in the evidence base. Most studies, particularly family/systemic, mindfulness and creative/expressive modalities, were rated moderate to weak in quality, largely reflecting a predominance of pilot and feasibility interventions, single-case studies and single arm designs. While these designs enabled inclusion of a broader literature, they increased risk of bias due to small, unrepresentative samples, and lack of control groups. Additionally, the limited use of follow-ups prevented evaluation of whether intervention effects were maintained over time.

Implications

These findings present several important empirical and clinical implications for future research and professional practice. Most of the reviewed studies measured paranoia as a secondary outcome for interventions designed to target other primary concerns. The lack of precedence afforded to paranoia in the literature may be attributed to several factors. First, the empirical literature typically conceptualises and reports adolescent psychotic experiences as a single construct, consequently neglecting the unique contribution of paranoia which can occur independently of other psychotic symptoms with distinct causal contributors and negative outcomes (Hermans et al., 2020; Ronald et al., 2014). Future research should prioritise the disaggregation of specific psychosis markers to support a better understanding regarding the distinct role of paranoia in these contexts. Second, the under-recognition of paranoia by mental health

professionals in youth with common mental disorders has contributed to an underestimation of paranoia prevalence, and consequent underinvestment in paranoia research, highlighting a need for better professional guidelines and practices for identifying paranoia in youth mental health settings. Another noteworthy observation is that many interventions targeted clinical populations in mental health settings, indicating a focus on treatment over early intervention and prevention. This runs contrary to best practice recommendations which endorse a movement away from the treatment of illness, towards early proactive prevention, as a means of improving health outcomes (Malla et al., 2016; McGorry & Mei, 2018). One way of approaching this in the context of paranoia is through the development of brief interventions in school settings as is currently being done to target low level anxiety and depression in adolescents (Caldwell et al., 2021; Pile et al., 2025; Zhang et al., 2023).

It is also noteworthy that only four studies in this review examined digital/hybrid interventions. This comes in light of a growing number of empirically supported digital interventions, including innovative VR techniques, which are being successfully used to treat adult paranoia (Bird et al., 2024; Freeman et al., 2023; Garety et al., 2021; Geraets et al., 2020; Yiend et al., 2024). There is also a wealth of studies demonstrating that adolescents respond well to digital interventions, and that they afford greater flexibility and accessibility, particularly for marginalized or socioeconomically disadvantaged youth who may face barriers in accessing in-person support (Monaghesh et al., 2022; Wani et al., 2024; Wright et al., 2023). In light of these observations, future research would benefit from examining whether digital interventions can be successfully adapted to treat adolescent paranoia. For instance, recent digitalised mindfulness and values-based interventions have shown promise for reducing paranoia in adults and could potentially be tailored to support adolescent populations (Davies et al., 2021; Kingston et al., 2019).

Profitable areas for intervention demonstrated in the adult literature have also not been tested in young people. For example, only one imagery-based intervention was included in the review (Rauschenberg et al., 2021), whereas there is an emerging evidence-base in adults (Bennetts et al., 2020; Cairns et al., 2024; Forkert et al., 2022; Newman-Taylor et al., 2021). Interventions targeting imagery may, for example, harness positive imagery to cultivate feelings of felt-security and self-compassion or reduce the impact of negative imagery using imagery rescripting (Bullock et al., 2016; Forkert et al., 2022; Newman-Taylor et al., 2020; Taylor et al., 2020). Given that negative imagery is implicated in adolescent anxiety and depression and has demonstrated promise as a developmentally appropriate treatment target, imagery-based interventions for paranoia in adolescents

could be important to explore (Pile & Lau, 2018, 2020; Pile et al., 2021).

Conclusions

This systematic review synthesises findings from 30 studies investigating a range of therapeutic modalities, outcomes and psychological difficulties. Despite various limitations pertaining to areas such as study quality, a predominance of small scale/pilot interventions, and heterogeneity across key study characteristics, these findings nonetheless provide an important, novel contribution to our understanding of the existing research examining interventions that assess paranoia in young people. The improvements in paranoia detected across many of the reviewed studies suggest that paranoia in adolescents can be treated by brief psychological interventions, using methods that clinicians are well trained in (i.e., CBT, mindfulness). The next critical steps are for paranoia specific interventions to be developed and tested; better identification of adolescents who may benefit from such interventions, and stronger methodological rigour in the evaluation of such treatments.

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Declarations

Ethical Approval This study is a systematic review that does not involve human participants. Accordingly, ethical approval is not necessary.

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