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Psychological treatments for people with epilepsy (Review)

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[Intervention Review]

Psychological treatments for people with epilepsy

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ABSTRACT

Background

Given the significant impact epilepsy may have on the health-related quality of life (HRQOL) of individuals with epilepsy and their families, there is increasing clinical interest in evidence-based psychological treatments, aimed at enhancing psychological and seizure-related outcomes for this group.

This is an updated version of the original Cochrane Review published in Issue 10, 2017.

Objectives

To assess the impact of psychological treatments for people with epilepsy on HRQOL outcomes.

Search methods

For this update, we searched the following databases on 12 August 2019, without language restrictions: Cochrane Register of Studies (CRS Web), which includes randomized or quasi-randomized controlled trials from the Specialized Registers of Cochrane Review Groups including Epilepsy, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid, 1946 to 09 August 2019), and PsycINFO (EBSCOhost, 1887 onwards), and from PubMed, Embase, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform (ICTRP). We screened the references from included studies and relevant reviews, and contacted researchers in the field for unpublished studies.

Selection criteria

We considered randomized controlled trials (RCTs) and quasi-RCTs for this review. HRQOL was the main outcome. For the operational definition of 'psychological treatments', we included a broad range of skills-based psychological treatments and education-only interventions designed to improve HRQOL, seizure frequency and severity, as well as psychiatric and behavioral health comorbidities for

adults and children with epilepsy. These psychological treatments were compared to treatment as usual (TAU), an active control group (such as social support group), or antidepressant pharmacotherapy.

Data collection and analysis

We used standard methodological procedures expected by Cochrane.

Main results

We included 36 completed RCTs, with a total of 3526 participants. Of these studies, 27 investigated skills-based psychological interventions. The remaining nine studies were education-only interventions. Six studies investigated interventions for children and adolescents, three studies investigated interventions for adolescents and adults, and the remaining studies investigated interventions for adults. Based on satisfactory clinical and methodological homogeneity, we pooled data from 11 studies (643 participants) that used the Quality of Life in Epilepsy-31 (QOLIE-31) or other QOLIE inventories (such as QOLIE-89 or QOLIE-31-P) convertible to QOLIE-31. We found significant mean changes for the QOLIE-31 total score and six subscales (emotional well-being, energy and fatigue, overall QoL, seizure worry, medication effects, and cognitive functioning). The mean changes in the QOLIE-31 total score (mean improvement of 5.23 points, 95% CI 3.02 to 7.44; P < 0.001), and the overall QoL score (mean improvement of 5.95 points, 95% CI 3.05 to 8.85; P < 0.001) exceeded the threshold of minimally important change (MIC: total score: 4.73 points; QoL score: 5.22 points), indicating a clinically meaningful postintervention improvement in HRQOL. We downgraded the certainty of the evidence provided by the meta-analysis due to serious risks of bias in some of the included studies. Consequently, these results provided moderate-certainty evidence that psychological treatments for adults with epilepsy may enhance overall HRQOL.

Authors' conclusions

Implications for practice: Skills-based psychological interventions improve HRQOL in adults and adolescents with epilepsy. Adjunctive use of skills-based psychological treatments for adults and adolescents with epilepsy may provide additional benefits in HRQOL when these are incorporated into patient-centered management. We judge the evidence to be of moderate certainty.

Implications for research: Investigators should strictly adhere to the CONSORT guidelines to improve the quality of reporting on their interventions. A thorough description of intervention protocols is necessary to ensure reproducibility.

When examining the effectiveness of psychological treatments for people with epilepsy, the use of standardized HRQOL inventories, such as the Quality of Life in Epilepsy Inventories (QOLIE-31, QOLIE-31-P, and QOLIE-89) would increase comparability. Unfortunately, there is a critical gap in pediatric RCTs and RCTs including people with epilepsy and intellectual disabilities.

Finally, in order to increase the overall quality of RCT study designs, adequate randomization with allocation concealment and blinded outcome assessment should be pursued. As attrition is often high in research that requires active participation, an intention-to-treat analysis should be carried out. Treatment fidelity and treatment competence should also be assessed. These important dimensions, which are related to 'Risk of bias' assessment, should always be reported.

PLAIN LANGUAGE SUMMARY

Psychological treatments for people with epilepsy

Review question

In this Cochrane Review, we wanted to find out if the well-being (quality of life) of people with epilepsy could be improved by participation in educational or skills-based psychological therapies.

Why is this important?

Epilepsy is a brain-condition in which sudden bursts of intense electrical activity happen in the brain and cause the brain's messages to get mixed up, resulting in a seizure. Seizures affect people in different ways: they may cause unusual sensations, movements or feelings, loss of awareness, falls, stiffness or jerking. Epileptic seizures can occur repeatedly and without any triggers. Seizures can happen anytime and anywhere; they can come on suddenly and can happen often.

Epilepsy can significantly impact a person’s wellbeing and quality of life. For instance, many people with epilepsy experience depression and anxiety, memory problems, unemployment and discrimination, adverse side effects from medications, challenges to independence and worries about seizures and their consequences.

Treatments for epilepsy typically focus on stopping or reducing the number of seizures a person has with as little side effects as possible. However, psychological therapies, usually delivered by psychologists, psychiatrists or other healthcare professionals could improve well-being in people with epilepsy.

What did we do?

On 12 August 2019, we searched research databases for studies that measured the effects of psychological therapy offered to people with epilepsy on their quality of life. We found 36 studies, which involved 3,526 people with epilepsy. Participants of most studies were adults (27 studies); only three studies included adolescents and adults, and six involved children and adolescents.

Most studies (27) measured the effects of “skills-based” psychological therapies. These treatments teach people skills they can use in their daily lives. The treatment approaches of skills-based therapies included: cognitive behavioral therapy (CBT) including CBT techniques such as breathing, reasoning or visualizing; counseling; and exercises in mindfulness. The other nine studies measured educational therapies. These treatments aimed to increase people’s knowledge of epilepsy and related conditions, treatments for epilepsy, or about how the brain works. The studies compared the effects of the psychological therapies with a person's usual care, antidepressant medicines or social support.

The 36 studies had different designs and assessed people's quality of life using different scales, so we couldn't compare them all. However, we were able to compare the results of 11 studies of skills-based therapies because they used the same scale to assess quality of life.

What did we find?

The 11 studies (involving 643 adults and adolescents) were conducted in Europe (3 studies), the USA (4), Hong Kong (2), Mexico (1) and Australia (1). People in the studies were followed and assessed from 12 weeks to 2 years.

The 11 studies measured different aspects of quality of life. People received skills-based psychological therapies reported better quality of life overall than those who received usual care (8 studies), social support (2) or antidepressant medicines (1).

Ten of these 11 studies also looked at subscales of the quality of life questionnaires to assess specific aspects of quality of life. People in these studies reported better results on the six subscales, - emotional well-being, energy and fatigue, overall well-being, seizure worries, medication effects, and social function, which are combined to calculated overall quality of life.

Key messages

We concluded that skills-based psychological therapies may improve well-being (quality of life) in adults and adolescents with epilepsy.

We are moderately confident in our result from these 11 studies of psychological therapies in people with epilepsy. We believe that more studies on this specific outcome of quality of life would be unlikely to change our findings.

This review is current up to 12 August 2019.

SUMMARY OF FINDINGS

Summary of findings 1. Psychological treatments compared with usual or supportive care

Psychological treatments compared with usual or supportive care

Patient or population: adolescents and adults with epilepsy
Setting: outpatient clinic or outpatient clinic and by phone or in-home sessions and by phone
Intervention: skills-based psychological interventions
Comparison: wait-list control (WLC), usual care (UC) or supportive care (SC) or antidepressant drug treatment

Outcomes	Comparative effect sizes* (95% CI)		№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Wait-list control, usual care, supportive care or antidepressant drug treatment	Psychological treatments			
QOLIE-31 total score[a]	The range of mean change in the control groups was −1.9 to 15.96 points.	The range of mean change in the intervention groups was 3.27 to 17.2 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 5.23 higher (95% CI 3.02 to 7.44 higher) than the control groups	643 (11 RCTs)	⊕⊕⊕⊖ MODERATE[c]	2 out of 3 studies that could not be included in meta-analysis due to use of QOLIE-89 or QOLIE-31-P reported significantly higher postintervention QOLIE total scores in the treatment over the control groups (Hosseini 2016; Yadegary 2015). For narrative synthesis of all other HRQOL

					outcomes see Table 2.
QOLIE-31 emotional well-being subscale[a]	The range of mean change in the control groups was −6.23 to 24.95 points.	The range of mean change in the intervention groups was 0.91 to 20.57 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 4.96 higher (95% CI 0.70 to 9.21 higher) than the control groups	643 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 energy or fatigue subscale[a]	The range of mean change in the control groups was −5.3 to 17.69 points.	The range of mean change in the intervention groups was 0.44 to 18.75 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 5.25 higher (95% CI 1.56 to 8.93 higher) than the control groups	642 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 overall QoL subscale[a]	The range of mean change in the control groups was −2.63 to 15 points.	The range of mean change in the intervention groups was 0.13 to 19.64 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 5.95 higher (95% CI 3.05 to 8.85 higher) than the control groups	639 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 seizure worry subscale[a]	The range of mean change in the control groups was −5.18 to 17.26 points.	The range of mean change in the intervention groups was 2.74 to 28.56 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 4.35 higher (95% CI 1.35 to 7.35 higher) than the control groups	632 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 cognitive functioning subscale[a]	The range of mean change in the control groups was −2.71 to 13.17 points.	The range of mean change in the intervention groups was 2.28 to 16.16 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 4.18 higher (95% CI 1.82 to 6.54 higher) than the control groups	641 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 medication effects subscale[a]	The range of mean change in the control groups was −8.11 to 12.04 points.	The range of mean change in the intervention groups was 0.93 to 6.64 points. The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 3.16 higher (95% CI 0.01 to 6.32 higher) than the control groups	643 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-
QOLIE-31 social func-	The range of mean change in the control groups was −4.28 to 13.98 points.	The range of mean change in the intervention groups was 2.3 to 10.49 points.	630 (10 RCTs)	⊕⊕⊕⊖ MODERATE[c]	-

tion sub-scale[a]		The pooled mean change from baseline in the intervention groups measured at postintervention[b] was on average 3.09 higher (95% CI -0.17 lower to 6.35 higher) than the control groups

* Comparative effect sizes were calculated from the mean changes between baseline and post-intervention in the intervention and control groups.

CI: Confidence interval; **QOLIE:** Quality of life in epilepsy; **RCT:** randomized controlled trial

GRADE Working Group grades of evidence
High certainty: We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

[a]Range 0 - 100 points, higher score means higher quality of life.
[b]The median postintervention measurement point was 3 months (8 weeks to 2 years).
[c]Serious risk of bias, i.e. included studies share serious risk of performance bias and five included studies share serious risk of attrition bias.

BACKGROUND

This review is an update of a review previously published in the *Cochrane Database of Systematic Reviews* (2017, Issue 10; Michaelis 2017).

Description of the condition

Epilepsy is defined as the chronic predisposition of the brain to have recurrent unprovoked seizures. According to the most recent update of the clinically-oriented definition of epilepsy, the diagnosis can be made after an individual suffers only one reflex or unprovoked seizure, if further diagnostic test results indicate the likelihood of a predisposition to recurring seizures (Fisher 2014). Recent epilepsy definitions also emphasize that epilepsy should not be conceptualized solely in terms of seizures, as many people with epilepsy experience associated behavioral, psychological, and social consequences that form part of their condition (Fisher 2005). It is estimated that between 0.6% (pediatric) to 1% (adult) of the world's population have epilepsy, making it one of the most common neurological conditions (CDC 2012; Russ 2012; WHO 2017).

Aproximately a third to a half of individuals with epilepsy have drug-resistant seizures (Kwan 2000); even the latest generation of antiseizure medicines (ASMs) have failed to increase the proportion of people with epilepsy who become seizure-free with drug treatment. Some individuals with drug-resistant seizures may be eligible for epilepsy surgery (Téllez-Zenteno 2005). However, in cases where surgical treatment options have been recommended, potential complications of permanent, significant neurological injury and seizure recurrence need to be taken into account (Tanriverdi 2009; Téllez-Zenteno 2010; Wellmer 2012). Furthermore, the other main epilepsy treatments, surgical resection, neuromodulation (e.g. vagus nerve stimulation, responsive neurostimulation, and deep brain stimulation) and diet, fail to control epileptic seizures fully in 10% to 40% of patients (Jehi 2014).

Individuals with epilepsy often have lower health-related quality of life (HRQOL) compared to those with other chronic diseases (Wang 2012). Even a single seizure may be associated with reduced HRQOL (Modi 2011). This impact is not surprising, given the potential extent of medical, social, and emotional ramifications of epilepsy. As a result, it is recommended that the comprehensive management of epilepsy should go beyond merely managing seizures, and additionally aim to improve the HRQOL of people with epilepsy (Jacoby 2008).

Factors contributing to poor HRQOL include medical aspects, such as seizure frequency and severity (Camfield 2001; Cramer 1999; Devinsky 1999; Williams 2003), ASM side effects (Benavente-Aguilar 2004; Gilliam 2004; Loiselle 2016), medication adherence (Wu 2014), as well as socioeconomic status (Loiselle 2016) and psychological comorbidities (Loiselle 2016; Ramsey 2016). Notably, psychological factors, such as distress and loneliness, show robust correlations with HRQOL, while seizure-related factors appear to be less closely related (Suurmeijer 2001; Baca 2011). When investigating the association between medical parameters and HRQOL, ASM side effects (Loiselle 2016; Modi 2011; Ramsey 2016; Wu 2014), and the number of prescribed ASMs have emerged as stronger predictors of HRQOL than seizure control (Ferro 2013; Ramsey 2016). Individuals with epilepsy are also at increased risk of psychiatric comorbidities or psychological difficulties, which may significantly impact HRQOL (Selassie 2014; Wagner 2015; Scott 2017). For example, children and adolescents with epilepsy are at a three- to six-fold increased risk (21% to 60%) of psychological comorbidities (e.g. attention deficit hyperactivity disorder [ADHD] and depression [Ott 2001; Ott 2003]), compared to the general population and youth with non-neurological (Davies 2003; Ekinci 2009; Rutter 1970) or neurological medical conditions (Wagner 2015).

Epilepsy and psychiatric disorders share a bi-directional relationship, which has been supported by both population-based and experimental studies in human and animal models (Chang 2011; Hesdorffer 2006; Jones 2013; Kanner 2006; Kanner 2009). Individuals with a previous history of psychiatric disorders are four to seven times more likely to develop an unprovoked seizure or chronic epilepsy, compared to individuals without this history (Hesdorffer 2000; Hesdorffer 2006). In a review of seizure incidence in psychopharmacological clinical trials (N = 75,873), the incidence of seizures was significantly lower amongst participants who received antidepressants compared to those receiving placebo (standardized incidence ratio = 0.48; 95% CI 0.36 to 0.61). The study concluded that second-generation antidepressants, other than bupropion, could potentially have apparent anticonvulsant effects. In addition, the diagnoses of depression, psychotic disorders, and obsessive compulsive disorder were associated with reduced seizure thresholds (Alper 2007). These findings prompted further research into the role of psychological states in the development and manifestation of seizures, as well as the potential effects of psychological therapy on individuals with epilepsy (Kanner 2006; Tang 2014).

Psychiatric comorbidity in epilepsy appears to be strongly associated with psychosocial factors (Gandy 2012). For instance, the increase in depression and anxiety one year after diagnosis of epilepsy is correlated with the degree to which an individual senses loss of self-control, rather than the actual number of seizures (Velissaris 2012). Moreover, HRQOL is correlated with depression symptoms in epilepsy (Gilliam 2002). Concerns over recurring seizures may diminish HRQOL, even in individuals with well-controlled epilepsy (Snyder 1990). These concerns may hamper psychosocial functioning and the achievement or maintenance of higher education and employment, despite seizure freedom (Gilbert 2012). By permeating the individual's sense of self-efficacy and consequently decreasing self-confidence, concerns about seizure recurrence that stem from the perceived unpredictability of the course of epilepsy can be far more disabling than the seizures themselves (Stevanovic 2007). Reported depressive symptoms were also associated with negative coping, suggesting that interventions targeting negative coping may improve depressive symptoms in youth with epilepsy (Wagner 2010). Daily routines and activities of daily living are often affected, including sleep, work productivity, school, and recreational and sports activities. This impact on work productivity may incur significant indirect costs for the wider economy (Larson 2012; Painter 2014). Notably, the healthcare costs for children with epilepsy in the first year of diagnosis are approximately USD 20,000 per patient. Seizure control, side effects, and HRQOL are strong drivers of healthcare charges (Ryan 2015; Ryan 2016).

Self- or family-management has been identified as a key health variable and is broadly defined as encompassing the personal resources needed to manage a chronic condition in the context of everyday life. Self-management of adult epilepsy

has been defined as “activities that an individual can perform alone that are known to either control frequency of seizures or promote well-being of the person with seizures” (Dilorio 1992). In pediatric chronic illness, self-management behaviors are modifiable behaviors linked to influences (e.g. coping responses) through processes (e.g. allocation of treatment responsibility). These self-management behaviors and processes operate within individual, family, community, and healthcare system domains (Dilorio 1992; Modi 2012; Schilling 2002). Comprehensive evidence in the Institute of Medicine's *Report on Epilepsy* supports the relevance of self-management domains in epilepsy, regardless of the age at onset, or of the epilepsy type (Institute of Medicine 2012). An adult self-management instrument has been developed and published to measure behaviors with psychometrics showing high internal consistency factor reliability (Escoffery 2015a; Escoffery 2015b). Pediatric self-management instruments are also available, but have tended to focus on specific aspects of self-management (Smith 2018).

Description of the intervention

In the treatment of epilepsy, physicians aim to reduce seizures using ASMs, surgical interventions (including neuromodulation), or diet treatment. Adjunctive psychological interventions for individuals with epilepsy provided by a range of different professionals (including psychologists, psychiatrists, psychotherapists, nurses and social workers) aim to optimize HRQOL, and to improve mental health and seizure control. Given the high prevalence of mental health disorders in the epilepsy population, and the significant influence epilepsy and its treatments can have on the HRQOL of individuals with epilepsy and their families, psychological interventions are commonly used as an important adjunctive treatment. In addition, psychological treatments may assist with self-management and adherence to epilepsy management, which is pivotal to improving and maintaining health outcomes for people with epilepsy. To operationalize the definition of 'psychological therapy', studies reviewed included a broad range of interventions that used psychological techniques for children and adults with epilepsy. These interventions can be grouped into two main categories, according to the opinion of the Psychology Task Force of the International League Against Epilepsy (ILAE) and based on general psychotherapy research:

Education-only interventions provide de-individualized facts and knowledge to the observational learner, while skills-based psychological interventions (which may involve educational elements) require an engaged learner who contributes to a personalized curriculum by applying knowledge for behavioral change.

1. Skills-based psychological interventions

Skills-based psychological interventions aim to improve HRQOL by improving the person's use of adaptive coping skills. These interventions are usually based on at least one theory of psychotherapy. The specific skills taught can encompass a broad range of treatment methods and treatment goals. Even though different psychotherapy theories use different terminology, therapeutic principles common to many emphasize the development of a person’s awareness of current feelings and repeated patterns of behavior followed by the translation of their enhanced understanding of behavioral patterns into more effective functioning (including interpersonal relationships and processing of emotions) to promote mental health and adjustment to chronic illness. These interventions are designed to increase learning, practice, and generalization of adaptive psychological skills through a variety of psychotherapeutic strategies. However, at the core of skills-based psychological interventions is the intention to enhance the practice and adoption of adaptive psychological skills in the person's everyday life outside of the intervention session. Skills-based psychological interventions usually begin with psycho-educational components to justify the teaching of specific psychological skills. Examples include cognitive behavioral or behaviorally-based interventions, mindfulness-based interventions, and other psychotherapeutic methods. The delivery of skills-based psychological interventions encourages an empathic and supportive approach from the therapist, inviting collaboration with the person. Depending on the treatment goal, certain skills-based psychological interventions can be focused on self- or family-management interventions or adherence interventions. Self- or family-management interventions typically focus on enhancing skills to improve medication-taking, managing seizure triggers, avoiding certain foods while on the ketogenic diet, and managing comorbidities associated with epilepsy.

2. Education-only interventions

Educational interventions (including psychoeducation) are defined as interventions that aim to increase knowledge about epilepsy, its comorbidities, and its treatments, or the working of the brain. They may accommodate the opportunity for participants to learn about certain skills (such as coping skills) but they do not guide participants through their practice, and do not place emphasis on incorporating these skills into their daily living.

How the intervention might work

The high level of psychiatric comorbidities in people with epilepsy has yielded intervention efforts for both children and adults. Several studies, with varying approaches, have been conducted with the objective of improving mental health and HRQOL in adults with epilepsy (e.g. Project UPLIFT, PEARLS [Ciechanowski 2010; Thompson 2010]). For instance, one approach compared a community-integrated home-based program (PEARLS) for managing depression in adults with epilepsy with a usual-care control group. This study found that, over 12 months, the proportion of participants with suicidal ideation differed significantly between groups, increasing by 12% in the control group and decreasing by 24% in the PEARLS group (Ciechanowski 2010). Compared with participants in the control group, participants assigned to the intervention group also had less severe depression.

Another approach is described by Martinović 2006, who delivered an intervention based on cognitive behavioral therapy (CBT) to prevent depressive symptoms in youths with epilepsy who were at risk of depression. Further approaches have attempted to improve well-being in individuals with epilepsy by using general stress reduction or tolerance techniques, which aim to be effective by reducing psychological stress and its physiological correlates (Novakova 2013). For example, Tang 2015 developed a mindfulness-based therapy for participants with drug-resistant epilepsy. Significantly more participants in the mindfulness-based therapy group had a clinically important improvement in the

Quality of Life in Epilepsy Inventory (QOLIE-31) compared to those in the attention-placebo intervention control group.

Reiter 2009 developed a multi-modal therapy for people with epilepsy that included biofeedback, relaxation, aura identification, and behavioral modification. Aura interruption techniques may also be part of psychological therapy, and allow individuals to learn new sets of reactions to pre-ictal and early ictal phenomena, which may decrease fear of recurring seizures and provide a subjective sense of control (Elsas 2011; Fried 1990; Michaelis 2012). Based on the bi-directional model of epilepsy and psychological states, psychological therapy for people with epilepsy can also emphasize the individuals' role and participation in the management of their own condition. Thus, there have also been several programs aimed at improving coping and self-management of epilepsy in both youths (Wagner 2010) and adults (DiIorio 2011; Gandy 2016). Adherence-promotion interventions that used intention as a strategy (Brown 2009), or family-based problem-solving about adherence barriers (Modi 2013; Modi 2016a), may merit further investigation..

Why it is important to do this review

Psychological treatments have been developed that aim to enhance psychological well-being and seizure control, and reduce psychiatric comorbidities in people with epilepsy. Establishing evidence of the effects of such interventions is methodologically challenging. A review of the current evidence is needed to help inform future therapeutic recommendations and research designs.

OBJECTIVES

To assess the impact of psychological treatments for people with epilepsy on HRQOL outcomes.

METHODS

Criteria for considering studies for this review

Types of studies

Randomized controlled trials (RCTs), or quasi-RCTs (e.g. studies in which the randomization is according to the day of the week or date of birth).

Types of participants

Men, women and children of any age with any type of epilepsy, drug-responsive or drug-resistant, with or without intellectual disabilities, whether or not they were taking antiseizure medication (ASM).

Types of interventions

For the operational definition of 'psychological treatments', we included a broad range of treatments that were designed to improve health-related quality of life (HRQOL), seizure frequency and severity, and reduce psychological and psychiatric comorbidities. We explain these different broad types of psychological treatments in detail in the Description of the intervention:

1. Skills-based psychological interventions (including educational elements);
2. Education-only interventions.

We included studies of comparisons of two or more of the above treatments, and comparisons to 'wait-list control', 'treatment as usual', and antidepressant pharmacotherapy.

Types of outcome measures

Main outcome measures

We included all studies that reported changes from baseline in validated HRQOL measures. If those studies also reported other quality-of-life-related parameters, symptoms of psychiatric comorbidities or seizure-related outcome measures we also extracted data from those parameters. We excluded studies without a HRQOL measure.

Primary outcomes

1. Mean of change from baseline, or comparisons of postintervention scores from validated HRQOL measures

Secondary outcomes

1. Comparisons of postintervention scores on validated measures of psychiatric comorbidities, such as depressive and anxiety symptoms
2. Comparisons of postintervention data from validated seizure-related outcome measures

Search methods for identification of studies

Electronic searches

We ran searches for the original review in March 2016, and subsequent searches in September 2016, February 2019, and August 2019. For the latest update, we searched the following databases on 12 August 2019. There were no language restrictions.

1. Cochrane Register of Studies (CRS Web); search strategy shown in Appendix 1.
2. MEDLINE Ovid (1946 to 09 August 2019); search strategy shown in Appendix 2.
3. PsycINFO EBSCO host (1887 onwards); search strategy shown in Appendix 3.

CRS Web includes randomized or quasi-randomized controlled trials from the Specialized Registers of Cochrane Review Groups including Epilepsy, the Cochrane Central Register of Controlled Trials (CENTRAL), PubMed, Embase, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform (ICTRP).

Searching other resources

References from published studies and relevant systematic reviews

We reviewed the reference lists of retrieved studies and reviews to search for additional reports of relevant studies.

Other sources

We contacted colleagues to ask if they were aware of any studies or unpublished data that we had missed.

Data collection and analysis

Selection of studies

Two review authors (RM and VT) independently assessed trial abstracts for inclusion, resolving disagreements through discussion.

Data extraction and management

The same two review authors independently extracted the following data, using an electronic Cochrane data collection form that we had adapted to fit the scope of this review:

Study methods

1. Type of intervention used
2. Design
3. Dates the study was conducted
4. Duration of study
5. Timepoints for outcome assessment
6. Sequence generation and allocation concealment
7. Blinding method
8. Controlled confounding variables
9. Other 'Risk of bias' concerns
10. Sources of study funding and potential conflicts of interest

Participants

1. Total sample size and total number of participants allocated to each group
2. Age, sex, and gender distribution
3. Seizure type and epilepsy syndrome
4. Duration of epilepsy
5. Etiology of epilepsy
6. Seizure frequency and severity
7. Presence or absence of learning disability or intellectual disability (ID)
8. Presence or absence of psychiatric comorbidity or other medical diagnoses
9. Antiseizure medication and co-medication
10. Setting of the study
11. Inclusion and exclusion criteria
12. Country of study

Outcome data

1. Name and definition of outcome
2. Units of measurement

Results

1. Study attrition
2. Sample size for each outcome
3. Missing data
4. Summary data for intervention and control groups (for example, means and standard deviations for all outcomes)

The authors tested the applicability of the data collection form by piloting the form. Again, we resolved any differences of opinion through discussion.

Assessment of risk of bias in included studies

The same two review authors independently assessed risks of bias for each randomized trial using Cochrane's recommended domain-based evaluation tool for randomized trials, in which we made critical assessments separately for different domains, including selection bias (random sequence generation, allocation concealment), performance bias (blinding of personnel), detection bias (blinding of outcome assessment), attrition bias (incomplete outcome data), reporting bias (selective reporting), and other potential sources of bias, including treatment infidelity, treatment competence (in terms of the training background of the professionals who delivered the treatment, and the quality of treatment delivery), and selective recruitment (Higgins 2017).

We examined all outcomes reported in papers for selective outcome reporting. We resolved any differences of opinion by discussion.

Measures of treatment effect

We expressed the treatment effect for each continuous outcome measuring HRQOL as a mean difference (MD) with a 95% confidence interval (CI). For studies that did not provide mean and standard deviation (SD) values for changes from baseline, we used correlation values, baseline values and postintervention values from other studies of comparable intervention method, treatment setting (group versus individual), and total treatment time to estimate change from baseline values.

We performed meta-analyses only for HRQOL data. Since HRQOL constituted the main outcome measure for this review, and we only included studies that investigated HRQOL, we excluded some studies that covered other outcome measures, e.g. psychiatric symptoms. From this perspective, a meta-analysis of any outcome other than HRQOL would imply a serious selection bias.

Unit of analysis issues

When assessing randomized trials, we took the level at which randomization occurred into account.

In trials with cluster-randomization, we considered the biases particular to a cluster-randomized trial, such as recruitment bias, baseline imbalance, loss of clusters, incorrect analysis, and comparability with individually-randomized trials, and chose the appropriate measure of analysis (e.g. adjusting results from cluster-randomized trials with intracluster correlation coefficients to combine with individually-randomized trials in meta-analysis if appropriate).

Considering the lasting nature of the intervention in question, a cross-over trial design would not have been appropriate, because of the likelihood of serious carry-over. Hence, we would only have included data from the first period.

When assessing multi-intervention studies, we listed all intervention groups in the Characteristics of included studies tables. We only used the intervention groups relevant to the review in analyses. We would have included studies that included three or more of the interventions listed in Types of interventions as separate comparisons in the analysis.

Dealing with missing data

Whenever possible, we contacted the original investigators to request missing data and clarification of methodology. If we assumed that the data were missing for reasons unrelated to the intervention, we said the data were 'missing at random' and we based the analyses on the available data. We discussed the potential reasons for the missing data and addressed the potential impact of missing data on the findings in the Discussion section of the review.

Assessment of heterogeneity

We assessed clinical heterogeneity by examining the distribution of important prognostic variables between studies. To assess the statistical heterogeneity of observed differences of study results, we used the Chi^2 test, forest plots, and the I^2 statistic. We judged that an I^2 greater than 70% and a Chi^2 result of $P < 0.01$ to indicate statistical heterogeneity of concern.

Assessment of reporting biases

We compared the reported outcomes with the outcome measures and points of measurements stated in the study methods to assess reporting bias within the publication. We assessed reporting biases by comparing the reported outcomes with the original study protocol. To assess reporting biases and to collect missing information if needed, we contacted all study investigators for their original protocols or comparable documents.

Where we could include 10 or more studies within a meta-analysis, we visually inspected funnel plots and considered whether any observed asymmetry may be due to publication bias. We produced funnel plots only for total HRQOL scores and not for subscales. As subscales contribute to the total score and publication bias is determined at study level, we determined that if publication bias appeared to be present within analysis of the total scores, it would also be present within the analyses of the subscales.

Data synthesis

To assess whether meta-analysis was appropriate, we compared the types of interventions and types of outcome measures or scales used in the studies, by tabulating the study characteristics. After we completed this, a group of studies appeared to be sufficiently homogeneous for meta-analysis (see criteria outlined in Assessment of heterogeneity). We meta-analyzed the results of clinically and statistically homogeneous studies using Review Manager 5 software (RevMan 2014). We used the inverse variance method for continuous outcomes with a random-effects model. We conducted a narrative synthesis for any outcomes for which the included studies were not sufficiently homogeneous, or for which we had insufficient data for meta-analysis.

Subgroup analysis and investigation of heterogeneity

Due to the scope of this review, there were several different interventions of interest, and the included studies were diverse. We identified the following subgroups. However, since they were either comparatively small or the information was unavailable, we did not undertake any subgroup analysis:

1. Children versus adults
2. Individuals with drug-resistant epilepsy versus individuals with drug-responsive epilepsy
3. Individuals with primary generalized epilepsy versus individuals with focal epilepsy versus unclassified epilepsy syndromes
4. Individuals with nocturnal seizures versus individuals with diurnal seizures (seizure-related outcomes only)
5. Individuals with seizure warning (aura) versus individuals without seizure warning (seizure-related outcomes only)
6. Staff-based versus non-staff-based treatments (i.e. web-based interventions)
7. Participants with intellectual disabilities (IQ below 70) would have been separately analyzed

We assessed methodological heterogeneity by examining the study design.

Sensitivity analysis

If reasonable, we would have conducted a sensitivity analysis by comparing the results of a second meta-analysis, including only studies at low risk of bias, to those in the overall meta-analysis.

Summary of findings and assessment of the certainty of the evidence

We used the GRADE approach to interpret findings (Schünemann 2017), and GRADEpro GDT software (which imports data from Review Manager 5 software [GRADEPro 2015]), to create a 'Summary of findings' table for the primary outcome of HRQOL.

RESULTS

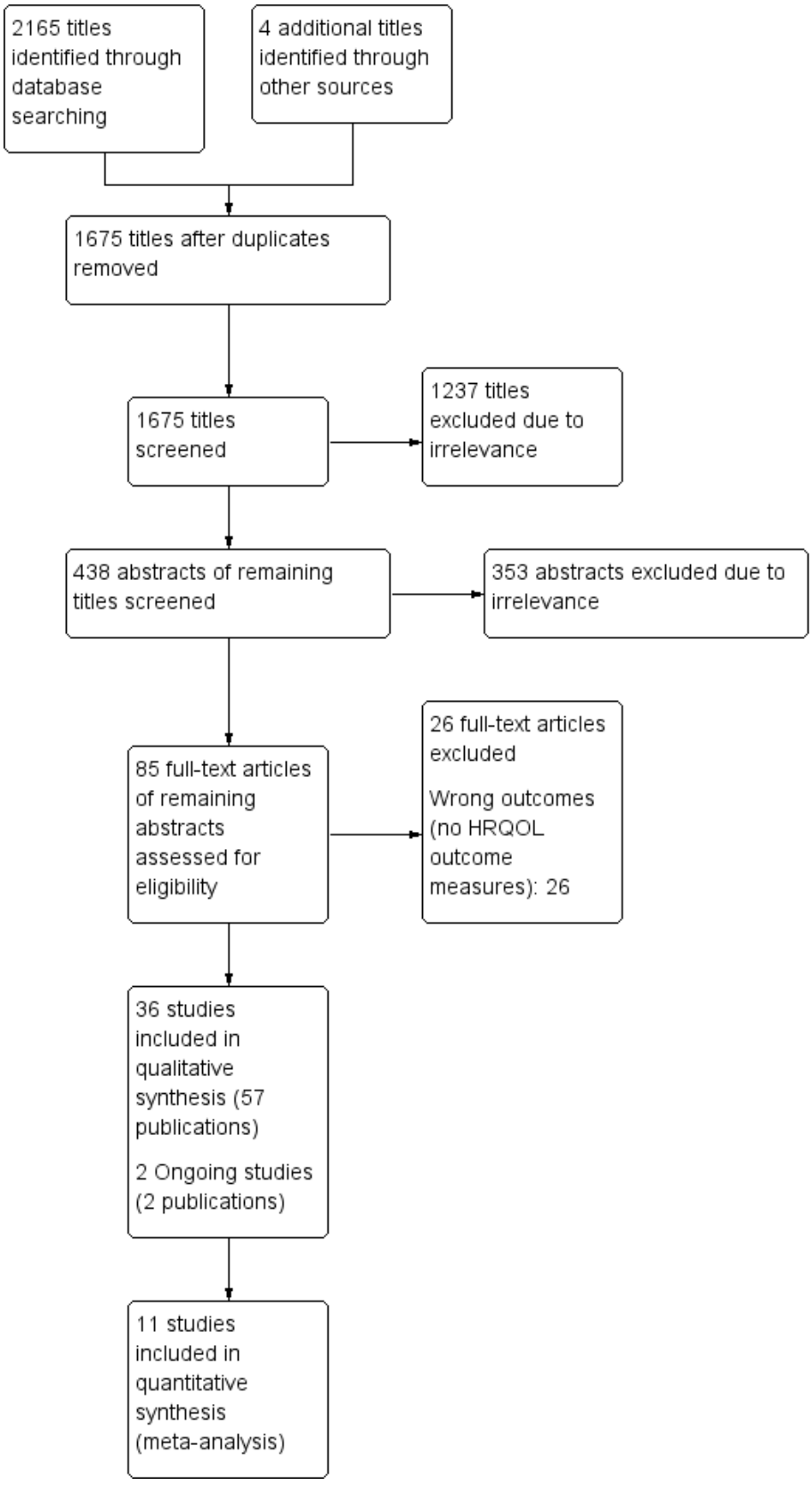
Description of studies

We searched for RCTs and quasi-RCTs that investigated psychological treatments for individuals with epilepsy and used validated HRQOL outcome parameters.

Results of the search

The electronic search yielded 2165 titles from the databases outlined, and we found four titles through handsearching. Following the removal of duplicates, 1675 titles remained. We ruled out 1237 titles as irrelevant (i.e. these titles clearly indicated that the studies were neither RCTs nor quasi-RCTs related to the investigation of psychological interventions for people with epilepsy). We screened the abstracts of the remaining 438 titles for eligibility, and obtained the full texts of 85 reports to assess for eligibility. We excluded 26 full text reports (24 studies, see Figure 1 and Characteristics of excluded studies) because they did not examine HRQOL outcomes. Two studies were ongoing (see Characteristics of ongoing studies).

Figure 1. Study flow diagram.



Included studies

We included 36 completed RCTs (3526 participants) in 57 publications in this review. Table 1 and the Characteristics of included studies tables outline the details of the studies and the components of the interventions. Nine studies were conducted in the USA (Caller 2016; Ciechanowski 2010; DiIorio 2011; Fraser 2015; Gilliam 2019; Pramuka 2007; Sajatovic 2016; Sajatovic 2018; Thompson 2010), six in Germany (Jantzen 2009; May 2002; Meyer 2019; Pfäfflin 2016; Rau 2006; Schröder 2014), three in Iran (Hosseini 2016; Pakpour 2015; Yadegary 2015) and the UK (Dorris 2017; Ridsdale 2018; Ring 2018), two in Australia (Edward 2019; Gandy 2014), Canada (Brown 2019; Hum 2019), Hong Kong (Au 2003; Tang 2015), and Sweden (Lundgren 2006; Lundgren 2008). The remaining studies were conducted in Italy (Beretta 2014), Malaysia (Lua 2013), Mexico (Orjuela-Rojas 2015), Norway (Helde 2005), Netherlands (Leenen 2018), Serbia (Martinović 2006) and Turkey (Turan Gurhopur 2018).

Interventions

The authors grouped the investigated psychological treatments according to the above-mentioned operational definition of 'psychological treatments' for adults and children with epilepsy (see also Table 1).

1. Skills-based psychological interventions (27 studies, 2240 participants)

Nine skills-based psychological interventions were cognitive or behavior-based interventions, or both, with the primary goal of treating depressive symptoms in adolescents or adults or both, with epilepsy and varying levels of depression severity (Ciechanowski 2010; Gandy 2014; Gilliam 2019; Hum 2019; Martinović 2006; Meyer 2019; Orjuela-Rojas 2015; Schröder 2014; Thompson 2010). The most common treatment strategies were cognitive restructuring to address depressive thoughts, and behavioral and social activation (see Characteristics of included studies for additional strategies in each study). Five of the studies delivered the intervention on an individual basis (Ciechanowski 2010; Gandy 2014; Gilliam 2019; Meyer 2019; Schröder 2014), while the other four used a group format (Hum 2019; Martinović 2006; Orjuela-Rojas 2015; Thompson 2010). Four of the interventions were conducted in a clinical setting (Gandy 2014; Gilliam 2019; Martinović 2006; Orjuela-Rojas 2015), two interventions were Internet-based (Meyer 2019; Schröder 2014), one intervention was phone-based (Hum 2019), one was Internet-based with complementing telephone calls (Thompson 2010), and one was home-based (Ciechanowski 2010). Three of these interventions included mindfulness techniques (Hum 2019; Schröder 2014; Thompson 2010).

Four studies focused on the primary treatment goal of improving HRQOL. Three of them used mindfulness techniques in combination with seizure management techniques, by introducing acceptance and coping related to seizure disturbances (Lundgren 2006; Lundgren 2008; Tang 2015). Lundgren 2006 and Lundgren 2008 included management of seizure triggers and development of aura interruption techniques. Hosseini 2016 investigated motivational interviewing, which focused on enhancement of internal motivation for coping with epilepsy. One intervention combined a single epilepsy education group session, covering epilepsy knowledge (including the topic of drug adherence) and nurse-led personalized counseling, with the primary treatment goal of enhancing quality of life (Helde 2005).

Four skills-based psychological interventions (labeled consumer-driven psychoeducation by the authors) focused on epilepsy-specific self-management behaviors as primary (Fraser 2015; Leenen 2018; Pramuka 2007) or secondary treatment goals (Dorris 2017; primary treatment goal: HRQOL), by discussing medical and psychosocial aspects of epilepsy self-management in a face-to-face group setting with children and adolescents (Dorris 2017) or adults (Fraser 2015; Leenen 2018; Pramuka 2007). Another self-management intervention applied a similar approach, but evaluated the impact of the intervention on HRQOL outcomes (Yadegary 2015). One Internet-based self-management program (WebEase) focused on the primary treatment goals of improving adherence and perceived stress levels, by targeting medication adherence, stress and sleep management (DiIorio 2011). Two consumer-driven self-management programs targeted special subgroups: one program was designed for people with comorbid mental illness focused on empowerment and support to increase coping with mental illness and epilepsy (Sajatovic 2016), and one program was designed for people who had recently experienced epilepsy-related complications and aimed at reduction of such negative health events (Sajatovic 2018). One home- and telephone-based intervention combined self-management and cognitive training (Home-Based Self-management and Cognitive Training Changes lives (HOBSCOTCH) in order to increase quality of life, mood, and objective and subjective neurocognitive functions (Caller 2016).

Two skills-based psychological interventions focused on seizure control and HRQOL. Au 2003 used CBT-based components (e.g. cognitive restructuring) with seizure management techniques (e.g. identifying and addressing seizure-provoking situations) on adults with epilepsy and subjective psychological distress. Ring 2018 investigated a nurse-led competency framework with the particular focus on supporting adults with epilepsy and intellectual disability with the primary treatment goal of improving seizure frequency and HRQOL

Two studies used motivational interviewing as their primary intervention strategy (Hosseini 2016; Pakpour 2015). Hosseini 2016 applied motivational interviewing with adults with epilepsy in a group format aiming to improve HRQOL; the intervention was designed to enhance internal motivation for changing through exploration, identification, and overcoming doubts and dualism. Pakpour 2015 investigated an adherence intervention using motivational interviewing in an individual setting. In this study, a program was designed to enhance medication adherence behavior and clinical outcomes in people with epilepsy, as measured by drug adherence, drug-taking behaviors, seizure severity, and HRQOL. An additional study (Brown 2019) used behavioral methods (e.g. performance feedback) to target physical activity in children with epilepsy and positively influence depressive symptoms and HRQOL.

2. Education-only interventions (9 studies, 1286 participants)

Education-only interventions focused on epilepsy knowledge, advocacy topics, daily self-management behaviors, and psychosocial aspects in order to enhance quality of life (six trials: Jantzen 2009; Lua 2013; May 2002; Ridsdale 2018, Turan Gurhopur 2018, Edward 2019), increase knowledge and coping

(Rau 2006), or satisfaction of participants with information and support (Pfäfflin 2016), or reduce drug-related problems (Beretta 2014). Four intervention programs were designed to be delivered in a group setting during a two-day weekend course (Flip&Flap (Jantzen 2009); FAMOSES (Rau 2006); MOSES (May 2002); SMILE (UK) (Ridsdale 2018). Three of these interventions were geared towards the education of children, adolescents, and their parents (Jantzen 2009, Rau 2006, Turan Gurhopur 2018). One intervention investigated the MOSES material using a short message service (SMS)-based system to deliver the general content of the educational intervention, complemented by information tailored to the individual (Lua 2013). One intervention provided participant-tailored medication education in individual sessions in order to reduce drug-related problems (Beretta 2014). Another provided a brief education intervention on lifestyle self-management in the control of seizures that was developed based on self-determination theory in order to improve HRQOL, satisfaction with life and resilience (Edward 2019).

Intervention delivery

A specialized team, usually consisting of medical (doctors, nurses) or mental health specialists (e.g. psychologist, psychiatric nurses, social workers) or both delivered most of the education interventions, except for one educational intervention that was delivered by an epilepsy nurse specialist and an electroencephalography (EEG) technician (Ridsdale 2018). Psychologists with different levels of clinical experience and training delivered most of the skills-based interventions. Five interventions included a peer coach with epilepsy (Fraser 2015; Hum 2019; Sajatovic 2016; Sajatovic 2018; Thompson 2010). One pragmatic design left the delivery of the educational intervention to the treating physician (Beretta 2014). Skills-based psychological interventions had a median duration of eight weeks (range 3 weeks to 2 years). Education-only group interventions (Jantzen 2009; May 2002; Ridsdale 2018; Turan Gurhopur 2018) took two to three days; education-only interventions with individual sessions comprised one (Edward 2019; Pfäfflin 2016), two (Beretta 2014) or 12 (Lua 2013) sessions. For more detailed information about the duration of each intervention please refer to Characteristics of included studies tables.

Control groups

Fifteen trials included a wait-list control (WLC) group (Au 2003; DiIorio 2011; Dorris 2017; Fraser 2015; Gandy 2014; Hosseini 2016; Hum 2019; Jantzen 2009; May 2002; Pfäfflin 2016; Rau 2006; Sajatovic 2018; Schröder 2014; Thompson 2010; Turan Gurhopur 2018). Eight studies included an immediate active control group: EpINFO program with education intervention, coping strategies and skill-building activities (Hum 2019); paper-based education intervention (Lua 2013); supportive therapy (Lundgren 2006); yoga (Lundgren 2008); counseling as usual (Martinović 2006); pharmacotherapy with a selective serotonin reuptake inhibitor (Gilliam 2019; Orjuela-Rojas 2015); attention-placebo social support (Tang 2015). The remaining 13 studies used usual care or treatment as usual as the control group (Beretta 2014; Brown 2019; Caller 2016; Ciechanowski 2010; Helde 2005; Leenen 2018; Meyer 2019; Pakpour 2015; Pramuka 2007; Ridsdale 2018; Ring 2018; Sajatovic 2016; Yadegary 2015). Hum 2019 used both an active control group (epilepsy information and self-management) and a wait-list control group. The use of a usual-care or treatment-as-usual design instead of a wait-list control group was especially comprehensible in long-term interventions (six months or longer [Ciechanowski 2010; Helde 2005]). One study did not describe in detail the format of the control group used (Edward 2019).

Outcome measures

We organized the outcome measures according to the types of outcome defined in the protocol (Types of outcome measures). The Characteristics of included studies tables outline the outcome measures and measurement points in each study. Altogether, the included studies used more than 50 different outcome measures. Skills-based psychological interventions carried out a median postintervention follow-up of six months (range 0 to 18 months). Education-only interventions carried out a median postintervention follow-up of six months (range 0 to 12 months).

Health-related quality of life

'Quality of Life in Epilepsy' inventories (QOLIE)

Twenty-five studies used the most commonly-used epilepsy-specific HRQOL questionnaires to measure outcomes (Quality of Life in Epilepsy-10/-31/-31P/-48/-89). Eleven studies used the QOLIE-31 (Au 2003; Beretta 2014; Caller 2016; Ciechanowski 2010; Fraser 2015; Gandy 2014; Lua 2013; Martinović 2006; Orjuela-Rojas 2015; Pakpour 2015; Schröder 2014), four studies used the patient-weighted QOLIE-P (Leenen 2018; Ridsdale 2018; Tang 2015; Yadegary 2015), four studies used the QOLIE-89 (Gilliam 2019; Helde 2005; Hosseini 2016; Pramuka 2007), four studies used the QOLIE-10 (DiIorio 2011; Meyer 2019; Sajatovic 2016; Sajatovic 2018), and single studies used the QOLIE-48 (Turan Gurhopur 2018) and a subscale item of the QOLIE-31 to inquire about overall QoL (Pfäfflin 2016). The QOLIE-31-P is a modification of the QOLIE-31, with an additional question about the individual's subjective level of distress in each of the six subscales, which allows for an individually-weighted calculation of scores for the individual's subjective evaluation (Cramer 2003). All studies using QOLIE-10, QOLIE-31, QOLIE-31-P, QOLIE-48 and QOLIE-89 questionnaires reported pre- and postintervention mean scores (± standard deviation [SD]). Three studies included the mean difference between pre- and postintervention scores (± SD; [Fraser 2015; Helde 2005; Tang 2015]). Only Tang 2015 reported the percentage of participants achieving a minimum clinically important change.

Of the 25 studies that used the QOLIE measures, we considered 14 skills-based psychological intervention studies to be sufficiently clinically and methodologically homogeneous for meta-analysis (Au 2003; Caller 2016; Ciechanowski 2010; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Hosseini 2016; Leenen 2018; Martinović 2006; Orjuela-Rojas 2015; Pramuka 2007; Tang 2015; Yadegary 2015). We did not include education-only interventions in the meta-analysis. Due to substantial baseline differences between intervention and control groups, we used the mean change from baseline (± SD) for the meta-analysis, rather than postintervention scores (± SD). We sought required data from all authors. Seven study authors provided unpublished data we could include in the meta-analysis: Caller 2016 provided the unadjusted mean change from baseline (± SD); Fraser 2015 provided the mean change from baseline (± SD) for the control group; Gilliam 2019 and Helde 2005 provided raw data so we could convert the results from QOLIE-89 to QOLIE-31; Orjuela-Rojas 2015 provided raw data to calculate the mean change from baseline (± SD); Tang 2015 and Leenen 2018 provided raw data so we could convert the results from QOLIE-31-P to QOLIE-31. Three studies did not provide the

mean change from baseline [± SD; (Au 2003; Ciechanowski 2010; Martinović 2006]). We calculated the mean change from baseline as a difference between pre- and postintervention means. In order to calculate an adjusted SD, we grouped these three studies with studies investigating interventions that were comparable in intervention method, treatment setting (group versus individual), and total treatment time: Au 2003 with Tang 2015; Ciechanowski 2010 with Gandy 2014; and Martinović 2006 with Orjuela-Rojas 2015. This allowed us to calculate the adjusted SD of the mean change from baseline, based on the correlation between pre- and postintervention means (± SD) of the studies with which they were grouped. Unfortunately, Martinović 2006 could not provide QOLIE-31 subscale outcomes, so we only included the total score from his study. We present in narrative form the results of the studies that did not provide the raw QOLIE-89 data (Hosseini 2016; Pramuka 2007), or raw QOLIE-31-P data (Yadegary 2015) that would allow us to convert the results into QOLIE-31 scores. As a result, the meta-analysis finally comprised data from 11 studies (Au 2003; Caller 2016; Ciechanowski 2010; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Leenen 2018; Martinović 2006; Orjuela-Rojas 2015; Tang 2015).

We did not include six studies using QOLIE-31 outcome measures in the meta-analysis because of meaningful clinical heterogeneity. In two skills-based psychological interventions, the intervention delivery was not face-to-face; it was either web-based (Schröder 2014), or SMS-based (Lua 2013). In one skills-based psychological intervention, the intervention goal was very narrowly defined: Pakpour 2015: increasing drug-adherence. Three interventions were 'education only' (Beretta 2014; Pfäfflin 2016; Ridsdale 2018). We present their results in narrative form. Two authors provided raw data that allowed us to calculate and present unpublished QOLIE-31 scores (Beretta 2014; Schröder 2014).

Other HRQOL outcome measures

Four studies used the World Health Organization Quality of Life instrument, short version (WHOQOL-BREF); (Hum 2019; Lundgren 2006; Lundgren 2008; Schröder 2014). Four studies used the Satisfaction with Life Scale (SWLS); (Edward 2019; Lundgren 2006; Lundgren 2008; Thompson 2010). Edward 2019 used the Short Form 12 (SF12).

Pediatric studies in particular used heterogeneous HRQOL measures: Brown 2019 used the Childhood Epilepsy Quality of Life scale (CHEQOL) and KIDSCREEN-27; Dorris 2017 used the Paediatric Quality of Life Inventory PedsQL™ version 4.0 and the Glasgow Epilepsy Outcome Scale for Young Persons (GEOS-YP); and Rau 2006 used the German questionnaire KINDL.

One study that only included participants with intellectual disability used the Epilepsy and Learning Disabilities Quality of Life (ELDQoL) (Ring 2018).

We present all of these other HRQOL outcomes in narrative form.

Psychiatric comorbidities: depression and anxiety

Several included studies also assessed psychiatric comorbidities. Even though some of them used the same outcome measure, we grouped individual results by outcome measures in narrative form rather than a meta-analysis. Since HRQOL constituted the main outcome measure of this review, we only included studies that investigated HRQOL, which led to the exclusion of some studies that included psychiatric symptoms as an outcome measure, but not HRQOL. From this perspective, a meta-analysis of any outcome other than HRQOL would imply a serious selection bias.

Depression

Seventeen studies examined changes in the level of symptoms of depression (Brown 2019; Caller 2016; Ciechanowski 2010; Dorris 2017; Fraser 2015; Gandy 2014; Gilliam 2019; Hum 2019; Leenen 2018; Martinović 2006; May 2002; Orjuela-Rojas 2015; Ridsdale 2018; Schröder 2014; Sajatovic 2016; Tang 2015; Thompson 2010). Six studies used the Beck Depression Inventory or Beck Depression Inventory-II (Gilliam 2019; Martinović 2006; Orjuela-Rojas 2015; Schröder 2014; Tang 2015; Thompson 2010); four studies used the Patient Health Questionnaire (Caller 2016; Fraser 2015; Sajatovic 2016; Thompson 2010). Four studies used the Hospital Anxiety and Depression Scale (Gandy 2014; Leenen 2018; Orjuela-Rojas 2015; Ridsdale 2018), three other studies used the Neurological Disorders Depression Inventory-Epilepsy Scale (Caller 2016; Gandy 2014; Hum 2019), Sajatovic 2016 used the Montgomery Asberg Depression Rating Scale as an additional measurement of depression symptom severity, Dorris 2017 used the Paediatric Index of Emotional Distress (PI-ED), Brown 2019 used the Children's Depression Inventory — Short (CDI-S), Gilliam 2019 also used the Center for Epidemiologic Studies Depression Scale (CES-D) and the Mini-International Neuropsychiatric Interview to assess depression. Two studies assessed suicidal ideation (Ciechanowski 2010; Orjuela-Rojas 2015). The studies used nine different outcome measures for depression.

Anxiety

Six studies examined changes in the level of anxiety symptoms. Four studies used the Hospital Anxiety and Depression Scale for assessing anxiety (Gandy 2014; Leenen 2018; Orjuela-Rojas 2015; Ridsdale 2018). One study used the Generalized Anxiety Disorder-7 (Fraser 2015), and one study used the Beck Anxiety Inventory (Tang 2015).

Seizure-related outcomes

Thirteen studies measured seizure frequency (Au 2003; Ciechanowski 2010; Gilliam 2019; Jantzen 2009; Leenen 2018; Lundgren 2006; Lundgren 2008; May 2002; Rau 2006; Ridsdale 2018; Ring 2018; Sajatovic 2016; Tang 2015). Four studies used seizure severity measures: the National Hospital Seizure Severity Scale (NHS3) (Leenen 2018), the Liverpool Seizure Severity Scale (Pakpour 2015), the Epilepsy and Learning Disabilities Quality of Life Seizure Severity Scale (ELDQoL-SSS) (Ring 2018), and the Seizure Severity Index (Tang 2015).

Participants

Most studies evaluated the benefit of interventions for adults with epilepsy. One study investigated CBT for adolescents and young adults with epilepsy (Martinović 2006), Dorris 2017 investigated a consumer-driven self-management intervention for children and adolescents, Jantzen 2009, Rau 2006 and Turan Gurhopur 2018 investigated educational interventions for children and adolescents with epilepsy, and Brown 2019 investigated a behavior-change counseling intervention aimed at increasing physical activity in children with epilepsy. Two studies investigated skills-based interventions for adolescents and adults (Caller 2016; Helde 2005), and three studies investigated educational interventions for adolescents and adults (May 2002; Pfäfflin 2016; Ridsdale 2018).

Several studies used participants' psychological functioning (e.g. depressive symptoms) as one of the inclusion criteria. Seven studies included only adults with epilepsy and depressive symptoms (Ciechanowski 2010: PHQ-9 score ≥ 10; Gilliam 2019: CES-D score > 14; Hum 2019: a minimum score of 12 on the Center for Epidemiologic Studies Depression Scale Revised (CESD-R); Meyer 2019: at least moderate depression (PHQ > 9); Orjuela-Rojas 2015: major depression according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders-IV [DSM IV]; Schröder 2014: self-reported depressive symptoms; Thompson 2010: score of < 38 on the CESD-R). One study included adults with epilepsy and a DSM IV diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, or chronic/recurrent major depressive disorder (Sajatovic 2016). Most studies did not specifically recruit participants with comorbid psychiatric diagnoses. Two studies recruited participants who experience elevated levels of psychological difficulties without reaching diagnostic criteria: one study included adolescents and young adults with epilepsy and subthreshold depressive symptoms (Martinović 2006), and one study included adults with epilepsy and self-reported psychological distress (Au 2003). One study only included adults with epilepsy and other chronic comorbidities, because the intervention targeted adverse effects stemming from drug interactions (Beretta 2014). Another study included adolescents and adults with subjective memory complaints, since the intervention included special cognitive and memory training (Caller 2016).

Ten studies used inclusion criteria related to seizure frequency, epilepsy type, or drug-responsiveness: Au 2003 only included participants with at least two seizures per month; Brown 2019 and Gilliam 2019 only included participants with at least one seizure in the previous 12 months, Hosseini 2016 only included participants with primary generalized tonic-clonic epilepsy and uncontrolled seizures; Meyer 2019 only included participants with "active epilepsy" (i.e. having taken ASDs within the past five years or a seizure within the past 10 years), Lundgren 2006 and Lundgren 2008 only included participants with at least four seizures over three months; Ridsdale 2018 only included participants reporting at least two seizures in the previous year; Sajatovic 2018 included participants with at least one negative epilepsy-related health event within the past year; Tang 2015 only included participants with drug-resistant epilepsy; and Yadegary 2015 only included participants with at least one seizure during the past year. Altogether, the number of individuals with drug-responsive epilepsy and primary generalized epilepsy was comparably small in the study populations of all included studies. None of the studies reported whether individuals experienced nocturnal or diurnal seizures, or if individuals experienced focal unaware seizures or prodromal seizure warnings.

Most studies excluded individuals with intellectual disability (ID). Four studies did not explicitly mention ID as an exclusion criterion but intellectual functioning was also not included in the demographic characterization of the patient population (Dilorio 2011; Edward 2019; Hosseini 2016; Yadegary 2015). Only one study investigated a nurse-led intervention and included only participants with epilepsy and ID (Ring 2018).

We include more details on study participants in Table 1 and the Characteristics of included studies tables. Since the subgroups outlined in the review protocol were either comparatively small or the information was unavailable, we did not undertake any subgroup analysis.

We found two studies that were still ongoing. See Characteristics of ongoing studies for details.

Excluded studies

We excluded 26 RCTs because they did not examine HRQOL outcomes.

Risk of bias in included studies

We include details of our judgments and the rationale in the Characteristics of included studies tables, and display summaries in Figure 2 and Figure 3. We shared the details of our judgments with all study authors prior to the publication of this review, for further clarification.

Figure 2. 'Risk of bias' graph: review authors' judgements about each 'risk of bias' domain presented as percentages across all included studies

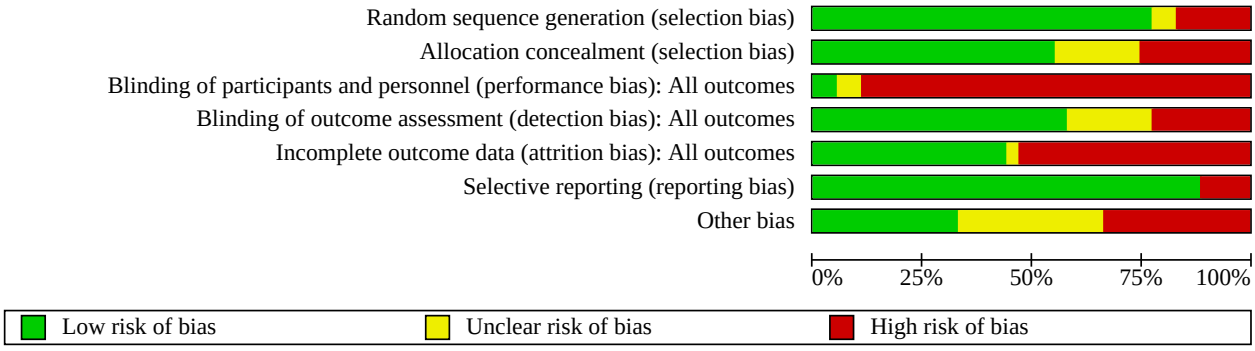


Figure 3. 'Risk of bias' summary: review authors' judgements about each 'risk of bias' domain for each included study

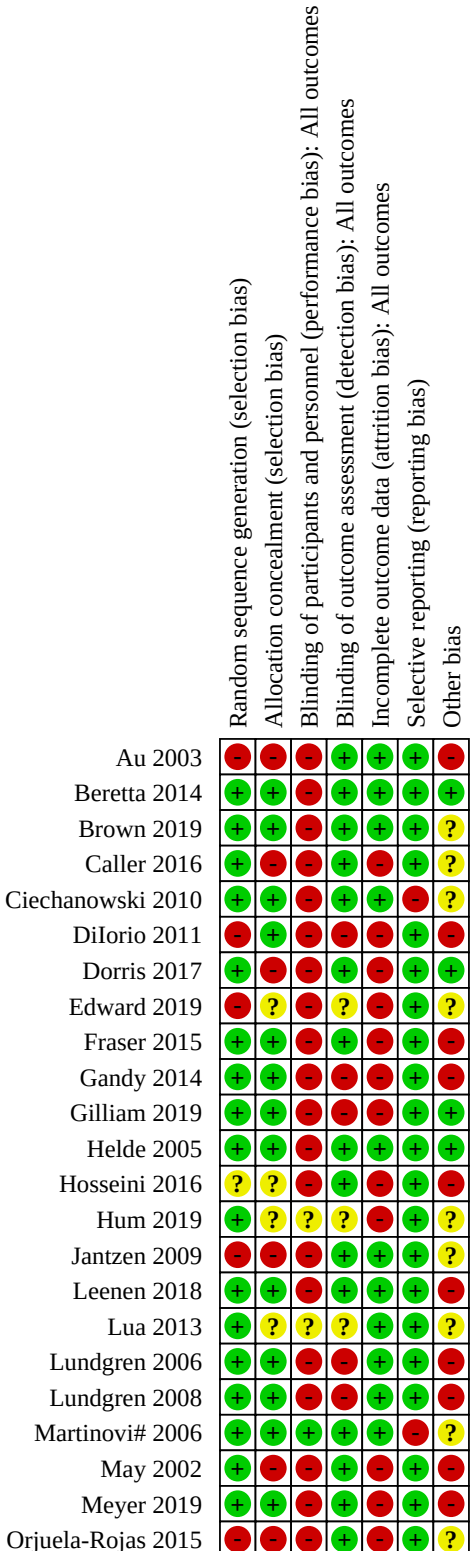
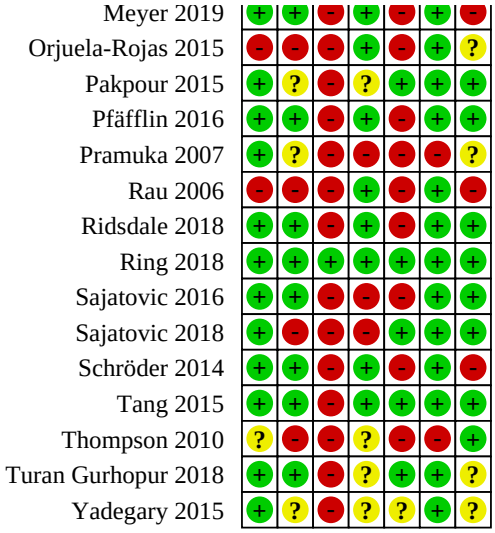


Figure 3. (Continued)



Allocation

Most studies (N = 28) reported an adequate method of random sequence generation (Beretta 2014; Brown 2019; Caller 2016; Ciechanowski 2010; Dorris 2017; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Hum 2019; Leenen 2018; Lua 2013; Lundgren 2006; Lundgren 2008; Martinović 2006; May 2002; Meyer 2019; Pakpour 2015; Pfäfflin 2016; Pramuka 2007; Ridsdale 2018; Ring 2018; Sajatovic 2016; Sajatovic 2018; Schröder 2014; Tang 2015; Turan Gurhopur 2018; Yadegary 2015). Two studies did not provide a sufficient description of the randomization process, hence were classified as unclear (Hosseini 2016; Thompson 2010). Reasons for a high risk of bias rating included quasi-randomized trial designs, such as a matched design (Au 2003), alternating assignment (DiIorio 2011), the placement of participants in the control group if they were unable to attend the intervention face-to-face sessions (Edward 2019), and allocation based on participants' application to one of two available courses in a wait-list control design (Jantzen 2009; Rau 2006). We rated one study at very serious risk of bias, since the allocation depended on the participants' ability to attend the meetings (Orjuela-Rojas 2015). One author provided further information to clarify the randomization procedure that had not been sufficiently described in the publication (Rau 2006).

Most of the studies (N = 20) reported proper procedures for allocation concealment (Beretta 2014; Ciechanowski 2010; DiIorio 2011; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Hosseini 2016; Lundgren 2006; Lundgren 2008; Leenen 2018; Martinović 2006; Meyer 2019; Pfäfflin 2016; Ridsdale 2018; Ring 2018; Sajatovic 2016; Schröder 2014; Tang 2015; Turan Gurhopur 2018). Allocation concealment can be considered inherent in study designs investigating a web-based intervention with a web-based registration and allocation procedure, hence a study with a low-quality randomization procedure could indeed feature a high-quality allocation concealment (DiIorio 2011). Nine studies reported an unconcealed allocation procedure (Au 2003; Caller 2016; Dorris 2017; Jantzen 2009; May 2002; Rau 2006; Sajatovic 2018; Thompson 2010; Orjuela-Rojas 2015), and seven studies provided insufficient descriptions (Brown 2019; Edward 2019; Hum 2019; Lua 2013; Pakpour 2015; Pramuka 2007; Yadegary 2015). Ten authors provided further information to clarify the allocation concealment procedure that had not been sufficiently described in the publication (Au 2003; Beretta 2014; Dorris 2017; Fraser 2015; Lundgren 2006; Lundgren 2008; May 2002; Ring 2018; Sajatovic 2018; Tang 2015).

Blinding

Blinding of participants and personnel is almost impossible to achieve when studying psychological treatments, so most studies had a high risk of bias (N = 30: Au 2003; Brown 2019; Beretta 2014; Caller 2016; Ciechanowski 2010; DiIorio 2011; Dorris 2017; Fraser 2015; Gandy 2014; Helde 2005; Hosseini 2016; Jantzen 2009; Leenen 2018; Lundgren 2006; Lundgren 2008; May 2002; Meyer 2019; Orjuela-Rojas 2015; Pakpour 2015; Pfäfflin 2016; Pramuka 2007; Rau 2006; Ridsdale 2018; Sajatovic 2016; Sajatovic 2018; Schröder 2014; Tang 2015; Thompson 2010; Turan Gurhopur 2018; Yadegary 2015). Four studies blinded the participants in both the treatment and the active control group, by telling them that they would participate in an intervention to improve coping with epilepsy (Lua 2013; Lundgren 2006; Lundgren 2008; Tang 2015). This was possible only if the study designs used an immediate and active control arm (social support group in two trials, Lundgren 2006; Tang 2015; yoga in one trial, Lundgren 2008; and paper-based education material in one trial, Lua 2013). There were no randomized personnel in three studies investigating a web-based intervention (DiIorio 2011; Meyer 2019; Schröder 2014). Two studies were classified as overall low risk, as the therapists who delivered the treatment (CBT and counseling as usual) were blinded to the participants' group status: the researchers only told the therapists that they would deliver psychological means to improve coping with epilepsy (Martinović 2006). Ring 2018 facilitated blinding of personnel and participants through cluster-randomization of intervention sites. In one study, the blinding status of the personnel delivering an SMS-based intervention remained unclear (Lua 2013) and in another study with an active control group and a WLC, the blinding status of personnel and participants remained unclear (Hum 2019).

We considered the risk of non-blinding of any type of control group that did not receive an immediate control intervention to be especially problematic, since it might lead to baseline imbalances of participant-reported outcome parameters, due to disappointment, i.e. the impression of having been denied an opportunity. Thus, we rated the risk lower in studies that obtained baseline measures prior to randomization. Thirteen studies reported this procedure (Brown 2019; DiIorio 2011; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Hosseini 2016; Lua 2013; Meyer 2019; Pfäfflin 2016; Ridsdale 2018; Sajatovic 2016; Sajatovic 2018).

Blinding of the assessment of participant-reported outcome data was adequate in most studies (N = 21: Au 2003; Brown 2019; Beretta 2014; Caller 2016; Ciechanowski 2010; Dorris 2017; Fraser 2015; Helde 2005; Hosseini 2016; Jantzen 2009; Leenen 2018; Martinović 2006; May 2002; Meyer 2019; Orjuela-Rojas 2015; Pfäfflin 2016; Rau 2006; Ridsdale 2018; Ring 2018; Schröder 2014; Tang 2015). Eight studies provided insufficient information (Brown 2019; Edward 2019; Hum 2019; Lua 2013; Pakpour 2015; Thompson 2010; Turan Gurhopur 2018; Yadegary 2015). Eight studies had a high detection bias, because personnel conducting the outcome assessment were aware of the treatment status (DiIorio 2011; Gandy 2014; Gilliam 2019; Lundgren 2006; Lundgren 2008; Pramuka 2007; Sajatovic 2016; Sajatovic 2018), although additional information was provided by Lundgren 2006 and Lundgren 2008 that outcome assessment was blinded only on seizure-related data. Thirteen authors provided further information on 16 studies to clarify the blinding of outcome assessment that had been insufficiently described in the publication (Au 2003; Brown 2019; Beretta 2014; DiIorio 2011; Fraser 2015; Gandy 2014; Jantzen 2009; Leenen 2018; Lundgren 2006; Lundgren 2008; Martinović 2006; May 2002; Orjuela-Rojas 2015; Ring 2018; Sajatovic 2016; Sajatovic 2018).

Incomplete outcome data

We rated three studies at low risk of attrition bias because all randomized participants completed the study (Au 2003; Lundgren 2006; Lundgren 2008). We rated 13 studies at low risk, as there were only a small amount of missing data, which were balanced across the groups, with justifiable reasons (Beretta 2014; Brown 2019; Ciechanowski 2010; Helde 2005; Jantzen 2009; Leenen 2018; Lua 2013; Martinović 2006; Pakpour 2015; Ring 2018; Sajatovic 2018; Tang 2015; Turan Gurhopur 2018). We rated 17 studies at high risk of bias, because of larger amounts of missing data (we applied a cut-off of 15% for short-term interventions [less than six months], and 20% for long-term interventions [at least six months]). Losses were balanced in three studies (Fraser 2015; Gilliam 2019; Ridsdale 2018), and unbalanced in 12 studies (Caller 2016; DiIorio 2011; Dorris 2017; Edward 2019; Gandy 2014; Hosseini 2016; Hum 2019; Meyer 2019; Orjuela-Rojas 2015; Pfäfflin 2016; Pramuka 2007; Sajatovic 2016). One study excluded participants who had missed more than one intervention session, which indicated that no intention-to-treat (ITT) analysis had been undertaken (Hosseini 2016). Three studies with overall high attrition only provided the total number of participants lost to follow-up, without reporting whether they belonged to the intervention or the control group (May 2002; Rau 2006; Thompson 2010). We assigned an unclear risk to one study that did not provide data on their attrition rate (Yadegary 2015).

The risk of attrition is usually quite high in experimental studies that require regular, active, and personal involvement of study participants, as is the case with psychological treatments. There were two studies that reimbursed their participants for participation in the study, but nonetheless had a high attrition rate (DiIorio 2011; Pramuka 2007).

Selective reporting

We rated 30 studies at low risk of bias as there was no evidence of selective outcome reporting within the publications, when examining all outcomes reported in the papers (Au 2003; Beretta 2014; Brown 2019; Caller 2016; Dorris 2017; Edward 2019; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Hosseini 2016; Hum 2019; Jantzen 2009; Leenen 2018; Lua 2013; Lundgren 2006; Lundgren 2008; May 2002; Meyer 2019; Orjuela-Rojas 2015; Pakpour 2015; Pfäfflin 2016; Rau 2006; Ridsdale 2018; Ring 2018; Sajatovic 2016; Sajatovic 2018; Tang 2015; Turan Gurhopur 2018; Yadegary 2015). We had initially rated six studies at a high risk of bias, as there was evidence of selective outcome reporting within the publications (Ciechanowski 2010; DiIorio 2011; Martinović 2006; Pramuka 2007; Schröder 2014; Thompson 2010). Two authors provided additional data (DiIorio 2011; Schröder 2014). We therefore ended up assessing four studies at high risk of bias due to evidence of selective outcome reporting within the publications (Ciechanowski 2010; Martinović 2006; Pramuka 2007; Thompson 2010).

Four research groups had previously published their study protocol as a separate publication (Leenen 2018; Meyer 2019; Ridsdale 2018; Sajatovic 2016). We requested study protocols from all other authors. We received 10 responses with complete registered protocols or documentation of the included outcome measures, and assessed the risk against these documents (Beretta 2014; Caller 2016; DiIorio 2011; Fraser 2015; Helde 2005; May 2002; Rau 2006, Sajatovic 2018; Schröder 2014; Tang 2015). We confirmed a rating of low risk of bias in 10 of the studies for which study protocols were available, as there was no evidence of selective outcome reporting following review of the documents (Beretta 2014; Caller 2016; Fraser 2015; Leenen 2018; Meyer 2019; Rau 2006; Ridsdale 2018; Sajatovic 2016; Sajatovic 2018; Tang 2015). For one study, additional outcome measures that would have been part of the scope of this review had originally been planned but then not obtained, due to a change of protocol (Schröder 2014). For three studies, it appeared that additional outcome measures had been obtained during the course of the study, but were not mentioned in the final publication (DiIorio 2011, Helde 2005; May 2002). However, these data were not part of the scope of this review. Nonetheless, we sought and obtained these data in two cases (DiIorio 2011; May 2002). In one case, the omitted outcome data that had aimed at capturing the development of the health economic variables (such as frequency of hospital admissions, missed school or work days, etc.) had been collected, but had never been analyzed (Helde 2005).

Other potential sources of bias

We considered other potential sources of bias, such as language bias, fidelity to the intervention protocol, competence in treatment delivery, and selective recruitment.

Our search yielded only one non-English publication, which was published in German (Rau 2006). However, we did not search non-English databases, so language bias remained unclear.

In general, we had little information to judge risks of bias in fidelity to the intervention protocol. Six studies reported the use of measures to assess adherence (Gandy 2014: regular

supervision with adherence checklist; Orjuela-Rojas 2015: regular monitoring with adherence checklist; Ridsdale 2018: all courses were audio-recorded and, of those, approximately 25% were chosen for the fidelity evaluation; Sajatovic 2016, Sajatovic 2018: sessions were audio-recorded and non-interventionist study staff evaluated fidelity; and Gilliam 2019: weekly supervision, monitoring and feedback by lead/senior psychologist with CBT adherence checklist). The results of their analysis were reported in two recent studies (Ridsdale 2018; Sajatovic 2018). Risk of infidelity to treatment protocol was rated low in these latter sudies. As a result, we sought clarification from all authors who had not reported the use of measures to assess fidelity to intervention protocol or the results thereof. Sajatovic 2016 replied that they had a high degree of fidelty and was therefore rated as low risk of bias. Eight studies provided additional details on their attempts to assess fidelity to the intervention protocol, with results (Beretta 2014: monitoring was carried out with regular on-site monitoring visits and verification of protocol adherence; Dorris 2017: audio recordings of each session were checked for fidelity ratings and regular supervision; Leenen 2018: forms were used to record if all sessions adhered to the intervention and session flip charts were reviewed after sessions) or without results; (Ciechanowski 2010: standard training protocols and supervision; Lundgren 2006 and Lundgren 2008: regular supervision; May 2002: regular supervision and video-taping of some sessions; Thompson 2010: adherence checklists). Beretta 2014 and Dorris 2017 were therefore rated as low risk of bias. We considered the risk of infidelity to the intervention protocol as low in three studies in which the delivery of the intervention was Internet-based (DiIorio 2011; Meyer 2019; Schröder 2014). In all other studies risk of infidelity to the intervention protocol was rated unclear (Au 2003; Brown 2019; Caller 2016; Edward 2019; Fraser 2015; Helde 2005; Hosseini 2016; Hum 2019; Jantzen 2009; Martinović 2006; Pakpour 2015; Pfäfflin 2016; Pramuka 2007; Sajatovic 2016; Tang 2015; Turan Gurhopur 2018; Yadegary 2015).

We assessed two dimensions of competence in treatment delivery. First, we reviewed the competence in terms of the professional training background of the personnel who delivered the intervention; in web-based intervention programs we evaluated the training background of the professionals who had designed the intervention. Second, we reviewed the competence of the measures used to assess the quality of actual treatment delivery. Most studies reported the training background of the personnel delivering the intervention (N = 21: Au 2003; Beretta 2014; Caller 2016; Ciechanowski 2010; DiIorio 2011; Dorris 2017; Edward 2019; Gandy 2014; Lundgren 2006; Lundgren 2008; Helde 2005; Hosseini 2016; Leenen 2018; Meyer 2019; Orjuela-Rojas 2015; Pakpour 2015; Pfäfflin 2016; Ring 2018; Ridsdale 2018; Sajatovic 2016; Sajatovic 2018). Seven studies provided additional details for training background (Brown 2019; Fraser 2015; Gilliam 2019; May 2002; Schröder 2014; Tang 2015; Thompson 2010), We rated the risk of bias as low for this domain in these studies. Four studies reported the use of measures to assess competence (Pakpour 2015: assessment of empathy, use of open-ended questions, etc; Ridsdale 2018: all courses were audio-recorded and, of those, approximately 25% were chosen for the competence evaluation; Sajatovic 2016: sessions were audio-recorded and non-interventionist study staff evaluated competence; Thompson 2010: supervision) The results of their analysis were reported in three studies (Pakpour 2015; Sajatovic 2016; Ridsdale 2018). We rated the risk of bias as low for competence in intervention delivery in these studies that reported results of the assessment. We sought clarification from all authors who had not reported the use of measures to assess competence or the results thereof. Six authors provided additional details about their attempts to assess competence, with results (Gilliam 2019: session recordings were reviewed for clinical supervision and quality assurance; Lundgren 2006 and Lundgren 2008: regular supervision) or without results (Gandy 2014: no measures to assess competence were used; May 2002: regular supervision and video-taping of some sessions; Pfäfflin 2016: regular supervision; Sajatovic 2018: sessions were assessed qualitatively for competence [rapport and empathy, engagement, timing, etc.]). As a result, we judged risk of incompetence to be low in three studies (Gilliam 2019; Lundgren 2006; Lundgren 2008), and competence to deliver the intervention protocol to be unclear in all other studies.

In general, we had little information to judge risks of bias in selective recruitment. Risk of selective recruitment was considered low in 12 studies that reported a consecutive recruitment procedure at the intervention site including screening of all patients for eligibility (Beretta 2014; Caller 2016; Dorris 2017; Gilliam 2019; Helde 2005; Pakpour 2015; Pfäfflin 2016; Ridsdale 2018; Ring 2018; Sajatovic 2016; Sajatovic 2018; Tang 2015; Thompson 2010). Risk of selective recruitment was considered high in all studies whose recruitment procedure involved subjective criteria (N = 2: Au 2003: subjective report of psychological distress; Leenen 2018: excluded patients who were not able or willing to function in group activities based on clinical judgment) or advertisement (N = 9: DiIorio 2011; Fraser 2015; Gandy 2014; Lundgren 2006; Lundgren 2008; May 2002; Meyer 2019; Rau 2006; Schröder 2014) or convenience sampling (N = 1: Hosseini 2016). Recruitment procedures were unclear in 11 studies (Brown 2019; Ciechanowski 2010; Edward 2019; Hum 2019; Jantzen 2009; Lua 2013; Martinović 2006; Orjuela-Rojas 2015; Pramuka 2007; Turan Gurhopur 2018; Yadegary 2015)

Effects of interventions

See: **Summary of findings 1** Psychological treatments compared with usual or supportive care

We have listed our outcomes in Table 2, organized in alphabetical order and categorized according to our operational definition of psychological treatment types.

Health-related quality of life

Quality of Life in Epilepsy Inventory (QOLIE-10, QOLIE-31, QOLIE-31-P, QOLIE-48, QOLIE-89)

Eleven studies (643 participants) contributed data to the meta-analysis; they investigated comparable skill-based psychological interventions and used the most common quality-of-life tool (QOLIE-31/-31-P/-89) as their outcome measure (also see Summary of findings 1). Seven studies used QOLIE-31 (Au 2003; Caller 2016; Ciechanowski 2010; Fraser 2015; Gandy 2014; Martinović 2006; Orjuela-Rojas 2015). Two studies used QOLIE-31-P (Leenen 2018; Tang 2015) and two studies used QOLIE-89 (Gilliam 2019; Helde 2005); all four study authors provided raw data allowing transformation to QOLIE-31 for the meta-analysis.

Meta analysis results

Among the 11 studies, two studies were of adolescents and adults (Caller 2016; Helde 2005), one of adolescents and young adults

(Martinović 2006), and eight of adults (Au 2003; Ciechanowski 2010; Fraser 2015; Gandy 2014; Gilliam 2019; Leenen 2018; Orjuela-Rojas 2015; Tang 2015). We found statistically significant mean changes in the total score and each subscale measure, except social function. A positive mean change indicated a postintervention improvement.

1. Total score (11 RCTs, 643 participants): significant mean change of 5.23 points (95% CI 3.02 to 7.44; P < 0.001; Chi^2 P = 0.08; I^2 = 41%); Analysis 1.1; Figure 4
2. Overall QoL (10 RCTs, 639 participants): significant mean change of 5.95 points (95% CI 3.05 to 8.85; P = < 0.001; Chi^2 P = 0.11; I^2 = 37%); Analysis 1.2; Figure 5.
3. Energy and fatigue (10 RCTs, 642 participants): significant mean change of 5.25 points (95% CI 1.56 to 8.93; P = 0.005; Chi^2 P = 0.05; I^2 = 48%); Analysis 1.3.
4. Emotional well-being (10 RCTs, 643 participants): significant mean change of 4.96 points (95% CI 0.70 to 9.21; P = 0.002; Chi^2 P = 0.002; I^2 = 66%); Analysis 1.4.
5. Seizure worry (10 RCTs, 632 participants): significant mean change of 4.35 points (95% CI 1.35 to 7.35; P = 0.005; Chi^2 P = 0.42; I^2 = 2%); Analysis 1.5.
6. Cognitive functioning (10 RCTs, 641 participants): significant mean change of 4.18 points (95% CI 1.82 to 6.54; P < 0.001; Chi^2 P = 0.69; I^2 = 0%); Analysis 1.6.
7. Medication effects (10 RCTs, 643 participants): significant mean change of 3.16 points (95% CI 0.01 to 6.32; P = 0.05; Chi^2 P = 0.62; I^2 = 0%); Analysis 1.7.
8. Social function (10 RCTs, 630 participants): non-significant mean change of 3.09 points (95% CI −0.17 to 6.35; P = 0.06; Chi^2 P = 0.68; I^2 = 0%); Analysis 1.8.

Figure 4. Forest plot of comparison: 1 QOLIE-31- Comparison of mean change from baseline, outcome: 1.1 QOLIE-31- total score.

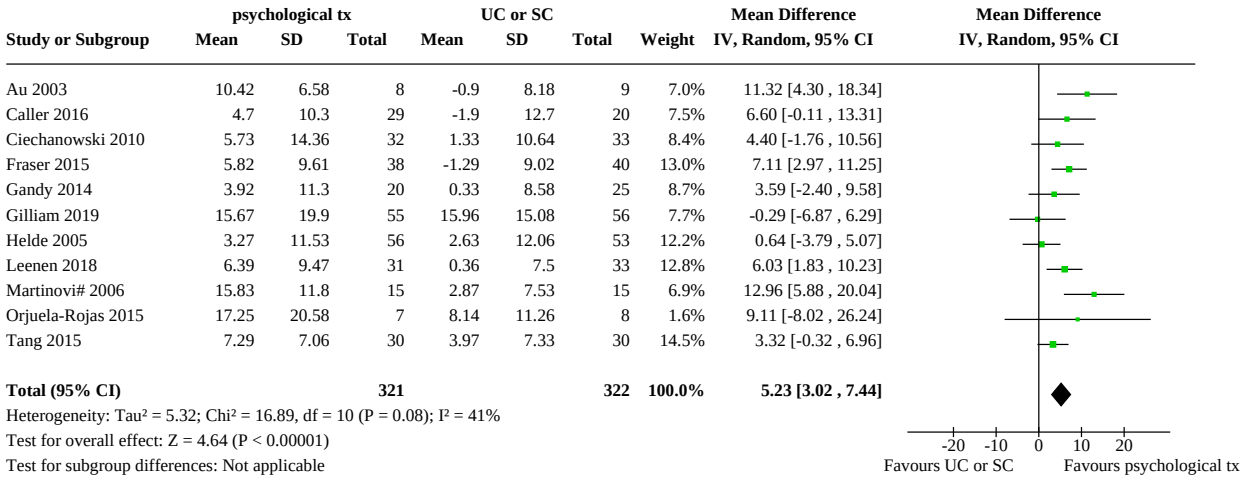
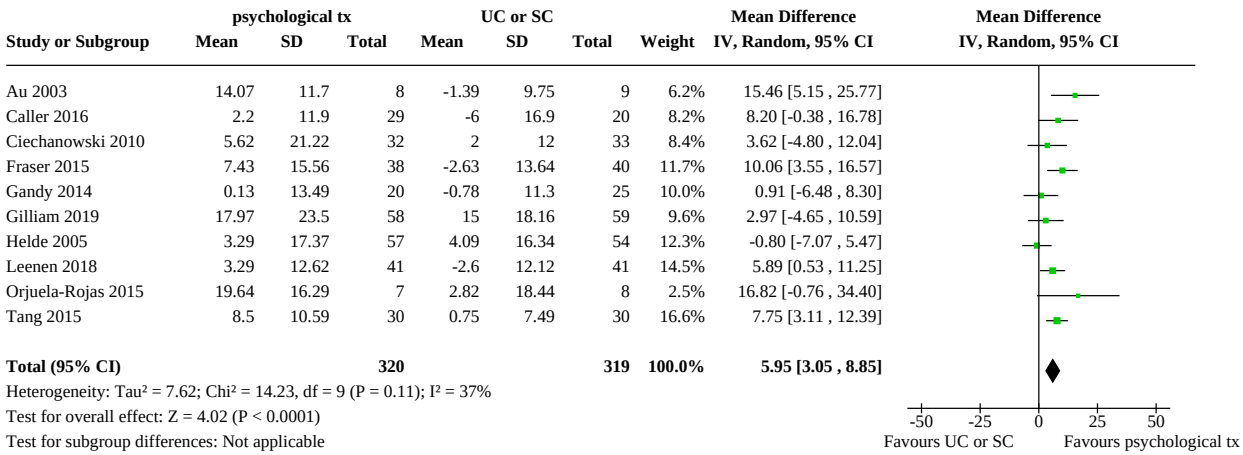


Figure 5. Forest plot of comparison: 1 QOLIE-31- Comparison of mean change from baseline, outcome: 1.2 QOLIE-31 - overall QoL subscale.



Funnel plots for analyses of QOLIE-31 total score and overall QoL are provided in Figure 6 and Figure 7, respectively. Within both plots, the Orjuela-Rojas 2015 study is clearly distinguishable from the other studies, but we interpret that this visually different result is due to this study having the smallest sample size and the most imprecise results (largest standard error) of all included studies, and that there is no clear evidence of publication bias from visual inspection of asymmetry of the plots.

Figure 6. Funnel plot of comparison: 1 QOLIE-31- Comparison of mean change from baseline, outcome: 1.1 QOLIE-31- total score.

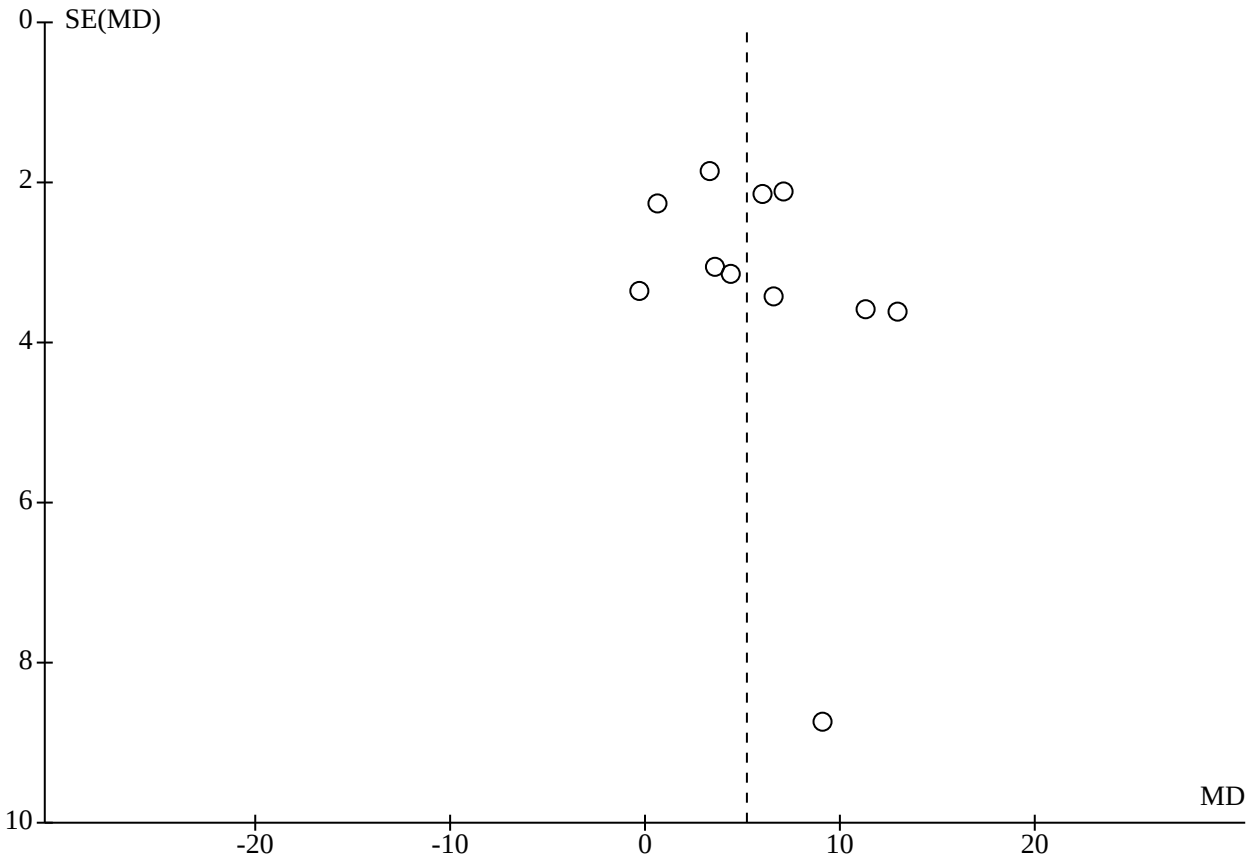
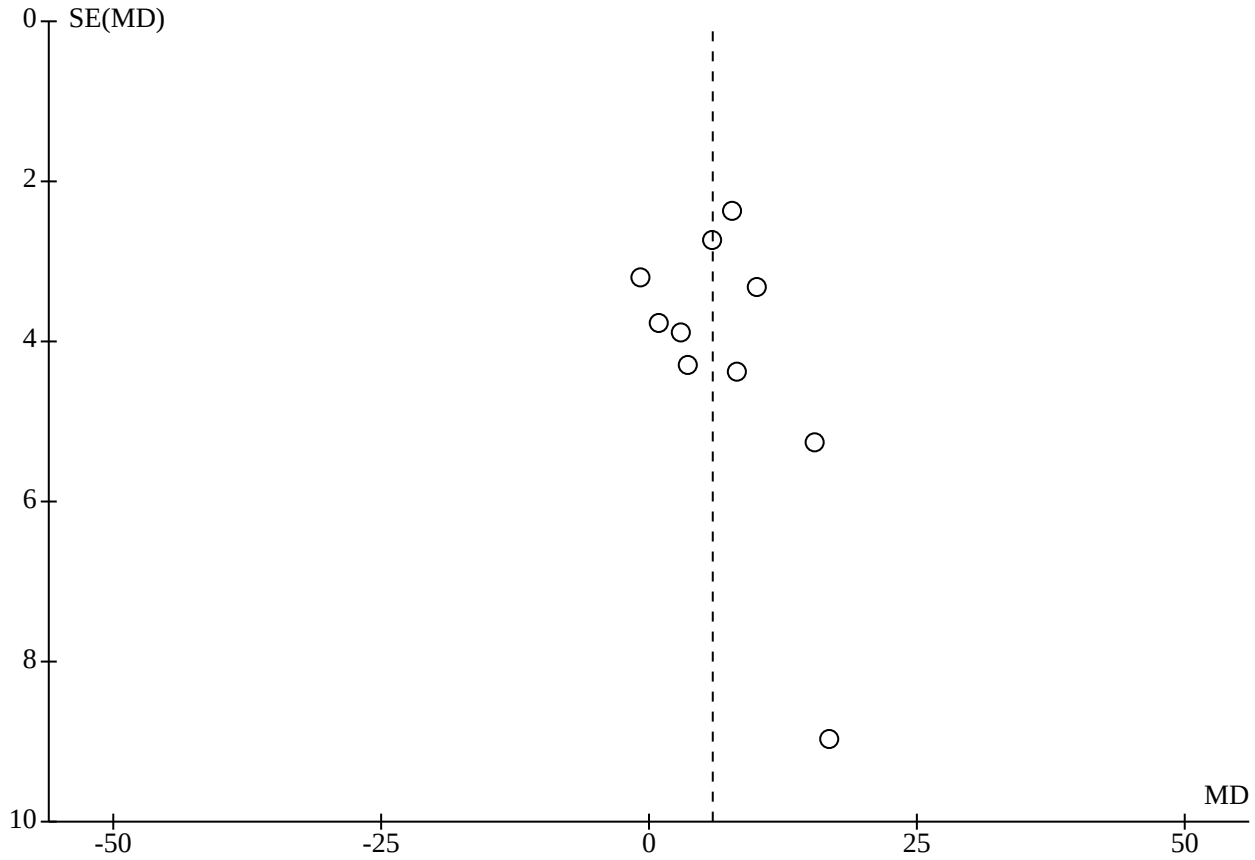


Figure 7. Funnel plot of comparison: 1 QOLIE-31- Comparison of mean change from baseline, outcome: 1.2 QOLIE-31 - overall QoL subscale.



Narrative results

We report the results of the 14 studies that used QOLIE-inventories and could not be included in the meta-analysis in narrative form. They were excluded because they were not skills-based but education-only interventions (four studies: Pfäfflin 2016, Ridsdale 2018; Beretta 2014, Lua 2013), or the uniqueness of the intervention protocol (two studies: Meyer 2019; Pakpour 2015), or inadequate data (Dilorio 2011; Hosseini 2016; Meyer 2019; Pramuka 2007; Sajatovic 2016; Sajatovic 2018; Turan Gurhopur 2018; Yadegary 2015).

Seven studies reported significant improvements in the treatment group when comparing the mean postintervention outcomes:

Hosseini 2016 reported a significant mean increase in the total score for the intervention group (mean change 35.95 [SD 8.74]; P < 0.001) and a significant mean decrease for the control group (mean change −8.07 [SD 8.91]; P < 0.001);
Lua 2013 (intervention mean 69.2 [SD 17.4] versus control mean 58.4 [SD 13.6]; P = 0.007);
Meyer 2019 (intervention mean 32.50 [SD 5.12] verses control mean 30.91 [SD 5.05]; P < 0.01 using intension-to-treat analysis);
Pakpour 2015 (intervention mean 62.14 [SD 13.21] versus control mean 56.01 [SD 12.12]; P < 0.001 [adjusted for variables such as age and gender]);
Sajatovic 2018 (SMART intervention mean 2.52 [SD 0.9] versus wait-list control mean 2.99 [SD 08] in which higher scores indicated worse quality of life; P < 0.001);
Turan Gurhopur 2018 (intervention mean increase 2.54 ± 0.238 versus control mean increase 2.26 ± 0.254, P < 0.002);
Yadegary 2015 (intervention mean 72.18 [SD 11.34] versus control mean 53.49 [SD 15.97]; P < 0.001).

The remaining seven studies did not report a significant mean postintervention difference in total scores between the treatment and control groups:

Beretta 2014 (intervention mean 63.00 [SD 15.48] versus control mean 65.04 [SD 14.38]; P value was reported to be non-significant, without precise value);
Dilorio 2011 (intervention mean 33.77 [SD 7.96] versus wait-list control mean 33.27 [SD 7.52]; P = 0.731);
Pfäfflin 2016 (intervention mean 68 (SD 21) versus control mean 66 [SD 20], P value was reported to be non-significant, without precise value);
Pramuka 2007 (intervention mean 67.3 [SD 2.6] versus control mean 65.0 [SD 2.8]; P value was reported to be non-significant, without precise value);
Ridsdale 2018 (intervention mean 66.3 [SD 13.0] versus control mean 65.5 [SD 14.0]; P = 0.195);
Sajatovic 2016 (intervention mean 2.38 [SD 0.60] versus control mean 3.03 [SD 0,79]; P = 0.129);

Schröder 2014 (intervention mean 50.55 [SD 3.69] versus control mean 52.22 [SD 3.19]; P = 0.667).

The potential impact of the three studies that did not contribute data to the meta-analysis was probably small (Hosseini 2016 [28 participants]; Yadegary 2015 [30 participants]; Pramuka 2007 [31 participants]), especially since two studies also reported significantly higher postintervention HRQOL in the treatment over the control groups (Hosseini 2016; Yadegary 2015).

Since most of the included studies had at least some bias issues, we did not perform a sensitivity analysis to compare studies at low risk of bias with studies at high risk of bias.

Other HRQOL outcome measures

Thirteen studies used other HRQOL outcome measures (Brown 2019; DiIorio 2011; Dorris 2017; Edward 2019; Hum 2019; Jantzen 2009; Lundgren 2006; Lundgren 2008; May 2002; Rau 2006; Ring 2018; Schröder 2014; Thompson 2010). We report the results in narrative form.

The World Health Organization Quality of Life instruction, short version (WHOQOL-BREF) was used in four studies (Hum 2019; Lundgren 2006; Lundgren 2008; Schröder 2014). Lundgren 2006 and Schröder 2014 reported a non-significant mean difference between groups (Lundgren 2006: intervention mean 58.36 [SD 9.66] and the control mean 55.31 [SD 6.59], P value was non-significant without precise value reported; Schröder 2014: intervention mean 75.9 [SD 15.04] versus control mean 78.62 [SD 17.39], P value was non-significant without precise value reported). Hum 2019 and Lundgren 2008 reported significant improvement in the intervention group (Hum 2019: P = 0.019; Lundgren 2008: P < 0.01) but not in the control group; however, the significance level for a group difference at postintervention was not specified (Hum 2019: mean changes from baseline scores for the intervention group, active control group, and wait-list control group were 6.88 [SD 2.6], 5.03 [SD 2.6], and 0.76 [SD 4.2], respectively; Lundgren 2008: postintervention group mean 57.2 [SD 7.2] versus control group mean 60.2 [SD 8.6]).

The Satisfaction with Life Scale (SWLS) was used by four studies (Edward 2019; Lundgren 2006; Lundgren 2008; Thompson 2010). Edward 2019 reported the mean scores at postintervention of the intervention group (mean 24.4 [SD 7.83] versus the control group 25.3 [SD 7.44]) without mentioning the significance level. Lundgren 2006 reported a significant group difference at postintervention (intervention group mean 23.28 [SD 4.58] versus control group mean 13.85 (SD 5.98); P < 0.05). Lundgren 2008 did not specify the significance level of the group difference at postintervention (intervention group mean 21.8 [SD 6.3] versus control group mean 21 [SD 7.1]). Thompson 2010 reported a non-significant difference between groups (21 [treatment mean] versus 18 [wait-list control mean]; P = 0.090; SD was not reported).

Seven studies used different HRQOL outcome measures:

Brown 2019 used the Childhood Epilepsy Quality of Life scale (CHEQOL: intervention mean of 77.5 [SD 13.3] versus control mean of 78.9 [SD 12.4]) and the KIDSCREEN-27 (intervention mean 50.4 [SD 10] versus control mean 47.5 [SD 7.6], but the significance level was not significant);
Dorris 2017 used two measures for quality of life, both showed non-significant postintervention mean between the intervention and control groups; the Paediatric Quality of Life Inventory PedsQL version 4.0 (intervention mean of 67.61 [SD 14.10] versus control mean of 66.93 [SD 17.28]) and the Glasgow Epilepsy Outcome Scale for Young Persons (GEOS-YP) (intervention mean 63.82 [SD 14.43] versus control mean 66.83 [SD 11.85]);
Edward 2019 reported the postintervention mean of the SF-12 physical health score (PCS) (intervention group mean of 52.1 [SD 8.82] versus control mean of 47.8 [SD 11.8]) and the mental health score (MCS) (intervention group mean of 47.3 [SD 8.65] versus control mean of 46.8 [SD 10.6]) without mentioning the significance level;
Jantzen 2009 reported that children and adolescents in the treatment group showed a significant increase in the social exclusion subscale in DISABKIDS, indicating better quality of life, based on postintervention scores (P value was not provided; d = 0.3 [Cohen] Cohen 1988);
May 2002 reported non-significant postintervention mean between groups using the Short-Form 36 mental component (intervention mean 43.69 [SD 11.51] versus wait-list control mean 42.46 [SD 11.75]), and the physical component (intervention mean 50.39 [SD 9.37] versus wait-list control mean 52.00 [SD 8.7]; P = 0.075);
Ring 2018 employed the Epilepsy and Learning Disabilities Quality of Life scale (ELDQoL). The comparison between the intervention group postintervention mean and control group was non-significant (mood scale intervention mean 26.01 [SD 8.74] versus control mean 26.64 [SD 8.81]; behavior scale intervention mean 15.65 [SD 6.51] versus control mean 16.28 [SD 6.77]);
Rau 2006 used the self-reported German questionnaire, Gesundheitsbezogene Lebensqualität und psychosoziale Auswirkungen der Epilepsie, (HRQoL and psychosocial consequences of epilepsy (intervention mean 70.62 [SD 13.29] versus wait-list control mean 77.25 [SD 15.0]; P = 0.075).

Psychiatric comorbidities outcome measures

Depression

Sixteen of the 36 studies included the level of depression as an outcome measure; all of them indicated that there were no statistical differences between the treatment and control groups at baseline. We used postintervention means to compare the differences between the two groups. Eight studies reported a significant postintervention difference between the intervention and control groups (Ciechanowski 2010; Fraser 2015; Gandy 2014; Hum 2019; Martinović 2006; Schröder 2014; Tang 2015; Thompson 2010). Nine studies used more than one outcome measure (Caller 2016; Ciechanowski 2010; Gandy 2014; Gilliam 2019; Hum 2019; Martinović 2006; Meyer 2019; Orjuela-Rojas 2015; Sajatovic 2016). Two studies, which used two outcome measures reported both significant and non-significant results (Ciechanowski 2010; Hum 2019). Eight studies reported non-significant results (Caller 2016; Dorris 2017; Leenen 2018; May 2002; Orjuela-Rojas 2015; Pfäfflin 2016; Ridsdale 2018; Sajatovic 2016). A lower mean score indicated fewer depressive complaints.

Beck Depression Inventory and Beck Depression Inventory-II (BDI and BDI-II)

In the six studies that used the BDI or BDI-II, four reported significantly better postintervention mean depressive symptoms in the treatment groups: Martinović 2006 (intervention mean 5.4 [SD 2.97] versus control mean 7.8 [SD 2.66]; P < 0.05); Schröder 2014 (intervention mean 15.84 [SD 13.00] versus control mean 18.37 [SD 10.23]; P = 0.01); Tang 2015 (intervention mean 6.90 [95% CI 4.49

to 9.31] versus control mean 9.47 [95% CI 6.26 to 12.67]; P = 0.045); Thompson 2010 (intervention mean 5.5 versus control mean 10.6; P value < 0.01). Gilliam 2019 and Orjuela-Rojas 2015 reported a non-significant difference (Gilliam 2019: intervention mean 12.8 [SD 11.9] versus control mean 12.3 [SD 9.9]; P value was not reported; Orjuela-Rojas 2015: intervention mean 17.2 versus control mean 14.6; P = 0.58; SD was not reported).

Hospital Anxiety and Depression Scale (HADS) for assessing depression (HADS-D)

Five studies used the HADS to assess depressive symptoms (Gandy 2014; Leenen 2018; Orjuela-Rojas 2015; Pfäfflin 2016; Ridsdale 2018). Gandy 2014 reported significantly better postintervention depressive symptoms in the treatment group (intervention mean 4.58 [SD 3.59] versus control mean 5.50 [SD 5.26]; P = 0.048), while in Leenen 2018 (intervention mean 5.7 [SD 2.7] versus control mean 5.5 [SD 2.6]), the P value was non-significant, without a precise value; Orjuela-Rojas 2015 (intervention mean 5.4 versus control mean 5.2; P = 0.93; SD was not reported); Pfäfflin 2016 (intervention mean 9.0% ≥ 11 and control mean 5.5% ≥ 11; P = 0.432); and Ridsdale 2018 (intervention mean 5.5 [SD 3.9] versus control mean 5.0 [SD 3.9], P value was non-significant, without precise value) reported a non-significant difference.

Patient Health Questionnnaire-9 for accessing depression (PHQ-9)

Five studies used the PHQ-9 to assess depressive symptoms (Caller 2016; Fraser 2015; Meyer 2019; Sajatovic 2016; Thompson 2010). Caller 2016 and Sajatovic 2016 reported a non-significant difference in postintervention changes (Caller 2016: intervention mean change −0.7 [SD 1] versus control mean change 1.2 [SD 1.2]; Sajatovic 2016: intervention group mean 9.70 [SD 5.55] versus control mean 11.76 [SD 5.72], P = 0.25). Fraser 2015 and Meyer 2019 reported significantly lower depression scores in the treatment group (Fraser 2015: intervention mean 6.3 [SD 5.5] versus control mean 8.6 [SD 6]; P = 0.02; Meyer 2019: intervention mean 10.42 [SD 4.38] versus control mean 12.73 [SD 4.19]; P < 0.001). Thompson 2010 used the PHQ-9 to identify individuals with a major depressive disorder at baseline, but did not provide postintervention data.

Neurological Disorders Depression Inventory for Epilepsy (NDDIE)

Four studies used the NDDIE to assess depressive symptoms (Caller 2016; Gandy 2014; Hum 2019; Meyer 2019). Gandy 2014 and Meyer 2019 found significantly reduced postintervention depressive symptoms in the treatment group (Gandy 2014: intervention mean 14.3 [SD 3.4] versus wait-list control mean 16.48 [SD 3.81]; P = 0.045; Meyer 2019; intervention mean 14.35 [SD 3.4] versus control mean 16.02 [SD 3.15]; P > 0.001). Hum 2019 reported a significant decrease in scores across time for the intervention group (mean change from baseline: 1.75 [SD 0.8], P = 0.023) and the active control group (mean change from baseline: 1.71 [SD 0.8], P = 0.016), but not the wait-list control group (mean change from baseline: 0.45 [SD 0.6], P = 0.654). Caller 2016 reported a non-significant difference in depressive symptoms between groups (treatment mean change from baseline −0.4 [SD 0.6] versus control mean change from baseline 0.7 [SD 0.8]; P = 0.30.

Other depression outcome measures

Three studies that used other measures found significant effects in the treatment group for postintervention depressive symptoms. Martinović 2006 used the Center for Epidemiological Study on Depression scale (intervention mean 9.8 [SD 4.2] versus control mean 13.6 [SD 4.64]; P < 0.05) and the Hamilton Depression Scale (intervention mean 3.3 [SD 1.29] versus control mean 5.8 [SD 1.98]; P < 0.05). Hum 2019 used the Quick Inventory of Depressive Symptomatology (QIDS) and found a significant decrease in scores across time for the intervention group (P = 0.014) and the active control group (P = 0.02), but not for the wait-list control group (P = 0.085). However, the significance level of the comparison of postintervention mean scores was not reported (intervention group: 9.55 [SD 1.1], active control group: 10.63 [SD 1.0] and wait-list control group 10.73 [SD 1.5]). Sajatovic 2016 used the Montgomery and Asberg Depression Rating Scale (MADRS) and found a significant treatment-by-time interaction effect (P = 0.036), and the comparison of postintervention group means (intervention group mean 16.75 [SD 10.28] versus control group mean 22.94 [SD 11.81]) was non-significant (P = 0.09).

Four studies that used other measures found non-significant differences in depressive symptoms between groups. Ciechanowski 2010 used the Hopkins Symptom Checklist-20 (treatment mean change from baseline −0.18 [SD 0.7] versus control mean change from baseline −0.48 [SD 0.7]; P = 0.09). May 2002 used the Depressive Mood Scale (intervention mean 13.63 [SD 8.99] versus wait-list control mean 12.22 [SD 8.86]; the P value was non-significant, without precise value). Brown 2019 and Dorris 2017 used pediatric depression outcome measures and found non-significant differences in depressive symptoms between groups. Brown 2019 used the Children's Depression Inventory — Short (CDI-S): intervention mean 45.6 (SD 6.9) versus control mean 44 (SD 4.8); Dorris 2017 used the Pediatric Index of Emotional Distress (PI-ED): intervention group mean: 14.95 (SD 6.39) versus control group mean: 13.39 (SD 6.69), P value was non-significant, without precise value.

Suicidal ideation

While Ciechanowski 2010 reported a significantly smaller proportion of participants with suicidal ideation at follow-up (decreasing 24% in the intervention group and increasing 12% in the usual care group; P = 0.025; post-treatment outcomes were not reported), Orjuela-Rojas 2015 did not find a significant difference in suicide risk between groups, using the Mini International Neuropsychiatric Interview (intervention mean 1.1 versus control mean 0.6; P = 0.42; SD was not reported).

Anxiety

Eight studies included the level of anxiety symptoms as an outcome measure (Fraser 2015; Gandy 2014; Leenen 2018; Meyer 2019; Orjuela-Rojas 2015; Pfäfflin 2016; Ridsdale 2018; Tang 2015). One study reported significant baseline differences between the intervention (11.2) and control (8.3); P = 0.04 (Orjuela-Rojas 2015). We used postintervention means to compare the difference between the two groups. A lower mean score indicated fewer anxiety complaints. Two studies reported a significant postintervention difference between the intervention and control groups (Meyer 2019; Tang 2015).

Beck Anxiety Inventory (BAI)

Among the eight studies that examined anxiety symptoms, only one study, using the BAI, reported significantly fewer postintervention anxiety symptoms between groups (intervention mean 9.73 [95% CI 6.35 to 13.22) versus control mean 10.70 [95% CI 7.24 to 14.16]; P = 0.008 [Tang 2015]). None of the remaining studies, assessing

anxiety with validated outcome measures, reported a significant difference.

Hospital Anxiety and Depression Scale (HADS) for assessing anxiety (HADS-A)

Gandy 2014 reported a non-significant postintervention difference between groups (intervention mean 6.11 [SD 2.96] versus control mean 7.45 [SD 3.78]; P = 0.089). Similar findings were also reported by Leenen 2018 (intervention mean 5.2 [SD 3.5] versus control mean 6.1 [SD 4.2], P value was non-significant, without precise value); Pfäfflin 2016 (20.9% with HADS-A ≥ 11 in the intervention group and 17.8% with HADS-A ≥ 11 in the control group; P value was non-significant, without precise value); Ridsdale 2018 (intervention mean 9.0 [SD 5.0] versus control mean 7.8 [SD 4.8], P = 0.917) and Orjuela-Rojas 2015 (intervention mean 9.7 versus control mean 9.2; P = 0.8). It is worth noting that in this study, the treatment group had a significantly higher anxiety score at baseline compared to control (11.2 versus 8.3; P value = 0.04).

Generalized Anxiety Disorder-7 (GAD-7)

While Meyer 2019 found a significant difference between groups at postintervention in symptoms of anxiety using the Generalized Anxiety Disorder-7 (intervention mean 7.74 [SD 4.3] versus control mean 9.82 [SD 3.91]; P < 0.001), Fraser 2015 did not find a significant difference between groups (intervention mean 5.4 [SD 6.6] versus control mean 6.1 [SD 5.1]; P = 0.282).

Seizure-related outcomes

Fifteen studies included seizure-related variables as outcome measures (Au 2003; Ciechanowski 2010; Gilliam 2019; Jantzen 2009; Leenen 2018; Lundgren 2006; Lundgren 2008; May 2002; Pakpour 2015; Rau 2006; Ridsdale 2018; Ring 2018; Sajatovic 2016; Sajatovic 2018; Tang 2015). Sajatovic 2018 reported negative health events (NHEs) which included seizure count but also other variables such as epilepsy-related emergency room visits and injuries. All of them reported no evidence of baseline imbalance between groups except in Lundgren 2008, in which no statistics were provided, and baseline imbalance was indicated from the raw data (treatment group N = 10, seizure frequency = 414; active control group N = 8, seizure frequency = 33). However, this study reported that 50% of participants in both the intervention and the active control groups were seizure-free at postintervention. Five studies reported a significant postintervention difference between the intervention and control groups (Lundgren 2006; Lundgren 2008; May 2002; Pakpour 2015; Tang 2015).

Three studies reported a significant postintervention reduction in seizure frequency between groups:
May 2002 (seizures per month in six months: intervention mean 2.77 [SD 1.64] versus control mean 2.74 [SD 1.62]; P < 0.041);
Lundgren 2006 (seizures in one month: intervention mean 0.71 [SD 0.91] versus control mean 6.00 (SD 3.91); P < 0.001);
Tang 2015 (seizures in six weeks: intervention mean 5.9 [95% CI 2.88 to 8.92] versus control mean 7.33 [95% CI 3.46 to 11.21]; P = 0.018).

Twelve studies reported non-significant postintervention differences between groups in seizure frequency: (Au 2003; Ciechanowski 2010; Gilliam 2019; Jantzen 2009; Lundgren 2008; Rau 2006; Ridsdale 2018; Sajatovic 2016), seizure recency (Ridsdale 2018), seizure severity (Gilliam 2019: seizure calendar; Leenen 2018: National Hospital Seizure Severity Scale (NHS3): intervention group mean 7.3 [SD 8.1] versus control group mean 8.4 [SD 9.3], P value was non-significant, without precise value; Ring 2018: Epilepsy and Learning Disabilities Quality of Life seizure severity scale (ELDQoL-SSS): intervention group mean 22.48 [SD 9.55] versus control group mean 23.07 [SD 9.70], P = 0.875).

Pakpour 2015 reported a significant postintervention reduction in seizure severity using the Liverpool Seizure Severity Scale (intervention mean 47.24 [SD 17.41] versus control mean 58.09 [SD 21.75]; P < 0.05).
Tang 2015 found no significant postintervention changes using the Seizure Severity Index (intervention mean 2.55 [95% CI 2.06 to 3.03] versus control mean 2.91 [95% CI 2.44 to 3.38]; P > 0.05).
Sajatovic 2018 also found no significant postintervention change of seizure count (intervention mean −1.4 [SD 5.12] versus control mean 5.5 [SD 0.62]; P = 0.60) and non-significant differences in seizure severity (intervention mean 19.52 [SD 8.3] versus control mean 17.91 [SD 7.8]; P = 0.06).

Lundgren 2006 and Lundgren 2008 measured seizure index (seizure frequency x seizure duration in seconds), which was not a validated outcome measure. With a comparable baseline seizure index, Lundgren 2006 reported significant postintervention reduction. Lundgren 2008 reported a significant difference in change scores between the two groups.

DISCUSSION

Despite our broad operational definition, psychological treatments for people with epilepsy have been investigated in a relatively small number of randomized controlled trials. We found 36 RCTs that fit our operational definition, and investigated HRQOL as a primary or secondary outcome parameter.

Summary of main results

Primary outcome measure

The Quality of Life in Epilepsy Inventory (QOLIE-10, QOLIE-31, QOLIE-31-P, QOLIE-48, QOLIE-89) was the most commonly used outcome measure for health-related quality of life (HRQOL), and was used in 25 studies. Results from the meta-analysis (11 studies: Au 2003; Caller 2016; Ciechanowski 2010; Fraser 2015; Gandy 2014; Gilliam 2019; Helde 2005; Leenen 2018; Martinović 2006; Orjuela-Rojas 2015; Tang 2015) found significant postintervention improvement for the total score and for six out of seven QOLIE-31 subscales (emotional well-being, energy and fatigue, overall QOL, seizure worry, cognitive functioning, and medication effects). The mean improvement in the total score and one subscale measuring overall QOL exceeded the minimally important change (MIC) threshold established by Borghs 2012 for a small effect size (d = 0.3 [Cohen]), indicating a clinically meaningful postintervention improvement in HRQOL (MIC: total score: 4.73 points; QoL score: 5.22 points). In the remaining 14 studies that were not included in the meta-analysis, seven reported significant differences between the treatment and control groups at post-treatment measures (Hosseini 2016; Lua 2013; Meyer 2019; Pakpour 2015; Sajatovic 2018; Turan Gurhopur 2018; Yadegary 2015), and seven reported non-significant group differences at post-treatment measures (Beretta 2014; DiIorio 2011; Pfäfflin 2016; Pramuka 2007; Ridsdale 2018; Sajatovic 2016; Schröder 2014). Eleven studies used HRQOL outcome measures other than the QOLIE inventories, but only three studies found a significant difference between the treatment and control groups at post-intervention, indicating significantly

better HRQOL in the treatment groups (Hum 2019; Jantzen 2009; Lundgren 2006).

Secondary outcome measures

Fewer than half of the studies (eight out of nineteen) examining depressive symptoms reported a decrease in symptoms for those receiving the treatment compared to control. Only two studies out of eight examining anxiety levels found a significant postintervention reduction in the treatment groups. A relatively small proportion of the studies (5/14) investigating seizure-related outcome measures reported a significant reduction at postintervention in the treatment groups.

Overall completeness and applicability of evidence

The studies in this updated review evaluated complex psychological treatments, typically applied in tertiary-care settings, and involved participant groups with comparable underlying epilepsy diagnoses, but differing severities of psychiatric and somatic comorbidities, and diverse cultural, ethnic, and socioeconomic backgrounds. There were differences between the included studies in their stated treatment methods, goals, strategies, and theoretical underpinnings. Psychologists with varying levels of experience delivered most of the treatments; team efforts including a wider range of specialists (doctors, nurses, social workers, etc.) were involved in some educational interventions. In some cases, the work of these therapists was carefully structured and supervised, while some studies presumably relied on shorter training courses.

We used 10 different outcome measures to investigate our primary outcome measure, i.e. HRQOL (QOLIE inventories, WHOQOL-BREF, SWLS, DISABKIDS, SF-12/-36, PedsQL, GEOS-YP, CheQoL, KIDSCREEN-27, ELDQoL). Hence, our efforts to pool data were hampered to some extent by the wide diversity of outcome measures used in these trials. We addressed this by including as many comparable outcome as possible. We therefore sought raw data from authors that used the QOLIE inventories convertible to QOLIE-31 (most commonly used in our included studies) and analyzed the mean change from baseline. In addition, we focused our meta-analyses on skills-based psychological interventions and did not include education-only interventions. The studies which are included in meta-analysis are representative of the whole evidence base for skills-based psychological interventions. We have no reason to think that the results from these meta-analyses would not be applicable in similar settings and patient groups.

Certainty of the evidence

We pooled results only from studies measuring the same construct (QOLIE-31, QOLIE-31-P, QOLIE-89) and limited meta-analysis to fairly similar interventions, to avoid clinical heterogeneity. Overall, the certainty of evidence of the meta-analysis was limited by a serious risk of bias in some of the included studies (e.g. Orjuela-Rojas 2015, with four high-risk and one unclear rating out of seven 'Risk of bias' parameters). Since most of the included studies had at least some bias issues, we did not perform a sensitivity analysis comparing studies with low risk of bias versus studies with high risk of bias. Given that the evidence directly answered our healthcare question, the results were precise enough, and fairly consistent across studies, and we found no evidence of publication bias or a dose-response gradient in the included studies, we considered there was no reason to further downgrade the certainty of the evidence. As the effect was not large, neither was there reason to upgrade the certainty of the evidence. Interpreting these findings with the GRADE approach, we are therefore moderately confident in the effect estimate that skills-based psychological interventions may enhance overall quality of life in people with epilepsy.

We identified RCTs and quasi-RCTs to include in this review, based on our operational definition of psychological interventions, regardless of the nature of the control group. The heterogeneity of control groups (e.g. usual care, wait-list control, other psychological or educational intervention, pharmacotherapy, etc.) may have influenced the interpretation of the effect of skills-based psychological interventions for people with epilepsy because they may have been attenuated by another evidence-based treatment (e.g. using sertraline for the treatment of depression in epilepsy in the control group, used by Gilliam 2019). As the number of included studies increases, we may take this into consideration and regroup our analyses in future updates.

In the process of evaluating the risks of bias, we considered two biases that are naturally inherent in the context of psychological intervention trials. The first bias was blinding of participants and the professionals who deliver the intervention. Although two studies managed to blind both participants and the professionals providing treatment (Martinović 2006 by using an active skills-based intervention control group, and Ring 2018 by using a cluster-randomized design), we considered this as a reasonable bias in psychological trials. Secondly, we rated all studies that included self-selection, e.g. through advertisement, web-based fora, study flyers, in the process of participant recruitment as having a high risk of bias for selective recruitment. We agreed that this is a high risk of bias for research design, but we could understand the reason from a clinical perspective, because patient volunteering may often reflect motivation to treatment. We therefore also considered this to be a reasonable bias in psychological trials.

Potential biases in the review process

The identification of relevant studies fitting our broad operational definition of psychological treatments was challenging. As outlined in the review protocol, we searched a wide variety of databases, including trial registers, and scanned reference lists of relevant systematic reviews. Two review authors independently evaluated all studies and referred to the wider group of review authors or the Epilepsy Review Group with any unresolved questions. Although this whole process was carried out carefully, we cannot discount the possibility that we may have missed a relevant study, or misjudged an included study or a study outcome. Since this review will be periodically updated, we will in future updates include any missed relevant studies, and correct misjudgments of included studies or study outcomes that come to our attention. Even though many of the included studies were published despite finding non-significant results, we cannot discount the potential risk of publication bias. However, the research community did not make us aware of trials that had been stopped or not published because of non-significant findings.

Three members of our review author team had also co-authored three of the included studies (Gandy 2014; Ridsdale 2018; Tang 2015). Following the strict standards of the Cochrane review process, we felt that this contributed a necessary critical expertise with the implementation of RCTs in this area of research, rather than an increased risk of bias. Gandy and Goldstein were not

involved in the actual review process. Since Tang had been involved in the review process, a second author with no conflict of interest (MR) assessed eligibility and risks of bias for her study.

Agreements and disagreements with other studies or reviews

The results of this review reinforced the conclusions of a recent systematic review of psychological treatments for epilepsy, which suggested that cognitive behavioral therapy and mindfulness-based interventions had consistently demonstrated significant improvements in HRQOL in prospective uncontrolled, as well as in controlled study designs (Tang 2014).

This review is in keeping with a systematic review of cognitive behavioral therapy for depression in people with epilepsy, which suggested that interventions tailored toward improving depression were possibly efficacious (Gandy 2013). Our results are also in line with the previous Cochrane Review focusing on seizure frequency as a primary outcome parameter, in that we could draw no reliable conclusions about the efficacy of psychological treatments in controlling seizures (Ramaratnam 2008).

From our review of randomized controlled trials investigating psychological treatments, we have identified the following two research problems in this area.

The feasibility of using randomized trial designs to study psychological interventions has been repeatedly challenged, primarily because the possibility of realistically balancing prognostic factors, on average, across intervention groups is questionable. The psychological (and psychopathological) make-up of most participants is regarded as being too multifaceted for this endeavor to be successful. In addition, these trial designs usually include pre- and postintervention outcome measurements only and are therefore limited in their ability to capture process-related outcomes. (Tschuschke 2005). Technology-focused outcome measures, such as electronic monitors and ecological momentary assessment (EMA) may provide systematic (i.e. equidistant) and frequent (e.g. daily) response data on symptoms, mood, and behavior. Such process-oriented variables may provide insight in nonlinear and complex dynamics of human change processes and therefore allow for more individualized psychotherapeutic management (Modi 2017).

Another important contributing factor to the effectiveness of psychological treatments is the therapeutic relationship between recipient and therapist (Baldwin 2013). However, no RCT investigating psychological treatment for epilepsy included this relationship as a variable.

AUTHORS' CONCLUSIONS

Implications for practice

We found moderate-certainty evidence that skills-based psychological interventions benefited adults with epilepsy in quality of life. The effect in the intervention groups was significantly better than in the control groups (using usual care, social support, counseling as usual, or selective serotonin reuptake inhibitors). Unfortunately, we found few interventions focused on quality of life in children and adolescents. Only one study (Ring 2018) investigated an intervention in individuals with intellectual disability (IQ < 70). These findings therefore can not be generalized to this population.

Implications for research

Increasing overall quality of reporting

In many cases, the quality of the study design and its implementation appeared to be better than the actual publication suggested. There are mechanisms available to raise the quality of reporting (e.g. submitting manuscripts of RCTs with a CONSORT checklist [Schulz 2010]). Adherence to the CONSORT guidelines and use of the CONSORT checklist may not only increase the effort by study authors and review authors, but it may also raise the quality of reporting in this resource-intensive field of research. The quality of reporting may be improved with small changes, such as including the descriptor 'assessor-blinded' in the title, since depending on the study design, this may be the only type of blinding that is feasible in this area of research. Adhering to CONSORT guidelines may be made difficult by a journal's word limitation policies. If that is the case, pertinent details about study design should be submitted as supplementary materials published online. Publication of research designs prior to conducting a study is now required by many journals, which increases transparency. The CONSORT group has developed an extension for trials assessing nonpharmacologic treatments to acknowledge and help navigate the specific challenges that are not addressed in the original CONSORT guidelines (Boutron 2008).

Furthermore, specific information about participant screening and selection will allow clinicians to assess the applicability of an intervention to their clinical setting or to modify an intervention for their patient population. We encourage the reporting of non-significant study results, since they also make important contributions to the concerns of the whole scientific community.

Increasing comparability by using common and meaningful HRQOL outcome measures

Investigators are encouraged to ensure that their outcome measures match the treatment goal of the investigated intervention (e.g. self-management, coping, etc.) (Modi 2017); HRQOL may constitute a secondary outcome measure. Despite diverse treatment goals and outcomes, the broad use of the standardized QOLIE inventories would increase comparability of studies investigating psychological treatments for children and adults with epilepsy.

Since many psychological treatments involve patient-oriented goal setting, it would be interesting to explore if the extended Quality of Life in Epilepsy-31-P would provide a more accurate reflection of the treatment effects than the use of the 'non-personalized' QOLIE-31, due to the individually-weighted calculation of scores for the individual's subjective evaluation. This exploration would require the correlation of this extended version with quantitative and qualitative clinical data in trials investigating psychological treatments.

We could not include any pediatric RCTs in the meta-analysis, due to a lack of epilepsy-specific HRQOL outcomes. Future pediatric studies should incorporate validated HRQOL measures that qualify as common data elements.

To help with the interpretation and evaluation of clinical rather than statistical relevance of outcomes, we recommend that all studies using HRQOL outcome measures for which a minimum clinically important change has been determined, include the percentage of participants whose results reached a minimum clinically important change, with confidence intervals.

If a minimum clinically important change has not been established, providing effect sizes would help readers to assess the clinical meaning of statistical results.

Increasing overall quality of study designs

In order to increase the overall quality of study designs, adequate randomization and allocation concealment, and blinded outcome assessment should be pursued when conducting RCTs investigating psychological treatments for people with epilepsy. As attrition is often high in this type of research, which requires active participation, an intention-to-treat analysis (or other appropriate statistical analysis accounting for follow-up data) should be carried out, and reasonable power calculations should be conducted to determine appropriate sample sizes. For active and immediate control groups, supportive therapy, social support, or regular counseling can be used as a control group for the effects of attention, which allows blinding of the participants to their treatment arm (Lundgren 2006; Martinović 2006; Tang 2015). To facilitate the attribution of treatment effects, the use of anti-seizure medications (ASMs) and the resulting changes should be recorded and reported. There are measures available that would allow for the evaluation of treatment fidelity, such as recording and scoring sessions, which should also be used and reported. Besides treatment fidelity, the quality of actual treatment delivery (i.e. the clinical skills of the therapist) should also be actively monitored and reported.

Due to limitations of self-report measures, future study designs could complement these measures with objective measures, e.g. hospital stays and emergency room visits, sick leaves and injuries, as well as biomarkers, such as functional Magnetic Resonance Imaging (fMRI), quantitative EEG analyses, etc. However, the validity of a number of fMRI studies has recently been questioned, which may have a large impact on the interpretation of weakly-significant neuroimaging findings (Eklund 2016).

In order to allow for a better assessment of the sustainability of study results, study designs should include a follow-up assessment of outcome measures at least three months after treatment discontinuation.

Increasing overall generalizability

Impaired intellectual function or disability or both are more common in people with epilepsy than in the general population, especially among people with early-onset epilepsy. Investigating the applicability of using skills-based psychological interventions or educational interventions in these populations could therefore provide important clinical insights. There was only one included study (Ring 2018) focused on using a skills-based psychological intervention for individuals with ID (IQ < 70). We recommend examining this subsample of people with epilepsy as a direction for further research.

Increasing implementation efforts

While an increasing number of clinical trials have investigated the efficacy of psychological interventions for people with epilepsy, only a smaller number of these interventions have outlasted the funding of the clinical trial period, and an even smaller number of interventions have been integrated into usual-care pathways in locations other than the original study site. Future funded studies may require a section and plan describing how implementation science addresses moving a successful intervention into clinical practice. In order to increase these implementation efforts, it seems essential to a) create training curricula, b) negotiate with insurance companies about acknowledging and reimbursing psychological treatments as part of usual care, and last but not least c) investigate the feasibility of replicating psychological intervention protocols in non-research settings and in particular in poorly-resourced environments where most of the world's population resides.

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REFERENCES

References to studies included in this review

Au 2003 *{published data only}*

Au A, Chan F, Li K, Leung P, Li P, Chan J. Cognitive-behavioral group treatment program for adults with epilepsy in Hong Kong. *Epilepsy & Behavior* 2003;**4**(4):441-6. [DOI: 10.1016/S1525-5050(03)00149-5] [PMID: 12899867]

Beretta 2014 *{published and unpublished data}*

Beretta S, Beghi E, Messina P, Gerardi F, Pescini F, La Licata A, et al. Comprehensive educational plan for patients with epilepsy and comorbidity (EDU-COM): a pragmatic randomised trial. *Journal of Neurology, Neurosurgery, and Psychiatry* 2014;**85**(8):889-94. [DOI: 10.1136/jnnp-2013-306553] [ISSN: 1468-330X 0022-3050] [PMID: 24403284]

Brown 2019 *{published data only}*

Brown DM, Mahlberg N, Pohl D, Timmons BW, Bray SR, Streiner DL, et al. Can behavioral strategies increase physical activity and influence depressive symptoms and quality of life among children with epilepsy? Results of a randomized controlled trial. *Epilepsy & Behavior* 2019;**94**:158-66. [DOI: dx.doi.org/10.1016/j.yebeh.2019.03.011] [ISSN: 1525-5069] [PMID: 30939411]

Caller 2016 *{published data only}*

Caller T, Ferguson R, Roth R, Secore K, Alexandre F, Zhao W, et al. Self-management (HOBSCOTCH) improves cognition and quality of life in epilepsy: a randomised controlled trial. *Neurology* 2016;**86**(16 Supplement):Abstract no: S22.005.

* Caller TA, Ferguson RJ, Roth RM, Secore KL, Alexandre FP, Zhao W, et al. A cognitive behavioral intervention (HOBSCOTCH) improves quality of life and attention in epilepsy. *Epilepsy & Behavior* 2016;**57**(Part A):111-7. [DOI: 10.1016/j.yebeh.2016.01.024] [PMID: 26943948]

Caller TA, Secore KL, Ferguson RJ, Roth RM, Alexandre FP, Kleen J, et al. A randomized controlled trial of hobscotch: a self-management intervention for cognitive impairment in epilepsy. *Epilepsy Currents* 2015;**15**(Suppl 1):39, Abstract no: 1.086. [ISSN: 1535-7597]

Jobst B, Caller T, Ferguson R, Roth R, Secore K, Alexandre F, et al. A cognitive-behavioral intervention (Hobscotch) improves quality of life and attention in epilepsy: a pilot study. *Epilepsia* 2016;**57**(Suppl 2):28, Abstract no: 0063. [DOI: 10.1111/epi.13609]

Streltzov N, Schimdt S, Zhao W, Roth R, Secore K, Schommer L, et al. Improving quality of life in epilepsy: replication and generalizability of an epilepsy self-management and cognitive training program (HOBSCOTCH). *Neurology* 2017;**88**(16 Suppl):Abstract no: S55.003.

Ciechanowski 2010 *{published and unpublished data}*

Chaytor N, Ciechanowski P, Miller JW, Fraser R, Russo J, Unutzer J, et al. Long-term outcomes from the PEARLS randomised trial for the treatment of depression in patients with epilepsy. *Epilepsy & Behavior* 2011;**20**(3):545-9. [DOI: 10.1016/j.yebeh.2011.01.017] [ISSN: 1525-5069] [PMID: 21333607]

* Ciechanowski P, Chaytor N, Miller J, Fraser R, Russo J, Unutzer J, et al. PEARLS depression treatment for individuals with epilepsy: a randomised controlled trial. *Epilepsy & Behavior* 2010;**19**(3):225-31. [DOI: 10.1016/j.yebeh.2010.06.003] [ISSN: 1525-5069] [PMID: 20609631]

DiIorio 2011 *{published and unpublished data}*

DiIorio C, Bamps Y, Walker E. Results of a randomised controlled trial evaluating WebEase, an online self-management program. *Epilepsy Currents* 2011;**11**(Suppl 1):Abstract no: 2.358.

* DiIorio C, Bamps Y, Walker ER, Escoffery C. Results of a research study evaluating WebEase, an online epilepsy self-management program. *Epilepsy & Behavior* 2011;**22**(3):469-74. [DOI: 10.1016/j.yebeh.2011.07.030] [ISSN: 1525-5069] [PMID: 21889413]

Dorris 2017 *{published data only}*

* Dorris L, Broome H, Wilson M, Grant C, Young D, Baker G, et al. A randomized controlled trial of a manual-based psychosocial group intervention for young people with epilepsy [PIE]. *Epilepsy & Behavior* 2017;**72**:89-98. [DOI: https://dx.doi.org/10.1016/j.yebeh.2017.04.007] [ISSN: 1525-5069] [PMID: 28575774]

Dorris L, Broome H, Wilson M, Grant C. Three-month outcomes of an RCT psychosocial group intervention for young people with epilepsy (PIE). *Epilepsia* 2016;**57**(Suppl 2):14, Abstract no: 0024. [DOI: 10.1111/epi.13609]

Edward 2019 *{published data only}*

Edward K-L, Cook M, Stephenson J, Giandinoto J-A. The impact of brief lifestyle self-management education for the control of seizures. *British Journal of Nursing* 2019;**28**(6):348-54. [DOI: dx.doi.org/10.12968/bjon.2019.28.6.348] [ISSN: 0966-0461] [PMID: 30925235]

Fraser 2015 *{published data only}*

Fraser RT, Johnson EK, Lashley S, Barber J, Chaytor N, Miller J, et al. Paces in epilepsy: results of a self-management randomized controlled trial. *Epilepsy Currents* 2015;**15**(Suppl 1):200, Abstract no: 2.039. [ISSN: 1535-7597]

Fraser RT, Johnson EK, Lashley S, Barber J, Chaytor N, Miller J, et al. The program for active consumer engagement in self-management (PACES) in epilepsy. *Epilepsia* 2015;**56**(Suppl 1):49, Abstract no: p0169. [DOI: 10.1111/epi.13241]

* Fraser RT, Johnson EK, Lashley S, Barber J, Chaytor N, Miller JW, et al. PACES in epilepsy: results of a self-management randomised controlled trial. *Epilepsia* 2015;**56**(8):1264-74. [DOI: 10.1111/epi.13052] [PMID: 26122460]

Gandy 2014 *{published and unpublished data}*

Gandy M, Sharpe L, Nicholson Perry K, Thayer Z, Miller L, Boserio J, et al. Cognitive behaviour therapy to improve mood in people with epilepsy: a randomised controlled

trial. *Cognitive Behaviour Therapy* 2014;**43**(2):153-66. [DOI: 10.1080/16506073.2014.892530] [PMID: 24635701]

Gilliam 2019 *{published data only}*

Gilliam FG, Black K, Carter J, Freedland KE, Sheline YI, Tsai W-Y, et al. A trial of sertraline or cognitive behavior therapy for depression in epilepsy. *Annals of Neurology* 2019;**86**(4):552-60. [DOI: dx.doi.org/10.1002/ana.25561] [ISSN: 1531-8249] [PMID: 31359460]

Helde 2005 *{published and unpublished data}*

Helde G, Bovim G, Bråthen G, Brodtkorb E. A structured, nurse-led intervention program improves quality of life in patients with epilepsy: a randomised, controlled trial. *Epilepsy & Behavior* 2005;**7**(3):451-7. [DOI: 10.1016/j.yebeh.2005.06.008] [PMID: 16087407]

Hosseini 2016 *{published data only (unpublished sought but not used)}*

Hosseini N, Mokhtari S, Momeni E, Vossoughi M, Barekatian M. Effect of motivational interviewing on quality of life in patients with epilepsy. *Epilepsy & Behavior* 2016;**55**:70-4. [DOI: 10.1016/j.yebeh.2015.10.012] [PMID: 26773672]

Hum 2019 *{published data only}*

Hum KM, Chan CJ, Gane J, Conway L, McAndrews MP, Smith ML. Do distance-delivery group interventions improve depression in people with epilepsy? *Epilepsy & Behavior* 2019;**98**(Pt A):153-60. [DOI: dx.doi.org/10.1016/j.yebeh.2019.06.037] [ISSN: 1525-5069] [PMID: 31374471]

Jantzen 2009 *{published data only}*

Jantzen S, Muller-Godeffroy E, Hallfahrt-Krisl T, Aksu F, Pust B, Kohl B, et al. FLIP&FLAP-a training programme for children and adolescents with epilepsy, and their parents. *Seizure* 2009;**18**(7):478-86. [DOI: 10.1016/j.seizure.2009.04.007] [ISSN: 1532-2688] [PMID: 19477662]

Leenen 2018 *{published data only}*

* Leenen LA, Wijnen BF, Kessels AG, Chan H, de Kinderen RJ, Evers SM, et al. Effectiveness of a multicomponent self-management intervention for adults with epilepsy (ZMILE study): a randomized controlled trial. *Epilepsy & Behavior* 2018;**80**:259-65. [DOI: dx.doi.org/10.1016/j.yebeh.2018.01.019] [ISSN: 1525-5069] [PMID: 29449140]

Wijnen B, Leenen L, De Kinderen R, Van Heugten C, Majoie M, Evers S. An economic evaluation of a multicomponent self-management intervention for adults with epilepsy (ZMILE study). *European Journal of Neurology* 2017;**24**(Suppl 1):72, Abstract no: O2218. [DOI: 10.1111/ene.13366]

Wijnen BF, Leenen LA, de Kinderen RJ, van Heugten CM, Majoie MH, Evers SM. An economic evaluation of a multicomponent self-management intervention for adults with epilepsy (ZMILE study). *Epilepsia* 2017;**58**(8):1398-408. [DOI: dx.doi.org/10.1111/epi.13806] [ISSN: 1528-1167] [PMID: 28589669]

Lua 2013 *{published data only (unpublished sought but not used)}*

Lua PL, Neni WS. A randomised controlled trial of an SMS-based mobile epilepsy education system. *Journal of Telemedicine and Telecare* 2013;**19**(1):23-8. [DOI: 10.1177/1357633x12473920] [PMID: 23390210]

* Lua PL, Neni WS. Health-related quality of life improvement via telemedicine for epilepsy: printed versus SMS-based education intervention. *Quality of Life Research* 2013;**22**(8):2123-32. [DOI: 10.1007/s11136-013-0352-6] [PMID: 23329469]

Lundgren 2006 *{published data only}*

Lundgren T, Dahl J, Melin L, Kies B. Evaluation of acceptance and commitment therapy for drug refractory epilepsy: a randomised controlled trial in South Africa - a pilot study. *Epilepsia* 2006;**47**(12):2173-9. [DOI: 10.1111/j.1528-1167.2006.00892.x] [PMID: 17201719]

Lundgren 2008 *{published data only}*

Dahl JC, Lundgren TL, Yardi N. Evaluation of short term ACT psychotherapy and yoga in a RCT trial for refractory seizures in India. *Epilepsia* 2005;**46 Suppl 6**:196, Abstract no: p545.

* Lundgren T, Dahl J, Yardi N, Melin L. Acceptance and Commitment Therapy and yoga for drug-refractory epilepsy: a randomised controlled trial. *Epilepsy & Behavior* 2008;**13**(1):102-8. [DOI: 10.1016/j.yebeh.2008.02.009] [PMID: 18343200]

Martinović 2006 *{published data only}*

Martinović Z, Simonović P, Djokić R. Preventing depression in adolescents with epilepsy. *Epilepsy & Behavior* 2006;**9**(4):619-24. [DOI: 10.1016/j.yebeh.2006.08.017] [ISSN: 1525-5050] [PMID: 17049927]

May 2002 *{published data only}*

May TW, Pfäfflin M. The efficacy of an educational treatment program for patients with epilepsy (MOSES): results of a controlled, randomised study. *Epilepsia* 2002;**43**(5):539-49. [ISSN: 0013-9580] [PMID: 12027917]

Meyer 2019 *{published data only}*

* Meyer B, Weiss M, Holtkamp M, Arnold S, Brückner K, Schröder J, et al. Effects of an epilepsy-specific Internet intervention (Emyna) on depression: results of the ENCODE randomized controlled trial. *Epilepsia* 2019;**60**(4):656-68. [DOI: 10.1111/epi.14673] [ISSN: 0013-9580] [PMID: 30802941]

Meyer B, Weiss M, Holtkamp M, Arnold S, Bruckner K, Schroder J, et al. Protocol for the ENCODE trial: evaluating a novel online depression intervention for persons with epilepsy. *BMC Psychiatry* 2017;**17**:55. [DOI: 10.1186/s12888-017-1229-y] [ISSN: 1471-244X] [PMID: 28173780]

Orjuela-Rojas 2015 *{published data only}*

Orjuela-Rojas JM, Martinez-Juarez IE, Ruiz-Chow A, Crail-Melendez D. Treatment of depression in patients with temporal lobe epilepsy: a pilot study of cognitive behavioral therapy vs. selective serotonin reuptake inhibitors. *Epilepsy & Behavior* 2015;**51**:176-81. [DOI: 10.1016/j.yebeh.2015.07.033] [PMID: 26284748]

Pakpour 2015 *{published data only}*

Pakpour AH, Gholami M, Esmaeili R, Naghibi SA, Updegraff JA, Molloy GJ, et al. A randomised controlled multimodal behavioral intervention trial for improving antiepileptic drug adherence. *Epilepsy & Behavior* 2015;**52**(Pt A):133-42. [DOI: 10.1016/j.yebeh.2015.08.036] [PMID: 26414343]

Pfäfflin 2016 *{published data only}*

Pfäfflin M, Schmitz B, May TW. Efficacy of the epilepsy nurse: results of a randomised controlled study. *Epilepsia* 2016;**57**(7):1190-8. [DOI: 10.1111/epi.13424] [ISSN: 0013-9580, Print 1528-1167, Electronic] [PMID: 27265887]

Pramuka 2007 *{published data only}*

Pramuka M, Hendrickson R, Zinski A, Van Cott AC. A psychosocial self-management program for epilepsy: a randomised pilot study in adults. *Epilepsy & Behavior* 2007;**11**(4):533-45. [DOI: 10.1016/j.yebeh.2007.06.013] [PMID: 17904909]

Rau 2006 *{published data only}*

Rau J, May TW, Pfäfflin M, Heubrock D, Petermann F. Education of children with epilepsy and their parents by the modular education program epilepsy for families (FAMOSES)--results of an evaluation study. *Rehabilitation* 2006;**45**(1):27-39. [DOI: 10.1055/s-2005-915371] [PMID: 16468111]

Ridsdale 2018 *{published data only}***57937389**

Kralj-Hans I, Goldstein LH, Noble AJ, Landau S, Magill N, McCrone P, et al. Self-Management education for adults with poorly controlled epILEpsy (SMILE (UK)): a randomised controlled trial protocol. *BMC Neurology* 2014;**14**:69. [DOI: dx.doi.org/10.1186/1471-2377-14-69] [ISSN: 1471-2377] [PMID: 24694207]

Ridsdale L, Kralj-Hans I, Noble A, Landau S, McCrone P, Morgan M, et al. Self-management education for epilepsy: an RCT protocol. *Journal of Neurology, Neurosurgery and Psychiatry* 2014;**85**(10):A20-A21, Abstract no: 076. [DOI: dx.doi.org/10.1136/jnnp-2014-309236.76]

* Ridsdale L, McKinlay A, Wojewodka G, Robinson EJ, Mosweu I, Feehan SJ, et al. Self-Management education for adults with poorly controlled epILEpsy [SMILE (UK)]: a randomised controlled trial. *Health Technology Assessment (Winchester, England)* 2018;**22**(21):1-142. [DOI: dx.doi.org/10.3310/hta22210] [ISSN: 2046-4924] [PMID: 29717699]

Ridsdale L, Wojewodka G, Robinson E, Landau S, Noble AJ, Morgan M, et al. Self-management education for adults with poorly controlled epilepsy (SMILE-UK). *Epilepsia* 2017;**58**(Suppl 5):S19, Abstract no: 0042. [DOI: 10.1111/epi.13944]

Ridsdale L. Self-management education for adults with poorly controlled epilepsy: the SMILE trial. *European Journal of Neurology* 2015;**22**(Suppl 1):118, Abstract no: L101. [DOI: dx.doi.org/10.1111/ene.12806]

Ring 2018 *{published data only}*

Ring H, Howlett J, Pennington M, Smith C, Redley M, Murphy C, et al. Training nurses in a competency framework to support adults with epilepsy and intellectual disability: the EpAID cluster RCT. *Health Technology Assessment* 2018;**22**(10):1-104. [DOI: 10.3310/hta22100] [PMID: 29457585]

Sajatovic 2016 *{published data only}*

Sajatovic M, Tatsuoka C, Welter E, Perzynski AT, Colon-Zimmermann K, Van Doren JR, et al. Targeted self-management of epilepsy and mental illness for individuals with epilepsy and psychiatric comorbidity. *Epilepsy & Behavior* 2016;**64**(Pt A):152-9. [DOI: dx.doi.org/10.1016/j.yebeh.2016.08.012] [ISSN: 1525-5069] [PMID: 27743547]

Sajatovic 2018 *{published data only}*

Sajatovic M, Colon-Zimmermann K, Kahriman M, Fuentes-Casiano E, Burant C, Aebi ME, et al. One-year follow-up of a remotely delivered epilepsy self-management program in high-risk people with epilepsy. *Epilepsy & Behavior* 2019;**96**:237-43. [DOI: dx.doi.org/10.1016/j.yebeh.2019.04.034] [ISSN: 1525-5069] [PMID: 31126825]

* Sajatovic M, Colon-Zimmermann K, Kahriman M, Fuentes-Casiano E, Liu H, Tatsuoka C, et al. A 6-month prospective randomized controlled trial of remotely delivered group format epilepsy self-management versus waitlist control for high-risk people with epilepsy. *Epilepsia* 2018;**59**(9):1684-95. [DOI: dx.doi.org/10.1111/epi.14527] [ISSN: 1528-1167] [PMID: 30098003]

Schröder 2014 *{published and unpublished data}*

Schröder J, Brückner K, Fischer A, Lindenau M, Köther U, Vettorazzi E, et al. Efficacy of a psychological online intervention for depression in people with epilepsy: a randomised controlled trial. *Epilepsia* 2014;**55**(12):2069-76. [DOI: 10.1111/epi.12833] [PMID: 25410633]

Tang 2015 *{published data only}*

Tang V, Kwan P, Poon WS. Mindfulness-based psychological treatment and social support intervention for drug-resistant epilepsy: a randomised, assessor-blinded, controlled trial. *Epilepsia* 2013;**54**(Suppl 3):324, Abstract no: P1027. [DOI: 10.1111/epi.12229]

* Tang V, Poon WS, Kwan P. Mindfulness-based therapy for drug-resistant epilepsy: an assessor-blinded randomised trial. *Neurology* 2015;**85**(13):1100-7. [DOI: 10.1212/WNL.0000000000001967] [PMID: 26333801]

Thompson 2010 *{published data only}*

Thompson NJ, Patel A, Selwa LM, Begley CE, Fraser RT, Johnson E, et al. Preventing depression in epilepsy: Project Uplift. *Epilepsy Currents* 2013;**13**(Suppl 1):489, Abstract no: C.06. [ISSN: 1535-7597]

* Thompson NJ, Walker ER, Obolensky N, Winning A, Barmon C, Diiorio C, et al. Distance delivery of mindfulness-based cognitive therapy for depression: project UPLIFT. *Epilepsy & Behavior* 2010;**19**(3):247-54. [DOI: 10.1016/j.yebeh.2010.07.031] [ISSN: 1525-5069] [PMID: 20851055]

Turan Gurhopur 2018 *{published data only}*

Turan Gurhopur FD, Isler Dalgic A. The effect of a modular education program for children with epilepsy and their parents on disease management. *Epilepsy & Behavior* 2018;**78**:210-8.

[DOI: dx.doi.org/10.1016/j.yebeh.2017.07.048] [ISSN: 1525-5069] [PMID: 29203274]

Yadegary 2015 *{published data only}*

Yadegary MA, Maemodan FG, Nayeri ND, Ghanjekhanlo A. The effect of self-management training on health-related quality of life in patients with epilepsy. *Epilepsy & Behavior* 2015;**50**:108-12. [DOI: 10.1016/j.yebeh.2015.04.051] [ISSN: 1525-5050] [PMID: 26232570]

References to studies excluded from this review

Albert 2019 *{published data only}*

Albert DV, Moreland JJ, Salvator A, Moore-Clingenpeel M, Haridas B, Cole JW, et al. Seizure action plans for pediatric patients with epilepsy: a randomized controlled trial. *Journal of Child Neurology* 2019;**34**(11):666-73. [DOI: dx.doi.org/10.1177/0883073819846810] [ISSN: 1708-8283] [PMID: 31156013]

Aliasgharpour 2013 *{published data only}*

Aliasgharpour M, Dehgahn Nayeri N, Yadegary MA, Haghani H. Effects of an educational program on self-management in patients with epilepsy. *Seizure* 2013;**22**(1):48-52. [DOI: 10.1016/j.seizure.2012.10.005] [PMID: 23122512]

Cazares 2017 *{published data only}*

Cazares Miranda V, Solis Flores L, Granados Rangel MG, Mendoza Hernandez F, Lopez Alvarenga JC. Benefits of personalised nurse counselling in neurological patients. *Revista Cientifica de la Sociedad Espanola de Enfermeria Neurologica* 2017;**46**:18-25. [DOI: 10.1016/j.sedene.2017.07.002]

Chadi 2018 *{published data only}*

Chadi N, Kaufman M, Weisbaum E, Malboeuf-Hurtubise C, Kohut SA, Locke J, et al. Comparison of an in-person vs. ehealth mindfulness meditation-based intervention for adolescents with chronic medical conditions: a mixed methods study. *Journal of Adolescent Health* 2018;**62**(2 Suppl):S12, Abstract no: 22.

Dahl 1985 *{published data only}*

Dahl J, Brorson LO, Melin L. Effects of a broad-spectrum behavioral medicine treatment program on children with refractory epileptic seizures: an 8-year follow-up. Epilepsia 1992;**33**(1):98-102. [ISSN: 0013-9580] [PMID: 1733765]

* Dahl J, Melin L, Brorson LO, Schollin J. Effects of a broad-spectrum behavior modification treatment program on children with refractory epileptic seizures. *Epilepsia* 1985;**26**(4):303-9. [PMID: 4006888]

Dash 2015 *{published data only}*

Dash D, Sebastian TM, Aggarwal M, Tripathi M. Impact of health education on drug adherence and self-care in people with epilepsy with low education. *Epilepsy & Behavior* 2015;**44**:213-7. [DOI: 10.1016/j.yebeh.2014.12.030] [PMID: 25768712]

Davis 1984 *{published data only}*

Davis GR, Armstrong HE Jr, Donovan DM, Temkin NR. Cognitive-behavioral treatment of depressed affect among epileptics: preliminary findings. *Journal of Clinical Psychology* 1984;**40**(4):930-5. [PMID: 6434595]

DiIorio 2009 *{published data only}*

DiIorio C, Reisinger EL, Yeager KA, McCarty F. A telephone-based self-management program for people with epilepsy. *Epilepsy & Behavior* 2009;**14**(1):232-6. [DOI: 10.1016/j.yebeh.2008.10.016] [PMID: 19010447]

Eshiet 2019 *{published data only}*

Eshiet U, Okonta J, Ukwe C. The efficacy of a pharmacist implemented educational treatment programme for people with epilepsy: a report of a randomised controlled trial. *Seizure* 2019;**69**:147-53. [DOI: 10.1016/j.seizure.2019.04.011] [ISSN: 1059-1311, Print 1532-2688, Electronic] [PMID: 31048271]

Helgeson 1990 *{published data only}*

Helgeson DC, Mittan R, Tan SY, Chayasirisobhon S. Sepulveda Epilepsy Education: the efficacy of a psychoeducational treatment program in treating medical and psychosocial aspects of epilepsy. *Epilepsia* 1990;**31**(1):75-82. [PMID: 2303015]

Li 2016 *{published data only}*

Li J, Wang X, Meng H, Zeng K, Quan F, Liu F. Systemic family therapy of comorbidity of anxiety and depression with epilepsy in adolescents. *Psychiatry Investigation* 2016;**13**(3):305-10. [DOI: 10.4306/pi.2016.13.3.305] [PMID: 27247596]

McLaughlin 2011 *{published data only}*

McLaughlin DP, McFarland K. A randomised trial of a group based cognitive behavior therapy program for older adults with epilepsy: the impact on seizure frequency, depression and psychosocial well-being. *Journal of Behavioral Medicine* 2011;**34**(3):201-7. [DOI: 10.1007/s10865-010-9299-z] [PMID: 20927577]

Mills 1999 *{published data only}*

Mills N, Bachmann MO, Harvey I, Hine I, McGowan M. Effect of a primary-care-based epilepsy specialist nurse service on quality of care from the patients' perspective: quasi-experimental evaluation. *Seizure* 1999;**8**(1):1-7. [ISSN: 1059-1311] [PMID: 10091840]

Modi 2016b *{published data only}*

Modi AC, Mann KA, Urso L, Peugh J. Preliminary feasibility and efficacy of text messaging and application-based adherence interventions in adolescents with epilepsy. *Epilepsy & Behavior* 2016;**63**:46-9. [DOI: dx.doi.org/10.1016/j.yebeh.2016.07.036] [ISSN: 1525-5069] [PMID: 27565437]

Modi 2016c *{published data only}*

Modi AC, Guilfoyle SM, Mann KA, Rausch JR. A pilot randomised controlled clinical trial to improve antiepileptic drug adherence in young children with epilepsy. *Epilepsia* 2016;**57**(3):e69-75. [DOI: 10.1111/epi.13289] [ISSN: 1528-1167 0013-9580] [PMID: 26693964]

Mohamadpour 2017 *{published data only}*

Mohamadpour S, Tajikzadeh F, Aflakseir A. The efficacy of mindfulness-based cognitive therapy on self-efficacy and

anxiety among epileptic patients. *Archives of Neuroscience* 2017;**4**(2):e39060. [DOI: 10.5812/archneurosci.39060]

Olley 2001 *{published data only}*

Olley BO, Osinowo HO, Brieger WR. Psycho-educational therapy among Nigerian adult patients with epilepsy: a controlled outcome study. *Patient Education and Counseling* 2001;**42**(1):25-33. [DOI: 10.1016/s0738-3991(00)00087-2] [PMID: 11080603]

Peterson 1984 *{published data only}*

Peterson GM, McLean S, Millingen KS. A randomised trial of strategies to improve patient compliance with anticonvulsant therapy. *Epilepsia* 1984;**25**(4):412-7. [PMID: 6430689]

Pfäfflin 2012 *{published data only}*

Hagemann A, Pfäfflin M, Nussbeck F, May TW. The efficacy of an educational program for parents of children with epilepsy (FAMOSES): results of a controlled multicenter evaluation study [Was bringt das Schulungsprogramm famoses den Eltern epilepsiekranker Kinder? Ergebnisse einer kontrollierten, multizentrischen Evaluationsstudie]. ekvv.uni-bielefeld.de/blog/uniaktuell/resource/Poster2.pdf (accessed 3 May 2016).

* Pfäfflin M, Petermann F, Rau J, May TW. The psychoeducational program for children with epilepsy and their parents (FAMOSES): results of a controlled pilot study and a survey of parent satisfaction over a five-year period. *Epilepsy & Behavior* 2012;**25**(1):11-6. [DOI: 10.1016/j.yebeh.2012.06.012] [PMID: 22980075]

Ridsdale 2000 *{published data only}*

Ridsdale L, Kwan I, Cryer C. Newly diagnosed epilepsy: can nurse specialists help? A randomised controlled trial. Epilepsy Care Evaluation Group. *Epilepsia* 2000;**41**(8):1014-9. [PMID: 10961629]

Tajrishi 2015 *{published data only}*

Tajrishi MP, Abbasi S, Fard TN, Yousefi S, Abadi AM, Kasmaei HD. Efficacy of attribution retraining on mental health of epileptic children. *Iranian Red Crescent Medical Journal* 2015;**17**(10):e19393. [DOI: 10.5812/ircmj.19393] [ISSN: 2074-1804]

Tan 1986 *{published data only}*

Tan SY, Bruni J. Cognitive-behavior therapy with adult patients with epilepsy: a controlled outcome study. *Epilepsia* 1986;**27**(3):225-33. [PMID: 3516668]

Thompson 2015 *{published data only}*

Thompson NJ, Patel AH, Selwa LM, Stoll SC, Begley CE, Johnson EK, et al. Expanding the efficacy of project UPLIFT: distance delivery of mindfulness-based depression prevention to people with epilepsy. *Journal of Consulting and Clinical Psychology* 2015;**83**(2):304-13. [DOI: 10.1037/a0038404] [PMID: 25495361]

Yoo 2015 *{published data only}*

Yoo H, Kim H-S. Development and evaluation of the Empowering A Self-Efficacy (EASE) program for children with epilepsy. *Journal of Korean Academy of Nursing* 2015;**45**(1):54-63. [DOI: dx.doi.org/10.4040/jkan.2015.45.1.54] [ISSN: 2093-758X] [PMID: 25743734]

References to ongoing studies

Bennett 2016 *{published data only}***21184717**

Bennett S, Heyman I, Coughtrey A, Simmonds J, Varadkar S, Stephenson T, et al. Guided self-help interventions for mental health disorders in children with neurological conditions: study protocol for a pilot randomised controlled trial. *Trials [Electronic Resource]* 2016;**17**(1):532. [ISSN: 1745-6215] [PMID: 27809925]

Singh 2019 *{published data only}*

Singh G, Sharma S, Bansal RK, Setia RK, Sharma S, Bansal N, et al. A home-based, primary-care model for epilepsy care in India: basis and design. *Epilepsia Open* 2019;**4**(2):264-74. [DOI: dx.doi.org/10.1002/epi4.12311] [ISSN: 2470-9239] [PMID: 31168493]

Additional references

Alper 2007

Alper K, Schwartz KA, Kolts RL, Khan A. Seizure incidence in psychopharmacological clinical trials: an analysis of Food and Drug Administration (FDA) summary basis of approval reports. *Biological Psychiatry* 2007;**62**(4):345-54. [PMID: 17223086]

Baca 2011

Baca C, Vickrey B, Caplan R, Vassar S, Berg A. Psychiatric and medical comorbidity and quality of life outcomes in childhood-onset epilepsy. *Pediatrics* 2011;**128**(6):e1532-43. [DOI: 10.1542/peds.2011-0245] [PMID: 22123895]

Baldwin 2013

Baldwin SA, Imel Z. Therapist effects. In: Lambert MJ, editors(s). Handbook of Psychotherapy and Behavioral Change. New York: Wiley, 2013:258-97.

Benavente-Aguilar 2004

Benavente-Aguilar I, Morales-Blanquez C, Rubio EA, Rey JM. Quality of life of adolescents suffering from epilepsy living in the community. *Journal of Paediatrics and Child Health* 2004;**40**(3):110-3. [DOI: 10.1111/j.1440-1754.2004.00308.x] [PMID: 15009574]

Borghs 2012

Borghs S, de la Loge C, Cramer JA. Defining minimally important change in QOLIE-31 scores: estimates from three placebo-controlled lacosamide trials in patients with partial-onset seizures. *Epilepsy & Behavior* 2012;**23**(3):230-4. [DOI: 10.1016/j.yebeh.2011.12.023] [PMID: 22341962]

Boutron 2008

Boutron I, Moher D, Altman DG, Schulz KF, Ravaud P, CONSORT Group. Methods and processes of the CONSORT Group: example of an extension for trials assessing nonpharmacologic treatments. *Annals of Internal Medicine* 2008;**148**(4):W60-6. [PMID: 18283201]

Brown 2009

Brown I, Sheeran P, Reuber M. Enhancing antiepileptic drug adherence: a randomised controlled trial. *Epilepsy & Behavior* 2009;**16**(4):634-9. [DOI: 10.1016/j.yebeh.2009.09.014] [PMID: 19864187]

Camfield 2001

Camfield C, Breau L, Camfield P. Impact of pediatric epilepsy on the family: a new scale for clinical and research use. *Epilepsia* 2001;**42**(1):104-12. [PMID: 11207793]

CDC 2012

Centers for Disease Control and Prevention (CDC). Epilepsy in adults and access to care — United States, 2010. *MMWR. Morbidity and Mortality Weekly Report* 2012 Nov 16;**61**(45):909-13. [PMID: 23151949]

Chang 2011

Chang YT, Chen PC, Tsai IJ, Sung FC, Chin ZN, Kuo HT, et al. Bidirectional relation between schizophrenia and epilepsy: a population-based retrospective cohort study. *Epilepsia* 2011;**52**(11):2036-42. [PMID: 21929680]

Cohen 1988

Cohen J. Statistical Power Analysis for the Behavioral Sciences. Lawrence Erlbaum Associates, 1988.

Crail-Melendez 2013

Crail-Melendez D, Herrera-Melo A, Martinez-Juarez IE, Ramirez-Bermudez J. Cognitive-behavioral therapy for depression in patients with temporal lobe epilepsy: a pilot study. *Epilepsy & Behavior* 2012;**23**(1):52–6. [DOI: 10.1016/j.yebeh.2011.11.001] [PMID: 22154515]

Cramer 1999

Cramer JA, Westbrook LE, Devinsky O, Perrine K, Glassman MB, Camfield C. Development of the Quality of Life in Epilepsy Inventory for Adolescents: the QOLIE-AD-48. *Epilepsia* 1999;**40**(8):1114-21. [PMID: 10448825]

Cramer 2003

Cramer JA, Van Hammée G, N132 Study Group. Maintenance of improvement in health-related quality of life during long-term treatment with levetiracetam. *Epilepsy & Behavior* 2003;**4**(2):118–23. [DOI: doi.org/10.1016/S1525-5050(03)00004-0] [PMID: 12697135]

Cull 1997

Cull C, Goldstein LH (eds). The Clinical Psychologist's Handbook of Epilepsy: Assessment and Management. Routledge Press, 1997.

Davies 2003

Davies S, Heyman I, Goodman R. A population survey of mental health problems in children with epilepsy. *Developmental Medicine and Child Neurology* 2003;**45**(5):292-5. [PMID: 12729141]

Devinsky 1999

Devinsky O, Westbrook L, Cramer J, Glassman M, Perrine K, Camfield C. Risk factors for poor health-related quality of life in adolescents with epilepsy. *Epilepsia* 1999;**40**(12):1715-20. [PMID: 10612334]

Dilorio 1992

Dilorio C, Faherty B, Manteuffel B. Self-efficacy and social support in self-management of epilepsy. *Western Journal of Nursing Research* 1992;**14**(3):292-307. [DOI: 10.1177/019394599201400303] [PMID: 1615646]

Ekinci 2009

Ekinci O, Titus JB, Rodopman AA, Berkem M, Trevathan E. Depression and anxiety in children and adolescents with epilepsy: prevalence, risk factors, and treatment. *Epilepsy & Behavior* 2009;**14**(1):8-18. [PMID: 18804186]

Eklund 2016

Eklund A, Nichols TE, Knutsson H. Cluster failure: why fMRI inferences for spatial extent have inflated false-positive rates. *Proceedings of the National Academy of Sciences of the United States of America* 2016;**113**(28):7900-5. [PMID: 27357684]

Elsas 2011

Elsas SM, Gregory WL, White G, Navarro G, Salinsky MC, Andrews DJ. Aura interruption: the Andrews/Reiter behavioral intervention may reduce seizures and improve quality of life - a pilot trial. *Epilepsy & Behavior* 2011;**22**(4):765-72. [PMID: 22056814]

Escoffery 2015a

Escoffery C, Bamps Y, LaFrance WC Jr, Stoll S, Shegog R, Buelow J, et al. Development of the Adult Epilepsy Self-Management Measurement Instrument (AESMMI). *Epilepsy & Behavior* 2015;**50**:172-83. [DOI: 10.1016/j.yebeh.2015.07.025] [PMID: 26303037]

Escoffery 2015b

Escoffery C, Bamps Y, LaFrance WC Jr, Stoll S, Shegog R, Buelow J, et al. Factor analyses of an Adult Epilepsy Self-Management Measurement Instrument (AESMMI). *Epilepsy & Behavior* 2015;**50**:184-9. [DOI: 10.1016/j.yebeh.2015.07.026] [PMID: 26264465]

Ferro 2013

Ferro MA, Camfield CS, Levin SD, Smith ML, Wiebe S, Zou G, et al. Trajectories of health-related quality of life in children with epilepsy: a cohort study. *Epilepsia* 2013;**54**(11):1889-97. [PMID: 26264465]

Fisher 2005

Fisher RS, Van Emde Boas W, Blume W, Elger C, Genton P, Lee P, et al. Epileptic seizures and epilepsy: definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE). *Epilepsia* 2005;**46**(4):470-2. [PMID: 15816939]

Fisher 2014

Fisher RS, Acevedo C, Arzimanoglou A, Bogacz A, Cross JH, Elger CE, et al. ILAE official report: a practical clinical definition of epilepsy. *Epilepsia* 2014;**55**(4):475-82. [PMID: 24730690]

Fried 1990

Fried R, Fox MC, Carlton RM. Effect of diaphragmatic respiration with end-tidal CO2 biofeedback on respiration, EEG, and seizure frequency in idiopathic epilepsy. *Annals of the New York Academy of Sciences* 1990;**602**:67-96. [PMID: 2122789]

Gandy 2012

Gandy M, Sharpe L, Nicholson Perry K. Psychosocial predictors of depression and anxiety in patients with epilepsy: a systematic review. *Journal of Affective Disorders* 2012;**140**(3):222-32. [PMID: 22197509]

Gandy 2013

Gandy M, Sharpe L, Perry KN. Cognitive behavior therapy for depression in people with epilepsy: a systematic review. *Epilepsia* 2013;**54**(10):1725-34. [PMID: 24032437]

Gandy 2016

Gandy M, Karin E, Fogliati VJ, McDonald S, Titov N, Dear BF. A feasibility trial of an Internet-delivered and transdiagnostic cognitive behavioral therapy treatment program for anxiety, depression and disability among adults with epilepsy. *Epilepsia* 2016;**57**(11):1887-96. [PMID: 27714788]

Gilbert 2012

Gilbert F. The burden of normality: from 'chronically ill' to 'symptom free'. New ethical challenges for deep brain stimulation postoperative treatment. *Journal of Medical Ethics* 2012;**38**(7):408-12. [PMID: 22431560]

Gilliam 2002

Gilliam F. Optimizing health outcomes in active epilepsy. *Neurology* 2002;**58**(8 Suppl 5):S9–20. [PMID: 11971128]

Gilliam 2004

Gilliam FG, Fessler AJ, Baker G, Vahle V, Carter J, Attarian H. Systematic screening allows reduction of adverse antiepileptic drug effects: a randomized trial. *Neurology* 2004;**62**(1):23-7. [PMID: 14718691]

GRADEPro 2015 [Computer program]

McMaster University (developed by Evidence Prime) GRADEPro GDT. Version (accessed prior to 24 August 2017). Hamilton (ON): McMaster University (developed by Evidence Prime), 2015. Available at gradepro.org.

Hesdorffer 2000

Hesdorffer DC, Hauser WA, Annegers JF, Cascino G. Major depression is a risk factor for seizures in older adults. *Annals of Neurology* 2000;**47**(2):246-9. [PMID: 10665498]

Hesdorffer 2006

Hesdorffer DC, Hauser WA, Olafsson E, Ludvigsson P, Kjartansson O. Depression and suicide attempt as risk factors for incident unprovoked seizures. *Annals of Neurology* 2006;**59**(1):35-41. [PMID: 16217743]

Higgins 2017

Higgins JP, Altman DG, Sterne JA, editor(s). Chapter 8: Assessing risk of bias in included studies. In: Higgins JP, Churchill R, Chandler J, Cumpston MS (editors). Cochrane Handbook for Systematic Reviews of Interventions version 5.2.0 (updated June 2017). The Cochrane Collaboration, 2017. Available from www.training.cochrane.org/handbook.

Institute of Medicine 2012

Institute of Medicine (US) Committee on the Public Health Dimensions of the Epilepsies. Epilepsy Across the Spectrum: Promoting Health and Understanding. England M, Liverman C, Schultz A, Strawbridge L (eds) edition. Washington, DC: National Academies Press, 2012. [ISBN: 978-0-309-25506-6] [PMID: 22993876]

Jacoby 2008

Jacoby A, Baker GA. Quality-of-life trajectories in epilepsy: a review of the literature. *Epilepsy & Behavior* 2008;**12**(4):557-71. [PMID: 18158270]

Jehi 2014

Jehi L. Responsive neurostimulation: the hope and the challenges. *Epilepsy Currents* 2014;**14**(5):270–1. [DOI: 10.5698/1535-7597-14.5.270] [PMID: 25346636]

Jones 2013

Jones NC, O'Brien TJ. Stress, epilepsy, and psychiatric comorbidity: how can animal models inform the clinic? *Epilepsy & Behavior* 2013;**26**(3):363-9. [PMID: 23099287]

Kanner 2006

Kanner AM. Depression and epilepsy: a new perspective on two closely related disorders. *Epilepsy Currents* 2006;**6**(5):141-6. [PMID: 17260039]

Kanner 2009

Kanner AM, Byrne R, Chicharro A, Wuu J, Frey M. A lifetime psychiatric history predicts a worse seizure outcome following temporal lobectomy. *Neurology* 2009;**72**(9):793-9. [PMID: 19255406]

Kwan 2000

Kwan P, Brodie MJ. Early identification of refractory epilepsy. *New England Journal of Medicine* 2000;**342**(5):314-9. [PMID: 10660394]

Larson 2012

Larson AM, Ryther RC, Jennesson M, Geffrey AL, Bruno PL, Anagnos CJ, et al. Impact of pediatric epilepsy on sleep patterns and behaviors in children and parents. *Epilepsia* 2012;**53**(7):1162–9. [PMID: 22594377]

Lefebvre 2019

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf M-I, et al. Technical Supplement to Chapter 4: Searching for and selecting studies. In: Higgins JP, Thomas J, Chandler J, Cumpston MS, Li T, Page MJ, et al (eds). Cochrane Handbook for Systematic Reviews of Interventions Version 6. The Cochrane Collaboration, 2019. Available from training.cochrane.org/handbook/supplementary-materials.

Loiselle 2016

Loiselle KA, Ramsey RR, Rausch JR, Modi AC. Trajectories of health-related quality of life among youth with newly

diagnosed epilepsy. *Journal of Pediatric Psychology* 2016;**41**(9):1011-21. [DOI: 10.1093/jpepsy/jsw019] [PMID: 27017987]

Michaelis 2012

Michaelis R, Schonfeld W, Elsas SM. Trigger self-control and seizure arrest in the Andrews/Reiter behavioral approach to epilepsy: a retrospective analysis of seizure frequency. *Epilepsy & Behavior* 2012;**23**(3):266-71. [PMID: 22341960]

Modi 2011

Modi AC, Ingerski LM, Rausch JR, Glauser TA. Treatment factors affecting longitudinal quality of life in new onset pediatric epilepsy. *Journal of Pediatric Psychology* 2011;**36**(4):466-75. [PMID: 21278379]

Modi 2012

Modi AC, Pai AL, Hommel KA, Hood KK, Cortina S, Hilliard ME, et al. Pediatric self-management: a framework for research, practice, and policy. *Pediatrics* 2012;**129**(2):e473-85. [PMID: 22218838]

Modi 2013

Modi AC, Guilfoyle SM, Rausch JR. Preliminary feasibility, acceptability, and efficacy of an innovative adherence intervention for children with newly diagnosed epilepsy. *Journal of Pediatric Psychology* 2013;**38**(6):605-16. [PMID: 23613481]

Modi 2016a

Modi AC, Guilfoyle SM, Mann K, Rausch JR. A pilot randomized controlled clinical trial to improve antiepileptic drug adherence in young children with epilepsy. *Epilepsia* 2016;**57**(3):e69-75. [DOI: 10.1111/epi.13289] [PMID: 26693964]

Modi 2017

Modi AC, Wagner J, Smith AW, Kellermann TS, Michaelis R. Implementation of psychological clinical trials in epilepsy: review and guide. *Epilepsy & Behavior* 2017;**74**:104–113. [PMID: 28734195]

Novakova 2013

Novakova B, Harris PR, Ponnusamy A, Reuber M. The role of stress as a trigger for epileptic seizures: a narrative review of evidence from human and animal studies. *Epilepsia* 2013;**54**(11):1866-76. [PMID: 24117321]

Ott 2001

Ott D, Caplan R, Guthrie D, Siddarth P, Komo S, Shields WD, et al. Measures of psychopathology in children with complex partial seizures and primary generalized epilepsy with absence. *Journal of the American Academy of Child and Adolescent Psychiatry* 2001;**40**(8):907-14. [PMID: 11501690]

Ott 2003

Ott D, Siddarth P, Gurbani S, Koh S, Tournay A, Shields WD, et al. Behavioral disorders in pediatric epilepsy: unmet psychiatric need. *Epilepsia* 2003;**44**(4):591-7. [PMID: 12681010]

Painter 2014

Painter E, Rausch JR, Modi AC. Changes in daily activity patterns of caregivers of children with newly diagnosed epilepsy: a case-controlled design. *Epilepsy & Behavior* 2014;**31**:1-6. [DOI: 10.1016/j.yebeh.2013.11.001] [PMID: 24291521]

Ramaratnam 2008

Ramaratnam S, Baker GA, Goldstein LH. Psychological treatments for epilepsy. *Cochrane Database of Systematic Reviews* 2008, Issue 3. Art. No: CD002029. [DOI: 10.1002/14651858.CD002029.pub3]

Ramsey 2016

Ramsey RR, Loiselle K, Rausch JR, Harrison J, Modi AC. Predictors of trajectories of epilepsy-specific quality of life among children newly diagnosed with epilepsy. *Epilepsy & Behavior* 2016;**57**(Pt A):202-10. [DOI: doi: 10.1016/j.yebeh.2016.02.002] [PMID: 26974247]

Reiter 2009

Reiter JM, Andrews DJ. A neurobehavioral approach for treatment of complex partial epilepsy: efficacy. *Seizure* 2000;**9**(3):198-203. [PMID: 10775516]

RevMan 2014 [Computer program]

Nordic Cochrane Centre, The Cochrane Collaboration Review Manager 5 (RevMan 5). Version 5.3. Copenhagen: Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Ried 2001

Ried S, Specht U, Thorbecke R, Goecke K, Wohlfarth R. MOSES: an educational program for patients with epilepsy and their relatives. *Epilepsia* 2001;**42**(Suppl 3):76–80. [DOI: 10.1046/j.1528-1157.2001.042suppl.3076.x] [PMID: 11520330]

Russ 2012

Russ SA, Larson K, Halfon N. A national profile of childhood epilepsy and seizure disorder. *Pediatrics* 2012;**129**(2):256–64. [DOI: 10.1542/peds.2010-1371] [PMID: 22271699]

Rutter 1970

Rutter M, Graham P, Yule W. A Neuropsychiatric Study in Childhood. Philadelpia: Lippincot, 1970.

Ryan 2015

Ryan JL, McGrady ME, Guilfoyle SM, Follansbee-Junger K, Arnett AD, Modi AC. Health care charges for youth with newly diagnosed epilepsy. *Neurology* 2015;**85**(6):490-7. [DOI: 10.1212/WNL.0000000000001746] [PMID: 26163432]

Ryan 2016

Ryan JL, McGrady ME, Guilfoyle SM, Follansbee-Junger K, Peugh JL, Loiselle KA, et al. Quality of life changes and health care charges among youth with epilepsy. *Journal of Pediatric Psychology* 2016;**41**(8):888-97. [DOI: 10.1093/jpepsy/jsv098] [PMID: 26503299]

Schilling 2002

Schilling LS, Grey M, Knafl KA. The concept of self-management of type 1 diabetes in children and adolescents: an evolutionary

concept analysis. *Journal of Advanced Nursing* 2002;**37**(1):87-99. [PMID: 11784402]

Schulz 2010

Schulz KF, Altman DG, Moher D, CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. *Journal of Clinical Epidemiology* 2010;**63**(8):834-40. [PMID: 20346629]

Schünemann 2017

Schünemann HJ, Oxman AD, Vist GE, Higgins JP, Deeks JJ, Glasziou P, et al, on behalf of the Cochrane Applicability and Recommendations Methods Group. Chapter 12: Interpreting results and drawing conclusions. In: Higgins JP, Churchill R, Chandler J, Cumpston MS, editor(s). Cochrane Handbook for Systematic Reviews of Interventions version 5.2.0 (updated June 2017). The Cochrane Collaboration, 2017. Available from www.training.cochrane.org/handbook.

Scott 2017

Scott AJ, Sharpe L, Hunt C, Gandy M. Anxiety and depressive disorders in people with epilepsy: a meta-analysis.. *Epilepsia* 2017;**58**(6):973-82. [PMID: 28470748]

Selassie 2014

Selassie A, Wilson DA, Martz GU, Smith GG, Wagner JL, Wannamaker BB. Epilepsy beyond seizure: a population-based study of comorbidities. *Epilepsy Research* 2014;**108**(2):305-15. [PMID: 24405940]

Smith 2018

Smith G, Modi AC, Johnson EK, Shegog R, Austin JK, Wagner JL. Measurement in pediatric epilepsy self-management: a critical review.. *Epilepsia* 2018;**59**(3):509-22. [DOI: 10.1111/epi.13992] [PMID: 29322489]

Snyder 1990

Snyder M. Stressors, coping mechanisms, and perceived health in persons with epilepsy. *International Disability Studies* 1990;**12**(3):100-3. [PMID: 2096116]

Stevanovic 2007

Stevanovic D. Health-related quality of life in adolescents with well-controlled epilepsy. *Epilepsy & Behavior* 2007;**10**(4):571-5. [PMID: 17416209]

Suurmeijer 2001

Suurmeijer TP, Reuvekamp MF, Aldenkamp BP. Social functioning, psychological functioning, and quality of life in epilepsy. *Epilepsia* 2001;**42**(9):1160-8. [PMID: 11580765]

Tang 2014

Tang V, Michaelis R, Kwan P. Psychobehavioral therapy for epilepsy. *Epilepsy & Behavior* 2014;**32**:147-55. [DOI: 10.1016/j.yebeh.2013.12.004] [PMID: 24418662]

Tanriverdi 2009

Tanriverdi T, Ajlan A, Poulin N, Olivier A. Morbidity in epilepsy surgery: an experience based on 2449 epilepsy surgery procedures from a single institution. *Journal of Neurosurgery* 2009;**110**(6):1111-23. [PMID: 19199440]

Tschuschke 2005

Tschuschke V. Die Psychotherapie in Zeiten evidenzbasierter Medizin. *Psychotherapeutenjournal* 2005;**2**:106-15.

Téllez-Zenteno 2005

Téllez-Zenteno JF, Dhar R, Wiebe S. Long-term seizure outcomes following epilepsy surgery: a systematic review and meta-analysis. *Brain* 2005;**128**(Pt 5):1188-98. [PMID: 15758038]

Téllez-Zenteno 2010

Téllez-Zenteno JF, Hernandez Ronquillo L, Moien-Afshari F, Wiebe S. Surgical outcomes in lesional and non-lesional epilepsy: a systematic review and meta-analysis. *Epilepsy Research* 2010;**89**(2-3):310-8. [PMID: 20227852]

Velissaris 2012

Velissaris SL, Saling MM, Newton MR, Berkovic SF, Wilson SJ. Psychological trajectories in the year after a newly diagnosed seizure. *Epilepsia* 2012;**53**(10):1774-81. [PMID: 22967034]

Wagner 2010

Wagner JL, Smith G, Ferguson PL, Van Bakergem K, Hrisko S. Pilot study of an integrated cognitive-behavioral and self-management intervention for youth with epilepsy and caregivers: Coping Openly and Personally with Epilepsy (COPE). *Epilepsy & Behavior* 2010;**18**(3):280-5. [PMID: 20488757]

Wagner 2015

Wagner JL, Wilson DA, Smith G, Malek A, Selassie AW. Neurodevelopmental and mental health comorbidities in children and adolescents with epilepsy and migraine: a response to identified research gaps. *Developmental Medicine and Child Neurology* 2015;**57**(1):45-52. [PMID: 25088717]

Wang 2012

Wang J, Wang Y, Wang LB, Xu H, Zhang XL. A comparison of quality of life in adolescents with epilepsy or asthma using the Short-Form Health Survey (SF-36). *Epilepsy Research* 2012;**101**(1-2):157-65. [PMID: 22512895]

Wellmer 2012

Wellmer J, Von der Groeben F, Klarmann U, Weber C, Elger CE, Urbach H, et al. Risks and benefits of invasive epilepsy surgery workup with implanted subdural and depth electrodes. *Epilepsia* 2012;**53**(8):1322-32. [PMID: 22708979]

WHO 2017

World Health Organization. Epilepsy Fact Sheet. Updated February 2017. www.who.int/mediacentre/factsheets/fs999/en/ (accessed prior to 24 August 2017).

Williams 2003

Williams J, Steel C, Sharp GB, DelosReyes E, Phillips T, Bates S, et al. Parental anxiety and quality of life in children with epilepsy. *Epilepsy & Behavior* 2003;**4**(5):483-6. [PMID: 14527488]

Wu 2014

Wu YP, Follansbee-Junger K, Rausch J, Modi A. Parent and family stress factors predict health-related quality in pediatric patients with new-onset epilepsy. *Epilepsia* 2014;**55**(6):866-77. [PMID: 24673687]

References to other published versions of this review

Michaelis 2016

Michaelis R, Tang V, Wagner JL, Modi AC, LaFrance W, Goldstein LH, et al. Psychological treatments for people with epilepsy. *Cochrane Database of Systematic Reviews* 2016, Issue 2. Art. No: CD012081. [DOI: 10.1002/14651858.CD012081]

Michaelis 2017

Michaelis R, Tang V, Wagner JL, Modi AC, LaFrance Jr WC, Goldstein LH, et al. Psychological treatments for people with epilepsy. *Cochrane Database of Systematic Reviews* 2017, Issue 10. Art. No: CD012081. [DOI: 10.1002/14651858.CD012081.pub2]

* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Au 2003

Study characteristics	
Methods	Prospective, randomized, assessor-blinded, controlled trial comparing group CBT (ZMILE) to WLC on QOL, seizure frequency and self-efficacy. Outcome measures were obtained at baseline (3 months prior to intervention) and postintervention (3 months after intervention).
Participants	Inclusion criteria: at least 2 seizures per month, with subjectively-reported psychological distress Exclusion criteria: active serious medical disorders, psychotic features, severe mental deficiency and a history of neurosurgery within the last year 17 adults were enrolled; 8/9 were allocated to CBT (ZMILE)/WLC. The mean ages were 38.3 (SD 7.0) years in CBT and 41.4 (SD 7.7) years in WLC. The durations of epilepsy in years were 20.3 (SD 7.9) in CBT and 26.7 (SD 13.6) in WLC. 8/5 participants in CBT had complex focal seizure/secondary generalization. 1/8/4 participants in WLC had simple focal seizure/complex focal seizure/secondary generalization.The mean weekly seizure frequency at baseline was 3.71 (SD 1.82) in CBT and 3.48 (SD 2.23) in WLC The study was conducted in the Neurology Clinic of the Queen Elizabeth Hospital, Hong Kong. The dates when the study was conducted were not stated. The study was partially supported by the Queen Elizabeth Hospital Research Grant; no conflict of interest reported.
Interventions	The intervention group (ZMILE) received a total of 8 x 2-hour sessions of group CBT, conducted weekly for 8 weeks. Following a structured format, the intervention was provided by 2 trained clinical psychologists, with the following components: understanding stress and its relationship to seizures, relaxation training, cognitive restructuring, identification of seizure-provoking situations, systematic desensitization, stress management, and communication skills. Participants were also asked to complete homework assignments between the sessions on relaxation, recording of negative thoughts, and coping methods
Outcomes	Outcomes: QoL, self-efficacy, and seizure frequency, measured with the QOLIE-31, ESES, seizure frequency (average over 3 months of weekly self-report) Time points measured: 1) Baseline (3 months before treatment) 2) Postintervention (3 months after the last treatment session)
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	Allocation was performed using a matched design

Au 2003 *(Continued)*

Allocation concealment (selection bias)	High risk	Allocation was not concealed, based on information provided by study authors
Blinding of participants and personnel (performance bias) All outcomes	High risk	Insufficient information
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Assessors were blinded, based on information provided by study authors
Incomplete outcome data (attrition bias) All outcomes	Low risk	There was no attrition
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	High risk	Professionals who delivered the interventions were clinical psychologist trained in CBT and seizure management technique, so the risk of bias was low in this dimension of treatment competency. However, there was no information on how treatment competency was monitored so the risk of bias in this dimension was unclear. The risk of bias is unclear in terms of treatment fidelity as no adherence measures were mentioned. All participants recruited had subjectively reported psychological distress, inadequate seizure control and at least 2 seizures per month; but there were no details on how these participants were identified, so the risk of selective recruitment was high

Beretta 2014

Study characteristics	
Methods	Unblinded, randomized, controlled study comparing a participant-tailored educational plan (Treatment) in adults with epilepsy and chronic comorbidity to UC on drug-related problems and quality of life. Outcome measures were obtained at baseline, 1 month and 6 months post-baseline
Participants	Inclusion criteria: adults with epilepsy and the following criteria: the presence of at least 1 chronic clinical condition requiring medical treatment; clinically-relevant AEs attributable to the present treatment, clinically-relevant drug interactions, or both; possible modification of the treatment schedule to eliminate AEs or risky drug interactions Exclusion criteria: adults with a non-modifiable treatment schedule, who were unable to understand or comply with an educational plan, unable or unwilling to release a written informed consent 174 adults randomized. 91/83 participants were allocated to Treatment/UC. The age ranged from 18 to 70+ in both groups. 65/17 participants in Treatment and 69/9 participants in UC had focal epilepsy/generalized epilepsy; the remainder were unclassifiable. The seizure frequency per month in the preceding 6 months ranged from 0 to 5+ in both groups. 60/51 participants had ≤ 2 comorbidities, and 27/29 participants had ≥ 3 comorbidities in Treatment/UC; the remaining were not specified The study was carried out in San Gerardo University Hospital. Consecutive participants were randomized from December 2009 to December 2011. All follow-up was completed in June 2012. This clinical trial have been funded by the Italian Drug Agency (AIFA Study Protocol Code FARM77RW2S), which provided research grants for all the participating centres. The author received research grants from Sigma-Tau, Janssen-Cilag,Kedrion Pharma, Eisai. MPC received speaker's or consultancy and/or research

Beretta 2014 *(Continued)*

	grants from Cyberonics, UCB, Eisai, Novartis, Janssen-Cilag, GSK. CF received research grants from Merck Serono and Pfizer.
Interventions	The treatment consisted of an educational plan (1 hour counseling), delivered by treating physician to the participant on an individual basis. The plan comprised the following components: The cause and nature of any AEs or drug interactions; the tolerability profile of each drug present in the schedule, illustrated as a simple list, including the commonest AEs, presented in decreasing order of frequency; the clinical manifestations (if any) associated with the current drug interactions; any contraindication to the use of over-the-counter drugs that may potentially interfere with the current treatment schedule; the reasons for, and the potential benefits of the suggested treatment change; an encouragement to withdraw any drug that may potentially interfere or be contraindicated. The educational plan was administered at admission and in the same form after 1 month, as a reminder
Outcomes	Drug-related problems (particularly drug interactions), QoL, measured with the (QOLIE-31 Time points measured: 1) Baseline 2) 1 month after baseline 3) 6 months after baseline
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A centralized, computer-generated allocated sequence was used for the randomization. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Information was sought and provided in the study protocol. Assignment to the experimental or control arm was done electronically, via a protected database
Blinding of participants and personnel (performance bias) All outcomes	High risk	Neither the participants nor the physicians providing the intervention were blinded
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Physicians assessing outcomes were blind to the assigned arm
Incomplete outcome data (attrition bias) All outcomes	Low risk	1/91 in Treatment and 1/83 in UC withdrew during the study
Selective reporting (reporting bias)	Low risk	Unpublished data (QOLIE-31 raw data) were sought and provided. No evidence to suggest reporting bias after review of study protocol
Other bias	Low risk	Risk of bias for treatment infidelity, competency in training background of the professionals who delivered the intervention and selective recruitment were low. There were no measures to monitor the quality of treatment delivery, so treatment competency in this dimension was unclear

Brown 2019

Study characteristics	
Methods	A blinded randomized controlled trial comparing 6 months of behavioral counseling intervention (Treatment) in children with epilepsy to TAU on physical activity, depressive symptoms and QoL
Participants	Inclusion criteria: Children aged 8 – 14 years with a diagnosis of epilepsy as confirmed by a neurologist; with at least 1 seizure in the previous 12 months; ambulatory; fluency in English or French; intellectual functioning at grade ≥ 3 level as judged by parents; and access to a computer Exclusion criteria: Participants with additional diagnoses of psychogenic seizures or autism were not included 115 adults randomized. 56/59 participants were allocated to intervention/TAU The mean age of the participants was 11.4 years (± 1.9). 6/17/28/23 participants in intervention and 9/11/28/24 participants in TAU had simple focal/complex focal/generalized tonic-clonic/absence seizures. The duration of epilepsy was 4.2 years (± 3.2) in the intervention group and 3.8 years (± 3.2) in the TAU group. The study was carried out at 2 study sites in Canada: McMaster site and Ottawa site. Recruitment occurred between January 2012 and March 2017. This work was financially supported by the Ontario Brain Institute EpLink section (PI: GM Ronen), the Innovation Fund of the Alternative Funding Plan for the Hamilton Academic Health Sciences Organization (PI: GM Rone), and the Children's Hospital Academic Medical Organization Innovation Fund of the Children's Hospital of Eastern Ontario, Ottawa (Local PI: Daniela Pohl). No conflict of interest reported.
Interventions	Counseling sessions were conducted by trained research assistant (McMaster site) or the study research coordinator (Ottawa site). Counseling sessions were 15 mins long and occurred weekly for weeks 1 – 4, bi-weekly for weeks 6 – 12, and monthly (booster sessions) for weeks 16 – 24. The aims of these sessions were to develop motivation as well as to learn and implement self-regulatory skills to support behavior change. All participants were given the goal to reach a level of PA consistent with the number of steps associated with meeting Canadian PA guideline recommendations by the end of the 6-month period
Outcomes	Physical activity, Childhood Epilepsy Quality of Life scale (CHEQOL), KIDSCREEN-27, Children's Depression Inventory—Short (CDI-S) Time points measured: 1) Baseline (2-week period) 2) 16 weeks after baseline 3) 28 weeks after baseline 4) 52 weeks after baseline
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Separate balanced block randomization schemes were established for each activity group, and an allocation ratio of 1:1 was used
Allocation concealment (selection bias)	Low risk	The research coordinator at the McMaster study site conducted this process for all participants at both sites, and treatment allocation was concealed from the study team
Blinding of participants and personnel (performance bias)	High risk	The author clarified that the participants were not blinded

Brown 2019 *(Continued)*

All outcomes		
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The author clarified that the outcome assessment was blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	The author clarified 16 dropouts i.e. 14% attrition
Selective reporting (reporting bias)	Low risk	Reviewing the publication does not reveal selective reporting
Other bias	Unclear risk	Altogether unclear risk for infidelity to intervention protocol, competence to deliver the intervention (except for the training dimension), and selective recruitment

Caller 2016

Study characteristics	
Methods	Assessor-blinded, randomized, controlled trial comparing a group receiving HOBSCOTCH (H: Home-Based Self-management and Cognitive Training Changes lives), HOBSCOTCH plus memory training (H+) and care as usual (Control) on quality of life, mood, objective and subjective neurocognitive functions. Outcome measures were obtained at baseline and postintervention follow-up (8 weeks)
Participants	Inclusion criteria: epilepsy, with or without uncontrolled seizures, with subjective memory complaints (QOLIE-31 cognition subset questions ≤ 7) who provided informed consent. Exclusion criteria: severe mental disability, estimated IQ < 70, visual impairment precluding reading and writing, and those without reliable phone access 66 participants (age 16 to 65 years). 22 were randomized to each of H, H+, and Control. A total of 17 participants withdrew. H/H+ were combined in the analysis (N = 29) compared with Control (N = 20). The mean age in H/H+ was 49.3 (± 9.2) and 41.4 (± 11.2) in Control. There were 19 women in H/H+ and 13 women in Control. 17 participants in H/H+ and 13 participants in Control had received epilepsy surgery The study was conducted at Dartmouth-Hitchcock Epilepsy Center between January 2013 and June 2014. The study was funded by the Center of Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Special Interest Projectwithin theManaging EpilepsyWell (MEW) network 3U48DP001935-04S3 and U48DP005018. Dr. Jobst has received research support from Neuropace, Inc., and NIH and is currently on the advisory committee of Neuropace. None of this is related to this work.
Interventions	An epilepsy specialized Advanced Registered Nurse Practitioner or Registered Nurse trained as 'memory coaches', delivered the intervention. The intervention program was structured into 8 weekly 45- to 60-minute sessions, with the first session in a group format and the subsequent 6 sessions conducted over the telephone, followed by a final in-person review session with outcome assessment. Participants randomized into H/H+ groups were offered an intervention based on self-efficacy principles, including organizational skills, seizure management, and social skills. It also comprised problem-solving therapy and behavior modification strategies, focused on cognitive symptoms. Participants in the H+ group were also required to participate in cognitive training, using a Nintendo handheld console and the Brain Age program, with tasks consisting of multiple working memory exercises. The total time of training was equal to 20 to 40 minutes of daily training. Participants in the control group received usual care
Outcomes	Primary outcome measure was change in quality of life (QOLIE-31).

Caller 2016 *(Continued)*

	Secondary outcome measures were mood (PHQ-9), neuropsychological status (RBANS), self-report cognitive function (FACT-Cog), self-perceived executive function (BRIEF-A), and patient satisfaction (a satisfaction survey) Time points measured: 1) Baseline (after randomization) 2) 8 weeks after baseline
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was ensured by using a computer-generated random assignment
Allocation concealment (selection bias)	High risk	Allocation concealment was not performed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to the treatment they received
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome measures were collected by a research coordinator blinded to treatment arms
Incomplete outcome data (attrition bias) All outcomes	High risk	A total of 17/55 (25.8%) dropouts. Treatment group H (7/22; 31.8%), Treatment group H+ (8/22; 36.4%), Control (2/22; 9.1%)
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting within publication
Other bias	Unclear risk	Low risk in terms of the training component of treatment competence and selective recruitment. But there was no information on how the quality of treatment delivery was ensured and so the risk of bias was unclear for the treatment delivery dimension of treatment competence. Risk of bias was unclear for treatment infidelity

Ciechanowski 2010

Study characteristics

Methods	Assessor-blinded, randomized controlled trial evaluating the long-term effect on improving depressive symptoms between a home-based collaborative care intervention for adults with epilepsy and depression (PEARLS) and TAU control group. Outcome measures were obtained at baseline through 12-month follow-up
Participants	Inclusion criteria: ICD-9 epilepsy diagnosis and significant depression based on PHQ-9 score ≥10 Exclusion criteria: pregnant women, bipolar or psychotic disorder, active psychiatric treatment, substance abuse history based on questionnaire, cognitive impairment based on screening test

Ciechanowski 2010 *(Continued)*

	80 adults were recruited; 40 were randomized to PEARLS and 40 to TAU, stratified by whether or not seizures were reported in the preceding 6 months The mean ages were 43.3 years (SD 11.0) in PEARLS, and 44.4 (SD 11.1) TAU. 23/29 were women in PEARLS/TAU. In the past 6 months prior to recruitment, 29/30 participants had at least 1 seizure in PEARLS/TAU. In the month prior to recruitment, 11/12 participants had seizures with LOC and 14/18 participants had seizures without LOC in PEARLS/TAU The study was conducted in the University of Washington Regional Epilepsy Center, USA. Recruitment took place between April 2007 and April 2008. The study was funded by the Prevention Research Centers Program and Epilepsy Program of the Centers for Disease Control and Prevention and the University of Washington Health Promotion Research Center (U48DP000050) and the CHAMMP (Center for Healthcare Improvement for Addictions, Mental Illness and Medically Vulnerable Populations) at Harborview Medical Center, Seattle WA; no conflict of interest reported.
Interventions	PEARLS is a home-based, multimodal depression intervention. Participants received PST by masters-level trained social workers who participated in PEARLS training (pearlsprogram.org). PST is a skill-enhancing behavioral depression treatment addressing problems that cause and maintain depression symptoms. PST was modified in this study to emphasize social and physical activation. Participants were scheduled for 8 x 50-minute in-home sessions in weeks 1 to 3, 5, 7, 11, 15, and 19. From week 19 until study end (12 months), participants received monthly 5- to 10-minute telephone calls from the therapist for PHQ-9 administration, and assessment of their use of PST. Therapists reported to the study psychiatrist regularly; psychiatrist would call participants to clarify clinical issues (e.g. suicidal ideation) The TAU group received no active treatment, but physicians of participants assigned to the TAU arm received a letter reporting the depression diagnosis and encouraging depression treatment as clinically appropriate
Outcomes	HSCL-20, suicidal ideation, QOLIE-31, seizure frequency, medication use, satisfaction with epilepsy health care Time points measured: 1) Baseline 2) 6 months (by phone) 3) 12 months (by phone) 4) 18 months (by phone)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated random assignment and block randomizations were used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Concealment was ensured
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to the treatment they received
Blinding of outcome assessment (detection bias)	Low risk	Assessors were blinded

Ciechanowski 2010 *(Continued)*

All outcomes		
Incomplete outcome data (attrition bias) All outcomes	Low risk	8/5 and 7/11 were missed in the 6-month/12-month follow-up in PEARL and TAU, respectively. The attrition rates (20%/12.5% for 6-month follow-up and 15%/27.5% for 12-month follow-up for PEARL and TAU, respectively) were higher than the authors' expectation (i.e. 10%) but lower than our cut-off for long-term studies (i.e. 20%) 10 (25%) and 12 (30%) were lost at the 18-month follow-up in PEARL and TAU, respectively. Although the attrition rates were comparable for the 2 groups, they were higher than the authors' expectation, and higher than our cut-off for long-term studies. The risk of bias was therefore high for 18-month follow-up
Selective reporting (reporting bias)	High risk	Unpublished data were sought and provided. Postintervention suicidal ideation was missing. Evidence to suggest reporting bias
Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and competence to deliver the intervention. Low risk for training background (competence) of personnel delivering the intervention

DiIorio 2011

Study characteristics	
Methods	Unblinded, quasi-randomized, controlled trial comparing a 6-week online epilepsy self-management program (WebEase) to WLC in adults with epilepsy. Outcomes are medication adherence, perceived and sleep quality. Outcome measures were obtained at baseline, 6 weeks and 12 weeks after randomization
Participants	The protocol for the study and all recruitment notices were reviewed and approved by the Emory University institutional review board prior to beginning recruitment. Participants for this study were recruited though epilepsy-based websites and forums, online clinical research matching services, and referrals from health care professionals. Inclusion criteria: adults aged 18 or older, with a diagnosis of epilepsy, had been on antiseizure medication for at least 3 months, had access to Internet, willing to participate and had not participated in WebEase before, spoke and read English. Participants for this study were recruited through epilepsy-based websites and forums, online clinical research matching services, and referrals from healthcare professionals. 194 adults were recruited. 97 were allocated to each group. A secondary review of eligibility yielded 148 participants who were retained for analysis (70 in WebEase; 78 in WLC). The mean age was 41.8 years in WebEase and 40.0 in WLC. 48/61 were women in WebEase/WLC. 42/52 participants had seizures in the past 30 days in WebEase/WLC. The mean number of seizures in 30 days prior to recruitment was 10.8 (SD 32.9) in WebEase and 9.3 (SD 25.9) in WLC. The number of participants who reported tonic-clonic/complex focal/simple focal/absence of seizures were 25/22/8/4 in WebEase and 29/18/12/6 in WCL. The dates when the study was conducted were not stated. This study was supported by the CDC Epilepsy Program in the National Center for Chronic Disease Prevention and Health Promotion under Cooperative Agreement 1U48-DP001909-01. The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of the CDC. No conflict of interest was reported.
Interventions	WebEase is a theory-based, interactive, Internet-based self-management program for people with epilepsy. WebEase incorporates concepts and principles of social cognitive theory, the transtheoretical model of behavior change, and motivational interviewing. The WebEase program lasted for 6 weeks. Participants spent 2 weeks in each of the 3 modules (medication, stress, sleep) that constitute the core of WebEase. The program was designed to correspond with a person's stage of change. Regular weekly

Dilorio 2011 *(Continued)*

	reminders were sent to participants until the end of 6 weeks. Participants received an Amazon gift card at the end of their participation in the study.
Outcomes	MAS, PSS, ESI-R, PSQI, ESMS, Epilepsy Knowledge Profile, QOLIE-10 Time points measured: 1) Baseline prior to randomization 2) 6 weeks after randomization 3) 12 weeks after randomization
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Quasi-randomization by assigning participants alternately
Allocation concealment (selection bias)	Low risk	Concealment was ensured
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel were blinded since this was a web-based intervention
Blinding of outcome assessment (detection bias) All outcomes	High risk	The assessors were not blinded at any assessment, based on information provided by study authors
Incomplete outcome data (attrition bias) All outcomes	High risk	22/70 and 12/78 missed the second assessment in WebEase and WLC, respectively. 18/70 and 33/78 missed the third assessment in WebEase and WLC. The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	Unpublished data (QOLIE-10 outcomes) were sought and provided. No evidence to suggest reporting bias
Other bias	High risk	Low risk of bias for treatment infidelity as this was a web-based intervention. Training background of personnel developing the WebEase intervention was rated as low risk for incompetence. Risk of bias is high for selective recruitment as website and forums were used to recruit study participants

Dorris 2017

Study characteristics

Methods	Assessor-blinded, randomized, controlled trial comparing group intervention (PIE) and WLC in children and adolescents with epilepsy (aged 12 - 17 years) on quality of life and epilepsy knowledge. Outcome measures were obtained at baseline, postintervention (6 weeks), 3- and 6-month follow-up
Participants	Inclusion criteria: children and adolescents aged between 12 and 17 years with a diagnosis of epilepsy (controlled or refractory), able to speak, read, and write English, and who attended mainstream schooling

Dorris 2017 *(Continued)*

	Exclusion criteria: formal diagnosis of Learning Disability, suicidal ideation and/or scored ≥ 40 on the BDI-Y and BAI-Y, had a diagnosis of non-epileptic seizures only. 83 participants randomized. 40/43 were allocated to PIE/WLC, respectively. The mean age in years was 14.4 (range 12 - 17) and 14.3 (range 12 - 17) in PIE and WLC, respectively. There were 26/24 female participants in PIE/WLC, respectively. 12/19 had focal seizures; 25/29 had generalized clonic/tonic clonic seizures; 4/5 had myoclonic seizures, 16/16 had absence seizures, 0/1 had tonic seizures, in PIE and WLC, respectively. All participants were recruited across 7 tertiary pediatric neuroscience centres in the UK. Recruitment took place over a four-month period from April to July 2015. The study was financially supported by UCB Pharma (award number: G0002101) and a monetary award from Yorkhill Children's Foundation; no conflict of interest reported.
Interventions	PIE was a group-based self-management intervention, based specifically on initial consumer survey findings. The intervention was conducted in a 6-week group setting co-led by a clinical psychologist and epilepsy nurse, which met once a week for 6 weeks for 120 minutes. Topics included medical (medication adherence, managing medical appointments, ketogenic diet) and sleep hygiene self-management aspects of epilepsy in addition to psychosocial issues such as driving, development of coping strategies for anxiety or low mood through strategies such as problem-solving, and techniques based on CBT and mindfulness
Outcomes	PedsQL™ version 4.0, GEOS-YP, EKP-G, SSEC-C, Brief - Illness Representations Questionnaire (B-IPQ), PI-ED, CHI-ESQ -Caregiver and young person self-report versions Time points measured: 1) Baseline 2) Postintervention (6 weeks) 3) 3-month follow-up 4) 6-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Participants were randomly allocated to the intervention or control conditions using a stratified (block) randomization protocol (excel random number generator)
Allocation concealment (selection bias)	High risk	The primary author stated that the allocation of participants was randomized but not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel who facilitated the intervention were not blinded to the allocation of participants
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The researcher inputting the data remained blinded until study completion
Incomplete outcome data (attrition bias) All outcomes	High risk	3/40 and 11/43 missed the second assessment in PIE and WLC, respectively.The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	Reviewing the publication does not reveal selective reporting

Dorris 2017 *(Continued)*

Other bias	Low risk	Low risk for infidelity to intervention protocol, since the intervention protocol was manualized, training sessions were provided by the authors, weekly supervision sessions were provided and audio recordings of each session were checked for fidelity. Fidelity was considered high. No evidence to suggest selective recruitment bias. Competence in delivery of intervention delivery was not assessed and therefore remains unclear

Edward 2019

Study characteristics	
Methods	A quasi-randomized trial comparing group intervention (brief education intervention on lifestyle self-management) and control in adult (aged > 18) with epilepsy. Outcome measures were obtained at baseline (at the time of recruitment) and 6 months after intervention
Participants	The participating sites were two large hospitals in Melbourne, Australia, one public and one private. Patients recruitment was conducted in year 2015. Inclusion criteria: only adults (> 18 years) who had been diagnosed with epilepsy were eligible. People with history of seizures from causes other than epilepsy, such as acute trauma, were not included in this study unless the comorbidity existed in addition to a diagnosis of epilepsy. Furthermore, as documents were available only in English, people with limited English comprehension were excluded. Once the 60 participants had been recruited, they were contacted again and allocated to the intervention or control group. Random allocation to groups was used; but if a participant was unable to attend the intervention face-to-face session, they were placed into the control group by the researcher responsible for participant group allocation 60 participants were recruited (male N = 31). N = 37/23 were allocated to control/intervention. The average age was 40.4/39.9 years in the control/intervention group. All 60 participants were analyzed at time point 1, and 35 were analyzed at time point 2 (18 in control and 17 in intervention group). This study was supported by St Vincent's Private Hospital Melbourne. The funder did not participate in the research process. No conflict of interest was reported
Interventions	Self-Management and Lifestyle Education for Adults Living with Epilepsy was a theory-informed, evidence-based and peer-reviewed education package developed specifically for the purpose of this study. The development was based on the framework of the SDT. SDT is centered on supporting people's natural tendencies to behave in ways that promote and maintain their health. The education package was divided into 4 education modules: managing epilepsy and medical care; socializing on a budget; leading a healthy lifestyle; and emotional self-management. Including these topics addresses some key triggers that can bring on a seizure in people with epilepsy. The facilitators were clinical nurse specialists in neurosciences, who were trained by a research team member qualified in SDT and training in the module content, and had received instructions on how to conduct sessions
Outcomes	SF-12, SWLS, CD-RISC, MMAS-8 Time points measured 1) Baseline (at the time of recruitment, no information on whether it was before or after randomization 2) 6 months after the intervention
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**

Edward 2019 *(Continued)*

Random sequence generation (selection bias)	High risk	Random allocation to groups was used; but if a participant was unable to attend the intervention face-to-face session, they were placed into the control group by the researcher responsible for participant group allocation
Allocation concealment (selection bias)	Unclear risk	Insufficient information
Blinding of participants and personnel (performance bias) All outcomes	High risk	Neither the participants nor the personnel who delivered the intervention were blinded
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Insufficient information
Incomplete outcome data (attrition bias) All outcomes	High risk	6/23 (26%) and 19/37 (51%) missed the second assessment in intervention and control group, respectively. The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	No evidence to suggest reporting bias. Study protocol not yet provided upon request
Other bias	Unclear risk	Risk of bias for the training dimension in treatment competency was low as professionals who delivered the intervention received targeted training. But risk of bias for competency on treatment delivery and treatment fidelity were unclear. Risk of bias for selective recruitment was unclear

Fraser 2015

Study characteristics	
Methods	Unblinded, randomized, controlled trial comparing group intervention (PACES) and WLC in people with epilepsy on self-management and quality of life. Outcome measures were obtained at baseline (after randomization), postintervention (8 weeks) and 6 months follow-up
Participants	Inclusion criteria: adults, age 18 and above, with an established diagnosis of epilepsy for at least 6 months, able to speak, read, and write English, and reasonably cognitively intact (MoCA); aged ≥ 21 Exclusion criteria: severe mental illness or psychosis, or known cognitive impairment (IQ < 70) 92 participants randomized. 46 were allocated to each group; 41/38/37 and 42/40/39 were analyzed in PACES and WLC, respectively, at baseline/postintervention (8 weeks), and 6-month follow-up. The mean age was 44.9 (SD 12.5) and 45.4 (SD 12.6) in PACES and WLC, respectively. There were 23 women in each group. 8/7 had simple focal seizures; 20/23 had complex focal; 9/7 had secondarily generalized seizures; 14/20 had tonic-clonic seizures; 2/3 had myoclonic seizures, 6/4 had absence seizures, 2/2 had other seizures, in PACES and WLC, respectively All participants were recruited through the UW Regional Epilepsy Center and Swedish Epilepsys Center, both in Seattle, USA. Recruitment took place from 2010 to 2013. This work was financially supported by the Centers for Disease Control and Prevention SIP 12-09, grant no. DP002273; no conflict of interest reported.
Interventions	PACES was a group-based, psycho-educational intervention, based specifically on initial consumer survey findings. The intervention was conducted in an 8-week group setting of 6 to 8 adults, co-led by a psychologist and trained peer with epilepsy, which met 1 evening a week, at a hospital, for 75 minutes.

Fraser 2015 *(Continued)*

	Topics included medical, psychosocial, cognitive, and self-management aspects of epilepsy, in addition to community integration and optimizing epilepsy-related communication
Outcomes	ESMS, ESES, QOLIE-31, PHQ-9), and the GAD-7 Time points measured: 1) Baseline (after randomization) 2) Postintervention (8 weeks) 3) 6-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A random-number generator was used for randomized assignment. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Information was sought and provided; allocation was concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and personnel were not blinded to the treatment they received or provided
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Information was sought and provided. According to authors, outcome assessment was blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	The dropout rate was 16/92 (17.4%) overall; 9/46 (19.6%) in the Intervention and 7/46 (15.2%) in the WLC group, respectively. The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting bias within study, or after review of documentation of outcome measures used in the study
Other bias	High risk	Unclear risk of bias for treatment infidelity and competence in delivering the intervention. Training background of personnel delivering the intervention was rated as low risk for incompetence. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Gandy 2014

Study characteristics	
Methods	Unblinded, randomized, controlled trial comparing individual CBT to WLC in people with epilepsy on mood-related symptoms. Outcome measures were obtained at baseline, post-treatment and 3-month follow-up
Participants	Randomized 59 adults aged 18 - 65, had a formal diagnosis of epilepsy according to the ILAE criteria, had an IQ of ≥ 80 (at least low average) according to the National Adult Reading Test, were fluent in English and provided written informed consent.

Gandy 2014 *(Continued)*

	Exclusion criteria: psychotic disorder, suicidal, severe personality disorder, about to undergo epilepsy surgery, primary health concern and reason for seeking psychological support related to chronic illness other than epilepsy (e.g. MS) 31 and 28 participants were randomly enrolled to CBT and WLC. The mean age in years was 41 (SD 12; range 19 - 66) in CBT, and 38 (SD 13; range 20 - 63) in WLC. 9/13 participants had refractory epilepsy in CBT/WLC. The mean duration of epilepsy in years was 15 (SD 13; range 5 - 37) in CBT, and 9 (SD 13; range 5 - 32) in WLC. The mean number of AEDs was 2 (SD 0.8; range 0 - 4) in CBT, and 2 (SD 1; range 1 - 4) in WLC. 14/21 participants had focal epilepsy; 6/4 participants had generalized epilepsy in CBT/WLC. 13/10 participants had a history of previous illness in CBT/WLC. The estimated IQ was 104 (SD 10; range 84 - 118) in CBT, and 106 (SD 10; range 81 - 122) in WLC Participants were recruited from the Comprehensive Epilepsy Service at the Royal Prince Alfred Hospital, in Sydney, Australia. A minority (N = 7) were recruited through advertisements about the study by Epilepsy Action Australia. Recruitment took place between January 2011 and December 2011. Dr Milena Gandy was supported by the generous scholarships of the National Health Research Council of Australia and the Molly McDonnell Foundation of the Epilepsy Society of Australia for this research. Prof. Louise Sharpe is supported by an NHMRC Senior Research Fellowship. The authors also acknowledged the Epilepsy Action Australia for advertising the study and providing seizure diaries for participants. No conflicts of interest was reported.
Interventions	The CBT program included 9 individual sessions: 1 x 1- to 2-hour assessment session for formulation of treatment goals, and 8 weekly, individualized 1-hour therapist-client sessions, with elements including home-based practical tasks, behavioral activation, CBT model, anxiety management, and communication skills about their illness. The intervention was delivered by postgraduate doctorate-level intern psychologists under the supervision of senior clinical psychologists (> 10 years of experience). All therapists and supervisors attended a 1-day workshop; a strict adherence checklist was completed by all therapists, who attended weekly supervision with senior clinical psychologists
Outcomes	NDDI-E, the HADS, QOLIE-31 Time points measured: 1) Baseline (before randomization) 2) Post-treatment 3) 3-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A list of random numbers, using the Bernoulli function, was generated and used consecutively for randomization. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Concealment was ensured
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment
Blinding of outcome assessment (detection bias) All outcomes	High risk	Outcome assessment was not blinded, based on information provided by study authors

Gandy 2014 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	High risk	12/31 (39%) and 5/28 (18%) withdrew from the study at 3-month follow-up. Attrition rate was considered high
Selective reporting (reporting bias)	Low risk	Unpublished data were sought and provided. No evidence to suggest selective reporting
Other bias	High risk	Although there was regular supervision with adherence checklist, results for treatment adherence were not available so the risk of bias was unclear. The professionals who delivered the interventions received training specifically on the use of treatment, so the risk of bias was low in this dimension of treatment competency. But there was no measures to monitor treatment delivery, so the risk of bias was unclear for the competency to deliver the intervention. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Gilliam 2019

Study characteristics	
Methods	A randomized trial to compare depression and multiple secondary health outcomes of sertraline and CBT in persons with current major depression and active epilepsy. Outcome measures were obtained at baseline (before randomization), week 8 (during intervention) and week 16 (immediately after intervention)
Participants	Inclusion criteria: age 21 - 75 years, diagnosis of epilepsy confirmed by a board-certified neurologist with subspecialty training in epilepsy, occurrence of an absence, focal with impaired awareness, or generalized motor seizure within the past 12 months while taking a recommended dose of an approved antiseizure medication, score of > 14 on the CES-D, diagnosis of current major depressive episode on the MINI, and able to read and understand study documents based on investigators' assessment Exclusion criteria: suicidal attempt within the past year, current alcohol or other substance abuse disorder, history of bipolar depression or psychotic disorder, pregnant or lactating, prior hypersensitivity reaction to sertraline, progression central nervous system disorder (such as tumor or multiple sclerosis), significant medical illness such as hepatic or renal disorder (serum creatinine < 3 mg/dl) Out of 1020 individuals prescreened in clinic, 140 participants were randomized to sertraline group (N = 72) and CBT (N = 68); mean age at enrollment was 39.6 years; 77 were women; 127 (90.7%) had not received prior treatment for depression. There was no statistically significant difference in demographic characteristics and baseline measures. 49 in both groups completed treatment as assigned. 23 (32%) did not complete the sertraline treatment; 19 (28%) did not complete the CBT treatment. All subjects were recruited from the general neurology and subspecialty epilepsy clinics at Columbia University and Washington University, as well as through announcements in local periodicals. The dates were not specified. This work was funded by the National Institute for Neurological Disorders and Stroke (R01NS040808). No conflict of interest was reported.
Interventions	A 16-week intervention intended to eliminate depression was administered. Each participant's physician continued epilepsy management. Either sertraline or CBT was the treatment for depression. Sertraline treatment: sertraline was initiated at 50 mg a day, and increased by 50 mg at 2-week intervals as needed for a CES-D score > 14, up to a maximum dose of 200 mg a day CBT: administered by licensed therapist using standardized manual-based Beck guidelines in a 1-hour session each week. The therapist completed a weekly written assessment to document the components of CBT used in each session (authors provided us further information that there was weekly clinical supervision in group format, the group included several experienced CBT therapists and each meeting lasted about 90 minutes; supervision was also provided on as-needed basis; but the record for such

Gilliam 2019 *(Continued)*

	meeting to ensure adherence to treatment protocol was no longer available). If approved by the participant, CBT sessions were taped for quality monitoring. Participants were encouraged to attend all session in person, but a minority of the sessions could be performed by telephone in consideration of transportation limitations
Outcomes	Primary outcome: the proportion of participants achieving remission from depression based on MINI Secondary outcomes: BDI, CES-D, suicidal module of the MINI, QOLIE-89, AEP, seizure rate and severity based on seizure calendars Time point measures for depression severity (BDI and CES-D), seizures and treatment side effects: 1) Baseline (prior to randomization) 2) 2-week interval between clinic visit until treatment completion at 16 weeks Time point measures for all other outcome measures: 1) Baseline (prior to randomization) 2) 4-week interval following baseline assessment until treatment completion at 16 weeks
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was carried out by a simple, nonstratified electronic randomization procedure
Allocation concealment (selection bias)	Low risk	The randomization code was generated by a computer program by a non-investigator. The code was kept in a locked computer in a secure room. Only a single study administrator had access to the code, which was masked prior to assignment
Blinding of participants and personnel (performance bias) All outcomes	High risk	There was no blinding of participants and personnel as confirmed by the authors
Blinding of outcome assessment (detection bias) All outcomes	High risk	Reasearch assistants who were aware of the intervention implemented the study procedures. They did not attempt to blind research assistants collecting outcome data because they were unable to ensure blinding based on their pilot studies of CBT
Incomplete outcome data (attrition bias) All outcomes	High risk	The attrition rate was 23/72 (31.9%) and 19/68 (27.9) in the sertraline and CBT groups, respectively. The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	The authors reported all data at baseline, 8-week and 16-week measurements; although the interval data were not reported in the publication, they were not intended to be treated as treatment outcome based on the hypotheses
Other bias	Low risk	Although there was regular supervision with adherence checklist, results for treatment adherence were not available (confirmed by author) so the risk of bias was unclear. Risk of bias in both dimensions of treatment competency for training and delivery were low. risk of bias was low in selective recruitment

Helde 2005

Study characteristics	
Methods	Assessor-blinded, randomized controlled trial comparing a nurse-led intervention (Intervention) for adults with epilepsy to a UC control arm, on epilepsy-related quality of life. Outcome measures were obtained before randomizations and after 2 years
Participants	Randomized 114 participants with a definite diagnosis of epilepsy and ASM for more than 1 year, ≥ 1 seizure during the previous year, the ability to cooperate, and understand written and oral information, and who provided written informed consent. 58/57 and 56/54 participants were randomized/analyzed in Intervention and UC, respectively. The mean age was 35.3 years (range 16 - 69) in Intervention, and 39.5 (range 16 - 67) in UC. There were 32 women in each group. 18/32/34/3/4/13/0 participants in Intervention, and 18/34/30/5/3/13/1 participants in UC, had simple focal/complex focal/secondarily generalized tonic-clonic/absence/myoclonic/primarily generalized tonic-clonic/unclassified seizures. 8/2 participants had major seizures (convulsive seizure with reduced consciousness) more frequently than once a month in Intervention/UC; 14/12 had minor seizure more frequently than once a week. The mean duration of epilepsy was 19 years in both groups. 20/28/9 participants in Intervention, and 12/38/4 participants in UC had 1/2/3 or more AEDs All participants were outpatients in the Neurological Clinic in Trondheim, Norway. Recruitment took place from February 2001 to March 2002. The study was supported by a grant from GlaxoSmithKline, Norway; no conflict of interest reported.
Interventions	Intervention comprised a 1-day group education program (5 - 11 participants/group). General information about different aspects of living with epilepsy was provided by a multidisciplinary team consisting of the nurse, a neurologist, a social worker, and a clinical neurophysiologist. Extended nurse follow-up and counseling was provided after the group session for continuity of care (nurse's presence in neurologist consultations; the nurse called the participants every 3 months to ensure consultation and to address individual needs; the importance of compliance with medical regimen was emphasized) The UC group was offered conventional treatment according to individual needs
Outcomes	QOLIE-89 Time points measured: 1) Baseline (before randomization) 2) 2 years after randomization 100-mm VAS scale (general satisfaction with the follow-up by the Neurological Clinic during the last 2 years) Time points measured: 1) 3 months after the final interview (2 years after randomization)
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computer-generated block randomization was used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured

Helde 2005 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	High risk	Neither participants nor service providers were blinded, based on information provided by study authors
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The assessors were blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	1/58 and 2/56 withdrew from the study. No evidence to suggest attrition bias
Selective reporting (reporting bias)	Low risk	Unpublished data (QOLIE-89 raw data) were sought and provided. No evidence to suggest selective reporting
Other bias	Low risk	Low risk for selective recruitment and training background (competence) of personnel delivering the intervention. Treatment fidelity and competence to deliver the intervention remain unclear

Hosseini 2016

Study characteristics	
Methods	Assessor-blinded, quasi-randomized, controlled trial comparing individual CBT and WLC in people with epilepsy, on quality of life. Outcome measures were obtained at baseline and 2-month follow-up
Participants	Randomized 56 participants (age 18 and above) with willingness to participate, epilepsy diagnosis for at least 1 year, with primary generalized tonic-clonic epilepsy and uncontrolled seizures that were diagnosed by a neurologist, no other chronic illness, and not enrolled in any other research. 28/23 and 28/24 were randomized/analyzed in Intervention and WLC, respectively. The mean age was 29.08 (SD 8.06) and 32.75 (SD 10.89) in Intervention and WLC. There were 10 women in Intervention and 12 women in WLC. The mean duration of epilepsy in years (was 18.17 (SD 12.74) in Intervention, and 15.2 (SD 8.89) in WLC, respectively. Exclusion criteria: immigrants, missing more than 1 intervention session, recent tragic life events (such as loss of life, divorce, etc.) All participants were diagnosed with epilepsy at the Nour and Kashani Hospitals in Isfahan, Iran. The dates when the study was conducted were not stated. The study was financially supported by the university's research deputy; no conflict of interest was reported.
Interventions	Intervention comprised 5 group sessions, each separated by 4 days. The structure of the motivational interviewing sessions was extracted from the book *Motivational Interviewing Group Intervention* for each session. Motivational interviewing is a strategy for fortification and enhancement of internal motivation, for changing through thought exploration, identification, and overcoming doubts and dualism. Aspects of the group intervention included being hopeful to overcome issues, decreasing social isolation, helping others to solve their problems, and learning that others may have to grapple with the same issues The WLC was offered conventional treatment, according to individual needs
Outcomes	QOLIE-89 Time points measured: 1) Baseline (before randomization)

Hosseini 2016 *(Continued)*

	2) 2 months after the intervention and randomization
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The described procedure remained unclear, but suggested quasi-randomization by assigning participants alternately
Allocation concealment (selection bias)	Unclear risk	Unclear if allocation was concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and personnel were not blinded to the treatment they received and provided
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessment was blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	The dropout rate in the treatment group was 5/28 (17.9%). Attrition was considered high. Furthermore, the reason for exclusion (missing > 1 treatment session) indicated that the model of analysis was not ITT
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	High risk	Unclear risk of bias for treatment infidelity and competence in delivering the intervention. Training background of personnel delivering the intervention was rated as low risk for incompetence. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Hum 2019

Study characteristics

Methods	Unblinded, controlled trial comparing a mindfulness-based CBT program (UPLIFT) to epilepsy information and self-management program (EpINFO) or WLC in adults with epilepsy and symptoms of depression. The study aimed to explore the efficacy of UPLIFT in reducing depression and improving quality of life
Participants	Inclusion criteria: > 18 years of age, resided in the province of Ontario, access to a computer, Internet, and phone, diagnosed with epilepsy for a minimum of 1 year, experienced some depressive symptoms as reflected by a minimum score of 12 on the CESD-R, reading comprehension score > 7 on an EQAO Junior Division Assessment of Reading (www.eqao.com/en) or a listening comprehension assessment score > 18 on the WIAT-III. 55 adults were enrolled. 20, 24 and 11 participants were allocated to UPLIFT, EpINFO and WLC, respectively. The mean age was 36.9 (± 2.9)/37.2 (± 2.6)/29.4 (± 2.3) years in UPLIFT, EpINFO and WLC, respectively. 4 (UPLIFT), 9 (EpINFO) and 8 (WLC) participants were women. 3/2/12/3 participants in UPLIFT had generalized/focal/mixed/unknown seizures, 2/5/13/4 participants in EpINFO had generalized/focal/mixed/unknown seizures, 1/1/6/3 participants in WLC had generalized/focal/mixed/unknown seizures. Patients were referred from local epilepsy clinics and community epilepsy agencies in Ontario, Canada, The dates when the study was conducted were not stated. This research was finan-

Hum 2019 *(Continued)*

	cially supported by EpLink – The Epilepsy Research Program of the Ontario Brain Institute (OBI); no conflict of interest reported.
Interventions	The program UPLIFT (Thompson 2010) taught coping strategies during each session with skill-building exercises for participants to complete in between sessions. The intervention was delivered by phone by a licensed mental health professional and a person living with epilepsy during 1-hour sessions, delivered once a week for 8 weeks
Outcomes	The QIDS, NDDIE, and the psychological health subscale of the WHOQOL-BREF scale 1) Baseline 2) 6 months postintervention 3) 1 year postintervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Participants were randomly assigned (stratified by age and sex) using an online random-number generator to 1 of 3 groups
Allocation concealment (selection bias)	Unclear risk	Altogether unclear risk of allocation concealment
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Altogether unclear risk of performance bias
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Altogether unclear risk of detection bias
Incomplete outcome data (attrition bias) All outcomes	High risk	Attrition was 24.6%
Selective reporting (reporting bias)	Low risk	We have not received the study protocol. As far as we can tell from the publication, there is no selective reporting of outcome measures
Other bias	Unclear risk	Altogether unclear risk of infidelity to treatment protocol, incompetence to deliver the treatment protocol, and selective recruitment

Jantzen 2009

Study characteristics

Methods	Unblinded, quasi-randomized controlled trial comparing the FLIP&FLAP epilepsy intervention group (IG) for children and adolescents with epilepsy to a WLC on HRQOL and the children's ability to explain epilepsy to others. Outcome measures were obtained at baseline and 6 months after treatment
Participants	Inclusion criteria: diagnosis of epilepsy, taking antiseizure medication, sufficient German literacy, willingness of the child and at least 1 carer to participate in the education-program

Jantzen 2009 *(Continued)*

	192 families enrolled; 105 were enrolled to IG, and 87 were enrolled to WLC. At baseline, the final sample include 67 in IG, and 74 in WLC. Written consent was obtained from parents; children gave oral consent to participate Mean ages in years were 11.6 (SD 3.0; range 6 - 17) in IG, and 11.7 (SD 2.5; range 6 - 16) in WLC. Mean duration of seizures in years were 4.7 (SD 4.0) in IG, and 5.6 (SD 3.7) in WLC. 19/15/4/13/3/11 participants in IG and 22/15/7/3/1/10 participants in WLC had tonic-clonic/complex focal/simple focal/absence/myoclonic /unclassified seizures. 42 (IG) and 48 (WLC) participants were seizure-free for > 6 months. 29 in IG and 39 in WLC were receiving monotherapy The study took place in the University of Luebeck, Germany; participants were recruited from 10 specialized German epilepsy centres, between autumn 2003 and spring 2005. The work was financially supported by JanssenCilag GmbH (Neuss, Germany) as well as the Friedrich Bluhme and Else Jepsen Stiftung (Luebeck). No conflict of interest reported.
Interventions	The intervention group could be held as a 2-day (14 hours per course) or a 2½ day (16 hours per course) continuous session in group format (5 - 8/group). The intervention was delivered by healthcare professionals, such as nurses, social workers, doctors, or psychologists; 2 trainers were required per course. The following domains were included: disease knowledge, disease-related emotions, communication, self-responsibility, self-management, participation, and educational insecurity. One of the main aims was to help children to conceptualize their seizures. By watching the film and receiving age-appropriate information, the participants were enabled to understand their seizures and to develop a more adequate self-concept
Outcomes	DISABKIDS modular HRQOL questionnaire, disclosure of epilepsy, seizure-free episode Time points measured: 1) Baseline (immediately before intervention for IG and at recruitment for WLC) 2) Follow-up assessment (6 months after intervention)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Grouping was based on participant's time of application - those who applied for the first course were assigned to IG, while those who applied for the second course were assigned to WLC
Allocation concealment (selection bias)	High risk	Allocation was not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and therapists were not blinded
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessment was blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	The attrition was < 10% in all subgroups of the sample
Selective reporting (reporting bias)	Low risk	No evidence for selective reporting within publication

Jantzen 2009 *(Continued)*

Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and all dimensions of treatment competence

Leenen 2018

Study characteristics	
Methods	Assessor-blinded randomized, controlled trial comparing a multicomponent self-management group intervention (MCI) and TAU in adults with epilepsy on self-management and quality of life. Outcome measures were obtained at baseline, 3- and 6-month follow-up.
Participants	Inclusion criteria: adults, aged 18 and above, diagnosed with epilepsy and using AED, able to understand Dutch, and who were willing and able to use eHealth devices Exclusion criteria: people with epilepsy who were not willing or able to function in group activities and clinical judgment 104 participants randomized. 52/48 were allocated to MCI/TAU, respectively. The mean age in years was 40.0 (SD 13.1) and 43.5 (SD 15.4) in MCI and TAU, respectively. There were 24/28 women in each group, respectively. The mean duration of epilepsy was 20.3/19.9 years in MCI/TAU, respectively, and the mean seizure frequency at baseline 4.5/5.8 in MCI/TAU, respectively All participants were recruited trough the Academic Centre for Epileptology in Maastricht. Recruitment took place from March 2014 to December 2015. This study was funded by the Netherlands Organization for Health Research and Development (ZonMw), grant application number 836011018; no conflict of interest reported.
Interventions	MCI was a group-based self-management education program with e-Health interventions directed at improving self-efficacy, so improving the self-management skills of people with epilepsy. The MCI consisted of 5 weekly group sessions of 2 hours each, followed by a 2-hour booster session after 3 weeks and was delivered by 2 nurse practitioners. All group sessions consisted of 2 components: education and practicing goal-setting skills. In the educational part, participants were sharing and discussing strategies about 3 topics: 1) self-monitoring and self-monitoring using (e-Health) tools; 2) risk-evaluation and management; and 3) shared decision-making/concordance. The goal-setting component of the intervention is based on Aspinwall and Taylors' 5 stages of proactive coping.
Outcomes	ESES, GSES, MEMS, MARS-5, Questionnaire seizure frequency, NHS3, HADS, QOLIE-31-P, UPCC, SIDAED Time points measured: 1) Baseline 2) 3-month follow-up 3) 6-month follow-up
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomization was executed with a randomization program (www.randomization.com).
Allocation concealment (selection bias)	Low risk	The randomization scheme was distributed to the researcher in sealed envelopes during the first visit, prior to baseline

Leenen 2018 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel who facilitated the intervention were not blinded to the allocation of participants
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The author clarified "the data analyst was not involved in the intervention and was not aware of the patient status."
Incomplete outcome data (attrition bias) All outcomes	Low risk	6/52 and 9/50 missed the second assessment in CBT (ZMILE) and TAU, respectively.The attrition rate was considered low
Selective reporting (reporting bias)	Low risk	No evidence to suggest reporting bias
Other bias	High risk	The intervention protocol was manualized and training sessions were provided by the authors. The author clarified that forms were used to record if all sessions adhered to the intervention protocol and that fidelity was high. However, no competence measures were used. It is therefore altogether unclear risk for competence to deliver the intervention. High risk for selective recruitment bias as unspecified "inability" to function in group activities or "clinical judgment that they would not be able to comprehend topics discussed within the MCI (e.g. PWE with cognitive deficits)" were exclusion criteria

Lua 2013

Study characteristics	
Methods	Randomized, controlled, open-label trial comparing an SMS-based epilepsy education program (IG) to a paper-based epilepsy education program as control (CG) in individuals with epilepsy on epilepsy-related quality of life. Outcome measures were obtained at baseline and after intervention (3 months after randomization)
Participants	Inclusion criteria: adults (aged 18 or above), epilepsy, on regular treatment, able to either write, read, or understand and communicate in Malay or English language, capable of completing questionnaires (either written or verbal), mobile phone owners, and active users, provided written consent 144 randomized, 72 into each group; 71 in IG and 65 CG were included in the final analysis. The mean age of all participants was 30.5 (SD 11.8) years. There were 38 and 33 women in IG and CG, respectively. 13 participants in IG and 16 in CG had a duration of epilepsy between 6 and 12 months, 15/16 participants in IG/CG had duration of > 120 months. 36/36 and 40/32 in IG/CG had generalized seizures/focal seizures. The study was conducted in the Neurology Clinics of 3 public hospitals in the states of Terengganu, Pahang, and Kelantan in Malaysia. The dates when the study was conducted and sources of funding were not stated; no conflict of interest reported.
Interventions	The intervention for both the IG and CG included a printed epilepsy education module. It was based on the Modular Service Package Epilepsy (MOSES), and was modified to suit the sociodemographic backgrounds of participants in the East Coast Peninsular Malaysia (May 2002; Ried 2001). 11 parts were included: 1) basic knowledge, 2) history and statistics, 3) living with epilepsy, 4) diagnosis, 5) treatment and therapy, 6) prognosis, 7) self-control, 8) myth and facts, 9) psychosocial aspects, 10) laws and acts, and 11) reference. All participants were instructed to read 1 part a week at home, based on the schedule provided in the user manual.

Lua 2013 *(Continued)*

	IG received an add-on SMS-based mobile epilepsy education system (MEES) throughout the 3 months. 3 parts were included: 1) epilepsy education module, 2) drug-taking reminder, and 3) clinic appointment reminder. During the period, 2 simple SMS messages, generated from each printed education module, were automatically delivered to participants every 4 days; they also received SMS reminders once a month for their medication and their appointment, based on individual schedules. MEES allowed participants to send queries and comments about their healthcare services or their illness by SMS to a specific number, to be addressed by researchers
Outcomes	Malay Quality of Life Inventory in Epilepsy-30 (MQOLIE-30) Time points measured: 1) Baseline (at recruitment) 2) 3 months (after intervention)
Notes	Data were sought but not provided

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	An interactive voice response system was used for randomization. No evidence to suggest selection bias
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	No information provided about blinding of personnel delivering the intervention
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	1/72 (1%) and 7/72 (10%) withdrew from the study (both < 20%, which was our cut-off). No evidence to suggest attrition bias
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and treatment competence

Lundgren 2006

Study characteristics

Methods	Unblinded, randomized, controlled trial comparing ACT to ST in adults with epilepsy on quality of life and seizure control. Outcome measures were obtained at baseline, postintervention, 6 months and 12 months following the end of interventions

Lundgren 2006 *(Continued)*

Participants	27 participants (aged 27 - 55 years) with epilepsy, who were institutionalized or day-workers in a centre of epilepsy in South Africa participated; all of them were able and willing to participate, had a minimum of 4 seizures during the past 3 months, and had a verified diagnosis of epilepsy using EEG 14/13 participants were randomly allocated to ACT/ST, respectively; 7 women in each group. 4 and 5 participants in ACT and ST needed an interpreter. 10/1/2/4 participants in ACT and 9/0/1/7 participants in ST had generalized tonic-clonic seizures/myoclonic jerks/complex focal seizures/absence seizures Exclusion criteria: signs of an ongoing progressive illness The study took place in Epilepsy, South Africa, and the Department of Neurology, University of Cape Town. The dates when the study was conducted and source of study funding were not stated; no conflict of interest reported.
Interventions	The treatment included an ACT (ACT plus behavioral techniques for seizure management) and ST. The design involved 4 sessions, comprised 1 individual session (1½ hours), 2 group sessions (3 hours each), followed by 1 individual session (1½ hours). All participants were subsequently provided individual boosters, and followed up for an additional session at 6 and 12 months (1 hour each). The booster sessions were conducted after the follow-up measures were taken. Total therapy time over the 12-month study was 11 hours. The ACT protocol can be downloaded at www.contextualpsychology.org and www.ACT-Forum.se. Participants in the ACT learned to improve their valued living by building a broader behavioral repertoire in valued life directions. Therapeutic components included techniques to build psychological flexibility around the chain of seizure behaviors, self as context, defusion, acceptance, contact with present moment, committed action, and empowerment. The patterns of seizures were discussed, as they occurred as obstacles to valued living. Participants were required to make records of seizure patterns, in terms of antecedents, seizure responses, and consequences. Individualized seizure management techniques (e.g. counter-measures) were taught. The ST goal was to provide an equal amount of professional attention in a supportive environment. The therapists were instructed to give no active advice. The intervention was delivered by 2 clinical psychologists from Uppsala University, Sweden (first and second authors) trained in ACT, and with experience in behavioral treatment of epilepsy
Outcomes	SWLS, WHOQOL-BREF, seizure frequency, seizure index Time points measured: 1) Baseline 2) Postintervention 3) 6-month follow-up 4) 12-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computerized randomization table was used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured, according to information provided by study authors

Lundgren 2006 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and personnel were not blinded to the treatment they received or provided
Blinding of outcome assessment (detection bias) All outcomes	High risk	Outcome assessors were not blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	There were no dropouts
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	High risk	Low risk for incompetence of personnel delivering the intervention, but no measure to check adherence was used. Risk of bias is therefore unclear for treatment fidelity. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Lundgren 2008

Study characteristics	
Methods	Unblinded, randomized controlled trial comparing ACT to yoga in adults with epilepsy on seizure control and quality of life. Outcome measures were obtained at baseline, postintervention, 6 months and 12 months following the end of interventions
Participants	Inclusion criteria:adult (18 years or older), ability and willingness to participate in the program, a minimum of 3 seizures during the past 3 months, and an EEG-verified diagnosis of epilepsy Recruited 18 adults (aged 18 - 55) from an outpatient clinic for epilepsy in southwest India. 10 and 8 were allocated to ACT and yoga, respectively. The mean age was 21.9 years in ACT and 25.8 years in yoga; 3 women in each group. 6 and 5 participants required an interpreter for the treatment in ACT and yoga, respectively. 6 in each group had generalized tonic-clonic seizures; 2 and 1 had myoclonic jerks in ACT and yoga, 3 and 2 had complex focal seizures in ACT and yoga, 1 had absence seizures in yoga. The dates when the study was conducted and the sources of funding were not stated; no conflict of interest reported.
Interventions	Refer to Lundgren 2006 for the structure and intervention details of ACT The yoga training for epilepsy had 2 main features: stimulating activity that the participants considered meaningful, and using yoga techniques to decrease the risk of epileptic seizures and promote well-being. The program focused on 3 different physical dimensions and 2 psychological dimensions to unite the mind, body, and soul. The yoga teacher and the participants discussed barriers to living a life they considered important. Accepting private events and living meaningful lives were essential parts of the treatment. The teacher used metaphors, direct instructions, and encouragement to help the participants to be active in areas considered important. Examples of such domains were: relationships, work, health, and leisure time
Outcomes	SWLS, WHOQOL-BREF, seizure frequency, seizure index Time points measured: 1) Baseline 2) Postintervention

Lundgren 2008 *(Continued)*

	3) 6-month follow-up 4) 12-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computerized randomization table was used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured, according to information provided by study authors
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and personnel were not blinded to the treatment they received and provided
Blinding of outcome assessment (detection bias) All outcomes	High risk	Outcome assessors were not blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	There were no dropouts
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	High risk	Low risk for incompetence of personnel delivering the intervention, but no measure to check adherence was used. Risk of bias is therefore unclear for treatment fidelity. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Martinović 2006

Study characteristics

Methods	Blinded, randomized, controlled trial comparing CBI to counseling as usual (TAU) in adolescents with epilepsy on depressive symptoms. Outcome measures were obtained at baseline, 6-month and 9-month follow-up
Participants	Inclusion criteria: newly-diagnosed epilepsy (either focal or generalized, at least 2 unprovoked seizures within a period of not longer than 12 months), subthreshold depression (as defined by Hamilton Depression Scale, scores 6 to 8), normal intelligence Exclusion criteria: epilepsy caused by progressive cerebral lesion, mental retardation, a diagnosis of depression, psychotic symptoms, schizophrenia, bipolar disorder, social phobia, agoraphobia, or panic disorder according to DSM-IV 32 participants were included in the study. All participants attended either elementary or high-school classes depended on age. 16 were randomized into BCI and TAU. The final sample analyzed was 30, as 1 participant in each group withdrew after randomization.

Martinović 2006 *(Continued)*

	The mean age was 17.2 (SD 2.5; range 13 - 19) years in the CBI and 17.6 (SD 2.2; range 13 - 19) in TAU. There were 9 girls in each group. 6/5 (CBI) and 9/10 (TAU) participants had generalized seizures/focal seizures. 7/9 and 8/6 participants were receiving monotherapy/polytherapy in CBI/TAU. 5 in CBI and 7 in TAU were drug-resistant. The mean IQ was 104 (SD 14.6; range 87 - 130) in CBI and 102 (SD 15.8; range 85 - 132) in TAU All participants were recruited from general practices in Belgrade and its surrounding areas. They were then referred to the Outpatient Department of Epilepsy, located at the Institute of Mental Health. The dates when the study was conducted were not stated. There was no statement on conflicts of interest in the publication.
Interventions	CBI was applied as part of an individual treatment plan, aimed at analyzing and modifying distorted automatic thoughts related to negative depressive thinking. It was delivered in group format with 7 to 8 participants/group, administered in 8 sessions during the first 2 months, and then in 1 session a month during the next 4 months. Participants in CBI learned to recognize and correct all main types of cognitive errors: catastrophic, over-generalization, personalization, and selective abstraction. Sessions consisted of activity plans, relaxation, identification and correction of thought distortions through cognitive restructuring, role playing, development of social skills, and problem-solving. All participants randomized to CBI were instructed to note, in a treatment diary, the occurrence of negative thoughts and counter-measures taken (positive thoughts). Negative and positive thoughts were rated on a 4-point scale TAU was administered in the same number of sessions and formats. It consisted of therapeutic counseling without elements of CBI
Outcomes	BDI, CES-D scale, HAMD, QOLIE-31, seizure control, the rating of positive and negative thoughts on a 4-point scale Time points measured: 1) Baseline 2) 6-month follow-up 3) 9-month follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer-generated list of numbers was used for randomization. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Both the participants and the therapists who delivered the treatment (CBI and TAU) were unaware of the study hypotheses. They were told that they would be provided with or deliver psychological means to improve coping with epilepsy. No evidence to suggest performance bias
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Assessors were blinded, according to information provided by study authors
Incomplete outcome data (attrition bias) All outcomes	Low risk	1 dropout in each group. No evidence to suggest attrition bias

Martinović 2006 *(Continued)*

Selective reporting (reporting bias)	High risk	Results of the following parameters were unavailable: 1) familial risk factors, 2) environmental risk factors, 3) the rating of positive and negative thoughts on a 4-point scale, 4) seizure control. Unpublished data were sought but not provided
Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and all dimensions of treatment competence

May 2002

Study characteristics	
Methods	Assessor-blinded, randomized, controlled trial comparing the Educational Epilepsy Program MOSES (Modular Service Package Epilepsy) to a WLC in adults with epilepsy on quality of life, self-esteem, depressive symptoms, epilepsy knowledge and coping, seizure frequency, as well as epilepsy-specific daily living restrictions, fears, mobility, and leisure. Outcome measures were obtained at baseline and 6 months after intervention
Participants	Inclusion criteria: epilepsy, regardless of syndrome, duration, or severity Exclusion criteria: mental retardation, acute psychiatric illness, non-epileptic seizures only Enrolled 383 people. The final sample included 242 participants (aged 16 - 80), 113 received MOSES and 129 were allocated in WLC. The mean age was 37.5 (SD 13.7; range 16 - 77) years in MOSES, and 38.4 (SD 13.5; range 16 - 80) years in WLC. There were 65/73 women in MOSES/WLC. The duration of epilepsy ranged from 1 to 54 years in MOSES and 1 to 61 years in WLC. 23/71/3 participants MOSES and 20/81/0 participants in WLC had generalized epilepsy/focal epilepsy/focal and generalized signs. The rest had an undetermined type of epilepsy, or no data were available. 45/46/58/3/1/5 participants in MOSES, and 57/56/59/11/0/3 participants in WLC had simple focal seizures/complex focal seizures/tonic-clonic seizures/absence seizures/myoclonic seizures/tonic seizures. The rest were undetermined. 23/35 participants had no seizures in the past 6 months in the MOSES and WLC groups. 38/39 had 1 to 5 seizures in the past 6 months; 21/30 had > 1 seizure a month; 17/22 had > 1 seizure a week; 11/1 had > 1 seizure a day. 110 participants in MOSES and 125 in WLC received treatment with antiseizure medication Participants were drawn from 22 epilepsy centres in Germany, Austria, and Switzerland. The dates when the study was conducted were not stated. The study was supported by Sanofi-Synthelabo; no conflict of interest reported.
Interventions	The aims of MOSES were to improve participants' knowledge about epilepsy, its consequences, diagnostic and therapeutic measures, and to improve participants' understanding of psychosocial and occupational problems. The participants were encouraged to cope actively with their disease, to live with as few limitations as possible, to participate in the treatment process, and to gain more self-esteem. The program focused on enhancing the self-help potentials of the participants, and on promoting the participants to become 'experts' in dealing with their epilepsy. As results, a reduction of psychosocial problems and an improvement of quality of life were expected. The program included 9 units: living with epilepsy, epidemiology, basic knowledge, diagnostics, therapy, self-control, prognosis, psychosocial aspects, and network. To cover the program, ~14 lessons (60 minutes each) were necessary. In this study, MOSES was offered as a 2-day course (course details were not specified)
Outcomes	SF-36, Rosenberg self-esteem scale, Depression Scale (D-S), Restrictions in Daily Living Due to Epilepsy, Epilepsy Knowledge Profile, Coping with Epilepsy and Adaptation, seizure frequency, and contentedness of drug therapy, evaluation of the MOSES program Time points measured: 1) Baseline 2) 6 months after completion of the course

May 2002 *(Continued)*

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random sequence generation was ensured, according to information provided by study authors
Allocation concealment (selection bias)	High risk	Allocation was not concealed, according to information provided by study authors
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded, according to information provided by study authors
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessors were blinded, according to information provided by study authors
Incomplete outcome data (attrition bias) All outcomes	High risk	133/383 withdrew after randomization; of the remaining 250, 8 were excluded due to violation of study protocol. 242 were included in the final sample. Attrition rate was considered high
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	High risk	As professionals who delivered the intervention had to have had at least 2 years of experience caring for people with epilepsy (social worker, nurse, medical doctor etc.) and received additional theoretical and practical training and supervision to deliver the MOSES intervention, we rated risk of bias as low in this dimension of treatment competence. Regular supervision (no results available), no adherence checklist, some sessions were video-taped (no results available). Risk of bias is therefore unclear for treatment fidelity and competence in treatment delivery. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Meyer 2019

Study characteristics

Methods	A parallel-group, pragmatic randomized controlled trial of an Internet-based cognitive-behavioral therapy (Emyna), offered adjunctively to care as usual (CAU), to improve depression among people with epilepsy. Outcome measures were obtained at baseline, 3 months, 6 months and 9 months through a secure, encrypted online survey service
Participants	Inclusion criteria: age of at least 18; diagnosis of active epilepsy (defined by having taken AEDs within the past 5 years or having experienced seizures within the past 10 years); diagnosis of a current depressive disorder (confirmed by telephone-administered diagnostic interview administered by trained research associates); at least moderate depression severity (PHQ-9 > 9); ability to read and speak German; with Internet access. Exclusion criteria: antidepressant medication was newly prescribed or changed within 1 month prior to inclusion; currently in psychotherapy; had been diagnosed with bipolar disorder, schizophrenia, or oth-

Meyer 2019 *(Continued)*

	er psychotic disorder, or borderline personality disorder; acute suicidality was confirmed in telephone interview Participants were recruited consecutively by outpatient clinics in epilepsy centres and other hospitals as well as Internet forums, social media (e.g. Facebook), and health insurance brochures. 543 individuals were interested in participating in the study, 483 provided consent, 283 were not eligible based on inclusion/exclusion criteria. Finally, 200 met inclusion criteria and were randomized into control group (N = 100) or intervention (N = 100). The mean age of the total sample was 40.3 (SD = 13.12); 73 were male. 73, 60 and 60 participants in CAU+Emyna and 81, 66, and 57 participants in CAU completed 3-month, 6-month and 9-month postintervention assessment, respectively. Participants were recruited consecutively via outpatient clinics in epilepsy centers and other hospitals as well as Internet forums, social media (e.g. Facebook), and health insurance brochures between July 2016 and May 2017. This research was funded by Gaia, Germany, a research-focused small-to-medium enterprise that specializes in e-health interventions and regularly participates in publicly funded research. The authors reported potential conflicts of interest as below: B.M., M.W., and F.S. are affiliated with Gaia, the company that funded this trial and that developed, owns, and operates the Internet intervention evaluated in it. B.M. is employed full-time as Chief Scientific Office, M.W. is Chief Executive Officer and founder of Gaia, and F.S. is employed full-time as a research associate. None of the authors who are not employed by Gaia (M.H., S.A., K.B., J.S., Y.N.) has received any remuneration from Gaia. M.H. has received speaker honoraria and/or consultancy fees from Bial, Desitin, Eisai, LivaNova, Novartis, Shire, and UCB within the past 3 years. S.A. has received speaker honoraria and/or consultancy fees from Bial, Desitin, Eisai, LivaNova, and UCB within the past 3 years. The other authors (K.B., J.S., Y.N.) declare that they have no competing interests.
Interventions	The intervention was named 'Emyna', inspired by the Greek word "emyna", denoting 'defense', and alluding to the idea that the program might help people with epilepsy to defend themselves against some of the adverse emotional effects brought about by epilepsy. Emyna is a fully-automatic Internet intervention that requires no clinician support. It conveys CBT techniques and exercises to people with epilepsy and can be accessed over a period of 180 days. Program content is presented in interactive 'simulated dialogues' in which participants navigate through the program by reading brief text passages or listening to audio recordings and then selecting one of several response options.
Outcomes	Primary outcome - depressive symptom severity PHQ-9, NDDIE Secondary outcomes and additional measures GAD-7, DASS-21, WSAS, QOLIE-10, Seizure frequency by self-report, illness-related sick day off work in the previous 3 months, number of days hospitalized in the previous 3 months, positive/negative adverse events attributed to intervention by INEP-ON TIme point measured: 1) Baseline 2) 3 months after intervention 3) 6 months after intervention 4) 9 months after intervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was performed by the principal investigator (PI; Y.N.) using a computer-generated sequence to assign the allocation sequence

Meyer 2019 *(Continued)*

Allocation concealment (selection bias)	Low risk	The PI did not have knowledge of participant characteristics prior to performing the randomization, because participants were enrolled by trained research associates. Thus, concealed allocation was ensured
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to whether they were receiving the intervention, but the intervention was delivered using a fully automatic Internet intervention that requires no clinician support, so performance bias is considered low
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data were collected by a secure, encrypted online survey service
Incomplete outcome data (attrition bias) All outcomes	High risk	27/100 (27%) in the CAU+Emyna and 19/100 (19%) in the CAU-only dropped out at 3 months post-assessment. The attrition bias was considered high
Selective reporting (reporting bias)	Low risk	No evidence to suggest reporting bias
Other bias	High risk	Low risk of bias for treatment infidelity as this was a web-based intervention. Training background of personnel developing the Emyna intervention was rated as low risk for incompetence. Risk for selective recruitment was high as Internet forums social media were used

Orjuela-Rojas 2015

Study characteristics	
Methods	Assessor-blinded, quasi-randomized, controlled trial comparing group CBT with SSRIs treatment of MDD in adults with TLE on mood and quality of life. Outcome measures were obtained at baseline, 6 weeks (during treatment), and 12 weeks (immediately after treatment)
Participants	Inclusion criteria: adults (aged over 18), diagnosed with MDD according to the criteria of the DSM-IV, diagnosed with TLE according to the criteria of the ILAE, literate; individuals on antidepressant treatments were allowed to participate only if they had been on stable doses for > 8 weeks, and still showed signs of significant depression Exclusion criteria: high risk of suicide that required hospitalizations, abused or dependent on drugs, history of head trauma within 6 months prior to the recruitment, any condition that would prevent understanding the study or the psychotherapeutic process, such as mental retardation, psychosis, delirium, or dementia, previous CBT The 15 participants were assigned to CBT (N = 7) and SSRIs (N = 8) according to the participant's ability to attend the weekly session. There was 1 woman in the CBT and 4 in the SSRI group. The mean age was 33.8 years in CBT, and 43.1 years in SSRI. The duration of epilepsy/age at seizure onset was 12.4/21.4 years in CBT, and 22.3/20.7 years in SSRIs. The average number of seizures a month was 5.2 in CBT, and 4.6 in SSRI. 3 participants in each group had a comorbid anxiety disorder The study was conducted at the National Institute of Neurology and Neurosurgery in Mexico City. Recruitment took place between January 2013 and December 2013. This work was undertaken at theNational Institute of Neurology and Neurosurgery with support from the Department of Neuropsychiatry and by an author's research scholarship from the Consejo Nacional de Ciencia y Tecnologia (CONACYT). No conflicts of interest was reported.
Interventions	The CBT sessions comprised 1 weekly 90-minute session for 12 consecutive weeks. The components and structure of CBT were based on Crail-Melendez 2013. Therapeutic elements included the basics

Orjuela-Rojas 2015 *(Continued)*

	and relationship of depression and epilepsy, identification of emotions, modification of activities to improve mood, identification and reviewing of thought records, automatic thoughts, introduction of thought distortions, learning alternative thoughts, introduction of the concept of core beliefs, down-arrow techniques, etc. According to the study protocol, the SSRI group received treatment with a SSRI (sertraline or citalopram) for 12 weeks, based on the protocol suggested by the American Psychiatric Association in their practice guidelines for depression, in which titration is done at week 6, after the second evaluation
Outcomes	BDI, HADS, QOLIE-31, MINI Time-points measured 1) Baseline 2) 6 weeks during treatment 3) 12 weeks (immediately after treatment)
Notes	Original data were sought and provided by study authors

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Group assignment was not random. Allocation to CBT group was based on participant's ability to attend the weekly sessions; the rest were assigned to the SSRI group
Allocation concealment (selection bias)	High risk	Allocation was not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and personnel were not blinded
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Psychiatrists who applied monitoring scales were blinded to the study
Incomplete outcome data (attrition bias) All outcomes	High risk	2/7 (28.5%) in CBT and 1/8 (12.5%) in SSRI lost to follow-up. We considered the overall attrition rate (20%) high for this short-term intervention
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Unclear risk	Unclear risk for treatment infidelity, selective recruitment and the competency of treatment delivery. Risk of bias was low in training component of treatment competence

Pakpour 2015

Study characteristics

Pakpour 2015 *(Continued)*

Methods	Unblinded, randomized controlled multicenter trial comparing MI with UC in adults with epilepsy on their drug adherence, drug-taking behaviors, seizure severity and HRQOL. Outcome measures were obtained at baseline, 3 months, and 6 months following delivery of the intervention
Participants	Inclusion criteria: adults (aged 18 or above), diagnosis of epilepsy according to the ILAE criteria, independent in daily living activities or were responsible for taking their medications, prescribed AEDs Exclusion criteria: rapidly progressing neurological or medical condition, were not prescribed AEDs, diagnosis of an intellectual disability, major cognitive impairment (MMSE < 23), unable to read and write Persian Recruited 275 adults with epilepsy. 137 and 138 were randomly assigned to MI and UC, respectively. The mean age was 41.37 (SD 16.25) years in MI, and 39.86 (SD 15.01) years in UC. There were 45 in MI and 49 women in UC. 41 (MI) and 96 (UC) were on polytherapy. 55/34/48 in MI and 60/38/40 in UC had idiopathic/cryptogenic/symptomatic epilepsy. 60/38/32 in MI and 64/39/30 in UC had focal seizures/generalized seizures/absence seizures; the rest were unknown in either group The study involved 8 neurologic clinics from Qazvin (N = 2) and Teheran (N = 6). Recruitment took place between June 2014 and February 2015. The source of funding was not mentioned in the publication. The authors declared no conflicts of interest.
Interventions	MI intervention was a multifaceted program, designed to enhance medication adherence behavior and clinical outcomes in participants with epilepsy. 3 weekly, individual face-to-face sessions, each lasting for 40 to 60 minutes, were provided. Participants were encouraged to express their experiences, values, readiness, and confidence for behavior change during the intervention. The MI techniques used to resolve barriers and encourage participants to take medications regularly used open-ended questions, affirmations, reflective statements, and summaries to elicit change talk. The participants also received a drug diary calendar to help them monitor their plan on medication adherence. All sessions were delivered on an individual basis, by a male health psychologist with 10 years of experience working with medication adherence in people with chronic diseases, who had received 60 hours of training of MI in Qazvin and Tehran All participants, in both MI and UC, received standard care consistent with 'treatment as usual' for patients with epilepsy
Outcomes	MARS, AED serum levels, BMQ, PBC, behavioral intention, self-monitoring, action planning, coping planning, SRBAI, LSSS, and QOLIE-31 Time points measured: 1) Baseline before randomization 2) 3 months after intervention 3) 6 months after intervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer-generated code based on random-number sequence with stratification by the study sites was used. Randomization was performed by independent researcher who was not involved in the study. No evidence to suggest selection bias
Allocation concealment (selection bias)	Unclear risk	Insufficient information was provided

Pakpour 2015 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	High risk	Insufficient information on the blinding of participants was provided
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Unclear – insufficient information was provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	4/275 dropouts at follow-up. Attrition rate was considered low
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Low risk	Low risk for the training component of treatment competence, quality of treatment delivery and selective recruitment. There was no information on how treatment fidelity was ensured, so the risk of bias remained unclear

Pfäfflin 2016

Study characteristics	
Methods	Assessor-blinded, randomized, controlled trial comparing a group receiving individual counseling provided by an EN and WLC in people with epilepsy on satisfaction with treatment. Outcome measures were obtained at baseline and 6-month follow-up
Participants	Inclusion criteria: adults (age 16 and above) with epileptic seizures, who were referred to an epilepsy outpatient clinic, and who agreed in writing to participate in the study Exclusion criteria: incapable of responding to the questionnaire (language or learning difficulties), only non-epileptic seizures 187 participants; 92 and 95 were randomized, 67 and 76 were analyzed in EN and WLC. The mean age was 42.6 (± 14.8), and 44.9 (± 15.0) in EN and WLC group. There were 34 women in EN and 45 women in WLC. The mean duration of epilepsy was 20.7 (± 16.8) in EN, and 23.5 (± 17.1) in WLC 2 outpatient clinics that specialized in epilepsy participated. The dates when the study took place were not stated. The study was financially supported by UCB Pharma; no conflict of interest reported.
Interventions	The 2 certified ENs ('epilepsy specialist assistant' or 'epilepsy specialist counselor') who provided the intervention had received a 1-year part-time training, with blended e-learning, attendance periods, homework, visits to specialized epilepsy institutions, and train-the-trainer training, in order to engage in patient-education programs. Participants of the EN group were offered time for counseling, and advice during their routine visit. The EN handed out a short questionnaire in order to assess participants' major needs. The questionnaire covered the following topics: epilepsy, therapeutic issues, risks and adverse effects of medication and other therapies, pregnancy, problems in daily life with seizures, consequences of seizures for driving, employment, the job, school and families, and social issues, and an open-ended question for topics not listed. The nurses provided leaflets and other written information about driving regulations, pregnancy, social support, and self-support groups. Participants of the control group had routine care only
Outcomes	Primary outcome measure was satisfaction of participants with information and support Secondary outcome measures were satisfaction with patient–doctor relationship, organization of treatment, epilepsy knowledge, coping, and restrictions in daily life.

Pfäfflin 2016 *(Continued)*

	HADS and global Quality of Life (item from QOLIE-31) Time points measured: 1) Baseline (before randomization) 2) 6 months after baseline
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random allocation by a computer-generated block randomization list
Allocation concealment (selection bias)	Low risk	Random allocation by a computer-generated block randomization list
Blinding of participants and personnel (performance bias) All outcomes	High risk	WLC group design. The epilepsy nurse was a new service, added to the standard service of the outpatient clinics
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Questionnaires were returned anonymously to the Society for Epilepsy Research (GfE) for statistical analysis
Incomplete outcome data (attrition bias) All outcomes	High risk	Dropout rate in EN group: 27%; dropout rate in WLC group: 20%
Selective reporting (reporting bias)	Low risk	HADS scores were available as a supplementary table, online
Other bias	Low risk	Low risk for selective recruitment and the training component of treatment competence. Unclear risk for treatment fidelity and competence in delivering the intervention. There was regular supervision but no results available as the adherence checklist was personalized

Pramuka 2007

Study characteristics

Methods	Unblinded, randomized, controlled trial comparing a psychoeducational program (Treatment) to TAU in participants with epilepsy on epilepsy-related quality of life, self-efficacy, locus of control, and personality. Outcome measures were obtained at baseline, and 1-month and 6-month follow-up
Participants	Inclusion criteria: adults (18 or above) with a diagnosis of epilepsy made by a neurologist, ability to understand and participant in the consent process Exclusion criteria: not specified 55 adults were enrolled. 31 and 24 were allocated to Treatment and TAU, respectively. The mean ages were 48.89 years (SD 14.3) in Treatment, and 48.1 years (SD 14.3) in TAU. The mean ages at first seizure were 22.5 years (SD 16.7) in Treatment, and 20.32 years (SD 13.1) in TAU.

Pramuka 2007 *(Continued)*

	Participants were recruited at a university hospital-based regional epilepsy centre (from August 2003 to April 2005), and the VA Pittsburgh Healthcare System Neurology Clinic (from May 2004 to May 2005). This work was supported by the Centers for Disease Control and Prevention (CDC) as a Special Interest Project of the University of Pittsburgh Prevention Research Center on Healthy Aging through CDC Cooperative Agreement U48/CCU320171. The authors acknowledge the ongoing financial and administrative support of the Epilepsy Program of the Centers for Disease Control
Interventions	The treatment was delivered in group format (6 to 12 per group), with weekly 2-hour sessions, for 6 consecutive weeks. Participants were reimbursed USD 10 for each intervention they attended, and USD 20 for completion of baseline or follow-up questionnaires. The curriculum and materials were developed with a multidisciplinary team (epilepsy centre neuropsychologist, an epilepsy nurse, a rehabilitation psychologist, an exercise physiologist, and a behavioral interventionist). Therapeutic components included a mixture of psychoeducation, medical information, and advocacy topics, framed in the self-management activities of self-evaluation, self-monitoring, stimulus control, and self-reward, plus peer support. The topics for the 6 weekly treatment were 1) taking charge of your medical care, 2) taking charge of your self-advocacy, 3) taking charge of stress, 4) taking charge of your schedule and goals, 5) taking charge of your relationships, and 6) taking charge of your future. Group interventions were co-led by 2 licensed psychologists and a research associate, with a guest lecture on medical issues, by an epilepsy nurse clinician. Those in the TAU maintained their regular schedule of follow-up appointments with their neurologists and the epilepsy nurse in the clinic
Outcomes	QOLIE-89, ESES, WPSI, LOCS, MCMI-III Time points measured: 1) Baseline 2) 1-month follow-up 3) 6-month follow-up
Notes	Data were sought but not provided

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A table of random number was used to generate a randomization sequence. No evidence to suggest selection bias
Allocation concealment (selection bias)	Unclear risk	Insufficient information
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants and investigators who led the group were not blinded to group assignment
Blinding of outcome assessment (detection bias) All outcomes	High risk	Outcome assessors were not blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	12/31 (38%) in the Treatment, and 5/24 (21%) in the TAU groups withdrew after randomization. Attrition rate was considered high for this short-term intervention
Selective reporting (reporting bias)	High risk	Baseline scores for both groups, and data for 6 months after baseline assessment for the TAU group were unavailable. Data were sought but not provided

Pramuka 2007 *(Continued)*

Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and all dimensions of treatment competence

Rau 2006

Study characteristics	
Methods	Assessor-blinded, quasi-randomized, controlled multicenter trial comparing a group educational program for children and their parents (FAMOSES) and WLC in children with epilepsy on knowledge, coping, and treatment outcome. Outcome measures were obtained at baseline and 3-month follow-up
Participants	Inclusion criteria: children with epilepsy, able to read and write in German, parents of children with epilepsy, whether or not they could read and write German Exlusion criteria: children with non-epileptic seizures only, and their families 70 children (8 - 13 years) and 159 parents were enrolled. 82/55 and 77/48 parent were allocated/analyzed in the FAMOSES and WLC groups, respectively. 38/31 and 32/19 children were allocated/analyzed in the FAMOSES and WLC groups, respectively. The mean ages in years were 10.8 (SD 1.8) and 10.3 (SD 1.8) in FAMOSES and WLC. There were 18 girls in FAMOSES and 12 girls in WLC. The mean durations of epilepsy in years were 5.4 (SD 3.6) years in FAMOSES and 4.3 years (SD 3.1) in WLC. 15/12 had focal epilepsy; 6/3 had generalized epilepsy; 6/1 had epilepsy with focal and generalized features; 2/1 had non-classified epilepsy; 2/2 did not provide information about their epilepsy in FAMOSES/WLC. 15/11 had further illnesses in FAMOSES/WLC. 28/17 took at least 1 AED in FAMOSES/WLC The participating 9 institutions in Germany were Epilepsy Center Bethel, Bielefeld, Epilepsy Center Berlin-Brandenburg, Epilepsy Center Kleinwachau, Epilepsy outreach clinic, Regensburg, pediatric practice Dr. Bettendorf, Epilepsy Center Vogtareuth, Epilepsy Center Raisdorf, Epilepsy Center Kork, and the pediatric clinic Links der Weser, Bremen. Recruitment took place from January 2003 to January 2004. Sources of funding and conflicts of interest were not reported.
Interventions	FAMOSES is an educational program developed by an interdisciplinary project group to improve knowledge, coping, and treatment outcome, emotional and practical adaptation to the condition. The educational program comprised 1 group session (14 hours) for children (4 to 6 children) and 1 separate group session for parents (6 to 10 adults) The WLC group was offered conventional treatment according to individual needs
Outcomes	KINDL (Gesundheitsbezogene Lebensqualität und psychosoziale Auswirkungen der Epilepsie/Health-related Quality of Life and psychosocial consequences of epilepsy), epilepsy knowledge, seizure frequency, contentment with therapeutic regimen, missed school days, evaluation of FAMOSES by participants Time points measured: 1) Baseline (before randomization) 2) 3 months after the intervention (FAMOSES)/baseline (WLC)
Notes	

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	Unclear in publication. According to information sought from authors, the allocation depended on the participants' application to the 1st or 2nd available course and the availability of places in the chosen course

Rau 2006 *(Continued)*

Allocation concealment (selection bias)	High risk	Unclear in publication. According to information sought from authors, the allocation was not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Blinded to final assessor only. Neither participants nor service providers were blinded
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The participating research institutes that assessed the data received an anonymous set of collected data
Incomplete outcome data (attrition bias) All outcomes	High risk	76.4% of all study participants returned the questionnaires (parents: 78.6%; children: 71.4%; FAMOSES (children): 18,4%; WLC (children): 40,6%)
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all measured times
Other bias	High risk	Not enough information to evaluate fidelity to the intervention protocol and selective recruitment. However, infidelity to the intervention protocol is unlikely, since the intervention is manualized and personnel delivering the intervention received prior training and supervision as part as the standardized FAMOSES training procedures. Selective recruitment bias is present as families could choose the earlier (intervention group) or later (WLC) appointment.

Ridsdale 2018

Study characteristics	
Methods	Assessor-blinded, randomized, controlled trial comparing the Educational Epilepsy Program SMILE (UK) (Self-management education for people with poorly controlled epilepsy) to TAU in adolescents and adults with epilepsy on quality of life, seizure frequency and recency, psychological distress, impact and stigma of epilepsy, self-mastery, medication adherence, and adverse effects. Outcome measures were obtained at baseline and 6 and 12 months after randomization
Participants	Inclusion criteria: epilepsy, aged ≥ 16 years, prescribed antiseizure medication, reporting at least 2 seizures (of any type) in the previous year, able to answer questionnaires in English Exclusion criteria: nonepileptic seizures, acute illness or substance misuse, serious psychiatric illness or a terminal condition, or if they were currently participating in other epilepsy-related research Enrolled 407 people. The final sample included 404 participants (aged 16 - 85), 205 received SMILE and 199 were allocated to TAU. The mean age was 42.5 (SD 14.3; range 16 - 85) years in SMILE (UK), and 40.8 (SD 14.0; range 17 - 82) years in TAU. There were 115/104 women in SMILE (UK)/TAU. The duration of epilepsy ranged from 8 to 32 years in SMILE (UK) and in TAU. 52/58 participants had < 1 seizure a month in the past 12 months in the SMILE (UK) and TAU groups. 147/138 had ≥ 1 per month in the past 12 months; as per inclusion criteria all participants received treatment with antiseizure medication. The trial was run from King's College London, UK. Participants were drawn from specialist epilepsy clinics at eight hospitals in London and South East England. PWE were recruited from specialist epilepsy clinics between December 2013 and August 2016. This research was independent and funded by the National Institute for Health Research (Health Technology Assessment, 09/165/01 — Self-Management education for adults with poorly controlled epILEpsy [SMILE] A Randomized Controlled Trial); no conflict of interest reported.

Ridsdale 2018 *(Continued)*

Interventions	The intervention was based on MOSES with the aims to communicate information and to encourage participants to share their own experiences with others. Participants were given a workbook containing course content to use during the sessions and to take home (see May 2002 for further information). Groups included 5 - 14 participants. The course was 16 hours over 2 consecutive days, delivered by an epilepsy nurse specialist and an EEG technician
Outcomes	QOLIE-31-P with added Patient-specific weightings, seizure frequency scales, seizure recency (number of days since last seizure), HADS, Impact of Epilepsy, Stigma of Epilepsy, and Self-Mastery and Control Time points measured: 1) Baseline 2) 6 months after randomization (only QOLIE-31-P, seizure frequency and recency, and Impact of Epilepsy) 3) 12 months after randomization
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was provided by an online system managed by the King's Clinical Trials Unit
Allocation concealment (selection bias)	Low risk	Randomization was provided by an online system managed by the King's Clinical Trials Unit, maintaining full allocation concealment
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel who facilitated the intervention were not blinded to the allocation of participants
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Research staff who completed follow-up assessments and the participants' healthcare providers were blinded to treatment allocation
Incomplete outcome data (attrition bias) All outcomes	High risk	51/205 and 39/199 missed the second assessment in SMILE and TAU, respectively.The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	No evidence to suggest reporting bias
Other bias	Low risk	Low risk for infidelity to intervention protocol, since the intervention protocol was manualized. A fidelity implementation found that trainers within the trial delivered the intervention according to protocol, with good adherence and high competence. No evidence to suggest selective recruitment bias

Ring 2018

Study characteristics

Ring 2018 *(Continued)*

Methods	Blinded, cluster-randomized, controlled trial comparing a nurse-led competency framework (EpAID) to TAU in adults with epilepsy and ID on seizure severity and QoL
Participants	Inclusion criteria: The presence of a developmental ID with an IQ of ≤ 70. A diagnosis of epilepsy with a history of at least 1 seizure in the 6 months preceding recruitment into the trial (not considered by those managing the epilepsy to have been a non-epileptic seizure) Exclusion criteria: The presence of a rapidly progressive physical or neurological illness. Alcohol or drug dependence Enrolled 312 people from 17 research clusters. 184 received EpAID and 128 were allocated to TAU. The mean age was 39.6 (SD 13.3; range 18.1 - 65.5) years in EpAID, and 37 (SD 12.5; range 18.4 - 63.5) years in TAU. There were 85/67 women in EpAID/TAU. The age at epilepsy diagnosis was 5.6 (± 7.6) and 7.3 (± 9.9) in EpAID/TAU, respectively. 15/20/1/10 participants had focal/generalized/undetermined/special epilepsy syndromes in EpAID, 15/28/7/4 participants had focal/generalized/undetermined/special epilepsy syndromes in TAU Participants were drawn from 17 individual cluster sites from across England, Scotland and Wales. The first site recruited in September 2014 and the final site recruited in September 2015.This trial was funded by the NIHR Health Technology Assessment programme; no conflict of interest reported.
Interventions	The experimental intervention was the Learning Disability Epilepsy Specialist Nurse Competency Framework. This provides guidelines describing a structure and goals to support the delivery of epilepsy care and management by LD-trained nurses. The guidelines were developed by the UK ESNA in association with the UK Royal College of Nursing. A key element of the competency framework is that it is not a manualized treatment guideline for epilepsy but rather a list of what management a nurse should be able to deliver at their given level of competence. Within these constraints, nurses delivered their interventions at a frequency determined by clinical need, through home visits, telephone clinics and visits to the local primary care or ID team base as appropriate. When nurses considered that it was appropriate, and as described in the competency framework, they also delivered epilepsy education to patients and carers. In addition, interactions with other clinicians, for example participants' primary care health service, local community ID health team and/or local neurology service were facilitated by the nurses as and when they considered clinically appropriate. Nurses delivered the intervention on an as-needed basis for 24 weeks
Outcomes	ELDQoL-SSS, injuries associated with seizures, the level of distress manifested by the patient, as perceived by an informant; an economic analysis, carer strain, and AED side effects Time points measured: 1) Baseline 2) Postintervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization of the clusters was undertaken independently by KCTU using block randomization with fixed block sizes
Allocation concealment (selection bias)	Low risk	The author clarified "allocation was undertaken by the King's College clinical trials unit who knew nothing about the sites. None of the research team were aware of which arm a cluster was randomised to."
Blinding of participants and personnel (performance bias)	Low risk	To minimize expectations of the participants, their carers and families and the clinical staff at each cluster, they were not informed that there were 2 arms in the trial (an 'active' arm and a TAU arm), nor were they informed which arm

Ring 2018 *(Continued)*

All outcomes		of the study they had been randomized to. Clinicians in both arms were aware that they were part of a treatment trial and all had received direct training from a senior nurse
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The author clarified "research assistants involved in outcome assessments were blinded to which group participants were allocated to, as was the whole research team."
Incomplete outcome data (attrition bias) All outcomes	Low risk	Attrition was 13%
Selective reporting (reporting bias)	Low risk	We have not received the study protocol. As far as we can tell from the publication, there is no risk of selective reporting
Other bias	Low risk	Unclear risk of infidelity to intervention protocol and incompetence to carry out the intervention. Training background of personnel was competent/expert level, i.e. low risk of bias in this dimension of competence. No risk of selective recruitment Appropriate analysis used for the cluster-randomized design (linear mixed-effects model which compares individuals within the treatment and control groups while allowing for clustering as a random effect)

Sajatovic 2016

Study characteristics	
Methods	Unblinded randomized, controlled trial comparing a 12-week Targeted Self-Management for Epilepsy and Mental Illness (TIME) program to TAU in adults with epilepsy and comorbid mental illness on depression symptom severity. Outcome measures were obtained at baseline, 12 weeks (postintervention) and 16 weeks after baseline assessment
Participants	Inclusion criteria: adults aged 18 or older, with a diagnosis of epilepsy and a DSM IV diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, or chronic/recurrent major depressive disorder, confirmed with the MINI, who spoke and read English. 44 adults were recruited. 22 were allocated to each group. The mean age was 52.0 years in TIME and 45.1 in TAU. 13/12 were women in TIME/TAU. The mean seizure frequency in the past 30 days in TIME/TAU was 3.7/8.8. The number of participants who reported generalized/focal/unclassified seizures were 16/5/1 in TIME and 14/6/2 in TAU. The mean duration of epilepsy was 27.6/25.4 in TIME/TAU.
Interventions	The TIME intervention stresses information-sharing in a way that is accessible to participants with epilepsy and comorbid mental illness and fosters motivation for active self-management. Topics addressed include a summary of facts vs myths about mental illness and epilepsy, developing an action plan for concurrently coping with mental illness and epilepsy, personal goal-setting, stress management, and training to communicate with care providers.The final TIME intervention was operationalized in 2 steps. Step 1: 12 group-format, in-person 60- to 90-minute sessions (up to 8 participants per group), collaboratively delivered by a nurse educator–peer educator dyad. Step 2: Following the group sessions, participants had 2 telephone maintenance sessions (spaced approximately 2 weeks apart) with the peer educator and 2 telephone sessions (spaced approximately 2 weeks apart) with the nurse educator. Phone sessions emphasized support and ongoing self-management. Nurse educators provided brief linkage (information sharing, opportunity for questions) to the participants' clinical providers. The study took place at Case Western Reserve University Prevention Research Center; the time when the study was conducted was not stated. This publication was supported by the Grant or Cooperative Agreement Number U48DP001930 (SIP12-057) under the Health Promotion and Disease Prevention Re-

Sajatovic 2016 *(Continued)*

	search Centers Program, funded by the Centers for Disease Control and Prevention; no conflict of interest reported.
Outcomes	MADRS, BPRS, PHQ-9, GAF, WHODAS-II, 30-day self-reported seizure frequency, QOLIE-10, PSQI, ESES, MSPSS, ISMI, 10-item ESS Time points measured: 1) Baseline 2) 12 weeks (postintervention) 3) 16 weeks
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was allocated using a computer-generated list
Allocation concealment (selection bias)	Low risk	Randomization using a computer-generated list that was only available after all baseline assessments were completed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel who facilitated the intervention were not blinded to the allocation of participants
Blinding of outcome assessment (detection bias) All outcomes	High risk	According to the principal investigator outcome assessment was not blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	3/22 and 6/22 missed the second assessment in TIME and TAU, respectively.The attrition rate was considered high
Selective reporting (reporting bias)	Low risk	Results for ESES, MSPSS, ESS, and ISMI are missing in the publication but were provided by the principal investigator. The study protocol mentions: Adherence:TRQ, Substance use: ASI which are not reported in the publication. The main author clarified: "We ended up not using/reporting the ASI data because of concern with data quality and/or complexity of the scale."
Other bias	Low risk	Low risk for infidelity to intervention protocol or incompetence in delivery of intervention. Fidelity to the TIME intervention and competence were assessed quantitatively (for example, duration and content covered) and qualitatively (for example, participant–interventionist interaction) at each session. Noninterventionist study staff evaluated acceptability of each fidelity dimension. Immediate feed-back and course correction were established as needed. Any deviation was addressed in debriefing sessions conducted immediately after the intervention. While the results were not mentioned in the publication, the author clarified: "We had a relatively high degree of fidelity and if there was any “drift” observed during a session it was addressed during the mandatory debriefing that followed each session." No evidence to suggest selective recruitment bias

Sajatovic 2018

Study characteristics	
Methods	A randomized controlled trial to test a self-management intervention for people with epilepsy (SMART) that specifically focused on high-risk subgroups of people who have recently experienced seizures or epilepsy-related complications
Participants	Study participants were drawn from the community with assistance from the local Ohio Epilepsy Association, MetroHealth System, a regional safety net healthcare provider, the Lois Stoke Veterans Administration, and University Hospitals of Cleveland Neurological Institute, a tertiary care centre. Specific date was not mentioned. Inclusion criteria: Aged 18 or above, having at least 1 negative health event (NHE) within the past 6 months, able to provide written consent and participate in study procedures Exclusion criteria: Immediate risk of self-harm, dementia, pregnant, unable to read/understand English 139 individuals were assessed for eligibility, 19 were excluded based on inclusion/exclusion criteria, 120 were randomized. 60 and 60 were randomized into the SMART and WLC, respectively. 60, 53 and 51 in the SMART group and 60, 58 and 52 in the WLC were analyzed in the baseline, 10-week and 24-week follow-ups, respectively This study was supported by a grant from the Centers for Disease Control and Prevention SIP 14-007 1U48DP005030. The authors declared potential conflicts of interest as below: M.S. has received research grants from Otsuka, Alkermes, Merck, Janssen, Reuter Foundation, Woodruff Foundation, Reinberger Foundation, National Institute of Health, and the Centers for Disease Control and Prevention; is a consultant to Bracket, Otsuka, Supernus, Neurocrine, Health Analytics, and Sunovion; and has received royalties from Springer Press, Johns Hopkins University Press, Oxford Press, and UpToDate. C.T. has research grants from the National Science Foundation, Biogen, and Philips Healthcare. S.L. has research grants from the National Institute of Health and within the past 3 years has been a speaker for Sunovion. The other authors have no conflicts of interest to report.
Interventions	SMART has 8 sessions conducted over approximately 8 - 10 weeks, SMART is operationalized in 2 steps. In step 1, 1 group-format, in-person 60- to 90-minute session (up to 10 participants), was collaboratively delivered by a nurse educator-peer educator dyad. Peer educators were individuals with epilepsy with at least 3 lifetime NHEs. Following the in-person session, there were 7 group-format sessions delivered by the Internet on personal computer tablets using posters/graphics and emphasizing interactive discussion. The online communication system used was Adobe Connect, secure Web conferencing software. In step 2, following the group sessions, participants had 6 telephone maintenance sessions with the peer educator and the nurse educator alternating calls. Nurse- and peer-educator calls were intended to be brief (no more than 10 - 15 mins) and followed a semiscripted structure in which the nurse- or peer-educator asked participants how they were doing with attempting to meet their personal care plan
Outcomes	Primary outcome: Self-reported NHEs in the 6 months prior to the study enrollment and during the 6-month RCT Secondary outcome: PHQ-9, MADRS, QOLIE-10, SF-36, LSSS, ESES, MSPSS, ESMS, ESS TIme point measured: 1) Baseline (immediately prior to randomization)

Sajatovic 2018 *(Continued)*

	2) 10-week (shortly after the completion of the SMART sessions) 3) 24-week (6-month follow up)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated 1:1 randomization was based on a randomized block design with random block sizes
Allocation concealment (selection bias)	High risk	The primary author stated that the allocation of participants was randomized but not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Participants were not blinded to their treatment; personnel who facilitated the intervention were not blinded to the allocation of participants
Blinding of outcome assessment (detection bias) All outcomes	High risk	According to principal investigator outcome assessment was not blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	7/60 and 2/60 missed the 10-week assessment in SMART and WLC, respectively. The attrition rate was considered low
Selective reporting (reporting bias)	Low risk	No evidence to suggest reporting bias
Other bias	Low risk	Low risk for infidelity to intervention protocol. Noninterventionist study staff evaluated fidelity quantitatively (i.e. duration and content covered) and qualitatively (i.e. participant-interventionist interaction) at each session. The fidelity checklist contained 7 items using a yes/no format (completed by noninterventionist study staff) that assessed whether the interventionists adhered to study content (1 item), format (1 item), rapport and empathy with group participants (2 items), peer educator engagement (1 item), and timing/schedule planning (2 items). If there were any "no" responses on the fidelity checklist, these were addressed at a debriefing held immediately after the SMART session. No evidence to suggest selective recruitment

Schröder 2014

Study characteristics

Methods	Assessor-blinded, randomized, controlled trial comparing an online psychological intervention for depression (Deprexis) to a WLC in adults with epilepsy. The study aimed to evaluate the feasibility and efficacy of the program on depressive symptoms and quality of life. Outcome measures were obtained at baseline and 9 weeks after baseline (after intervention)
Participants	Inclusion criteria: self-reported epilepsy diagnosis (externally validated based on an epilepsy-specific inventory, the PESOS questionnaire), self-reported depressive symptoms Exclusion criteria: acute suicidal ideation, diagnosis of psychosis, bipolar disorder, or suicidality, insufficient time to take part in the online program for 9 weeks

Schröder 2014 *(Continued)*

	78 adults were enrolled. 38 and 40 were randomized to Deprexis and WLC, respectively. The mean age was 35.03 years (SD 9.99; range 18 - 57) in Deprexis and 40.03 (SD 11.85; range 22 - 77) in WLC. 27 and 32 were women in Deprexis and WLC. AEDs were well tolerated/badly tolerated by 17/20 participants in Deprexis and 19/20 participants in WLC. 1 participant in each group was not taking any AEDs. 26/12 participants in Deprexis had ≤ 1 seizure a month, and 27/13 in WLC had > 1 seizure a month. 15/18/5 participants in Deprexis and 22/14/4 participants in the WLC had 1/2/≥ 3 different seizure types Participants in WLC group were, on average, significantly older than participants in the intervention group (P = 0.048). To take this group difference into account, the variable 'age' had been entered as a covariate in the statistical analyses. Participants were recruited by a patient database from the Epilepsy Center Alsterdorf, Germany, and postings in moderated epilepsy-specific online forums. Recruitment took place between May 2012 and July 2013. Sources of funding were not stated; no conflict of interest reported.
Interventions	This trial used the Internet-based program Deprexis, which is aimed at reducing symptoms of depression. It predominantly comprised elements of CBT, such as cognitive restructuring and behavioral activation, and complemented these with mindfulness and acceptance exercises, among others. Users interacted with the program by a simulated dialogue, in which they were continuously asked to select one of several response options, and were presented with subsequent content that aimed to match their expressed preferences and requirements. Depending on reading speed and each user's individual path through the program, each module lasted for approximately 10 to 60 mins. The participants could log in for a duration of 9 weeks
Outcomes	BDI-I, WHOQOL-BREF, QOLIE-31 Time points measured: 1) Baseline 2) 9 weeks after the baseline
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation was done in consecutive order, using a computer-generated randomized number table. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured
Blinding of participants and personnel (performance bias) All outcomes	High risk	Since the intervention was delivered by an Internet platform, the provision was considered blinded; this conclusion was discussed with and agreed by study authors. However, the participants could not be blinded to their group status
Blinding of outcome assessment (detection bias) All outcomes	Low risk	All assessments and outcome measures were obtained online
Incomplete outcome data (attrition bias) All outcomes	High risk	14/38 (Deprexis) and 8/40 (WLC) withdrew from the study. The overall attrition rate was 28%, which was higher than the expected rate (25%), as stated in the study methodology. Attrition bias was considered high for this short-term intervention
Selective reporting (reporting bias)	Low risk	Unreported data were sought and provided by study authors. Comparison with registered protocol showed that some outcome parameters had original-

Schröder 2014 *(Continued)*

		ly been planned, but due to a change of protocol, had not been collected during the course of the study
Other bias	High risk	Low risk of bias for treatment infidelity as this was a web-based intervention. Training background of personnel developing the website was rated as low risk for incompetence. Risk of bias is high for selective recruitment as advertisement was used to recruit study participants

Tang 2015

Study characteristics	
Methods	Assessor-blinded, randomized, controlled trial comparing a mindfulness-based therapy (MT) to a placebo attention social support (SS) in adults with epilepsy on quality of life, mood and anxiety symptoms, and seizure control. Outcome measures were obtained at 6-week pre-intervention baseline and 6 weeks postintervention
Participants	Inclusion criteria: adults (aged 18 or above) with drug-resistant epilepsy according to ILAE definition Exclusion criteria: primary diagnosis of organic mental disorder, psychotic disorders, psychogenic nonepileptic seizures, learning disability, or mental retardation 61 adults were enrolled. 30 and 31 were randomly allocated to MT and SS. The mean age was 34.77 years (SD 10.26) in MT and 35.47 (SD 11.22) in SS. There were 14 women in each group. The mean disease duration in years was 20.43 (SD 9.95) in MT and 18.93 (SD 11.08) in ST. 36.7%/23.3%/36.7%/3.3% of the participants in MT and 40%/40%/16.7%/3.3% of the participants in SS were under AED monotherapy/2 drugs/3 drugs/4+ drugs. The total number of seizures in 6 weeks pre-intervention was 9.83 (SD 9.78) in MT, and 9 (SD 11.79) in SS. 40%/36.7% of participants in MT/SS had experienced seizures within the past week Participants were recruited from the Neurology Outpatient Clinic in the Prince of Wales Hospital, the teaching hospital of the Chinese University of Hong Kong. The study took place between September 2011 and January 2013. The study was not funded by any organization. The authors had reported no conflicts of interest.
Interventions	Intervention comprised an active treatment: MT, and a placebo attention control, SS. Intervention was delivered in group format (7 to 8/group) with 4 x 2½-hour biweekly sessions, conducted by the same clinical psychologist. All participants received an identical educational package with basic knowledge and management of epilepsy, including layman terms of the etiology and types of seizure, sleep hygiene, and the importance of drug adherence and regular exercise. The MT protocol was based on several guiding references on mindfulness for participants with chronic diseases. The concept of mind–body connection that is rooted in the Chinese culture was emphasized. Therapeutic components, such as mindfulness techniques (e.g. mindful eating, body scan), the concept of acceptance, and coping with seizure-related disturbances (i.e. auras and postictal physical and psychological reactions) were included. Participants had experiential, progressive training on mindfulness techniques during sessions. No direct intervention was provided in the SS group. It was designed to create a supportive atmosphere for sharing of illness experiences and self-help strategies with the same contact hours (10 hours) and format as the MT group
Outcomes	QOLIE-31-P, BAI, BDI, seizure frequency, SSQ Time points measured: 1) Baseline (6 weeks before intervention) 2) Follow-up (6 weeks after the intervention)

Tang 2015 *(Continued)*

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Block randomization was used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Low risk	Allocation concealment was ensured, based on information provided by study authors
Blinding of participants and personnel (performance bias) All outcomes	High risk	All participants were told that they were provided 'supportive treatment'; they were not aware of the experimental/control design of the study. Investigator who led the group was not blinded to group assignment
Blinding of outcome assessment (detection bias) All outcomes	Low risk	All outcome assessors were blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	1 participant in the SS group withdrew. No evidence to suggest attrition bias
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Low risk	Low risk for selective recruitment and the training component of treatment competence. Unclear risk for treatment fidelity and competence in delivering the intervention as no measures were used

Thompson 2010

Study characteristics

Methods	Unblinded, controlled trial comparing a home-based depression intervention (UPLIFT) to WLC in adults with epilepsy and symptoms of depression. The study aimed to explore the efficacy of UPLIFT in reducing depression, increasing knowledge, skills, and self-efficacy, and improving quality of life. Outcome measures were obtained at baseline, interim (8 weeks after intervention, postintervention time point for UPLIFT), and post-test (16 weeks after intervention, postintervention time point for WLC; repeated measure for UPLIFT)
Participants	Inclusion criteria: adults diagnosed with epilepsy for > 1 year, had depressive symptoms as indicated by a score of > 13 on the CES-D, but not severe depression (< 38 on CES-D), who were English-speaking and willing to be audio-taped Exclusion criteria: active suicidal ideation and cognitive impairment (i.e. ≤ 20 on the telephone MMSE) 53 adults were enrolled. 26 and 27 were allocated to the UPLIFT and WLC, respectively. The mean/median age was 36.4/34.0 years in UPLIFT and 35.4/31.0 in WLC. 20 (UPLIFT) and 23 (WLC) were women. 13 participants in UPLIFT and 19 in WLC had a seizure in the 4 weeks prior to enrollment. 10 participants in UPLIFT and 9 in TAU had a major depressive disorder with mean/median CES-D scores of 25.7/24.5 in UPLIFT and 27.33/30.0 in WLC Recruitment and screening were coordinated by the physicians and nurses at the participating hospital-based epilepsy clinic (names of the specific clinic was not provided in the publication) from

Thompson 2010 *(Continued)*

	June 2007 to November 2008. Funding was made possible by Cooperative Agreement U48 DP 000043 through the Emory Prevention Research Center, from the Centers for Disease Control and Prevention (CDC). There was no statement regarding potential conflicts of interest in the publication.
Interventions	Intervention was delivered either by telephone or web in group-conferencing format, with weekly 1-hour sessions for 8 consecutive weeks. The UPLIFT acronym refers to both mindfulness (using practice) and CBT (learning to increase favorable thoughts) which formed the basis of the intervention materials. The telephone and web intervention contained the same elements and structure. Each session included a check-in, instruction, skill-building, and discussion, with homework between sessions that was reviewed in the next session. Therapeutic components included knowledge about depression, epilepsy, CBT, mindfulness, and skills related to CBT and mindfulness. Participation in the sessions involved skills practice, discussion, and group exercises based on session's main topics. CBT-related topics included thought monitoring, identifying cognitive distortions, self-esteem, problem identification, goal-setting, and identifying supports. Relaxation exercises, including a body scan and progressive muscle relaxation, were used for coping and to facilitate awareness of the body. Mindfulness activities consisted of attention to breath, sights, and sounds, and other meditations All sessions were co-facilitated by a layperson with epilepsy and a student research assistant in the Master of Public Health program, supervised by a licensed clinical psychologist
Outcomes	mBDI, BDI, PHQ-9, knowledge and skills, DCSES, SWLS, BRFSS, SCS Time points measured: 1) Baseline (0 week, baseline) 2) Interim (8 weeks postintervention for the first telephone and web UPLIFT) 3) Post-test (16 weeks postintervention for the first telephone and web UPLIFT and 8 weeks postintervention for the WLC)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Detailed information on method of randomization was unavailable
Allocation concealment (selection bias)	High risk	Allocation was not concealed
Blinding of participants and personnel (performance bias) All outcomes	High risk	Neither the participants nor the project staff were blinded to the group assignment
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information was provided
Incomplete outcome data (attrition bias) All outcomes	High risk	13 persons lost from the study (3 attended 1 session; 10 attended none). The authors did not provide details of the dropouts in each group (13/53 = 24.5%). In addition, the number of participants in the telephone group (N = 13) and web group (N = 12) participating in UPLIFT did not match the total number of UPLIFT (N = 26) reported. Evidence of attrition bias noted for this short-term intervention

Thompson 2010 *(Continued)*

Selective reporting (reporting bias)	High risk	Outcome parameters were unavailable for the post-test time point, except BDI and mBDI. Results of PHQ-9 and self-compassion were unavailable for all time points. Evidence of selective reporting noted. Unpublished data were sought but not provided
Other bias	Low risk	Low risk of bias for treatment infidelity as this was a web-based intervention. Training background of personnel developing the UPLIFT intervention was rated as low risk for incompetence. Risk of bias is low for selective recruitment

Turan Gurhopur 2018

Study characteristics	
Methods	A randomized controlled study. The objective was to evaluate the efficacy of the Modular Education Program for Children with Epilepsy and Their Parents on disease management
Participants	Inclusion criteria: aged between 7 and 18, had epilepsy for at least 6 months, having no mental deficiency, being literate, agreeing to participate in the study Exclusion criteria were not stated clearly The records of the previous year were examined by the authors in order to reach the number of appropriate cases in the study, 100 children were identified who were followed in the Pediatric Neurology Polyclinic for epilepsy without mental deficiencies. 50 were randomized into the experimental group and 50 into the control group. After randomization, 8 families from the experimental group refused to participate Study conducted between January and June 2014. Participants were recruited from a pediatric neurology polyclinic of a university hospital in Antalya, Turkey (Akdeniz University Hospital Pediatric Neurology Polyclinic). This research was supported by the Akdeniz University Scientific Research Projects Management Unit. The authors declare no conflict of interest in this study.
Interventions	The intervention has 8 modules, 4 for children (1. Knowledge about epilepsy, 2. Epilepsy and me, 3. Seizure management and 4. Epilepsy and social life) and 4 for parents (1. Knowledge about epilepsy, 2. Epilepsy and my child, 3. Seizure management, and 4. Epilepsy and social life). The teaching materials and methods used in the modules are as follows: slides, the Guide to Living with Epilepsy for Children and Parents, videos (occurrence of epileptic seizure; management of seizure moments; management of seizures at home, on vacation, at school; using medicine, and living with epilepsy), role playing, demonstration and implementation of certain activities, brainstorming, discussion, question and answer, drawing pictures, and narration. The modular education program was introduced to the children and parents one-to-one in a quiet place. The modular education program was taught on weekdays with a total duration of 16 hours. All the children participating in this study and all the parents had the same training, but each participant was interviewed separately. No training was given to the control group during the study, but in order to determine the effectiveness of the training, the same number of follow-ups was carried out in the control group
Outcomes	Outcome measures for children: EKTC, SSEC-C, QOLIE-48 Outcome measures for parents: EKSP, PAASS TIme points measured: 1) Baseline (pretest)

Turan Gurhopur 2018 *(Continued)*

2) Post-test 1 (immediately after training)

3) Post-test 2 (1 month later)

4) Post-test 3 (3 months later)

Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	In a closed envelope, papers numbered from1 to 100 are placed. The child and his/her parents who are interested in participating in the study are asked to choose one of these numbers from the envelope. 1 - 50 children and their parents were in the experimental group; 51–100 children and their parents were in the control group
Allocation concealment (selection bias)	Low risk	Allocation was concealed because closed envelopes were used for randomization
Blinding of participants and personnel (performance bias) All outcomes	High risk	Neither the participants nor the project staff were blinded to the group assignment
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	There was no information reported in the publication
Incomplete outcome data (attrition bias) All outcomes	Low risk	8/50 families from the intervention group refused to participate after randomization; none withdrew from the control. No evidence to suggest attrition bias re final dropout rate
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and all dimensions of treatment competence

Yadegary 2015

Study characteristics

Methods	Randomized, controlled trial comparing a self-management training program (Intervention) with a UC control group in adults with epilepsy on epilepsy-related quality of life. Outcome measures were obtained at baseline and 1 month after intervention
Participants	Inclusion criteria: adults with epilepsy for at least 1 year, using antiseizure medication, had at least 1 seizure in the past year, able to read and write, were willing to participate Exclusion criteria: conditions in which intensive care was needed, enrolled in other research studies, were absent from each training session 60 participants (aged between 18 and 65) were recruited. 30 were randomly assigned to each of intervention and UC. 9/12/7/2 participants in intervention and 12/8/5/5 participants in UC were aged 18 to 25/26 to 35/36 to 45/46 to 65, respectively. 14 (intervention) and 15 (UC) were women. 2/1 participants

Yadegary 2015 *(Continued)*

	in intervention and 28/29 in UC had focal seizures/generalized seizures. 17 participants had a seizure in the last month in both groups. 20/10 participants in intervention and 23/7 participants in UC had monotherapy/polytherapy The study took place in a teaching hospital in Zanjan, Iran. The dates when the study was conducted were not stated.
Interventions	The intervention was delivered in group format (5 to 6 participants per group) with 4 x 2-hour sessions within 1 month. Participants were phoned before every session to encourage them to attend. The intervention materials consisted of 2 parts. The first part (1st session) included medical aspects of epilepsy, e.g. definition of epilepsy, description of seizures, types of seizures, observation and classification of its causes, and diagnosis of epilepsy. Participants also received instructional booklet with the content. The second part (2nd to 4th session) was designed to promote self-management; details included medication management, information management, safety management, lifestyle management, and seizure management. All materials were presented using PowerPoint presentations The UC control group received only the routine clinical care, and were contacted through 2 short phone calls during the month
Outcomes	QOLIE-31-P Time points measured 1) Baseline 2) 1 month after intervention
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A table of random numbers was used. No evidence to suggest selection bias
Allocation concealment (selection bias)	Unclear risk	Insufficient information was provided
Blinding of participants and personnel (performance bias) All outcomes	High risk	Insufficient information was provided
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Insufficient information was provided
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Insufficient information was provided
Selective reporting (reporting bias)	Low risk	No evidence to suggest selective reporting
Other bias	Unclear risk	Unclear risk for selective recruitment, treatment fidelity and all dimensions of treatment competence

ACT: acceptance and commitment therapy; AE: adverse event; AED: anti-epilepsy drug; AEP: Adverse Events Profile; ARNP: advanced registered nurse practitioner; ASI: ASM: anti-seizure medication; BDI: Beck Depression inventory; B-IPQ: brief illness reports questionnaire; BMW: beliefs about medication questionnaire; BPRS: brief psychiatric rating scale; BRFSS: behavioral risk factor surveillance system; CBI: cognitive behavioral intervention; CBT: cognitive behavioral therapy; CD-RISC: Connor-Davidson resilience scale; CDI-S: children's depression inventory - short; CEQOL: childhood epilepsy quality of life; CES-D: Centers for Epidemiological Studies - depression; CHI-ESQ: Commission for Health improvement - experience of service questionnaire; DASS-21: depression and anxiety stress scale; EEG: electroencephalography; EKP-G: epilepsy knowledge profile - general; EKSP: epilepsy knowledge scale for parents; EKTC: epilepsy knowledge test for children; ELDQOL-SSS: epilepsy and learning disability quality of life - seizure severity scale; EN: epilepsy nurse; EQAO: education, quality and accountability office; ESES: epilepsy self-efficacy scale; ESI-R: revised epilepsy stress inventory; ESMS: epilepsy self-management scale; ESS: epilepsy stigma scale; GAD: generalized anxiety disorder; GAF: global assessment functioning; GEOS-YP: Glasgow epilepsy outcome scale for young people; GSES: generic self-efficacy scale; HADS: hospital anxiety and depression scale; HAMS: Hamilton anxiety rating scale.;SCL: Hopkins symptom checklist; ID: intellectual disability; ILAE: International League Against Epilepsy; ISMI: internalized stigma of mental illness scale; ITT: intention-to-treat; LOC: loss of consciousness; LOCS: locus of control scale; LSSS: Liverpool seizure severity scale; MADRS: Montgomery Asberg depression rating scale; MAS: medication adherence scale; MCMI: Millon clinical multiaxial inventory; MINI: mini international neuropsychiatric interviews scale; MMAS: Moriskey medication adherence scale; MOCA: Montreal cognitive assessment; MDD: major depressive disorder; MQOLI: Malay quality of life in epilepsy; MS: multiple sclerosis; MSPSS: multidimensional scale of perceived social support; NDDI-E: neurological depressive disorders inventory - epilepsy; NHE: negative health event; NHS3: national hospital seizure severity scale; PA: Physical Activity; PAASS: parents anxiety about seizure scale; PEDsQL: pediatric quality of life; PBC: perceived behavioral control; PESOS: performance, sociodemographic aspects, subjective estimation; PHQ: patient health questionnaire; PI-ED: pediatric index - emotional distress; PHQ: patient health questionnaire; PST: problem-solving treatment; PSQI: Pittsburgh sleep quality index; PSS: perceived stress scale; PWE: people with epilepsy; QIDS: quick inventory of depressive symptoms; QoL: quality of life; QOLIE: quality of life in epilepsy; SCS: self-compassion scale; SDT: self-determination theory; SIDAED: side effects of anti-epileptic drugs; SRBAI: self- index; reported behavioral automaticity index; SSEC-C: seizure self-efficacy scale for children; SSQ: seizure severity questionnaire; SSRIs: selective seratonin uptake inhibitors; ST: supportive therapy; SWLS: satisfaction with life scale; TAU: treatment as usual; TLE: temporal lobe epilepsy; UC: usual care; UPCC: Utrecht proactive coping confidence; WHO-DAS: World Health Organization disability assessment schedule; WHOQOL-BREF: World Health Organization quality of life - brief; WIAT: Weschsler individual achievement test; WLC: wait-list control; WPSI: Washington psychosocial seizure inventory; WSAS: work and social adjustment scale;

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Albert 2019	No HRQOL outcome measures
Aliasgharpour 2013	No HRQOL outcome measures
Cazares 2017	No HRQOL outcome measures
Chadi 2018	No HRQOL outcome measures
Dahl 1985	No HRQOL outcome measures
Dash 2015	No HRQOL outcome measures
Davis 1984	No HRQOL outcome measures
DiIorio 2009	No HRQOL outcome measures
Eshiet 2019	No HRQOL outcome measures
Helgeson 1990	No HRQOL outcome measures
Li 2016	No HRQOL outcome measures
McLaughlin 2011	No HRQOL outcome measures
Mills 1999	No HRQOL outcome measures

Study	Reason for exclusion
Modi 2016b	No HRQOL outcome measures
Modi 2016c	No HRQOL outcome measures
Mohamadpour 2017	No HRQOL outcome measures
Olley 2001	No HRQOL outcome measures
Peterson 1984	No HRQOL outcome measures
Pfäfflin 2012	No HRQOL outcome measures
Ridsdale 2000	No HRQOL outcome measures
Tajrishi 2015	No HRQOL outcome measures
Tan 1986	No HRQOL outcome measures
Thompson 2015	No HRQOL outcome measures
Yoo 2015	No HRQOL outcome measures

Characteristics of ongoing studies *[ordered by study ID]*

Bennett 2016

Study name	Guided self-help interventions for mental health disorders in children with neurological conditions: study protocol for a pilot randomized controlled trial
Methods	A pilot randomized controlled trial will be conducted. Participants will be randomized to receive guided self-help for common mental health disorders or to a 12-week wait-list control. The wait-list control group will receive the intervention after a waiting period of 12 weeks
Participants	18 patients with neurological conditions and mental health disorders attending specialist neurology clinics at a National UK Children's Hospital. Exclusion criteria are limited to those at significant risk of harm to self or others, the presence of a primary mental health disorder other than anxiety, depression or disruptive behavior (e.g. psychosis, eating disorder, obsessive-compulsive disorder) or intellectual disability at a level meaning potential participants would be unable to access the intervention
Interventions	Participants in the treatment group will receive 10 sessions of guided self-help delivered over the telephone
Outcomes	The primary outcome measure is reduction in symptoms of mental health disorders
Starting date	This trial was registered on 25 September 2015
Contact information	
Notes	

Singh 2019

Study name	A home-based, primary-care model for epilepsy care in India: Basis and design
Methods	A randomized trial aims to determine whether treatment adherence to antiepileptic drugs is better with home-based care or with routine clinic-based care. The secondary aims are to compare the effects of the 2 care pathways on seizure control and quality of life
Participants	The estimated number of participants in each arm was 91; to make up an anticipated attrition rate of 30%, the total number of recruitment will be 240. People over 1-year-old with active epilepsy were invited to enroll in the trial regardless of prior treatment status. People with febrile seizures, neonatal seizures, single seizures not fulfilling the current operational definition for epilepsy, and acute symptomatic seizures associated with head injury, stroke, and toxic, metabolic, and acute infective conditions were excluded. Participants will be randomized into either 'clinic-based' or 'home-based' arm by a computer-generated, simple randomization scheme
Interventions	Clinic-based arm: (n = 120, age range 1 - 80) are asked to attend monthly clinics at the Government District Hospital for review visits and drug dispensing Home-based arm: (n = 120, age range 1 - 67) receive an interventional package comprising the following: a) delivery of AEDs, b) education and counseling about self-management, social functioning, and stigma abrogation, c) adherence monitoring; all provided at home on a monthly basis by study personnel with qualification equivalent to ANMs. During the first home visit, the study purpose is explained, and information about drugs, including frequency and timings of drug-taking, are provided. A comprehensive brochure, a seizure diary, and prescription record are also supplied. During subsequent monthly visits, study personnel hold continued discussions regarding self-management; impart psychosocial education about schooling, marriage, and employment; inquire about medication side-effects; verify seizure diaries; and supply the scheduled stock of AEDs
Outcomes	Primary outcome: adherence, appraised at monthly intervals by pill counts and vernacular version of the SRMS and BMQ Secondary outcomes: quality of life appraisal by the PIES scale and several seizure-related parameters including monthly seizure frequency, time to first seizure (in days) after enrollment, and proportion of participants experiencing seizure freedom for the duration of study
Starting date	Starting on 07 December 2017; the duration of the trial will be for 24 months
Contact information	Dr. Josemir W. Sander, Department of Clinical & Experimental Epilepsy. Email: l.sander@ucl.ac.uk
Notes	

AED: anti-epileptic drug; ANM: auxiliary nurse midwife; BMQ: brief medication questionnaire; PIES: personal impact of epilepsy scale; SRMS: Self-Reporting Medication-Taking Scale

DATA AND ANALYSES

Comparison 1. QOLIE-31- Comparison of mean change from baseline

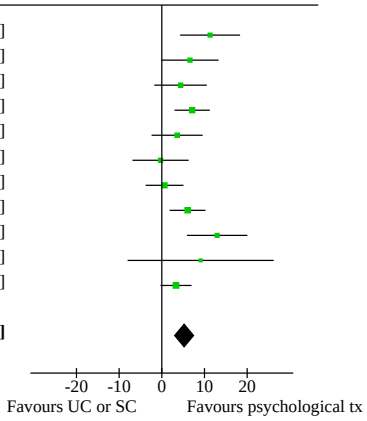
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 QOLIE-31- total score	11	643	Mean Difference (IV, Random, 95% CI)	5.23 [3.02, 7.44]
1.2 QOLIE-31 - overall QoL subscale	10	639	Mean Difference (IV, Random, 95% CI)	5.95 [3.05, 8.85]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.3 QOLIE-31 - energy and fatigue subscale	10	642	Mean Difference (IV, Random, 95% CI)	5.25 [1.56, 8.93]
1.4 QOLIE-31 - emotional well-being subscale	10	643	Mean Difference (IV, Random, 95% CI)	4.96 [0.70, 9.21]
1.5 QOLIE-31 - seizure worry subscale	10	632	Mean Difference (IV, Random, 95% CI)	4.35 [1.35, 7.35]
1.6 QOLIE-31 - cognitive functioning subscale	10	641	Mean Difference (IV, Random, 95% CI)	4.18 [1.82, 6.54]
1.7 QOLIE-31 - medication effects subscale	10	643	Mean Difference (IV, Random, 95% CI)	3.16 [0.01, 6.32]
1.8 QOLIE-31 - social function subscale	10	630	Mean Difference (IV, Random, 95% CI)	3.09 [-0.17, 6.35]

Analysis 1.1. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 1: QOLIE-31- total score

Study or Subgroup	psychological tx Mean	SD	Total	UC or SC Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Au 2003	10.42	6.58	8	-0.9	8.18	9	7.0%	11.32 [4.30 , 18.34]
Caller 2016	4.7	10.3	29	-1.9	12.7	20	7.5%	6.60 [-0.11 , 13.31]
Ciechanowski 2010	5.73	14.36	32	1.33	10.64	33	8.4%	4.40 [-1.76 , 10.56]
Fraser 2015	5.82	9.61	38	-1.29	9.02	40	13.0%	7.11 [2.97 , 11.25]
Gandy 2014	3.92	11.3	20	0.33	8.58	25	8.7%	3.59 [-2.40 , 9.58]
Gilliam 2019	15.67	19.9	55	15.96	15.08	56	7.7%	-0.29 [-6.87 , 6.29]
Helde 2005	3.27	11.53	56	2.63	12.06	53	12.2%	0.64 [-3.79 , 5.07]
Leenen 2018	6.39	9.47	31	0.36	7.5	33	12.8%	6.03 [1.83 , 10.23]
Martinovi# 2006	15.83	11.8	15	2.87	7.53	15	6.9%	12.96 [5.88 , 20.04]
Orjuela-Rojas 2015	17.25	20.58	7	8.14	11.26	8	1.6%	9.11 [-8.02 , 26.24]
Tang 2015	7.29	7.06	30	3.97	7.33	30	14.5%	3.32 [-0.32 , 6.96]
Total (95% CI)			**321**			**322**	**100.0%**	**5.23 [3.02 , 7.44]**

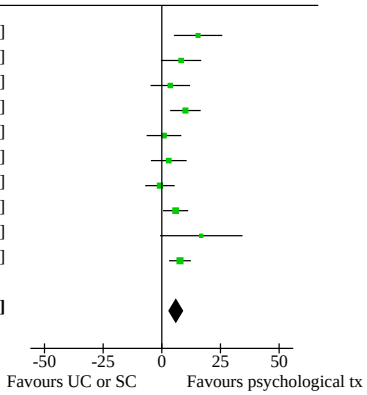
Heterogeneity: Tau² = 5.32; Chi² = 16.89, df = 10 (P = 0.08); I² = 41%
Test for overall effect: Z = 4.64 (P < 0.00001)
Test for subgroup differences: Not applicable



Analysis 1.2. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 2: QOLIE-31 - overall QoL subscale

	psychological tx			UC or SC				Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Au 2003	14.07	11.7	8	-1.39	9.75	9	6.2%	15.46 [5.15 , 25.77]	
Caller 2016	2.2	11.9	29	-6	16.9	20	8.2%	8.20 [-0.38 , 16.78]	
Ciechanowski 2010	5.62	21.22	32	2	12	33	8.4%	3.62 [-4.80 , 12.04]	
Fraser 2015	7.43	15.56	38	-2.63	13.64	40	11.7%	10.06 [3.55 , 16.57]	
Gandy 2014	0.13	13.49	20	-0.78	11.3	25	10.0%	0.91 [-6.48 , 8.30]	
Gilliam 2019	17.97	23.5	58	15	18.16	59	9.6%	2.97 [-4.65 , 10.59]	
Helde 2005	3.29	17.37	57	4.09	16.34	54	12.3%	-0.80 [-7.07 , 5.47]	
Leenen 2018	3.29	12.62	41	-2.6	12.12	41	14.5%	5.89 [0.53 , 11.25]	
Orjuela-Rojas 2015	19.64	16.29	7	2.82	18.44	8	2.5%	16.82 [-0.76 , 34.40]	
Tang 2015	8.5	10.59	30	0.75	7.49	30	16.6%	7.75 [3.11 , 12.39]	
Total (95% CI)			**320**			**319**	**100.0%**	**5.95 [3.05 , 8.85]**	

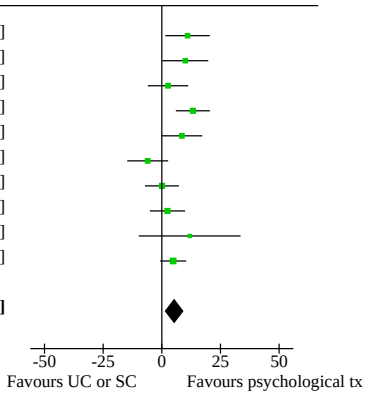
Heterogeneity: Tau² = 7.62; Chi² = 14.23, df = 9 (P = 0.11); I² = 37%
Test for overall effect: Z = 4.02 (P < 0.0001)
Test for subgroup differences: Not applicable



Analysis 1.3. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 3: QOLIE-31 - energy and fatigue subscale

	psychological tx			UC or SC				Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Au 2003	18.75	6.74	8	7.78	12.62	9	9.0%	10.97 [1.49 , 20.45]	
Caller 2016	4.7	15.8	29	-5.3	18.1	20	8.6%	10.00 [0.20 , 19.80]	
Ciechanowski 2010	5.06	21	32	2.41	13.47	33	10.0%	2.65 [-5.96 , 11.26]	
Fraser 2015	8.89	17.6	38	-4.35	14.86	40	11.9%	13.24 [5.99 , 20.49]	
Gandy 2014	3.75	16.29	20	-4.8	12.54	25	9.9%	8.55 [-0.12 , 17.22]	
Gilliam 2019	11.67	24.97	58	17.69	23.11	59	9.9%	-6.02 [-14.74 , 2.70]	
Helde 2005	0.44	20.64	57	0.37	18.32	54	11.9%	0.07 [-7.18 , 7.32]	
Leenen 2018	2.56	18.85	45	0.13	16.39	40	11.5%	2.43 [-5.06 , 9.92]	
Orjuela-Rojas 2015	20	16.83	7	8.13	25.62	8	2.5%	11.87 [-9.82 , 33.56]	
Tang 2015	8.84	9.16	30	4	12.55	30	14.7%	4.84 [-0.72 , 10.40]	
Total (95% CI)			**324**			**318**	**100.0%**	**5.25 [1.56 , 8.93]**	

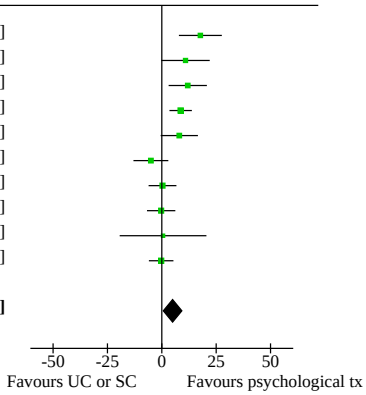
Heterogeneity: Tau² = 15.97; Chi² = 17.16, df = 9 (P = 0.05); I² = 48%
Test for overall effect: Z = 2.79 (P = 0.005)
Test for subgroup differences: Not applicable



Analysis 1.4. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 4: QOLIE-31 - emotional well-being subscale

	psychological tx			UC or SC				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Au 2003	11.5	11.01	8	-6.23	9.58	9	8.7%	17.73 [7.86 , 27.60]	
Caller 2016	1.1	15.7	29	-9.8	21.8	20	7.7%	10.90 [-0.23 , 22.03]	
Ciechanowski 2010	10.2	21.56	32	-1.73	13.59	33	9.7%	11.93 [3.14 , 20.72]	
Fraser 2015	5.39	11.97	38	-3.28	11.19	40	13.3%	8.67 [3.52 , 13.82]	
Gandy 2014	5.8	16.49	20	-2.24	11.72	25	9.9%	8.04 [-0.52 , 16.60]	
Gilliam 2019	19.93	21.31	58	24.95	22.92	59	10.4%	-5.02 [-13.04 , 3.00]	
Helde 2005	0.91	16.37	57	0.59	17.93	54	12.0%	0.32 [-6.08 , 6.72]	
Leenen 2018	2	17	46	2.3	13.82	40	11.9%	-0.30 [-6.82 , 6.22]	
Orjuela-Rojas 2015	20.57	19.92	7	20	19.36	8	3.6%	0.57 [-19.37 , 20.51]	
Tang 2015	3.3	11.79	30	3.6	10.47	30	12.8%	-0.30 [-5.94 , 5.34]	
Total (95% CI)			**325**			**318**	**100.0%**	**4.96 [0.70 , 9.21]**	

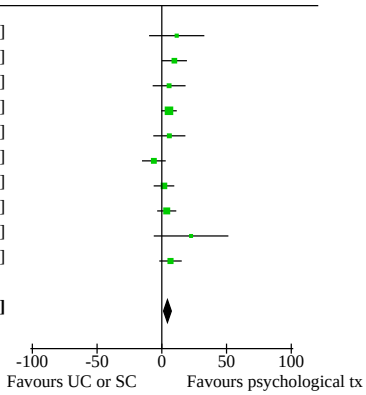
Heterogeneity: Tau² = 28.59; Chi² = 26.14, df = 9 (P = 0.002); I² = 66%
Test for overall effect: Z = 2.28 (P = 0.02)
Test for subgroup differences: Not applicable



Analysis 1.5. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 5: QOLIE-31 - seizure worry subscale

	psychological tx			UC or SC				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Au 2003	6.33	26.47	8	-5.18	16.68	9	2.0%	11.51 [-9.83 , 32.85]	
Caller 2016	8.5	15	29	-1.2	18.3	20	9.4%	9.70 [-0.00 , 19.40]	
Ciechanowski 2010	6.42	26.49	32	0.78	25.74	33	5.5%	5.64 [-7.06 , 18.34]	
Fraser 2015	6.07	13.41	38	0.53	13.64	40	23.9%	5.54 [-0.46 , 11.54]	
Gandy 2014	2.74	21.67	20	-3.08	20.31	25	5.8%	5.82 [-6.57 , 18.21]	
Gilliam 2019	11.12	27.46	57	17.26	22.38	58	10.5%	-6.14 [-15.30 , 3.02]	
Helde 2005	5.57	24.64	57	3.89	17.73	54	13.9%	1.68 [-6.27 , 9.63]	
Leenen 2018	5.94	19	41	2.14	13.89	36	16.1%	3.80 [-3.58 , 11.18]	
Orjuela-Rojas 2015	28.56	33.88	7	5.96	20.44	8	1.1%	22.60 [-6.22 , 51.42]	
Tang 2015	10.55	19.15	30	3.83	14.84	30	11.7%	6.72 [-1.95 , 15.39]	
Total (95% CI)			**319**			**313**	**100.0%**	**4.35 [1.35 , 7.35]**	

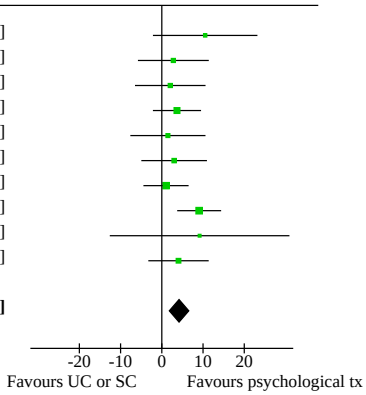
Heterogeneity: Tau² = 0.43; Chi² = 9.16, df = 9 (P = 0.42); I² = 2%
Test for overall effect: Z = 2.84 (P = 0.005)
Test for subgroup differences: Not applicable



Analysis 1.6. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 6: QOLIE-31 - cognitive functioning subscale

Study or Subgroup	psychological tx Mean	SD	Total	UC or SC Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Au 2003	7.81	14.82	8	-2.71	11.36	9	3.5%	10.52 [-2.15 , 23.19]
Caller 2016	8.8	16.4	29	6	14.1	20	7.5%	2.80 [-5.79 , 11.39]
Ciechanowski 2010	4.37	21.05	32	2.32	13.1	33	7.6%	2.05 [-6.50 , 10.60]
Fraser 2015	2.36	12.09	38	-1.32	14.18	40	16.3%	3.68 [-2.16 , 9.52]
Gandy 2014	3.16	16.97	20	1.68	13.43	25	6.7%	1.48 [-7.63 , 10.59]
Gilliam 2019	16.16	23.59	57	13.17	19.9	59	8.8%	2.99 [-4.97 , 10.95]
Helde 2005	2.28	13.98	57	1.26	15.39	54	18.5%	1.02 [-4.46 , 6.50]
Leenen 2018	9.07	12.97	44	0.01	12.1	41	19.6%	9.06 [3.73 , 14.39]
Orjuela-Rojas 2015	16.07	26.58	7	6.9	13.46	8	1.2%	9.17 [-12.62 , 30.96]
Tang 2015	7.66	15.76	30	3.61	13.05	30	10.4%	4.05 [-3.27 , 11.37]
Total (95% CI)			**322**			**319**	**100.0%**	**4.18 [1.82 , 6.54]**

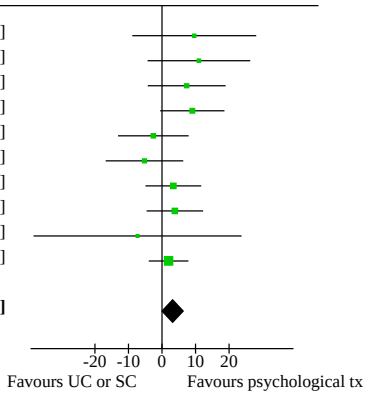
Heterogeneity: Tau² = 0.00; Chi² = 6.45, df = 9 (P = 0.69); I² = 0%
Test for overall effect: Z = 3.48 (P = 0.0005)
Test for subgroup differences: Not applicable



Analysis 1.7. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 7: QOLIE-31 - medication effects subscale

Study or Subgroup	psychological tx Mean	SD	Total	UC or SC Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Au 2003	5.56	22.07	8	-4.06	15.87	9	2.9%	9.62 [-8.86 , 28.10]
Caller 2016	6.4	30.1	29	-4.6	24.4	20	4.3%	11.00 [-4.31 , 26.31]
Ciechanowski 2010	3.68	24.78	32	-3.68	22.93	33	7.4%	7.36 [-4.26 , 18.98]
Fraser 2015	0.93	22.28	38	-8.11	20.83	40	10.9%	9.04 [-0.54 , 18.62]
Gandy 2014	1.53	18.61	20	4.11	16.98	25	9.0%	-2.58 [-13.11 , 7.95]
Gilliam 2019	6.64	34.21	57	11.87	29.02	59	7.5%	-5.23 [-16.79 , 6.33]
Helde 2005	5.95	20.49	57	2.57	23.95	54	14.4%	3.38 [-4.93 , 11.69]
Leenen 2018	3.15	18.05	46	-0.68	21.61	41	14.1%	3.83 [-4.59 , 12.25]
Orjuela-Rojas 2015	4.75	39.62	7	12.04	14.45	8	1.0%	-7.29 [-38.30 , 23.72]
Tang 2015	2.7	14.36	30	0.74	8.15	30	28.6%	1.96 [-3.95 , 7.87]
Total (95% CI)			**324**			**319**	**100.0%**	**3.16 [0.01 , 6.32]**

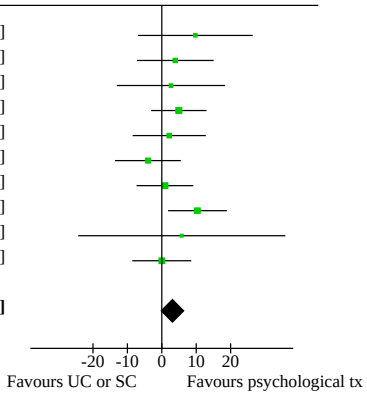
Heterogeneity: Tau² = 0.00; Chi² = 7.21, df = 9 (P = 0.62); I² = 0%
Test for overall effect: Z = 1.96 (P = 0.05)
Test for subgroup differences: Not applicable



Analysis 1.8. Comparison 1: QOLIE-31- Comparison of mean change from baseline, Outcome 8: QOLIE-31 - social function subscale

	psychological tx			UC or SC				Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Au 2003	5.48	12.4	8	-4.28	21.85	9	3.8%	9.76 [-6.90 , 26.42]	
Caller 2016	2.3	18.8	29	-1.6	20.1	20	8.5%	3.90 [-7.25 , 15.05]	
Ciechanowski 2010	4.77	22.34	32	2.1	40.15	33	4.3%	2.67 [-13.06 , 18.40]	
Fraser 2015	8.12	16.48	38	3.18	19.69	40	16.4%	4.94 [-3.10 , 12.98]	
Gandy 2014	7	18.52	20	4.84	17.51	25	9.4%	2.16 [-8.47 , 12.79]	
Gilliam 2019	9.96	27.19	55	13.98	24.27	57	11.6%	-4.02 [-13.58 , 5.54]	
Helde 2005	6.08	21.01	56	5.17	22.82	53	15.6%	0.91 [-7.34 , 9.16]	
Leenen 2018	10.03	21.66	40	-0.33	17.06	40	14.6%	10.36 [1.82 , 18.90]	
Orjuela-Rojas 2015	10.49	34.85	7	4.69	22.32	8	1.2%	5.80 [-24.30 , 35.90]	
Tang 2015	7.34	16.19	30	7.35	17.65	30	14.5%	-0.01 [-8.58 , 8.56]	
Total (95% CI)			**315**			**315**	**100.0%**	**3.09 [-0.17 , 6.35]**	

Heterogeneity: Tau² = 0.00; Chi² = 6.58, df = 9 (P = 0.68); I² = 0%
Test for overall effect: Z = 1.86 (P = 0.06)
Test for subgroup differences: Not applicable



ADDITIONAL TABLES

Table 1. Intervention methods, strategies, and treatment goals

	Study (intervention acronym)	Main treatment method	Primary treatment goal	Main treatment strategy	Provider	Setting	Delivery	Timing	Participants
Skills-based psychological interventions	Au 2003	Cognitive behavioral therapy	Seizure frequency	Stress management, cognitive restructuring, communication skills	Clinical psychologist	Clinic	Group	8 weekly 2-hour sessions	N = 17 adults with at least 2 seizures per month, with subjectively reported psychological distress
	Ciechanowski 2010 (PEARLS)		Depressive symptoms	Cognitive restructuring to address negative depressive thinking + behavioral activation	Trained social worker	Home-based + telephone calls	Individual	8 50-min in-home sessions in 5 months + 7 monthly 5- to 10-min telephone calls	N = 80 adults with epilepsy with significant depression
	Gandy 2014				Intern psychologist	Clinic	Individual	1 x 1- to 2-hour assessment session + 8 weekly 1-hour sessions	N = 59 adults with epilepsy
	Gilliam 2019			CBT based on standardized and manual-based Beck guidelines	Nurse educator and trained lay person with epilepsy	Therapist office	Individual	1-hour session per week for 16 weeks	N = 98 adults (age 21 - 75) with epilepsy and current major depressive episode
	Hum 2019 (UPLIFT)			see Thompson 2010	Licensed mental health professional and trained layperson with epilepsy	Telephone calls	Group	8 weekly 1-hour sessions	N = 55 adults with epilepsy and depressive symptoms

Table 1. Intervention methods, strategies, and treatment goals *(Continued)*

Martinović 2006			Cognitive restructuring to address negative depressive thinking + behavioral activation	NR	Clinic	Group	8 weekly sessions + 4 monthly sessions	N = 32 adolescents with epilepsy and subthreshold depression
Meyer 2019 (Emyna)			Cognitive restructuring to address negative depressive thinking + behavioral activation	NA	Internet-based	Individual	5 modules with no fixed sequence, each lasting for 60 - 180 min	N 154 adult (> 18) with active epilepsy and a current diagnosis of moderate depression
Orjuela-Rojas 2015				Licensed CBT therapist and psychiatrist	Clinic	Group	12 weekly 90-min sessions	N = 15 adults with epilepsy and major depression
Schröder 2014 (Deprexis)				NA	Internet-based	Individual	9 weekly modules (10 - 60 min)	N = 78 adults with self-reported depressive symptoms
Thompson 2010 (UPLIFT)				Master of Public Health student and trained lay person with epilepsy	Internet-based + telephone calls	Group	8 weekly 1-hour sessions	N = 53 adults with epilepsy and depression (but not severe depression)
Dorris 2017	Self-management program	Quality of life	Medical self-management and sleep hygiene, coping strategies and problem-solving techniques based on CBT and mindfulness	Epilepsy nurse and clinical psychologist	Clinic	Group	6 weekly 120-min sessions	N = 69 children and adolescents aged 12 - 17 with epilepsy
Fraser 2015 (PACES)		Self-management	Medical and psychosocial self-management + epilepsy-related communication	Psychologist and trained	Clinic	Group	8 weekly 75-min sessions	N = 83 adults with epilepsy

Table 1. Intervention methods, strategies, and treatment goals *(Continued)*

				lay person with epilepsy				
Leenen 2018 (ZMILE)		Self-management and quality of life	Self-monitoring, risk-evaluation and management; shared decision-making, goal-setting skills	Nurse practitioner	Clinic	Group	5 weekly 2-hour sessions followed by a 2-hour booster session after 3 weeks	N = 87 adults with epilepsy and on AEDs
Sajatovic 2016 (TIME)		Depressive symptoms	Personal goal-setting exercises (with focus on coping with mental illness and epilepsy), stress management, and training to communicate with care providers	Nurse educator and trained lay person with epilepsy	Clinic	Group	12 weekly 60- to 90-min sessions	N = 35 adults with epilepsy and comorbid mental illness
Sajatovic 2018		Negative health events	SMART "self-management for people with epilepsy and a history of negative health events"	Nurse educator and trained lay person with epilepsy	Clinic + telephone intervention calls + telephone maintenance	Group + individual	1 face-to-face 60- to 90-min group; 7 Internet-based group; 6 10- to 15-min telephone maintenance	N = 111 adults with at least 1 negative health event within the past 6 months
Yadegary 2015		Quality of life	Medical and psychosocial self-management + seizure communication	NR	Clinic	Group	4 weekly 120-min sessions	N = 60 adults with epilepsy
Dilorio 2011 (WebEase)	Motivational interviewing (MI)	Medication adherence + perceived stress	Medication adherence + stress and sleep management	NA	Internet-based	Individual	3 bi-weekly modules	N = 194 adults with epilepsy
Hosseini 2016		Quality of life	Enhancement of internal motivation for change, by overcoming dualism	Psychologist and trained layper-	Clinic	Group	5 sessions in 20 days	N = 56 adults with epilepsy.

Table 1. Intervention methods, strategies, and treatment goals *(Continued)*

				son with epilepsy				
Pakpour 2015		Medication adherence	MI techniques	Health psychologist	Clinic	Individual	3 weekly 40- to 60-min sessions	N = 275 adults with epilepsy
Lundgren 2006; Lundgren 2008	Mindfulness therapy (MT)	Quality of life	ACT + seizure management	Clinical psychologist	Clinic	Group + individual	5 individual 90-min sessions + 2 x group 3-hour sessions + 2 x 1-hour boosters at 6 and 12 months	N = 27 (Lundgren 2006) N = 18 adults with epilepsy (Lundgren 2008)
Tang 2015		Quality of life	Epilepsy management + mindfulness techniques + seizure-related acceptance	Clinical psychologist	Clinic	Group	4 x bi-weekly 2 x.5-hour sessions	N = 61 adults with drug-resistant epilepsy
Brown 2019	Behavior-change counseling	Physical activity and quality of life	Self-regulatory skills to support behavior change	Trained research assistant	Clinic	Individual	15-min sessions: weekly/bi-weekly/monthly weeks 1 – 4/ 6 – 12/16 – 24	N = Children aged 8 – 14 years with epilepsy
Caller 2016 (HOBSCOTCH)	Cognitive, memory + self-management training	Quality of life	Problem-solving therapy and behavior modification strategies + seizure management + social skills	Specialized nurse	Home-based + telephone calls	Group + individual	8 weekly 40- to 60-min sessions	N = 66 adolescents and adults with epilepsy and self-reported memory complaints
Helde 2005	Epilepsy education + nurse-led counseling	Quality of life	Personalized counseling + disease knowledge + drug adherence	Specialized nurse	Clinic + phone calls	Group + individual	1-day group + phone calls every 3 months for 2 yrs	N = 114 adults with epilepsy
Pramuka 2007	Epilepsy education program	Quality of life	Disease knowledge, advocacy topics, self-management, psychosocial aspects	Psychologist and epilepsy nurse	Clinic	Group	6 weekly 2-hour sessions	N = 55 adults with epilepsy

Table 1. Intervention methods, strategies, and treatment goals *(Continued)*

	Ring 2018	Learning Disability Epilepsy Specialist Nurse Competency Framework	Seizure frequency and quality of life	Provide care according to guidelines developed by the UK ESNA and UK Royal College of Nursing	Licensed mental health professional and trained lay person with epilepsy	Home visits, telephone, clinics and visits to the local primary care or ID team base	Individual	On an as-needed basis for 24 weeks	N = 312 adults with epilepsy and intellectual disability
Education-only interventions	Beretta 2014 (EDUCOM)	Patient-tailored medication education	Drug-related problems	Personalized education on drug interaction and tolerability	Treating physician	Clinic	Individual	1-hour session + booster session after 1 month	N = 174 adults with epilepsy and chronic comorbidity
	Edward 2019	Epilepsy education program	Seizure frequency	Education program developed based on the self-determination theory (managing epilepsy and medical care; socializing on a budget, healthy lifestyle, emotional management)	Specialized nurse	Not specified in the publication	Not specified in the publication	1 x 120-min session	N = 35 adults with epilepsy
	Jantzen 2009 (FLIP&FLAP)	Epilepsy education program	Quality of life	Disease knowledge, advocacy topics, self-management, psychosocial aspects	Trained nurses, social workers, medical doctors or psychologists	Clinic	Group	2-day course (14 hours)	N = 192 children and adolescents with epilepsy, including parents
	Lua 2013	Epilepsy education program	Quality of life	Disease knowledge, advocacy topics, self-management, psychosocial aspects	NR	SMS-based	Individual	11 weekly modules	N = 144 adults with epilepsy
	May 2002 (MOSES)	Epilepsy education program	Quality of life	Disease knowledge, advocacy topics, self-management, psychosocial aspects	Trained nurses, social workers,	Clinic	Group	2-day course (14 hours)	N = 383 adolescents and adults with epilepsy

Table 1. Intervention methods, strategies, and treatment goals *(Continued)*

				medical doctors or psychologists				
Pfäfflin 2016	Counseling	Satisfaction with information and support	Disease knowledge, advocacy topics, self-management, psychosocial aspects	Specialized nurse	Clinic	Individual	Delivery during routine visits	N = 187 adults with epilepsy
Rau 2006 (FAMOSES)	Epilepsy education program	Knowledge + coping	Disease knowledge, advocacy topics, self-management, psychosocial aspects	NR	Clinic	Group	2-day course (14 h)	N = 70 children with epilepsy
Ridsdale 2018 [SMILE (UK)]	Epilepsy education program (May 2002)	Quality of life	see May 2002	Nurse educator and trained lay person with epilepsy	Clinic	Group	2-day course (16 h)	N = 314 adolescents (≥ 16 years) and adults with poorly-controlled epilepsy
Turan Gurhopur 2018	Epilepsy education program	Epilepsy-specific knowledge, self-efficacy, quality of life	Modular education program including epilepsy knowledge, seizure management, and social aspects of epilepsy	NR	Clinic	Individual	2 - 3 days with a total of 16 hours	N = 92 including children with epilepsy aged 7 - 18; and parents of children with epilepsy

ACT: acceptance and commitment therapy; AED: anti-epilepsy drug; CBT: cognitive behavioral therapy; ESNA: EpilepSy Nurses Association; ID: intellectual disability; MI: motivational interviewing

Table 2. Effects of interventions

Study (intervention acronym)	HRQOL	Depression	Anxiety	Seizure-related outcomes	Additional outcomes	Time points measured

Table 2. Effects of interventions *(Continued)*

Skills-based psychological interventions	Au 2003	QOLIE-31[b]	NA	seizure frequency[a,d]	ESES	1) baseline 2) postintervention
	Brown 2019	CHEQOL[a,d], KIDSCREEN-27[a,d]	CDI-S[a,d]	NA	Physical activity[a]	1) baseline 2) postintervention (28 after baseline) 3) 52-week follow-up
	Caller 2016 (HOBSCOTCH)	QOLIE-31[b]	PHQ-9[d] NDDI-E[d]	NA	Self-reported cognitive and executive function	1) baseline 2) postintervention
	Ciechanowski 2010 (PEARLS)	QOLIE-31[b]	SCL-20[a,d] suicidal ideation[a,c]	NA	seizure frequency[d]	NA	1) baseline 2) postintervention 3) 12-month follow-up 4) 18-month follow-up
	DiIorio 2011 (WebEase)	QOLIE-10[d]	NA	NA	ESI-R[a], ESMS[a], MAS[a], PSQI[a], PSS[a], Epilepsy Knowledge Profile	1) baseline 2) postintervention 3) 12-week follow-up
	Dorris 2017	PedsQL[a,d] GEOS-YP[a,d]	PI-ED[d]	NA	NA	EKP-G, SSEC-C, B-IPQ	1) baseline 2) postintervention 3) 3-month follow-up 4) 6-month follow-up
	Fraser 2015 (PACES)	QOLIE-31[b]	PHQ-9[c]	GAD-7[d]	NA	ESES[a], ESMS[a]	1) baseline 2) postintervention 3) 6-months follow-up
	Gandy 2014	QOLIE-31[b]	HADS-D[a,c] NDDI-E[a,c]	HADS-A[a,d]	NA	NA	1) baseline 2) postintervention 3) 3-month follow-up
	Gilliam 2019	QOLIE-89[b]	SF-II[a, d] CES-D[a, d]	NA	Focal impaired seizures/month[d] ,	Adverse events profile[d]	1) baseline 2) 8-week interim assessment 3) 16-week (postintervention)

Table 2. Effects of interventions *(Continued)*

			Generalized tonic-clonic seizures/ month[d]		
Helde 2005	QOLIE-89[a,b]	NA	NA	VAS scale	1) baseline 2) postintervention
Hosseini 2016	QOLIE-89[a,c]	NA	NA	NA	1) baseline 2) postintervention
Hum 2019 (UP-LIFT)	WHO-QOL-BREF[a,d] QIDS[a,c] ND-DLE[a,d]	NA	NA	NA	1) baseline, 2) 6-month follow-up 3) 12-month follow-up
Leenen 2018 (ZMILE)	QOLIE-31-P[b,d] HADS-D[d]	HADS-A[d]	NHS3[d]	GSES[a], GSES[a], MEMS, MARS, UPCC, SIDAED	1) baseline 2) 3-month follow-up 3) 6-month follow-up
Lundgren 2006	SWLS[a] NA WHO-QOL-BREF[a]	NA	seizure frequency[c] seizure index[c]	NA	1) baseline 2) postintervention 3) 6-month follow-up 4) 12-month follow-up
Lundgren 2008	SWLS[a], NA WHO-QOL-BREF[a]	NA	seizure frequency[d], seizure index[c]	NA	1) baseline 2) postintervention 3) 6-month follow-up 4) 12-month follow-up
Martinović 2006	QOLIE-31[a,d] CES-D[a,d] HAMD[a,c]	NA	NA	NA	1) baseline 2) postintervention 3) 9-month follow-up

Table 2. Effects of interventions *(Continued)*

Meyer 2019	QOLIE-10[r] PHQ-9[a, c], NDDIE[c], DASS[c], WSAS[c]	GAD-7[c]	NA	NA	1) baseline 2) 3-month (postintervention) 3) 6-month follow-up 4) 9-month follow-up
Orjuela-Rojas 2015	QOLIE-31[r] BDI[a,c], HADS-D[a,d], MINI[a,d]	HADS-A[a,d]	NA	NA	1) baseline 2) mid-intervention 3) postintervention
Pakpour 2015	QOLIE-31[r]	NA	LSSS[d]	MARS[a]; for additional outcomes please see Characteristics of included studies table	1) baseline 2) postintervention 3) 6-month follow-up
Pramuka 2007	QOLIE-89[r]	NA[a,d]	NA	ESES, WPSI, LOC	1) baseline 2) postintervention 3) 6-month follow-up
Ring 2018	EL-DQoL-SSS[d]	NA	NA	EL-DQoL-SSS[a,d]	For additional outcomes please see Characteristics of included studies table	1) baseline 2) postintervention
Sajatovic 2016 (TIME)	QOLIE-10[r]	MADRS[a,d] PHQ-9[d]	NA	seizure frequency[d]	BPRS, GAF, WHO-DASII, PSQI, ESES, MSPSS, ISMI, ESS	1) baseline 2) postintervention 3) 16 week-follow up
Sajatovic 2018	QOLIE-10[r] SF-36 PCS[c] SF-36 MCS[c]	PHQ-9[c] MADRS[c]	NA	LSSS[c]	ESES[c], MSPSS[d], ESMS[c], ESS[d, NHEa]	1) baseline 2) 10-week follow-up 3) 24-week follow-up
Schröder 2014	QOLIE-31[r] WHO-	BDI[a,c]	NA	NA	NA	1) baseline

Table 2. Effects of interventions *(Continued)*

	(Depresix)	QOL-BREF[d]				2) postintervention
	Tang 2015	QOLIE-31-P[a,b]	BDI-II[c]	BAI[c]	seizure frequency[c] SSI[d]	NA	1) baseline 2) postintervention
	Thompson 2010 (UPLIFT)	SWLS[d]	BDI[a,c]	NA	NA	DCSES, SCS, knowledge and skills, BRFSS	1) baseline 2) postintervention 3) 4-month follow-up
	Yadegary 2015	QOLIE-31-P[a,c]	NA	NA	NA	NA	1) baseline 2) postintervention
Education-only interventions	Beretta 2014 (EDUCOM)	QOLIE-31[d]	NA	NA	NA	Drug-related problems[a]	1) baseline 2) postintervention 3) 6-month follow-up
	Edward 2019	SF12-PCS (ns) SF12-MCS (ns) SWLS (ns)	NA	NA	NA	CD-RISC (ns), MMAS-8 (ns)	1) baseline 2) 6-month follow-up postintervention
	Jantzen 2009 (FLIP&FLAP)	DISABKIDS[c]	NA	NA	Seizure-free episode[d]	Disclosure of epilepsy	1) baseline 2) postintervention
	Lua 2013	MQOLIE-30[a,c]	NA	NA	NA	NA	1) baseline 2) postintervention
	May 2002 (MOSES)	SF-36[a,b]	Depression Scale D-S[a,d]	NA	Seizure frequency[c]	For additional outcomes please see	1) baseline 2) postintervention

Table 2. Effects of interventions *(Continued)*

				Characteristics of included studies table	
Pfäfflin 2016	QOLIE-31 (Overall QoL)[d]	HADS-D[d]	HADS-A[d]	NA	Satisfaction with information and support[a]	1) baseline 2) postintervention
Rau 2006 (FAMOSES)	KINDL[d]	NA	NA	Seizure frequency[d]	Epilepsy knowledge[a]; for additional outcomes please see Characteristics of included studies table	1) baseline 2) postintervention
Ridsdale 2018 (SMILE [UK])	QOLIE-31 P[a,d]	HADS-A[d]	HADS-A[d]	seizure frequency and seizure recency[d]	Impact of epilepsy, stigma of epilepsy, medication adherence, self-mastery and control	1) baseline 2) 6-month follow-up 3) 12-month follow-up
Turan Gurhopur 2018	QOLIE-48[c]	NA	NA	NA	SSES-C[c], EKTC[c]	1) baseline (pretest), 2) immediately after intervention (post-test 1), 3) 1-month follow-up 4) 3-month follow-up

[a]primary outcome measure(s) in study.
[b]included in meta-analysis.
Interpretation of post-intervention outcomes
[c]Significant improvement in treatment group when comparing post-intervention outcomes of treatment and control group.
[d]No significant difference between treatment and control group at postintervention based on mean comparisons.
NA: not applicable
ns - Not specified, with no information in the publication suggesting significant difference between treatment and control group at post-intervention based on mean comparisons

Outcome Measures

BAI - Beck Anxiety Inventory; BDI or BDI II - Beck Depression Inventory or Beck Depression Inventory II; B-IPQ - Brief - Illness Representations Questionnaire; BPRS - Brief Psychiatric Rating Scale; BRFSS - Behavioral Risk Factor Surveillance System; CES-D - Center for Epidemiological Study on Depression scale; CDI-S - Children's Depression Inventory - Short; CD-RISC - Connor-Davidson Resilience Scale; CHEQOL - Childhood Epilepsy Quality of Life scale; DASS21 - Depression Anxiety Stress Scale-21; DISABKIDS - Modular HRQOL questionnaire; DCSES - Depression Coping Self-Efficacy Scale; EKP-G - Epilepsy Knowledge Profile-General; EKTC - Epilepsy Knowledge Test for Children; ELDQoL-SSS - Epilepsy and Learning Disabilities Quality of Life Seizure Severity Scale; ESES - Epilepsy Self-Efficacy Scale; ESMS - Epilepsy Self-Management Scale; ESS - 10-item Epilepsy Stigma Scale; ESI-R - Revised Epilepsy Stressor Inventory; GAD-7 - Generalized Anxiety Disorder-7; GAF - Global Assessment of Functioning; GEOS-YP - Glasgow Epilepsy Outcome Scale for Young Persons; GSES - General Self-Efficacy Scale; HADS - Hospital Anxiety Depression Scale; HAMD - Hamilton Depression Scale; ISMI - Internalized Stigma of Mental Illness Scale; HSCL-20 - Hopkins Symptom Checklist-20; KINDL - Gesundheitsbezogene Lebensqualität und psychosoziale Auswirkungen der Epilepsie (Health-related Quality of Life

and psychosocial consequences of epilepsy); LOC - Locus of Control Scale; LSSS - Liverpool Seizure Severity Scale; MADRS - Montgomery-Asbery Depression Rating Scale; MARS - Medication Adherence Report Scale; MAS - Medication Adherence Scale; MEMS - Medication Event Monitoring System; mBDI - Modified Beck Depression Inventory; MCMI-III - Millon Clinical Multiaxial Inventory-III; MINI - Mini International Neuropsychiatric Interview; MMAS-8 - Morisky Medication Adherence Scale (MMAS-8); MQOLIE-30 - Malay Quality of Life Inventory in Epilepsy-30; MSPSS - Multidimensional Scale of Perceived Social Support; NDDI-E - Neurological Depressive Disorders Inventory-Epilepsy; NHS3 - National Hospital Seizure Severity Scale; PedsQL - Paediatric Quality of Life Inventory PedsQL™; PHQ-9 - Patient Health Questionnaire-9; PI-ED - Paediatric Index of Emotional Distress; PSQI - Pittsburgh Sleep Quality Index; PSS - Perceived Stress Scale; QOLIE-31, QOLIE-31-P, QOLIE-89 - Quality of Life in Epilepsy-31, Patient-weighted Quality of Life in Epilepsy-31, Quality of Life in Epilepsy-89; SCS - Self-compassion Scale; SF12-PCS - Short-Form 12 Physical Health Score; SF12-MCS - Short Form 12 Mental Health Score; SF-36 - Short-Form 36; (PCS - physical health score, MCS - mental health score); SIDAED - Side-effects of Antiepileptic Drugs; SSEC-C - Seizure Self Efficacy Scale for Children; SSI - Seizure Severity Index; SWLS - Satisfaction with Life Scale; UPCC - Utrecht Proactive Coping Competence; VAS scale (Helde 2005) - General satisfaction with the follow-up by the Neurological Clinic during the last 2 years; WHODASII - World Health Organization Disability Assessment Schedule II; WHOQOL-BREF - World Health Organization Quality of Life instrument, short version; WPSI - Washington Psychosocial Seizure Inventory; WSAS - Work and Social Adjustment Scale; 4-point Likert scale (Martinović 2006) - Rating of positive and negative thoughts

APPENDICES

Appendix 1. Cochrane Register of Studies (CRS Web) search strategy

1. MeSH DESCRIPTOR Neuropsychology Explode All AND CENTRAL:TARGET

2. MeSH DESCRIPTOR Rehabilitation Explode All AND CENTRAL:TARGET

3. MeSH DESCRIPTOR Mind-Body Therapies Explode All AND CENTRAL:TARGET

4. MeSH DESCRIPTOR Psychotherapy Explode All AND CENTRAL:TARGET

5. MeSH DESCRIPTOR Psychology, Applied Explode All AND CENTRAL:TARGET

6. #1 OR #2 OR #3 OR #4 OR #5 AND CENTRAL:TARGET

7. abreaction OR aromatherap* OR "behav* modification" OR bibliotherap* OR biofeedback OR catharsis OR conditioning OR counseling OR counselling OR "crisis intervention" OR desensitisation OR desensitization OR "early intervention" OR "emotional freedom tapping" OR ("eye movement" NEAR2 (desensitisation OR desensitization OR reprocessing)) OR (feedback NEAR1 (psycholog* OR sensory)) OR flooding OR "free association" OR hypnosis OR hypnotherapy OR imagery OR logotherapy OR meditation OR mindfulness OR "post traumatic stress" OR PTSD OR psychodrama OR psychotherap* OR "residential treatment*" OR "rewind technique*" OR "stress manag*" OR "transactional analysis" OR "thought restructur*" AND CENTRAL:TARGET

8. ((acceptance NEAR2 commitment) OR (adherence NOT "non-adherence") OR anxiety OR art OR assertive OR autogenic OR autosuggestion OR aversive OR behav* OR "client cent*" OR cognitive OR color OR colour OR compassion* OR coping OR couples OR dance OR depression OR directive OR exercise OR family OR gestalt OR "human givens" OR humanistic OR implosive OR interpersonal OR language OR marital OR massage OR memory OR mentalisation OR mentalization OR music OR narrative OR nondirective OR "non-directive" OR nonpharmacol* OR "non-pharmacol*") NEAR2 (therap* OR treatment* OR train* OR retrain* OR rehabilitat* OR adapt* OR intervention* OR manag*) AND CENTRAL:TARGET

9. (panic OR "patient cent*" OR psycho* OR "quality of life" OR QOL OR "rational emotive" OR relaxation OR self* OR socioenvironmental OR "socio-environmental" OR stigma OR systemic OR systems OR "therapeutic community" OR trauma) NEAR2 (therap* OR treatment* OR train* OR retrain* OR rehabilitat* OR adapt* OR intervention* OR manag*) AND CENTRAL:TARGET

10. (adjustment OR attention OR confidence OR "day to day" OR loss OR physical OR reality OR suggestion) NEAR1 (therap* OR treatment* OR train* OR retrain* OR rehabilitat* OR adapt* OR intervention* OR manag*) AND CENTRAL:TARGET

11. #6 OR #7 OR #8 OR #9 OR #10 AND CENTRAL:TARGET

12. (nonepileptic OR "non-epileptic"):TI AND CENTRAL:TARGET

13. #11 NOT #12 AND CENTRAL:TARGET

14. MESH DESCRIPTOR Epilepsy EXPLODE ALL AND CENTRAL:TARGET

15. MESH DESCRIPTOR Seizures EXPLODE ALL AND CENTRAL:TARGET

16. epilep*:AB,KW,MC,MH,TI AND CENTRAL:TARGET

17. #14 OR #15 OR #16

18. #13 AND #17

Appendix 2. MEDLINE search strategy

This strategy includes the Cochrane Highly Sensitive Search Strategy for identifying randomized trials (Lefebvre 2019).

1. exp Neuropsychology/ or exp Rehabilitation/ or exp Mind-Body Therapies/ or exp psychotherapy/ or exp Psychology, Applied/

2. (abreaction or aromatherap* or "behav* modification" or bibliotherap* or biofeedback or catharsis or conditioning or counsel?ing or "crisis intervention" or desensiti?ation or "early intervention" or "emotional freedom tapping" or ("eye movement" adj2 (desensiti?ation or reprocessing)) or (feedback adj1 (psycholog* or sensory)) or flooding or "free association" or hypnosis or hypnotherapy or imagery or logotherapy or meditation or mindfulness or "post traumatic stress" or PTSD or psychodrama or psychotherap* or "residential treatment?" or "rewind technique?" or "stress manag*" or "transactional analysis" or "thought restructur*").tw.

3. (((acceptance adj2 commitment) or (adherence not "non-adherence") or anxiety or art or assertive or autogenic or autosuggestion or aversive or behav* or "client cent*" or cognitive or colo?r or compassion* or coping or couples or dance or depression or directive or exercise or family or gestalt or "human givens" or humanistic or implosive or interpersonal or language or marital or massage or memory or mentali?ation or music or narrative or nondirective or "non-directive" or nonpharmacol* or "non-pharmacol*") adj2 (therap* or treatment* or train* or retrain* or rehabilitat* or adapt* or intervention* or manag*)).tw.

4. ((panic or "patient cent*" or psycho* or "quality of life" or QOL or "rational emotive" or relaxation or self* or socioenvironmental or "socio-environmental" or stigma or systemic or systems or "therapeutic community" or trauma) adj2 (therap* or treatment* or train* or retrain* or rehabilitat* or adapt* or intervention* or manag*)).tw.

5. ((adjustment or attention or confidence or "day to day" or loss or physical or reality or suggestion) adj1 (therap* or treatment* or train* or retrain* or rehabilitat* or adapt* or intervention* or manag*)).tw.

6. 1 or 2 or 3 or 4 or 5

7. exp Epilepsy/

8. Seizures/

9. epilep$.tw.

10. 7 or 8 or 9

11. exp *Pre-Eclampsia/ or exp *Eclampsia/

12. 10 not 11

13. (nonepileptic or "non-epileptic").ti.

14. 6 and 12

15. 14 not 13

16. (randomized controlled trial or controlled clinical trial or pragmatic clinical trial).pt. or (randomi?ed or placebo or randomly).ab.

17. clinical trials as topic.sh.

18. trial.ti.

19. 16 or 17 or 18

20. exp animals/ not humans.sh.

21. 19 not 20

22. 15 and 21

23. remove duplicates from 22

Appendix 3. PsycINFO search strategy

S14 S3 AND S12 AND S13

S13 TI ((randomiz* OR randomis* OR controlled OR placebo OR blind* OR unblind* OR "parallel group" OR crossover OR cross-over OR cluster OR "head to head") N2 (analy* OR method OR procedure OR study OR studies OR trial)) OR AB ((randomiz* OR randomis* OR controlled OR placebo OR blind* OR unblind* OR "parallel group" OR crossover OR cross-over OR cluster OR "head to head") N2 (analy* OR method OR procedure OR study OR studies OR trial))

S12 S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11

S11 (adjustment or attention or confidence or "day to day" or loss or reality or suggestion) W1 (therap* or treatment or train* or retrain* or rehabilitat* or adapt* or intervention or manag*)

S10 (panic or "patient cent*" or psycho* or "quality of life" or QOL or rational-emotive or relaxation or self* or socioenvironmental or socio-environmental or stigma or systemic or systems or "therapeutic community" or trauma) W2 (therap* or treatment or train* or retrain* or rehabilitat* or adapt* or intervention or manag*)

S9 ((acceptance W2 commitment) or (adherence not "non-adherence") or anxiety or art or assertive or autogenic or autosuggestion or aversive or behav* or "client cent*" or cognitive or colo#r or compassion* or coping or couples or dance or depression or directive or exercise or family or gestalt or "human givens" or humanistic or implosive or interpersonal or language or marital or massage or memory or mentali#ation or music or narrative or nondirective or non-directive or nonpharmacol* or non-pharmacol*) W2 (therap* or treatment or train* or retrain* or rehabilitat* or adapt* or intervention or manag*)

S8 abreaction or aromatherap* or "behav* modification" or bibliotherap* or biofeedback or catharsis or conditioning or counsel#ing or "crisis intervention" or desensiti#ation or "early intervention" or "emotional freedom tapping" or ("eye movement" N2 (desensiti#ation or reprocessing)) or (feedback N1 (psycholog* or sensory)) or flooding or "free association" or hypnosis or hypnotherapy or imagery or logotherapy or meditation or mindfulness or "post traumatic stress" or PTSD or psychodrama or psychotherap* or "residential treatment#" or "rewind technique#" or "stress manag*" or "transactional analysis" or "thought restructur*"

S7 MM "Mind Body Therapy" OR MM "Aromatherapy"

S6 MM "Rehabilitation" OR MM "Psychotherapeutic Techniques" OR MM "Active Listening" OR MM "Animal Assisted Therapy" OR MM "Cotherapy" OR MM "Dream Analysis" OR MM "Empty Chair Technique" OR MM "Ericksonian Psychotherapy" OR MM "Mirroring" OR MM "Morita Therapy" OR MM "Motivational Interviewing" OR MM "Mutual Storytelling Technique" OR MM "Network Therapy" OR MM "Paradoxical Techniques" OR MM "Cognitive Rehabilitation" OR MM "Neuropsychological Rehabilitation" OR MM "Neurorehabilitation" OR MM "Occupational Therapy" OR MM "Physical Therapy" OR MM "Psychosocial Rehabilitation" OR MM "Therapeutic Social Clubs" OR MM "Vocational Rehabilitation" OR MM "Activities of Daily Living" OR MM "Adaptive Behavior" OR MM "Disability Management" OR MM "Habilitation" OR MM "Independent Living Programs" OR MM "Intervention" OR MM "Crisis Intervention" OR MM "Early Intervention" OR MM "Family Intervention" OR MM "Group Intervention" OR MM "School Based Intervention" OR MM "Rehabilitation Counseling" OR MM "Self Care Skills" OR MM "Support Groups" OR MM "Twelve Step Programs"

S5 MM "Psychotherapy" OR MM "Adlerian Psychotherapy" OR MM "Adolescent Psychotherapy" OR MM "Analytical Psychotherapy" OR MM "Autogenic Training" OR MM "Behavior Therapy" OR MM "Brief Psychotherapy" OR MM "Brief Relational Therapy" OR MM "Child Psychotherapy" OR MM "Client Centered Therapy" OR MM "Cognitive Behavior Therapy" OR MM "Cognitive Therapy" OR MM "Conversion Therapy" OR MM "Eclectic Psychotherapy" OR MM "Emotion Focused Therapy" OR MM "Existential Therapy" OR MM "Experiential Psychotherapy" OR MM "Expressive Psychotherapy" OR MM "Eye Movement Desensitization Therapy" OR MM "Feminist Therapy" OR MM "Geriatric Psychotherapy" OR MM "Gestalt Therapy" OR MM "Group Psychotherapy" OR MM "Guided Imagery" OR MM "Humanistic Psychotherapy" OR MM "Hypnotherapy" OR MM "Individual Psychotherapy" OR MM "Insight Therapy" OR MM "Integrative Psychotherapy" OR MM "Interpersonal Psychotherapy" OR MM "Logotherapy" OR MM "Narrative Therapy" OR MM "Network Therapy" OR MM "Persuasion Therapy" OR MM "Primal Therapy" OR MM "Psychoanalysis" OR MM "Psychodrama" OR MM "Psychodynamic Psychotherapy" OR MM "Psychotherapeutic Counseling" OR MM "Rational Emotive Behavior Therapy" OR MM "Reality Therapy" OR MM "Relationship Therapy" OR MM "Solution Focused Therapy" OR MM "Supportive Psychotherapy" OR MM "Transactional Analysis"

S4 MM "Neuropsychology" OR MM "Health Care Psychology" OR MM "Medical Psychology"

S3 S1 OR S2

S2 epilep* OR seizure* OR convuls*

S1 MM "Epilepsy" OR MM "Epileptic Seizures" OR MM "Experimental Epilepsy" OR MM "Grand Mal Seizures" OR MM "Petit Mal Seizures" OR MM "Status Epilepticus"

WHAT'S NEW

Date	Event	Description
12 August 2019	New search has been performed	Searches updated 12 August 2019; we include 11 new studies.
12 August 2019	New citation required but conclusions have not changed	Conclusions are unchanged.

HISTORY

Protocol first published: Issue 2, 2016
Review first published: Issue 10, 2017

Date	Event	Description
25 July 2018	Amended	Minor edits have been made to the text.

CONTRIBUTIONS OF AUTHORS

Rosa Michaelis: protocol, literature search, 'Risk of bias' assessment of studies, contacting authors for missing data, data analysis, interpretation and presentation of results.
Venus Tang: protocol, literature search, 'Risk of bias' assessment of studies, contacting authors for missing data, data analysis, interpretation and presentation of results.
Sarah Nevitt: data analysis, interpretation and presentation of results.
Janelle Wagner: review and modification of protocol, critical review of treatment methods, contacting authors for missing data, interpretation and discussion of results.
Avani Modi: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
W. Curt LaFrance Jr: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
Laura Goldstein: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
Milena Gandy: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
Rebecca Bresnahan: critical review of manuscript, esp. compliance of interpretation, discussion and presentation of results with Cochrane standards.
Kette Valente: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
Kirsten A Donald: review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.
Markus Reuber: eligibility and 'Risk of bias' assessment of Tang 2015, review and modification of protocol, critical review of treatment methods, interpretation and discussion of results.

DECLARATIONS OF INTEREST

RM: Dr Michaelis receives funding from the internal grant program (project IFF 2020-28) of the Faculty of Health at Witten/Herdecke University, Germany. Dr. Michaelis received a travel stipend from the ILAE to attend the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had a one-day meeting also related to the discussion of this update.

VT: Dr Tang is the author of one of the primary studies included within this review. However, she does not receive any financial benefits from this treatment program. Moreover, she was not responsible for the extraction of data of her study for this review. She received travel stipends from the ILAE to attend the 31st International Epilepsy Congress in Istanbul Turkey (September 2015) and the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had one-day meetings each related to the study.

SN: none known.

JW: Dr Wagner received travel stipends from the ILAE to attend the 31st International Epilepsy Congress in Istanbul Turkey (September 2015) and the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had one-day meetings each related to the study.

AM: Dr Modi received research funding from NIH and was a consultant to Fish and Richardson regarding adherence to medications in adults with multiple sclerosis. She received travel stipends from the ILAE to attend the 31st International Epilepsy Congress in Istanbul Turkey (September 2015) and the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had one-day meetings each related to the study.

WCL: Prof LaFrance works on this Cochrane project that addressed evidence-based interventions for epilepsy reviewed by the ILAE committee. He received travel stipends from the ILAE to attend the 31st International Epilepsy Congress in Istanbul Turkey (September 2015) and the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had one-day meetings each related to the study. Prof LaFrance receives author royalties for the seizure treatment book *Taking Control of Your Seizures: Workbook*, Oxford University Press, 2015. He studies evidence-based non-pharmacological interventions for people with seizures that are ethics committee-approved and peer-reviewed to address any potential bias.

LG: Prof Goldstein is co-author of one of the primary studies included within this review. However, she does not receive any financial benefits from this treatment program. Moreover, she was not responsible for the extraction of data for this review. She has received honoraria for speaking, and educational activities not funded by industry; she receives royalties from the publication of *Clinical Neuropsychology* (Wiley, 2004, 2013) and *The Clinical Psychologist's Handbook of Epilepsy* Cull 1997. This work represents independent research part-funded by the NIHR Maudsley Biomedical Research Centre (BRC) at South London and Maudsley NHS Foundation Trust and the Institute of Psychiatry, Psychology and Neuroscience, King's College London. The views expressed are those of the author, and not necessarily those of the NHS, the NIHR or the Department of Health.

MG: Dr Gandy is the author of one of the primary studies included within this review. However, she does not receive any financial benefits from this treatment program. Moreover, she was not responsible for the extraction of data for this review. Dr Gandy received a travel stipend from the ILAE to attend the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had a one-day meeting also related to the discussion of this update.

RB: none known.

KV: none known.

KD: none known.

MR: Prof Reuber is responsible for developing and supervising a team of psychotherapists working in a clinical neurology department and provides treatment to people with epilepsy. He therefore has an interest in demonstrating the effectiveness of psychotherapy. However, this potential bias is outweighed by his interest in the development of evidence-based treatments, encouraging him to assess the existing evidence as objectively and impartially as possible. He received a travel stipend from the ILAE to attend the 33rd International Epilepsy Congress in Bangkok Thailand (June 2019), during which the Task Force had a one-day meeting also related to the discussion of this update.

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- National Institute for Health Research, UK

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- International League Against Epilepsy, Other

  Support for meetings of the Psychobehavioral Treatments for Epilepsy Task Force
- Mahle foundation, Germany

  For supporting the fellowship and fellowship-related travels of Rosa Michaelis
- Integrated Curriculum Anthroposophical Medicine (ICURAM), Germany

  For supporting the fellowship and fellowship-related travels of Rosa Michaelis

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We further clarified the assessment of attrition bias. During the process of assessing attrition bias, we used a cut-off value of ≥ 15% attrition for short-term interventions (< 6 months) and a cut-off value of ≥ 20% attrition for long-term interventions (≥ 6 months).

We amended the section on assessment of heterogeneity. Since we considered many diverse treatment types with expected differences in the designs and included populations for this review, and some level of heterogeneity was to be expected, we assumed Chi^2 results with $P < 0.01$, and I^2 over 70% as cut-offs for a degree of heterogeneity of concern.

We amended the section on assessment of reporting bias. Rather than only comparing the reported outcomes with the outcome measures and points of measurements stated in the study methods to assess reporting bias within the publication, we also assessed reporting biases by comparing the reported outcomes with the original study protocol or comparable documents. We added that funnel plots would be examined where 10 or more studies were included in analyses of total QoL scores.

We amended the section on assessment of reporting bias by including the assessment of treatment infidelity, treatment competence (i.e. the training background of the professionals who delivered the treatment, and the quality of treatment delivery), and selective recruitment.

We amended the search strategy by limiting our search to publications in English. We were asked for this amendment by the British National Guideline Centre whose review methodology differs from Cochrane. We complied with their request because we support the consideration of these review results by national epilepsy guidelines.

We amended our categorization of psychological interventions. While our previous categorization included five categories (psychological interventions, self-management interventions, adherence interventions, educational interventions, mixed interventions), we have now included all psychological interventions that are not only educational in a new category called 'skills-based psychological interventions'.

Discussions within the International League Against Epilepsy Psychology Task Force and within the broader psychotherapy research community concluded that it is reasonable and pragmatic to emphasize the commonalities between these psychological interventions rather than overestimating their differences.

INDEX TERMS

Medical Subject Headings (MeSH)

Bias; Energy Metabolism; Epilepsy [*psychology] [*therapy]; Fatigue [therapy]; Psychotherapy; Quality of Life; Randomized Controlled Trials as Topic

MeSH check words

Adolescent; Adult; Child; Humans; Young Adult