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Psychological interventions for mental health disorders in children with chronic physical illness: a systematic review

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ABSTRACT

Background Children with chronic physical illness are significantly more likely to develop common psychiatric symptoms than otherwise healthy children. These children therefore warrant effective integrated healthcare yet it is not established whether the known, effective, psychological treatments for symptoms of common childhood mental health disorders work in children with chronic physical illness.

Methods EMBASE, MEDLINE, PsycINFO and CINAHL databases were searched with predefined terms relating to evidence-based psychological interventions for psychiatric symptoms in children with chronic physical illness. We included all studies (randomised and non-randomised designs) investigating interventions aimed primarily at treating common psychiatric symptoms in children with a chronic physical illness in the review. Two reviewers independently assessed the relevance of abstracts identified, extracted data and undertook quality analysis.

Results Ten studies (209 children, including 70 in control groups) met the criteria for inclusion in the review. All studies demonstrated some positive outcomes of cognitive behavioural therapy for the treatment of psychiatric symptoms in children with chronic physical illness. Only two randomised controlled trials, both investigating interventions for symptoms of depression, were found.

Conclusions There is preliminary evidence that cognitive behavioural therapy has positive effects in the treatment of symptoms of depression and anxiety in children with chronic physical illness. However, the current evidence base is weak and fully powered randomised controlled trials are needed to establish the efficacy of psychological treatments in this vulnerable population.

INTRODUCTION

Rates of psychiatric disorder are up to four times greater in children with chronic physical illness than in children who are physically well.[1–3] Psychiatric symptoms have considerable consequences for a child's quality of life, their behavioural, emotional, educational and social functioning,[4 5] and mental ill health has, in turn, been shown to impact upon management and medical consequences of the physical illness.[6–10] Delivery of effective psychological treatment to this population is therefore a priority. In the UK, government bodies such as the National Health Service (NHS) Confederation have highlighted the social, health and economic benefits that arise from integration of physical and mental health treatments.[11] The US National Center for Chronic Disease Prevention and Health Promotion's 'Public Health Action Plan to Integrate Mental Health Promotion and Mental Illness Prevention with Chronic Disease Prevention',[12] similarly includes an objective to develop strategies for integrating mental health and mental illness and public health systems.

There are highly effective evidence-based psychological treatments for some of the common psychiatric disorders in children and young people.[13] However, guidelines regarding evidence-based interventions for common mental health disorders in children with physical illness are scarce, and in many cases there remains a large unmet need. For example one study[14] found that of 114 children with epilepsy, 61% had psychiatric diagnoses, but, of these, only 33% had received treatment, despite regularly attending clinics for their epilepsy. Clinicians do not have adequate guidance to support them in making decisions regarding effective interventions in this population and thus children are not able to access appropriate and timely interventions for their mental health disorder.[14 15]

It appears that children with physical and mental health conditions are viewed as complex; the care of their physical health may be prioritised, inadvertently leading to neglect of their mental health needs. If clinicians who work with children in mental health and paediatric services are aware of the effectiveness of mental health treatments in this population, and the best ways for families to access them, then services can be organised to meet the need. It is inequitable that at the present time children who are already disadvantaged by their physical illnesses are not able to access appropriate services.

This systematic review therefore aimed to investigate the evidence for the effectiveness of psychological therapies for symptoms of common mental health disorders in children and young people with chronic physical illnesses. In addition, we aimed to conduct a meta-analysis of the findings if the data were appropriate. Finally, the review aimed to understand any key factors associated with the success of an intervention and the ability of children/young people to access it.

METHODS

Systematic review methods were used in accordance with Cochrane guidelines.[15a]

Search methods

Electronic Searches, citation searches, reference list searches and grey literature searches were independently undertaken by AC and SB.

Electronic searches

EMBASE, MEDLINE, PsycINFO and CINAHL databases were searched from inception to

February 2014. Grey/unpublished literature was also included, through searches of Google and Google Scholar. Broadly, the search terms were categorised into three primary areas; (1) Chronic illness, (2) Impairing psychiatric symptoms, (3) Psychotherapeutic intervention. See online supplementary appendix 1 for full list of search terms.

Other search resources

Citation lists and reference lists of identified papers were also searched for relevant papers. Additional literature was found through personal contact with researchers in the area.

Inclusion criteria

Study eligibility criteria were:
(1) Randomised controlled trials (RCTs), controlled trials, cohort studies, case control studies and multiple-baseline studies; (2) Studied participants aged 0–18 years with a chronic physical illness and symptoms of mental health disorder (anxiety, depression or disruptive behaviour symptoms; defined by Diagnostic and Statistical Manual of Mental Disorders IV[16] and Diagnostic and Statistical Manual of Mental Disorders 5 [17]); (3) Reported a child-related mental health measure as the *primary* outcome (The measure had to relate to the mental health of the child and not the parent/carer, although parent-reports of child health/behaviour were acceptable); (4) Studied a psychotherapeutic intervention (defined as an intervention in which a therapist purposively and systematically attempts to influence a patient by psychological means so that the patients' symptoms decrease or there is a positive change in behaviour'; as used in Yorke *et al*, 2007[18]). At present, there is no consensus regarding the definition of chronic physical illness. Van der Lee *et al*[19] conducted a systematic review of the definitions and measurement of chronic illness, and found three commonly used definitions for 'chronic illness' or 'chronic health conditions' (those of Pless and Douglas[20]; Perrin *et al*[21] and Stein *et al*[22]). All define chronic physical illnesses as lasting for at least 3 months (some define longer periods) and causing functional impairment. As definitions vary, so too do the lists of possible conditions that fall under these definitions. We derived our list of illnesses (and thus search terms) from those used in previous reviews of chronic physical illnesses in children.[2 23] Conditions included: AIDS and HIV, asthma, cancer, chronic fatigue syndrome, cleft palate, cystic fibrosis, deafness/hearing impairment, diabetes, epilepsy, heart disease, inflammatory bowel disease (IBD), kidney disease, liver disease, migraine, sickle cell anaemia, spina bifida and visual impairment.

Exclusion criteria

We excluded those interventions that had a primary aim of increasing self-efficacy or treatment adherence related to the physical illness. Additionally, we excluded papers where the psychiatric symptoms were directly related to the physical illness, such as interventions for anxious breathing in asthma. We excluded children who were 'survivors of cancer', as under definitions of chronic physical illness, it is not clear that this is a current illness, causing functional impairment within the last 3 months. We also excluded chronic pain (including headache), in line with previous reviews[23] and as this has been the topic of a recent distinct Cochrane review.[24]

Data collection and analysis

Study selection

Study selection was performed independently by two reviewers (AC and SB). Where disagreements arose about whether a study fitted with the inclusion criteria, this was resolved through discussion with RS as appropriate.

Data extraction

A data extraction form was developed, covering study characteristics and main results. Data was independently extracted by two reviewers (SB and SW). Data were inputted into EndNote X5 software.

Methodological quality assessment

Study quality was independently assessed by two reviewers (AC and SB) with the Effective Public Health Practice Project Quality Assessment Tool.[25 26] This tool was chosen for its suitability in assessing a range of study designs within the area of public health research. Studies are rated as strong, moderate or weak, using predefined criteria, on a range of areas: selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts. Total sample size is not considered. An overall total for study quality is also calculated by assessing the number of areas rated weakly (strong studies have no weak ratings, moderate ones have one weak rating and weak studies have two or more weak ratings).

RESULTS

The initial search identified 1966 independent papers. A total of 10 studies, and 2 follow-up studies, were found to fit with the criteria of the review.[27–38] A total of 209 participants (173 participants with a chronic physical illness and impairing psychiatric symptoms), took part in the studies. See figure 1 for flow chart of study selection, tables 1 and 2 for summaries of included studies and table 3 for comprehensive recruitment figures.

All studies investigated interventions for anxiety or depression. Study participants included children with epilepsy (n=2), IBD (n=3), diabetes (n=3), asthma (n=1) and cystic fibrosis (n=1). All interventions were based on a cognitive-behavioural framework; most had been previously used and evaluated in cohorts of children without a chronic physical illness. Two RCTs were found to fit with the criteria of the review.[32 37] The remaining studies were non-randomised designs (see tables 1 and 2). Due to the range of study designs, it was not possible to conduct a meta-analysis.

Quality assessment

Within the bounds of the research design, studies were, for the most part, well executed, and 9 out of 10 studies were rated strongly or moderately with respect to quality (see online supplementary appendix 2). One rated weakly[28], due to a lack of blinding, high rate of withdrawals/dropouts and the likely presence of selection bias of participants. No studies were rated 'strongly' with respect to blinding. As all studies demonstrated positive effects on mental health outcomes, it is not possible to analyse whether there is an association between methodological quality and study outcomes. However, we note that as this tool was designed to assess a range of study designs (randomised and non-randomised), it is possible for a study to rate strongly or moderately with respect to overall quality despite only moderate ratings across the categories (including study design). In addition, sample size is not accounted for and thus some strongly rated studies have small sample sizes and non-randomised designs. Positive study quality assessments therefore need to be interpreted with caution.

Depression interventions

All five depression interventions were 12-session cognitive behavioural therapy (CBT) protocols. Three studies[32 35 37] used

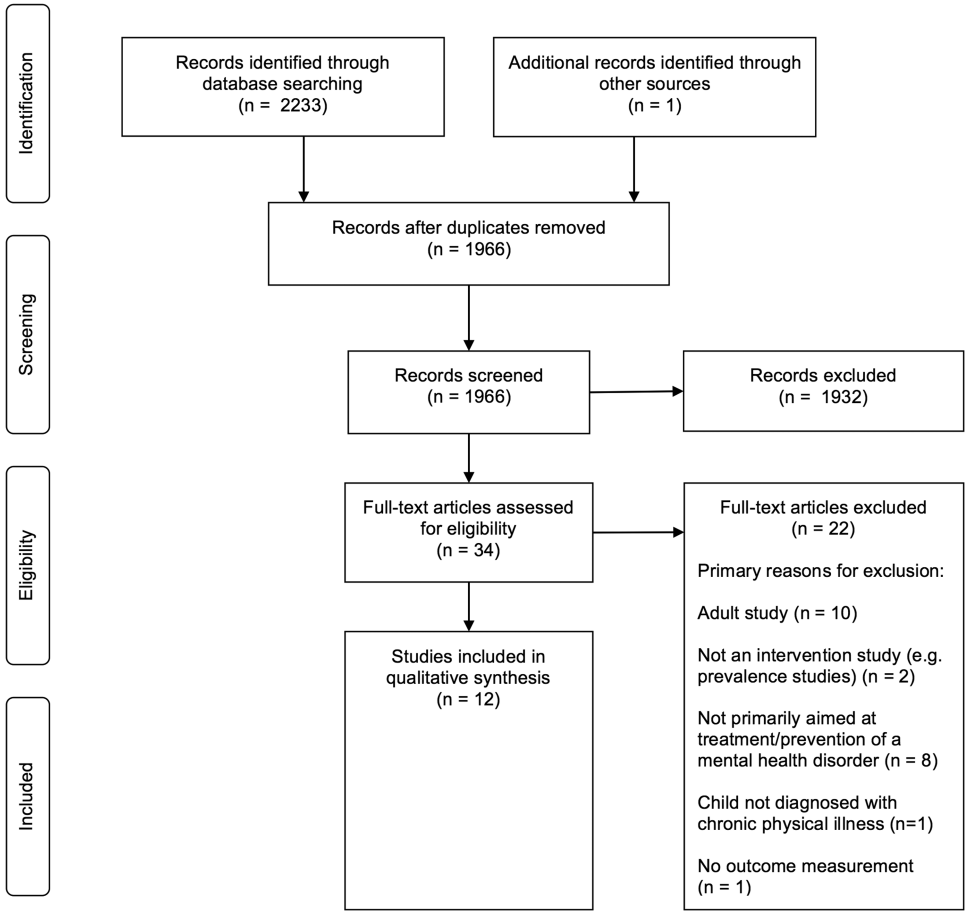

Figure 1 PRISMA 2009 flow diagram of literature search.

versions of protocols which have been well validated in children without physical illness (Treatment for Adolescents with Depression Study[39] and Primary and Secondary Control Enhancement Training[40]). Standard CBT strategies were delivered, such as mood monitoring, problem solving and behavioural activation. One study reports[34] on CBT delivered in a group format. Other programmes worked primarily one to one with the child. Szigethy *et al*[35 36] also offered three family sessions of 60 min; 40 min with the parents alone and 20 min with the family. The purpose of the family sessions was to review the perspectives of parents, review the skills learnt in the young person's session, review family coping skills and review homework tasks.

Four[33–35 37] of the five depression interventions (for children with diabetes or IBD) included protocol modifications related to physical health. For example, all four included psychoeducation about the relationship between specific physical illnesses and mood. One[34] also covered setting personal goals for diabetes self-care, diabetic barriers to behavioural activation and what to tell others about having diabetes. Martinović *et al*[32] did not report any specific modifications for the physical health comorbidity (epilepsy).

Anxiety interventions

Anxiety protocols varied in format, although all were based on basic principles of CBT for anxiety (eg, cognitive restructuring and exposure exercises) and many used adapted versions of previously validated protocols. Four were delivered in a one-to-one format; one[31] also added three parent sessions and one[30] combined the results of an individual and group intervention.

Again, four of the studies adapted the intervention to account for the physical illness. Three[28 29 31] related the material to illness-specific stressors (for IBD, diabetes and cystic fibrosis). In one, the intervention was particularly revised to account for the increased rates of learning problems found in children with epilepsy.[27] Such alterations included longer sessions (to allow for a slower pace), additional written materials, more concrete language and a focus on behavioural rather than cognitive elements.

Efficacy/effectiveness

It is difficult to interpret the results of these studies as a whole, due to the large variety of methodologies, generally small sample sizes and variety of outcome measures. As the two RCTs[32 37] have the highest quality rating and least bias, we consider them to have the most valid and reliable results regarding efficacy. We note that there are no RCTs focused on anxiety.

Both trials demonstrated statistically significant results, with large effect sizes. In their depression treatment study, Szigethy *et al*[37] state that they did not correct for Type 1 error, despite multiple comparisons, because 'the decision was made to err on the side of detecting versus not detecting a difference in treatment effect in this exploratory study'. In addition, a greater number of participants in the control group had their IBD rated as moderate/severe, compared with the intervention group. This means results may be confounded by illness severity.

All other studies demonstrated positive results for the interventions in terms of reductions in anxiety/depression, despite using different definitions of improvement (eg, presence of psychiatric disorder, change in clinical category or change on a symptom measure). Where analysis was undertaken, studies

Table 1 Characteristics of anxiety studies

Study	Symptom of mental health disorder	Physical health condition	Intervention	Interventionist	Type of study	Intervention location/ practical accommodations for physical illness	Participant n (% female)	Age of participants M years (SD)	Time points for measures/follow-up	Global quality rating	Country
Blocher *et al*[27]	Anxiety	Epilepsy	Computerised CBT	Doctoral-level clinician, master's-level clinician, and bachelor's-level research specialist	Pre-post	Medical care setting	15 (53·3)	11 (1·51)	Preintervention, mid-intervention and postintervention 3-month follow-up	Moderate	USA
Hains *et al*[29]	Anxiety	Diabetes	CBT (stress-inoculation programme)	Doctoral students in counselling psychology	Multiple baseline	Hospital	6 (50)	12, 15, 13, 18, 13, 14	Baseline (1–5 weeks prior to intervention), before each session, 3-month follow-up	Moderate	USA
Hains *et al*[28]	Anxiety	Cystic Fibrosis	CBT (stress-inoculation programme)	PhD psychologist	Multiple baseline	Participants' homes	5 (40)	13–15 years	Baseline (2–5 weeks prior to intervention), before each session, 3-month follow-up Parent-report preintervention, mid-intervention and at follow-up	Weak	USA
Papneja and Manassis[30]	Anxiety	Asthma	Group and individual CBT	Various, including psychology graduate student, psychiatrists, child youth worker, cognitive therapist and cognitive therapists in training	Matched case-control	Anxiety disorders clinic of a large urban children's hospital	36+36 (control) (gender not stated)	8–12 years	Preintervention and postintervention	Strong	Canada
Reigada *et al*[31]	Anxiety	Inflammatory bowel disease	CBT (for parent and child)	PhD-level clinical psychologist or advanced doctoral students	Pre-post	Sessions offered on same day as medical appointment/during infusions· Sessions over telephone also offered·	9 (44)	13·8 (2·2)	Preintervention and postintervention	Strong	USA

CBT, cognitive behavioural therapy.

Table 2 Characteristics of depression studies

Study	Symptom of mental health disorder	Physical health condition	Intervention	Interventionist	Type of study	Intervention location/practical accommodations for physical illness	Participant n (% female)	Age of participants M years (SD)	Time points for measures/ follow-up	Global quality rating	Country
Martinović *et al*[32]	Subthreshold depression	Epilepsy	CBT vs TAU (counselling)	Qualified therapists	Randomised controlled trial	Outpatient epilepsy department	15+15 (60)	BCI group: 17·2 (2·5)· TAU:17·6 (2·2)	Preintervention and postintervention 9-month follow-up	Strong	Serbia and Montenegro
McGrady and Hood[33]	Subthreshold depression	Diabetes	CBT	Psychology postdoctoral fellow/doctoral students	Pre-post	Same hospital that participants received diabetes care assessments	9 (33)	15·77 (1·44)	Preintervention and postintervention	Strong	USA
Rosselló and Jiménez-Chafey[34]	Depression	Diabetes	Group CBT	Doctoral level psychologists	Pre-post	Unclear	11 (82)	14·1 (1·3)	Preintervention and postintervention	Moderate	Puerto Rico
Szigethy *et al*[35]; Szigethy *et al*[36]	Depression	Inflammatory bowel disease	Individual CBT plus family sessions	Psychiatrist trained in intervention	Pre-post	Most sessions in outpatient office.· Telephone sessions/ covered two sessions at once if session missed. Sessions also given during medical procedures/ hospitalisations	11 (64)	14·8 (1·7)	Preintervention and postintervention 6-month and 12-month follow-ups	Strong	USA
Szigethy *et al*[37]; Thompson *et al*[38]	Subthreshold depression	Inflammatory bowel disease	CBT vs TAU plus depression information leaflet	Six trained therapists (child and adolescent psychiatrists, child and adolescent psychologists, clinical social workers)	Randomised controlled trial	Maximum of three sessions over the telephone. Face-to-face visits coordinated with medical visits/ hospitalisations where possible	22 (54·5)+19 (control; 47·5)	PASCET: 14·95 (2·33) TAU: 15·02 (1·83)	Preintervention and postintervention 9-month and 12-month follow-ups	Strong	USA

CBI, cognitive behavioural intervention; PASCET, Primary and Secondary Control Enhancement Training; TAU, treatment as usual.

Table 3 Summary of recruitment and attrition

Study	Participants invited	Completed screening (% invited)	Met inclusion criteria (% screened)	Agreed to participate (% of those meeting inclusion criteria)	Completed intervention (% agreed to participate)
Blocher *et al*[27]	149	29 (19.5)	20 (69.0)	18 (90)	15 (83)
Hains *et al*[29]	12	NA	NA	6	5 (83)
Hains *et al*[28]	Unknown	NA	NA	14	6 (43.9)
Martinović, *et al*[32]	Unknown	104	32 (at risk)	32 (100)	30 (93.8)
McGrady and Hood[33]	219	24 (10.0)	16 (0.67)	13 (81.3)	10 (76.9)
Papneja and Manassis.[30]	NA	NA	NA	NA	36 matched pairs
Reigada *et al*[31]	42	21* (50.) 10† (58.8)	17* (81.0) 10† (100)	9 (90)	9 (100)
Rosselló and Jiménez-Chafey[34]	24	20 (83.3)	16 (80)	16 (100)	11 (68.75)
Szigethy *et al*;[35] Szigethy *et al*[35 36]	168	156* 56†	68* 49†	41	
Szigethy *et al*;[37] Thompson *et al*[38]	121	102* 19†	25* 16†	11	11

*Initial screening.
†Diagnostic interview.
NA, not applicable.

Table 4 Summary of results of anxiety studies

Study	Main study findings for mental health outcome*	Main study findings for physical health outcome*	Other study outcomes*
Blocher *et al*[27]	Significant reductions over time (baseline, mid, post and 3-month follow-up) for: ▶ Child-rated anxiety ▶ Parent-rated total problem behaviours Non-significant changes for: ▶ Parent-rated internalising symptoms ▶ Parent-rated child anxiety 73% of participants scored within non-clinical range on child anxiety measure post-treatment	None	▶ All parents were satisfied with the computerised CBT intervention (agreeing or strongly agreeing that the programme was helpful for their child, and would recommend to another parent). ▶ All young people stated that the programme was helpful in reducing anxiety symptoms
Hains *et al*[28]	▶ Reductions in trait anxiety over intervention for four of the five participants, maintained at 3-month follow-up	▶ Reductions in functional disability scores post-treatment, although for two, the score then increased again at 3-month follow-up (one markedly so)	▶ Mean decrease in negative coping strategies and an increase in positive coping, but only for illness- (cystic fibrosis) specific problems ▶ Regarding general coping strategies, negative coping strategies did not change, and three young people demonstrated reductions in positive coping
Hains *et al*[29]	▶ Four out of the five young people scoring at elevated levels of anxiety preintervention demonstrated a reduction in anxiety post-treatment, with gains maintained (or improved upon) at the 3-month follow-up	▶ Diabetes stress—varied response. Little improvements made in most cases	▶ The two young people scoring at elevated levels for anger expression preintervention demonstrated reductions in anger expression scores at the end of treatment and at 3-month follow-up
Papneja and Manassis.[30]	Significant reductions over time for: ▶ Clinical Global Impression Scale score in children with anxiety and asthma, and children with anxiety alone Non-significant trend for: ▶ Less improvement in children with comorbid anxiety and asthma	None	
Reigada *et al*[31]	▶ Self-reported general anxiety was reduced (only descriptive statistics provided) ▶ Four participants did not meet criteria for clinician-rated principle anxiety diagnosis following the intervention	▶ Overall reduction in pain ▶ Changes in disease severity were varied; 50% of participants had reduced disease severity following the intervention, 25% had the same and 25% had increased disease severity	▶ Average parent satisfaction rating of satisfied/very satisfied with the intervention, they received very good/ excellent care and they would recommend the intervention to others ▶ Young people felt that the therapist cared a lot/very much and liked the programme

*Significant refers to statistical significance at the 0.05 level. Results refer to pre-post treatment differences, unless stated otherwise.

reported a statistically significant benefit for at least one outcome. In interpreting the outcomes of these studies, we note that Szigethy *et al*[36] offered additional sessions and/or psychotropic medications as necessary between end of treatment and follow-up. Gains at follow-up may not be due to the initial intervention alone. Tables 4 and 5 provide details on the main outcomes relating to mental health, physical health and other secondary outcomes.

Varied outcomes were demonstrated in relation to physical health measures. In general, where outcomes related to physical health showed significant improvement, these were related to subjective measures (eg, pain scales, self-reported self-management); no consistent significant difference was found for objective measures of physical health, such as glycaemic control.[28 29 31 33–35]

Practical adaptations for delivery within a physical healthcare setting

Most studies made accommodations for young people who had a physical illness, and thus a number of medical appointments. For example, studies conducted sessions in participants' homes,[28] outpatient settings that were either attached to a hospital, or were in the hospital,[29 30 32 33] or in other medical care settings.[27]

Studies of young people with IBD were particularly accommodating of medical appointments, through offering convenient time slots, telephone appointments and intervention locations. For example, appointments were coordinated with physical health appointments where necessary and some appointments were offered at the same time as a medical procedure (an infusion).

Meta-analysis

It was concluded that a meta-analysis would not be informative as there were only two RCTs, which reported different outcomes at different time points. The observational studies did not report appropriate data to undertake a meta-analysis. It was similarly not possible to fully investigate factors associated with the success of an intervention.

DISCUSSION

This review shows that children may benefit from cognitive behavioural interventions for depression and anxiety in the

Table 5 Summary of results of depression studies

Study	Main study findings for mental health outcome*	Main study findings for physical health outcome*	Other study outcomes*
Martinović *et al*[32]	Significantly greater decreases in scores for: ▶ Self-reported depressive symptoms in CBI group compared with TAU group ▶ Differences retained at 9-month follow up *Non-significant difference for:* ▶ Number of depressive episodes between groups (3 in TAU and 0 in CBI)		▶ CBI group significantly greater quality of life scores compared with TAU group, postintervention and at 9-month follow-up
McGrady and Hood[33]	Significant reductions for: ▶ Self-reports of depressive symptoms ▶ Parent reports of depressive symptoms	▶ Significant increase in self-reported self-management levels ▶ No significant change in parent-reported self-management; blood glucose monitor download; glycaemic control ▶ Seven out of nine participants demonstrated increases in HbA1c (ie, poorer glycaemic control)	
Rosselló and Jiménez-Chafey[34]	Significant reductions for: ▶ Self-reports of depressive symptoms Non-significant reductions for ▶ Anxiety and hopelessness	▶ Significant improvement in diabetes self-efficacy over the course of therapy ▶ No significant changes in glycaemic control, nor self-care behaviours	
Szigethy *et al*[35]	Significant reductions for: ▶ Self-reports of depressive symptoms ▶ Parent reports of depressive symptoms ▶ Maintained at both follow-up time points (6 months and 12 months)	▶ No significant change in illness severity postintervention ▶ Significant increase in subjective general health (child and parent-report measures) ▶ Mean increase in perceived physical functioning (young person report only; non-significant for parent-report)	▶ Significant increase in perceived social functioning (child and parent-report) ▶ Mean overall satisfaction with the intervention was 6·64 for parents and 5·64 for children, on a scale of 1–7, where 7 is the most helpful
Szigethy *et al*[37]	Significantly greater changes in the intervention group compared with control group for: ▶ Reduction in self/parent-rated depression severity (maintained at 12-month follow-up). ▶ Increases in global functioning Non-significant changes for: ▶ Reductions in the number of symptoms from clinician-rated interview; greater reductions were found in the intervention group, but this difference was not statistically significant (p=0.055)		▶ CBT group increased in mean perceived control score, whereas the comparison group demonstrated a mean decrease. The difference was maintained at the 6-month, but not at the 12-month follow-up

*Significant refers to statistical significance at the 0.05 level. Results refer to pre-post treatment differences, unless stated otherwise.
CBI, cognitive behavioural intervention.

context of a comorbid chronic physical health problem. However, it also emerged that there is a significant lack of studies evaluating treatment of psychiatric symptoms in children and young people with chronic physical illnesses, despite 435 studies demonstrating their efficacy in otherwise healthy children.[41] Methodologies, measures and methodological quality were variable, sample sizes were small and inclusion criteria differed, with studies investigating a variety of combinations of physical illness and psychiatric symptoms. This variability meant that a meta-analysis was not statistically appropriate and that the results are difficult to generalise.

While the significant results of all studies included in the search may represent an element of publication bias, full searches of trial databases were carried out prior to the review being undertaken. No currently running trials of interventions for common impairing psychiatric symptoms in children with long term conditions were found. Thus, it would appear that there is a true deficit in the literature, and that the available studies are representative of the little data available. It is possible that our search terms biased the findings towards cognitive behavioural interventions, however.

Specific adaptations to young people with a physical illness were generally included but were relatively minor and typically did not require significant specialist knowledge about the illness. Many child and adolescent mental health professionals are trained in the delivery of evidence-based cognitive behaviour therapies for anxiety and depression and therefore should be able to deliver these without significant additional training in paediatrics. Where specific information is needed to provide appropriate psychoeducation, Child and Adolescent Mental Health Service clinicians can liaise with the child's paediatrician.

Many studies made allowances for physical illness through the treatment location. Some studies allowed for the use of telephone sessions, sessions at home, or sessions at the same time/venue as medical appointments, to reduce the burden on families. This more flexible approach was particularly seen in the IBD studies,[31 35] which also showed good patient satisfaction. Clinically, a more flexible approach would be a step towards creating services that are more accessible for this population.

Directions for future research

Larger well controlled trials in the wider area of mental health interventions for children with physical illness are needed. Experimental studies are also needed since it is possible that some elevated level of anxiety regarding the physical illness may be beneficial and may contribute to good illness management. Existing studies have generally focused on adolescent populations and it would be useful to investigate the effects of interventions in younger age groups including disruptive behaviour. There were no studies of, for example, the efficacy of parenting programmes, a strongly evidence-based intervention for children with oppositional defiant disorder. Additional research to understand the effects of these interventions on physical health outcomes is also needed.

CONCLUSIONS

Together, these results suggest that it is possible to use evidence-based cognitive behavioural interventions to effectively treat anxiety and depressive symptoms in young people with chronic physical illnesses. Standard protocols developed for children and young people *without* physical illness can be used, with the same outcome measurement strategies. However, larger RCTs are needed. The results of this review suggest that this should ideally be a trial of a cognitive behavioural intervention, compared with treatment as usual. The cognitive behavioural intervention may need slight adaptation for use in children with physical illnesses—in particular flexibility around times and locations of appointments may be useful.

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Contributors SB, RS, AC and IH developed the search strategy. AC and SB ran the database searches and contacted researchers to identify relevant papers. AC and SB identified studies matching inclusion criteria; RS was consulted where there was disagreement or ambiguity regarding whether studies met inclusion criteria. SB and SW extracted data from the studies. AC and SB undertook quality analysis. RS, SB and IH drafted the manuscript. All authors read and approved the final manuscript.

Competing interests None.

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