Core Health Outcomes in Childhood Epilepsy (CHOICE): Development of a core outcome set using systematic review methods and a Delphi survey consensus

Holly Crudgington[1], Morwenna Rogers[2], Lucy Bray[3], Bernie Carter[3], Janet Currier[4], Colin Dunkley[5], Frances M Gibbon[6], Dyfrig Hughes[7], Samantha Lyle[1], Deborah Roberts[4], Catrin Tudur Smith[8], Paul Gringras[1,9], Deb K Pal[1, 9, 10, 11], Christopher Morris[2]

[1] King's College London, Basic and Clinical Neuroscience Department, Institute of Psychiatry, Psychology and Neuroscience, UK

[2] College of Medicine and Health, University of Exeter, UK

[3] Edge Hill University, Faculty of Health and Social Care, UK

[4] Lay co-investigator & epilepsy services user, UK

[5] Sherwood Forest Hospitals NHS Foundation Trust, UK

[6] Noah's Ark Children's Hospital for Wales, Cardiff and Vale University Health Board, UK

[7] Centre for Health Economics and Medicines Evaluation, Bangor University, UK

[8] Department of Biostatistics, University of Liverpool, Liverpool, UK

[9] Evelina London Children's Hospital, UK

[10] MRC Centre for Neurodevelopmental Disorders, King's College London, UK

[11] King's College Hospital, London, UK

Correspondence to:

Christopher Morris

Associate Professor in Child Health Research,

University of Exeter, UK

South Cloisters,

St Luke's Campus,

Exeter, EX1 2LU

Email: Christopher.morris@exeter.ac.uk

Phone: 01392 262980

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Summary

Objective: Establishing a core set of outcomes to be evaluated and reported in intervention trials aims to improve the usefulness of health research. There is no established core outcome set (COS) for childhood epilepsies. The aim of this study was to select a COS to be used in evaluative research of interventions for children with rolandic epilepsy (RE).

Methods: We followed guidance from the COMET (Core Outcome Measures in Effectiveness Trials) Initiative. First, we identified outcomes that had been measured in research through a systematic review. Second**,** young people with RE, parents and professionals were invited to take part in a Delphi survey in which participants rated the importance of candidate outcomes. Last, a face-to-face meeting was convened to seek consensus on which outcomes were critical to include and to ratify the final COS.

Results: From 37 eligible papers in the review we identified and included 48 candidate outcomes in the survey. We sent invitations to 165 people registered to take part in the survey; of these 102 (62%) completed Round 1, and 80 (78%) completed Round 2 (three young people, 16 parents, 61 professionals). In Round 2 we included four additional outcomes suggested by participants in Round 1. The consensus meeting included two young people, four parents and nine professionals who were eligible to vote and ratified the COS as 39 outcomes across 10 domains.

Significance: Our methodology was a proportionate and pragmatic approach towards producing a COS for evaluating research of interventions aiming to improve the health of children with RE.

Key words: Epilepsy; children; young people; paediatric; core outcome set.

Key point box

- There was no established core outcome set for childhood epilepsy.
- Consensus based methods were used to rate the importance of different outcomes in rolandic epilepsy (RE). This included two-rounds of a Delphi survey and a face-to-face meeting that included young people with RE, parents and various professionals.
- We identified 39 outcomes across 10 domains that contributed towards a core outcome set for use in epilepsy research.

Introduction

Epilepsy is a common neurological disorder that can be defined by a persisting tendency for epileptic seizures. Epilepsy encompasses many different conditions including around 30 different epilepsy syndromes and affects people of all ages, including children [1]. Seizure reduction, freedom from seizures, or a significant reduction in duration and intensity of seizures are typical primary outcomes in trials evaluating interventions for epilepsy. However, it is important to consider the adverse effects of antiepileptic medication as well as non-seizure outcomes, particularly in developing children.

The social and psychological consequences of seizures and children's perspectives are becoming more valued, and health-related quality of life (HRQoL) is an increasing focus for research [2]. It is important to consider that epilepsy-specific quality of life is not determined by seizures alone but can also be influenced by the child's learning, mental health and social support [3,4]. To overcome these issues, it is crucial to decide a core set of outcomes that are of greater importance to children and their families.

The variety of outcomes assessed in research and the different ways outcomes are measured can reduce the ability to combine and compare studies [5]. Recognising a core set of outcomes to be measured and reported in all trials of interventions for specific conditions aims to advance the usefulness of research and avoid waste [6–8]. A core outcome set (COS) that recommends the same suite of outcomes measured in the same way reduces both heterogeneity between studies and outcome reporting bias. It can also increase the potential for carrying out meta-analysis for important outcomes. The development of a COS should include the views of patients, carers and health professionals [7]. A COS may also be useful for other types of research, clinical audit, and structuring routinely collected health services clinical data. A COS specifies which aspects of health are to be assessed and how to measure them.

Currently there is no COS for evaluative research of interventions in children with epilepsy. The Core Outcome Measures in Effectiveness Trials (COMET) Initiative database recently added a study focused on West Syndrome [9] and a study conducted in Sri Lanka on the development of outcome criteria to measure effectiveness of anti-epileptic medication [10]. The National Institute for Health Care and Excellence (NICE) guidelines recommend seizure freedom as a primary outcome alongside seizure reduction, quality of life and cognitive functioning as secondary outcomes [11]. Cochrane reviewers advise focusing on longer-term outcomes such as psychosocial and health economic outcomes [12]. Scottish guidance recommends including aspects of academic attainment and mental health outcomes [13] and

the International League Against Epilepsy (ILAE) has published guidance on outcome measurement for clinical trials [14,15]. Children are included in the Common Data Elements recommended for epilepsy research by the National Institute of Neurological Disorders and Stroke (NINDS) [16]. The NINDS recommend a comprehensive list of items across various domains but children and parents were not consulted in the process [16].

The aim of this study was to develop a COS relevant to evaluative research of interventions for children with rolandic epilepsy (RE), as an exemplar of common childhood epilepsy syndromes. RE is also known as 'childhood epilepsy with centrotemporal spikes' in the revised ILAE Classification [1]. RE is the most common childhood epilepsy affecting 17-25% of children with epilepsy in the 5-14 year age range [17–19]. The syndrome is associated with specific neuropsychological impairments such as in speech and language, literacy, attention as well as motor coordination deficits but is not associated with autism spectrum disorder or intellectual disability [20–22]. Our study focused on children of school age (5 to 16 years old) with RE and our protocol is published [23]. Specifically, our objectives were to review published research to identify outcomes reported in research and to seek consensus on which outcomes were perceived to be most important to measure in research. The work was conducted in partnership with families, health professionals and epilepsy charities in the UK.

Our work is motivated by the necessity to change the agenda from a seizure-centred medical model towards broader child and family priorities and to focus scarce resources on the most important outcomes [24]. Our primary aim was to propose a COS for evaluative trials, but the findings may also inform decisions on outcomes measured in audits and/or routinely collected services data. The scope of this study included outcomes of any medical or social intervention where the aim was to improve the health of children with epilepsy and was not limited to medication. This study is part of a programme of work aiming to improve broad HRQoL for children with epilepsy. The COS will inform decisions about outcomes to be measured in a future clinical trial evaluating interventions for RE scheduled to begin recruitment in 2019.

Methods

Ethics and registration

The study was conducted in line with COMET methodological recommendations, [25] with a published protocol [23] and was registered on the COMET database (www.comet-initiative.org/studies/details/1030). Our study was approved by the NHS Health Research Authority (North East – Newcastle & North Tyneside 1 Research Ethics Committee: reference 18/NE/0014). Participants registered for the Delphi survey through our website (www.castlestudy.org.uk). Taking part in the Delphi was regarded as implicit consent. Young people took part in the Delphi if their parents agreed and provided them with the online Delphi link. Written consent was gathered at the face-to-face consensus meeting for

parents, young people and professionals. The study is reported in line with the Core Outcome Set - Standards for Reporting (COS-STAR) guidance [26], the GRIPP2 short form for Patient and Public Involvement (PPI) [27] and the review is reported with reference to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [28].

To develop the COS we undertook three steps: (1) identifying candidate outcomes; (2) rating the importance of candidate outcomes in a 2-round Delphi survey; and (3) a face-to-face consensus meeting to ratify results of the Delphi survey and agree core outcomes. We convened an advisory Panel (AP) of young people with epilepsy and their carers alongside to consult on various decisions throughout each step.

Step 1. Identifying candidate outcomes

We identified candidate outcomes via structured, systematic review methods described in our protocol [23]. Briefly, we looked for 1) primary evaluations and systematic reviews of interventions for RE; 2) qualitative or mixed methods studies about experiences and preferences for outcomes; and 3) epilepsy-specific and generic patient-reported outcome measures used with children with epilepsy. We searched for systematic reviews using terms for rolandic or childhood epilepsy in the Cochrane Database of Systematic Reviews, MEDLINE (via OvidSp), Embase (via OvidSp), PsycINFO (via OvidSp) and CINAHL (via EBSCOhost). We searched for controlled trials via the CENTRAL database and checked previously found systematic reviews for additional relevant trials. We also searched the

World Health Organisation International Clinical Trials Registry Platform for ongoing trials. Finally, we searched for qualitative or mixed methods research on MEDLINE, CINAHL and PsycINFO using terms for epilepsy combined with terms for qualitative research, experience and health related quality of life terms. The electronic search was carried out in October 2017 by MR (Supplementary materials S1). HC reviewed and screened the abstracts and selected references. Decisions on eligibility where there was uncertainty were made in consultation with two other reviewers (CM and DP). As outlined in our protocol[23] two people did not screen the references independently as the additional resources were not justified by the risk of missing outcome domains as we expected considerable duplication. HC coded outcomes extracted from the papers in consultation with CM using the COMET taxonomy;[29] any doubts about coding were resolved in consultation with the wider team. HC extracted and entered information from the papers into spreadsheets including; population, outcomes, measurement instruments and any other salient information and then summarised in the table (Supplementary materials S2). We did not assess risk of bias for included studies as this was not relevant to the aim of this study.

Step 2. Rating the importance of outcome domains in a 2-round Delphi survey

The outcome domains identified in step 1 were taken forward for importance rating in a Delphi survey. We conducted the online Delphi survey over two rounds (R1 and R2) using DelphiManager software [30]. Our protocol proposed three rounds but we shortened this to two rounds to reduce potential attrition and mitigate time constraints. We recruited participants from three key stakeholder groups: young people with RE aged 7-16 years,

parents of children with RE and professionals working with this group of children (paediatricians, paediatric neurologists, epilepsy specialist nurses etc). We recruited participants through various platforms including epilepsy charities, professional societies, and regional networks via OPEN UK (Organisation of Paediatric Epilepsy Networks). We posted advertisements on social media platforms (e.g. Facebook and Twitter). Four NHS hospitals were set up as Participant Identification Centres (PIC) to enable clinicians to recruit patients, parents and colleagues. We directed interested participants to the study website where they could register using an online form.

Participants were asked to rate the importance of each outcome in the Delphi survey using a scale from 1-9 in which options 1-3 were labelled 'less important', options 4-6 were 'important but not critical', and options 7-9 indicated 'critical for inclusion' in the COS. Participants were able to suggest additional outcomes in R1, which were considered by the core team members for inclusion in R2 (Supplementary materials 4). We considered if the suggested outcomes were in fact different from the concepts already covered in the existing Delphi and whether they had been suggested by more than one person. In R2, participants were shown the distribution of other stakeholders' scores from R1 in histograms as well as their own R1 score. They were asked to use this information to reflect on their score and rate the outcome again. Participants were able to give reasons for changing their score and leave free text comments.

We sent the Delphi survey link to people who registered interest online with a valid email address. R1 and R2 were open for two weeks each with a one-week interval in between. After R2 closed we downloaded the participant data and converted them into the percentage of stakeholders scoring from 1-9 across all outcomes. Our pre-defined consensus criteria were: (i) most important 'core' outcomes agreed by most stakeholders (>70% in each stakeholder group rated 7-9), (ii) less important outcomes (>70% in each stakeholder group rated 1-3) and (iii) those where there was partial or no agreement.

Step 3: Consensus meeting

Results from R2 of the online Delphi (Table 3) were shown at a face-to-face half-day meeting in London. We sent invitations to participants who had completed both R1 and R2 of the Delphi. We encouraged parents to bring their children to the meeting if their child had also taken part in the Delphi. Travel costs were reimbursed on behalf of participants as well as a payment given to non-salaried individuals. All three stakeholder groups were represented in the meeting (Supplementary material S5). A member of the research team (CM) chaired the meeting and ground rules were agreed to ensure that all participants felt comfortable about speaking out in the group.

Outcomes that had met the *a priori* criteria of 'consensus in' from the Delphi were initially displayed - all participants agreed that no further discussion was needed about their inclusion in the COS. All the remaining 'no consensus' outcomes were displayed and discussed in the meeting. We gave participants red and green cards to vote with. Holding

up a red card meant that the outcome was not important enough to include in the COS. Holding up a green card meant that the participant thought it critical that the outcome be included. The chair ensured that contrasting views about voting were discussed and that equal opportunity was given to participants to discuss their voting decisions. Outcomes meeting the criteria for 'consensus in' during the meeting were incorporated into the COS. The final COS was presented and ratified to the group via email after the meeting so that people could have further time to think on their decisions and confirm.

Patient and Public Involvement:

Two parents of children with epilepsy were co-applicants when we sought funding for the programme of research within this nested study and are coinvestigators. A Family Engagement Officer (FEO) convened an AP in the south of England to involve young people and parents as meaningful partners in the development and implementation of our research. The FEOs recruited young people with epilepsy and their parents through various UK charities (Young Epilepsy, Epilepsy Action, Epilepsy Research UK), clinical networks (including consultant clinics and epilepsy specialist nurses), word-of-mouth, online parent forums and social media groups. We consulted AP members through face-to-face meetings and also remotely using email and phone. The AP members were involved in reviewing the CHOICE documents sent to the ethics committee and the Delphi survey. Members of the AP were asked to consider ease of the instructions and use of the survey.

AP members gave insight as to the ease of the Delphi survey and the relevance of outcomes. Modifications were made to the Delphi survey based on AP feedback and some wording for Delphi instructions were changed. Two parent lay co-applicants (DR, JC) were part of the consensus meeting alongside the south England FEO who helped to facilitate the contribution of parents and children in the meeting.

Results

Step 1: Identifying candidate outcomes

Thirty seven papers were included in the review (Figure 1); 181 outcomes were recorded verbatim. A provisional list of 177 outcomes (Supplementary material 2) was reviewed at a face-to-face meeting. There were a large number of outcomes that overlapped considerably so outcomes were coded using the COMET taxonomy [29] in to the following domains: Physiological nervous system outcomes, Physical functioning, Social functioning, Role functioning, Emotional functioning/wellbeing, Cognitive functioning, Global quality of life and Adverse events/effects. Similar outcomes were discussed and aggregated in the meeting which resulted in 48 overall outcomes for inclusion in R1 of the Delphi survey (Table 1). Each outcome was given a lay domain name and description for use in the survey. The descriptions were agreed upon with two parent lay co-applicants at the study meeting.

Step 2: Delphi survey

One hundred and sixty-five people registered interest through our study website. Of the 165 interested people, 102 participants took part in R1 (professionals n=76, 75%; parents n=23, 20%; young people n=3, 3%), and 80 from R1 completed R2 (professionals n=61, 76%; parents n=16, 20%; young people n=3, 4%) (Table 2). The majority of people who completed R2 were from London (professionals, 30%; parents and young people, 21%), with full demographics of participants available in supplementary material (S3). One professional withdrew from the study in R1 due to work commitments. Four people did not fully answer R1 questions and only the questions they answered were included in the analysis. Twenty-two people did not fully complete R2 questions despite logging in and only the questions they answered were analysed. R1 and R2 of the Delphi was open for two weeks, with a one-week gap in between the rounds to allow the histograms to be created and uploaded for R2. Forty-eight outcomes were rated in R1 (Table 1) and an additional 19 outcomes were suggested in R1, of which four were brought forward based on pre-defined decisions (Supplementary material S4). After the close of the Delphi survey, 11 outcomes met the *a priori* condition for 'consensus in' from R2. Delphi R1 and R2 scores are shown in Table 3. The attrition rate from R1 to R2 was 22% overall (33% of parents, 20% of professionals, 0% of Young people), displayed in Table 2.

Step 3: Consensus meeting

Nineteen people were present at the face-to-face consensus meeting and 15 were eligible to vote: two young people (aged 11 and 12), four parents, nine professionals (two paediatricians, two paediatric neurologists, two sleep consultants, one clinical psychologist,

one physiologist and one professor of children's nursing) with information about meeting members available in supplementary material (S5). Five of the voters had not taken part in the Delphi survey but were deemed eligible as they had sufficient knowledge of the CHOICE project. 28 outcomes were voted as critical for the COS from the 41 no-consensus outcomes. Overall, 39 outcomes were deemed critical for inclusion in the COS split in to ten domains: Seizures, Sleep, Global Quality of Life, Mental Health, Social functioning, Physical functioning, Cognition, Behaviour, Family life and Adverse Events. An overview of the final COS and its development process is shown in figure 2 and the results of the consensus meeting in Table 4.

Discussion

This study enabled young people with epilepsy, parents and health professionals from different backgrounds to come together and reach consensus on important outcomes to measure in evaluative research in RE. The 39 outcomes included in the COS were rated as 'critical' by more than 70% of people in all three stakeholder groups. Using Delphi methodology avoids potential over-influence of one type of stakeholder and captures different perspectives. Hence our COS represents the view shared by young people with epilepsy, parents and various health professionals working with children with epilepsy. Future research evaluating interventions for children with RE should use the CHOICE COS as a reference for selecting outcomes and consider its adaptability for other childhood epilepsies.

The CHOICE COS is the result of a transparent process that was inclusive of young people and parents, as well as professionals in the field of epilepsy. The 39 outcomes across 10 domains perhaps represent more of a 'comprehensive' rather than a 'core' outcome set (Figure 2). A COS is meant to be a *minimum* set of outcomes to report. Further work could consider reducing the number of outcomes by ranking which outcomes are of most importance, relevant to each other. We did not have enough time during our face-to-face meeting to undertake a ranking task. The COMET handbook [25] identifies examples of where ranking has been used [31–33] as well as a recent study from the COMET database conducted in Sri Lanka that used a ranking method.[10]

Our COS captured commonly reported items such as 'seizure frequency' consistent with existing guidelines[11–16]. However, in contrast, our COS highlights non-seizure related outcomes such as 'school attendance' (attending school and engaging in school curriculum) and 'feelings about epilepsy' (emotions or reactions to having epilepsy such as embarrassment or stigma) agreed as critical for inclusion in the COS. All COS outcomes and their definitions are in Table 1. Outcomes such as 'pain' were not deemed as important for an epilepsy COS across the stakeholder groups. This might be a reflection on the relevance of that outcome for this specific type of epilepsy [21,34]. In the consensus meeting, the young people involved were vocal and fairly represented, and their views were often persuasive on other participants. The inclusion of more child-centred outcomes suggests that the seizure-centred view is not the only important outcome for HRQoL in young people with RE.

Pragmatically, to inform our trial we are identifying and assessing epilepsy-specific health related quality of life measures.

The COMET database included a study conducted in Sri Lanka that has developed outcome criteria to measure effectiveness of antiepileptic therapy in children, which included young people with epilepsy as one of the stakeholder groups [10]. The study was published whilst we were in the process of conducting our study. Their study recruited 15 young people with epilepsy, and the outcomes that reached consensus were very similar to ours, which adds assurance that our COS captures outcomes important to young people with epilepsy across different settings. For example, their work included outcomes such as frequency of seizures, severity of seizures, seizure freedom, cognitive function, activities that children like to do, school attendance, behaviour and quality of life, which map well on to the COS we propose. Interestingly, they ranked their outcomes with frequency of seizures being most important, followed by quality of life which might suggest that seizures affect QoL [10].

Major strengths of the CHOICE study include a prior defined protocol [23], following COMET initiative methodology and using the standardised COMET taxonomy [29]. The DelphiManager software ensured that the views of all three stakeholder groups were given equal representation despite varying numbers of participants in each group. The DelphiManager survey method ensures fair representation as analysis is assessed within stakeholder group before comparing across stakeholder group. This is the same method we used in the

consensus meeting, as we used proportions of stakeholder type to balance representation and compared within stakeholder group before comparing across. We included the views of young people with RE, their parents and professionals in the Delphi, and we convened APs alongside to ensure Patient Public Involvement (PPI) input at both the development and implementation stage of the COS.

A potential limitation of our study is that we conducted a proportionate rather than a comprehensive systematic review. Systematic reviews are time consuming and for the purposes of COS development they may not generate additional outcomes for conditions that are common [25]. We did use various databases for the review and included a wide range of studies; [23] we also provided opportunities for AP and survey participants to suggest any outcome domains not identified in the review. It is evident from the review results that such a large number of varied outcomes have been used in epilepsy research which demonstrates the important challenge of developing an agreed-upon COS. We encountered difficulties in recruiting RE patients to the CHOICE Delphi study, particularly that the term 'rolandic' was unfamiliar to many families. Our participant information sheets and adverts used rolandic as well as the ILAE term 'childhood epilepsy with centrotemporal spikes'.

The CHOICE study is a work package within a larger programme of work called "Changing Agendas on Sleep Treatment and Learning" (CASTLE, http://castlestudy.org.uk) and decisions were made to reduce to two rounds rather than three in the Delphi survey to

deliver the COS in time to inform design of the clinical trial. The impact of this meant that participant burden was lessened and perhaps is a reason we had little attrition between the two rounds. However, a three round Delphi would have possibly meant a larger sample of people may have reached consensus on more items.

The number of participants in our survey, particularly young people, was low in spite of our varied approach to recruitment. However, the three young people who took part in R1 of the survey also took part in R2. Attrition rates overall were good for the survey, with 78% of those that took part in R1 taking part in R2. This was in spite of the survey only being open for two weeks for each round. However, even with multiple e-mail reminders, some telephone calls were needed to improve the response rate. Clinical work load and school term time, as well as the short window that the rounds were open for, are likely to have contributed to the time it took for participants to respond. The number of people in each stakeholder group that were able to attend the consensus meeting after participating in the online Delphi was lower than expected based on the number invited. The meeting was held on a week day during school time, and parents and health professionals may have had different preferences for the timing of the meeting - specific needs such as clinic times for professionals and child care needs should be taken in to consideration for future studies.

The analysis of the Delphi results grouped professionals into one stakeholder group. We decided to group professionals due to small numbers in some professions. However, the

varying roles of stakeholders may have had some influence on the level of engagement with a COS of children with RE. For example, the majority of professionals were epilepsy specialist nurses, paediatric neurologists and paediatricians and the smaller numbers were seen in lecturers and NHS managers. Voting in the consensus meeting was not conducted anonymously because we wanted to seek consensus by having active discussion about shared or differing opinions and for participants to consider how other stakeholders voted.

The CHOICE COS focused principally on RE as an exemplar of childhood epilepsy. Focusing on RE avoided preferences for outcomes that might be affected by including children who have associated conditions such as autism or cerebral palsy. However, we consider the CHOICE COS could potentially be generalised across other childhood epilepsies. Future work could consider the extent to which any variations might be necessary to validate the COS in other childhood epilepsy syndromes. The scope of our work was primarily UK based but the COS may have broader international relevance. In order to promote uptake of the suggested COS internationally, an international consensus would be needed.

Having decided which outcomes to measure, the next step in the COS process is to decide how best to measure each of these outcomes and how to define them using published guidance [35]. The time burden for research participants will need consideration for the comprehensive outcome list we currently propose. Whilst further work is necessary to reduce the COS and define the outcomes further, our next step will be to identify and assess

the measurement properties of epilepsy specific health related quality of life measures to inform the CASTLE trial and assess whether the outcomes we propose are measured by these instruments. We will consult guidelines on the selection of outcome measurement instruments for a COS developer by Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) [35].

Conclusions

We recommend that future evaluative research in RE considers utilising the CHOICE COS as a framework for selecting outcomes for evaluative research**.** The CHOICE COS is a fair representation of the views of young people with RE, their parents and professionals views and has used established methodology [25]. Further work to reduce the COS to a smaller number of outcomes by ranking will make the COS more manageable. However, we propose that our work towards a COS helps advance research in childhood epilepsies. We hope that the utilisation of outcomes suggested by this COS as a framework in future studies will reduce reporting bias and allow for evidence to be synthesised across different studies.

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Ethics

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

Conflicts of interest

The authors declare that they have no competing interests.

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References

1. Berg AT, Berkovic SF, Brodie MJ, et al. Revised terminology and concepts for organization of seizures and epilepsies: report of the ILAE Commission on Classification and Terminology, 2005–2009. Epilepsia. 2010; 51:676–85.

2. Ronen GM, Streiner DL, Rosenbaum P, et al. Health-related quality of life in children with epilepsy: development and validation of self-report and parent proxy measures. Epilepsia [Internet]. 2003; 44:598–612.

3. Fayed N, Davis AM, Streiner DL, et al. Children's perspective of quality of life in epilepsy. Neurology [Internet]. 2015; 84:1830 LP-1837. Available from: http://n.neurology.org/content/84/18/1830.abstract

4. Ronen GM, Streiner DL, Boyle MH, et al. Outcomes trajectories in children with epilepsy: Hypotheses and methodology of a canadian longitudinal observational study. Pediatr Neurol [Internet]. 2014; 50:38–48.

5. Heneghan C, Goldacre B, Mahtani KR. Why clinical trial outcomes fail to translate into benefits for patients. Trials. 2017; 18:122.

6. Gargon E, Williamson PR, Altman DG, et al. The COMET Initiative database: Progress and activities update (2015). Trials. 2017; 18.

7. Williamson PR, Altman DG, Blazeby JM, et al. Developing core outcome sets for clinical trials : issue: to consider. Trials. 2012; 13:1–8.

8. Clarke M. Standardising outcomes for clinical trials and systematic reviews. Trials.

2007; 8:1–3.

9. Lux AL, Osborne JP. A proposal for case definitions and outcome measures in studies of infantile spasms and West syndrome: consensus statement of the West Delphi group. Epilepsia. 2004; 45:1416–28.

10. Murugupillai R, Ranganathan SS, Wanigasinghe J, et al. Development of outcome criteria to measure effectiveness of antiepileptic therapy in children. Epilepsy Behav [Internet]. 2018; 80:56–60.

11. National Institute for Health and Care Excellence. Epilepsies: diagnosis and management. Clin Guidel [CG137] [Internet]. (Last accessed 16 Oct 2018).

12. Tan HJ, Singh J, Gupta R, et al. Comparison of antiepileptic drugs, no treatment, or placebo for children with benign epilepsy with centro temporal spikes. Cochrane Database Syst Rev. 2014; 9:Cd006779.

13. Scottish Intercollegiate Guidelines Network. Diagnosis and Management of Epilepsies in Children and Young People, Scottish National Clinical Guideline. 2005. Withdrawn 2015. http://epilepsyscotland.org.uk/pdf/sign81.pdf. Last Accessed 16 Oct 2018)

14. Chadwick D, Beghi E, Callaghan N, et al. Considerations on designing clinical trials to evaluate the place of new antiepileptic drugs in the treatment of newly diagnosed and chronic patients with epilepsy. Epilepsia. 1998; 39:799–803.

15. Levy RH, Gram L, Johannessen SI, et al. Guidelines for clinical evaluation of antiepileptic drugs. Epilepsia. 1989; 30:400–8.

16. Loring DW, Lowenstein DH, Barbaro NM, et al. Common data elements in epilepsy research: development and implementation of the NINDS epilepsy CDE project. Epilepsia. 2011; 52:1186–91.

17. Cavazzuti GB. Epidemiology of different types of epilepsy in school age children of Modena, Italy. Epilepsia. 1980; 21:57–62.

18. Sidenvall R, Forsgren L, K:son BH, et al. A community-based prospective incidence study of epileptic seizures in children. Acta Paediatr [Internet]. 2008; 82:60–5.

19. Shinnar S, O'Dell C, Berg AT. Distribution of epilepsy syndromes in a cohort of children prospectively monitored from the time of their first unprovoked seizure. Epilepsia. 1999; 40:1378–83.

20. Kavros PM, Clarke T, Strug LJ, et al. Attention impairment in rolandic epilepsy: Systematic review. Epilepsia. 2008; 49:1570–80.

21. Smith AB, Bajomo O, Pal DK. A meta-analysis of literacy and language in children with rolandic epilepsy. Dev Med Child Neurol. 2015; 57:1019–26.

22. Vega YH, Smith A, Cockerill H, et al. Risk factors for reading disability in families with rolandic epilepsy. Epilepsy Behav [Internet]. 2015; 53:174–9.

23. Morris C, Dunkley C, Gibbon FM, et al. Core Health Outcomes In Childhood Epilepsy (CHOICE): Protocol for the selection of a core outcome set. Trials. 2017; 18:1–8.

24. Ronen GM, Streiner DL, Rosenbaum P. Health-related quality of life in childhood epilepsy: Moving beyond'seizure control with minimal adverse effects'. Health Qual

Life Outcomes. 2003; 1:36.

25. Williamson PR, Altman DG, Bagley H, et al. The COMET Handbook: Version 1.0. Trials. 2017; 18(Suppl 3):1–50.

26. Kirkham JJ, Gorst S, Altman DG, et al. Core Outcome Set–STAndards for Reporting: The COS-STAR Statement. PLoS Med. 2016; 13:1–11.

27. Staniszewska S, Brett J, Simera I, et al. GRIPP2 reporting checklists: tools to improve reporting of patient and public involvement in research. Res Involv Engagem. 2017; 3:13.

28. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. Int J Surg. 2010; 8:336–41.

29. Dodd S, Clarke M, Becker L, et al. A taxonomy has been developed for outcomes in medical research to help improve knowledge discovery. J Clin Epidemiol [Internet]. 2018; 96:84–92.

30. Crew R. DelphiManager brochure. 2015; :1–16.

31. Ruperto N, Ravelli A, Murray KJ, et al. Preliminary core sets of measures for disease activity and damage assessment in juvenile systemic lupus erythematosus and juvenile dermatomyositis. 2003; (April):1452–9.

32. Holmes CA, Hons BA, Mphil T. Nominal group technique: An effective method for obtaining group consensus. 2012; :188–94.

33. Jn AV, Measuring MLK. Measuring What Matters in Cerebral Palsy : A Breadth of

Important Domains and Outcome Measures. YAPMR [Internet]. 2009; 90:2089–95.

34. Martin B, Sameer Z, Fisher R, et al. The 2017 ILAE classification of seizure types and the epilepsies: what do people with epilepsy and their caregivers need to know. Epileptic Disord. 2018; 20:77–8.

35. Prinsen CAC, Vohra S, Rose MR, et al. How to select outcome measurement instruments for outcomes included in a “Core Outcome Set” - a practical guideline. Trials [Internet]. 2016; 17:1–10.

Figure 1. PRISMA flow chart of literature review

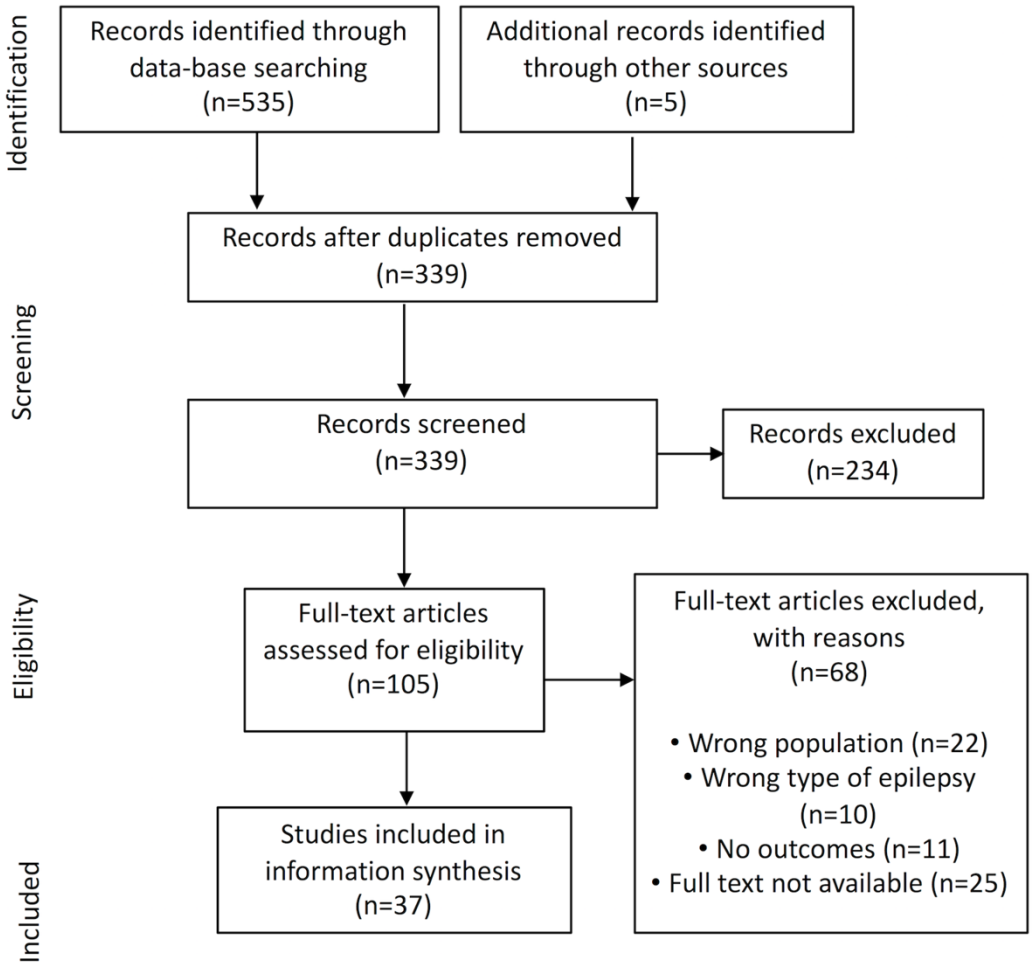

Figure 2. Overview of COS development and final COS

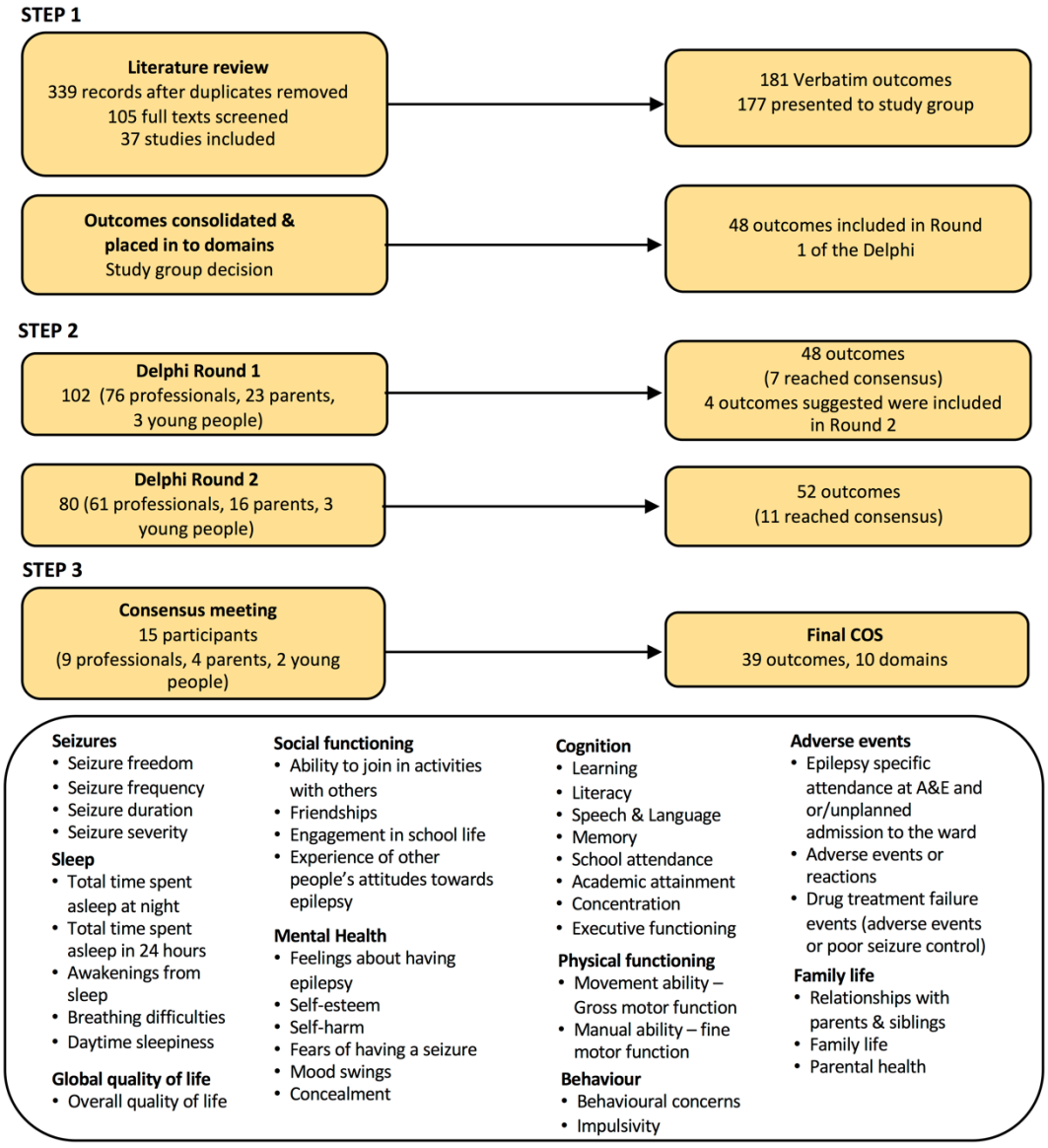

Table 1. Outcomes used in R1 & R2 of the Delphi survey

Outcome ID & name in Delphi	Description	Domain name
1. Seizure freedom	Not having seizures	Seizures
2. Seizure frequency	How often seizures occur	Seizures
3. Seizure duration	How long a seizure lasts	Seizures
4. Seizure severity	How bad seizures are in terms of effects on the person during and after seizures - such as falls or injuries, incontinence, confusion, and time to recover afterwards	Seizures
5. Time to fall asleep	Time it takes to fall asleep from snuggling down	Sleep
6. Time spent asleep	Total time spent asleep each day	Sleep
7. Awakenings	Waking in the night that parents/carers are aware of	Sleep
8. Breathing difficulties during sleep	Might include snoring or gasping for breath	Sleep
9. Daytime sleepiness	Feeling sleepy or actually sleeping during the day	Sleep
10. Fatigue	Lacking in energy	Physical functioning
11. Pain	Unpleasant physical sensation	Physical functioning
12. Coordination & balance	Using parts of the body together and efficiently, such as to ride a bike, or stand on one leg, catching and throwing	Physical functioning
13. Movement ability	Walking, running, jumping, hopping	Physical functioning
14. Manual ability	Dexterity in handling objects, handwriting	Physical functioning

Outcome ID & name in Delphi	Description	Domain name
15. Self-care	Daily routines such as eating, washing & dressing, toileting	Usual activities
16. Ability to join in activities with others	Joining in with people, such as playing out with friends, doing sports, joining in things	Social functioning
17. Ability to play on one's own	Reading, computer etc. imaginary play	Social functioning
18. Friendships	Forming and maintaining friendships	Social functioning
19. Engagement in school life	Feeling part of the school community	Social functioning
20. Social life	Engagement with friends and peers, such as going out, sleepovers, cinema	Social functioning
21. Experience of people's attitudes towards epilepsy	Bullying, social exclusion	Social functioning
22. Behaving appropriately	Being able to control emotions and respond to situations in context	Behaviour
23. Impulsivity	Acting without thinking	Behaviour
24. Fidgeting	Restless, being on the go, moving or squirming	Behaviour
25. Feeling normal	Feeling like other people of the same age	Mental health
26. Feelings about having epilepsy	Emotions or reactions to having epilepsy, such as embarrassment, shame, stigma	Mental health
27. Happiness	Feeling or showing pleasure or contentment	Mental health

Outcome ID & name in Delphi	Description	Domain name
28.Sadness	Feeling or showing sorrow or being unhappy	Mental health
29.Worried	Being anxious or troubled about actual or potential problems	Mental health
30.Annoyed	Being slightly angry or irritated	Mental health
31.Self-esteem	Overall feelings about yourself	Mental health
32.Mood swings	Quick unexplained changes of mood	Mental health
33.Self-harm	Thinking about hurting yourself on purpose or wishing you were dead	Mental health
34.Concealment	Not telling people about epilepsy	Mental health
35.Fears of having a seizure	Having a seizure in public, being injured during a seizure, dying during a seizure, what other people will do during a seizure	Mental health
36.Literacy	Reading, writing, spelling	Cognition
37.Speech & language	Making yourself understood and understanding when spoken to	Cognition
38.Memory	Short & long term	Cognition
39.Concentration	Focusing on something for the required period of time	Cognition
40.Learning	Gaining new skills & knowledge generally	Cognition
41.School attendance	Attending school and engaging in school curriculum	Cognition

Outcome ID & name in Delphi	Description	Domain name
42. Academic attainment	Reaching personal potential through studying and completing assigned tasks and projects, and advancing to next stages of education	Cognition
43. Executive functioning	The ability to plan and organise activities. Executive functions help you manage life tasks of all types. For example, executive functions let you organize a trip, a research project, or a paper for school effectively	Cognition
44. Overall quality of life	How you feel your life is generally	Global quality of life
45. Adverse events	Any unintended effects of treatments, side effects	Adverse events
46. Relationships with parents & siblings	Getting along well with and feeling close to other members of family	Family functioning
47. Family life	Impact of epilepsy on family life such as parent work opportunities and/or leisure time	Family functioning
48. Parent health	Parent's physical and emotional wellbeing	Family functioning

Outcomes suggested and included in R2		
Outcome ID & name in Delphi	**Description**	**Domain name**
49. Unplanned epilepsy related admissions to hospital as an inpatient	Unexpectedly needing to be admitted to hospital	Adverse events

Outcome ID & name in Delphi	Description	Domain name
50. Unplanned hospital attendances at A&E	Visiting the hospital due to an acute medical emergency	Adverse events
51. Attendance for medical appointments in outpatients	Routine attendances for medical epilepsy management	Seizures
52. Drug treatment failure (adverse events or poor seizure control)	Stopping medication because it's not working or causing problems	Adverse events

Table 2. Response of R1 and R2 of the Delphi survey

Stakeholder group	Registered interest	Round 1, n(% who were eligible to take part)	Round 2, n(% who were eligible to take part)
Professionals total	120	76 (63%)	61 (80%)
Paediatricians	51	33 (65%)	26 (82%)
Paediatric Neurologists	16	14 (88%)	12 (86%)
Epilepsy nurses	22	15 (68%)	12 (87%)
Consultant in sleep medicine	6	3 (50%)	2 (67%)
Physiologists	5	4 (80%)	3 (75%)
Respiratory & Sleep Physiologists	11	3 (27%)	2 (67%)
Dietetics lecturer	1	1 (100%)	1 (100%)
NHS manager	2	2 (100%)	2 (100%)
Child and adolescent psychiatrist	1	1 (100%)	1 (100%)
CEO Children's charity	1	0	0
Child Health Lecturer	1	0	0
Clinical Psychologist	1	0	0
Neuropsychologist	2	0	0
Parents	40	23 (58%)	16 (67%)
Young People	5	3 (60%)	3 (100%)
Total	165	102 (62%)	80 (78%)
***1 professional withdrew** *** 4 people did not answer fully in R1** *** 22 people did not fully answer in R2**			

Table 3. R1 & R2 percentage of scores for '7-9' critical across all 3 stakeholder groups
Green highlight indicated >70% of participants rated '7-9' critical. Yellow highlight indicates >50% of participants rated as '7-9' critical.

Outcome	Round 1			Round 2		
	Professionals (n=76)	Parents (n=23)	Young people (n=3)	Professionals (n=61)	Parents (n=16)	Young people (n=3)
1. Seizure freedom						
	85%	83%	67%	94%	88%	67%
2. Seizure frequency						
	91%	91%	67%	95%	94%	100%
3. Seizure duration						
	63%	87%	67%	73%	94%	100%
4. Seizure severity						
	77%	87%	33%	89%	100%	33%
5. Time to fall asleep						
	35%	22%	0%	19%	35%	0%
6. Time spent asleep						
	55%	39%	0%	48%	71%	0%
7. Wakings from sleep						
	59%	39%	67%	55%	76%	67%
8. Breathing difficulties during sleep						
	54%	65%	67%	55%	75%	67%
9. Daytime sleepiness						
	65%	39%	67%	73%	47%	67%
10. Fatigue						
	55%	35%	33%	52%	53%	33%
11. Pain						
	37%	57%	0%	26%	56%	0%

Outcome	Round 1			Round 2		
	Professionals (n=76)	Parents (n=23)	Young people (n=3)	Professionals (n=61)	Parents (n=16)	Young people (n=3)
12. Coordination & balance						
	40%	52%	100%	41%	59%	100%
13. Movement ability						
	27%	30%	67%	26%	31%	67%
14. Manual ability						
	31%	35%	33%	26%	47%	33%
15. Self-care						
	42%	30%	33%	28%	41%	33%
16. Ability to join activities with others						
	59%	48%	67%	64%	59%	67%
17. Ability to play in one's own						
	45%	26%	67%	36%	35%	67%
18. Friendships						
	58%	52%	67%	62%	53%	67%
19. Engagement in school life						
	74%	57%	67%	75%	59%	67%
20. Social life						
	64%	52%	33%	67%	65%	33%
21 Experience of other people's attitudes towards epilepsy						
	49%	43%	67%	46%	50%	67%
22. Behaving appropriately						
	56%	61%	67%	57%	71%	67%
23. Impulsivity						
	42%	48%	67%	46%	65%	100%
24. Fidgeting						
	38%	43%	33%	38%	65%	33%

Outcome	Round 1			Round 2		
	Professionals (n=76)	Parents (n=23)	Young people (n=3)	Professionals (n=61)	Parents (n=16)	Young people (n=3)
25. Feeling normal						
	68%	61%	33%	79%	65%	33%
26. Feelings about having epilepsy						
	68%	74%	33%	70%	65%	33%
27. Happiness						
	67%	64%	100%	79%	65%	100%
28. Sadness						
	65%	61%	33%	66%	63%	33%
29. Worried						
	67%	57%	67%	67%	63%	67%
30. Annoyed						
	49%	52%	100%	46%	69%	100%
31. Self-esteem						
	69%	65%	67%	77%	69%	100%
32. Mood swings						
	60%	52%	67%	54%	69%	100%
33. Self-harm						
	68%	59%	50%	70%	75%	67%
34. Concealment						
	57%	52%	33%	49%	56%	33%
35. **Fears of having a seizure**						
	74%	74%	100%	84%	81%	100%
36. Literacy						
	57%	57%	67%	66%	81%	67%
37. Speech & language						
	66%	57%	33%	67%	69%	33%
38**. Memory**						
	72%	65%	67%	72%	81%	67%
39**. Concentration**						
	72%	65%	100%	79%	81%	100%

Outcome	Round 1			Round 2		
	Professionals (n=76)	Parents (n=23)	Young people (n=3)	Professionals (n=61)	Parents (n=16)	Young people (n=3)
40. **Learning**						
	79%	74%	100%	80%	94%	100%
41. School attendance						
	70%	48%	67%	77%	50%	67%
42. Academic attainment						
	63%	52%	67%	72%	69%	100%
43. Executive functioning						
	63%	48%	100%	67%	69%	100%
44. **Overall quality of life**						
	92%	74%	67%	93%	88%	67%
45. Adverse events or reactions						
	71%	78%	67%	72%	81%	67%
46. Relationships with parents & siblings						
	58%	48%	100%	61%	63%	100%
47. Family life						
	62%	48%	67%	64%	56%	67%
48. Parental health						
	51%	43%	67%	46%	50%	67%
49. Unplanned epilepsy-related admissions to hospital as inpatient*						
				70%	67%	67%
50. Unplanned hospital attendances at A&E*						
				70%	64%	33%
51. Attendance for medical appointments in outpatients*						
				33%	44%	0%
52. **Drug treatment failure (adverse events or poor seizure control)***						
				78%	87%	100%

Table 4. Summary of consensus meeting voting results

Outcomes have been categories based on the follow:

1. Item previously 'consensus in' and no discussion needed
2. Discussed and voted in
3. Discussed and agreed to combine with another outcome/word differently (or to be considered as part of the 'how' an outcome is measured)
4. Agreed to not discuss further or voted as 'not critical for the COS'

Outcome	Number of stakeholder groups (out of 3) achieving consensus prior to meeting	% of 15 meeting participants voting as critical for inclusion in COS	% of meeting participants voting as not critical	Category of meeting conclusion
Seizure freedom	3	100%	0%	1
Seizure frequency	3	100%	0%	1
Seizure duration	3	100%	0%	1
Seizure Severity	2	100%	0%	2
Time to fall asleep	0	0	100%	4
Time spent asleep in 24 hours	1	100%	0%	3
Time spent asleep each night	1	100%	0%	3
Awakenings from sleep	2	100%	0%	2
Breathing difficulties during sleep	2	93%	6%	2
Daytime sleepiness	2	93%	6%	2
Fatigue	0	0%	100%	4
Pain	0	0%	100%	4

Outcome	Number of stakeholder groups (out of 3) achieving consensus prior to meeting	% of 15 meeting participants voting as critical for inclusion in COS	% of meeting participants voting as not critical	Category of meeting conclusion
Movement ability – Gross Motor function	1	100%	0	3
Manual ability (fine motor function)	1	93%	6%	3
Self-care	0	0%	100%	4
Ability to join in activities with others	1	100%	0%	2
Ability to play on one's own	1	0%	100%	4
Friendships	1	93%	7%	2
Engagement in school life	2	100%	0%	2
Experience of other people's attitudes towards epilepsy	1	100%	0%	2
Behavioural concerns	2	100%	0%	3
Impulsivity	1	79%	21%	2
Fidgeting	0	0%	100%	4
Feelings about having epilepsy	2	100%	0%	3
Self-harm	3	100%	0%	1
Fears of having a seizure	3	100%	0%	1
Self-esteem	2	100%	0%	2
Mood swings	1	100%	0%	2
Concealment	0	100%	0%	2
Learning	3	100%	0%	1
Concentration	3	100%	0%	1
Literacy	2	100%	0%	2

Outcome	Number of stakeholder groups (out of 3) achieving consensus prior to meeting	% of 15 meeting participants voting as critical for inclusion in COS	% of meeting participants voting as not critical	Category of meeting conclusion
Memory	3	100%	0%	1
Speech & Language	0	93%	7%	2
School attendance	2	100%	0%	2
Academic attainment	2	100%	0%	2
Executive functioning	1	100%	0%	2
Relationships with parents & siblings	1	100%	0%	2
Family life	1	100%	0%	2
Parental health	1	100%	0%	2
Overall quality of life	3	100%	0%	1
Adverse events or reactions	3	100%	0%	1
Drug treatment failure events (adverse events or poor seizure control)	3	100%		1
Epilepsy specific attendance at A&E and or/unplanned admission to the ward	2	100%	0%	3

SUPPLEMENTARY 1: Systematic Review Search

SEARCH LOG 1

DATABASE	DATE	Number of hits
CDSR	28/9/17	56
DARE	28/9/17	10
CENTRAL	28/9/17	60
MEDLINE	28/9/17	15
EMBASE	28/9/17	28
PSYCINFO	28/9/17	5
CINAHL	28/9/17	4

TOTAL: 147
DUPLICATES REMOVED: 33
NUMBER FOR REVIEW: 114 (RCTs 56; potential SRs 58)

Search strategies

Cochrane Library databases

CENTRAL

Search Name: Epilepsy outcomes
Date Run: 28/09/17 09:37:42.862
Description:

ID	Search	Hits
#1	MeSH descriptor: [Epilepsy, Rolandic] explode all trees	14
#2	rolandic:ti,ab	40
#3	BCECTS:ti,ab	2
#4	"centro temporal spikes":ti,ab	3
#5	"centrotemporal spikes":ti,ab	24
#6	(child* near/3 epilep*):ti,ab	611
#7	#1 or #2 or #3 or #4 or #5	62

CDSR/DARE

Search Name: Epilepsy outcomes
Date Run: 28/09/17 09:37:42.862
Description:

ID	Search	Hits
#1	MeSH descriptor: [Epilepsy, Rolandic] explode all trees	14

#2 rolandic:ti,ab 40
#3 BCECTS:ti,ab 2
#4 "centro temporal spikes":ti,ab 3
#5 "centrotemporal spikes":ti,ab 24
#6 (child* near/3 epilep*):ti,ab 611
#7 #1 or #2 or #3 or #4 or #5 62
#8 #1 or #2 or #3 or #4 or #5 or #6 643

MEDLINE
Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>
Search Strategy:
---
1 Epilepsy, Rolandic/ (543)
2 rolandic.ti,ab. (1530)
3 BCECTS.ti,ab. (53)
4 centro temporal spikes.ti,ab. (119)
5 centrotemporal spikes.ti,ab. (384)
6 1 or 2 or 3 or 4 or 5 (1952)
7 systematic.ti. (99433)
8 (systematic* adj2 review*).ab. (92392)
9 systematic overview.ti,ab. (845)
10 evidence synthesis.ti,ab. (2775)
11 (medline or pubmed).ab. (147225)
12 7 or 8 or 9 or 10 or 11 (229623)
13 6 and 12 (15)

EMBASE

Database: Embase <1974 to 2017 September 27>
Search Strategy:
---
1 rolandic epilepsy/ (726)
2 rolandic.ti,ab. (2129)
3 BCECTS.ti,ab. (89)
4 centro temporal spikes.ti,ab. (194)
5 centrotemporal spikes.ti,ab. (552)
6 1 or 2 or 3 or 4 or 5 (2835)
7 "systematic review (topic)"/ (22189)
8 systematic.ti. (114424)
9 (systematic* adj2 review*).ab. (113048)
10 systematic overview.ti,ab. (887)
11 evidence synthesis.ti,ab. (3064)
12 (medline or pubmed).ab. (176528)
13 7 or 8 or 9 or 10 or 11 or 12 (286135)
14 6 and 13 (28)

PsycINFO

Database: PsycINFO <1806 to September Week 4 2017>
Search Strategy:
---
1 rolandic.ti,ab. (492)
2 BCECTS.ti,ab. (29)
3 centro temporal spikes.ti,ab. (42)
4 centrotemporal spikes.ti,ab. (136)
5 1 or 2 or 3 or 4 (616)
6 systematic.ti. (18146)
7 (systematic* adj2 review*).ab. (18292)
8 systematic overview.ti,ab. (221)
9 evidence synthesis.ti,ab. (424)
10 (medline or pubmed).ab. (16611)
11 6 or 7 or 8 or 9 or 10 (36715)
12 5 and 11 (5)

CINAHL

Search ID#	Search Terms	Actions
S15	S6 AND S14	True S15 View Results (4) View Details Edit
S14	S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13	True S14 View Results (101,022) View Details Edit
S13	AB medline or pubmed	True S13 View Results (43,843) View Details Edit
S12	TI (metasynthesis or meta-synthesis) OR AB (metasynthesis or meta-synthesis)	True S12 View Results (661) View Details Edit
S11	TI evidence synthesis OR AB evidence synthesis	True S11 View Results (1,611) View Details Edit
S10	TI (systematic N2 overview) OR AB (systematic N2 overview)	True S10 View Results (397) View Details Edit

S9	TI (systematic* N2 review*) OR AB (systematic* N2 review*)	True S9	View Results (60,487) View Details Edit
S8	TI systematic	True S8	View Results (44,192) View Details Edit
S7	(MH "Systematic Review")	True S7	View Results (42,512) View Details Edit
S6	S1 OR S2 OR S3 OR S4 OR S5	True S6	View Results (138) View Details Edit
S5	TI centrotemporal spikes OR AB centrotemporal spikes	True S5	View Results (41) View Details Edit
S4	TI "centro temporal spikes" OR AB "centro temporal spikes"	True S4	View Results (11) View Details Edit
S3	TI BCECTS OR AB BCECTS	True S3	View Results (5) View Details Edit
S2	TI rolandic OR AB rolandic	True S2	View Results (98) View Details Edit
S1	(MH "Epilepsy, Rolandic")	True S1	View Results (1) View Details Edit

SUPPLEMENTARY 2 – Characteristics of included papers and Provisional list of outcomes

Table S2.1 - Characteristics of included papers

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
1	Baca, C. B., et al. (2011). (1)	**Observational** Prospective, community-based cohort study of newly diagnosed childhood epilepsy, with ongoing prospective follow up.	• 277 children 129 females, 148 males. • Mean age: 13 range: 8-17 • New diagnosed epilepsy, unprovoked seizure between 28 days and 15 years.	Health related quality of life Cognitive function	Child health questionnaire (CHQ) Neurologic medical records, parent interviews, school records, and standardized neuro-psychological testing using the Wechsler Intelligence Scale for Children.
2	Baca, C. B. et al., (2012) (2)	**Observational** Prospective community-based study of long-term outcomes of childhood-onset epilepsy. (The Connecticut Study of Epilepsy).	• 277 parent-child dyads • Mean age of child: 5.1, SD: 2.5. • Newly diagnosed childhood epilepsy.	Health related quality of life	Child health questionnaire (CHQ)
3	Bast et al., (2003) (3)	**Systematic Review (SR)** SR of the influence of sulthiame on EEG in BECTS	• 66 children • Diagnosis of BECTS • Mean age: 8.3, range 3-10 years	The rate of treatment failure events EEG	Any first seizure EEG
4	Benson, A., et al. (2016) (4)	**Qualitative** Mixed qualitative & quantitative in 2 stages. Phase one: qualitative exploratory design using semi-structured interviews. Phase 2: Questionnaires/cross-sectional survey	Phase one: • 33 Children aged 6-16 years, mean age: 7.33 and 40 parents. • Prescription of anti-epileptic medication Phase two: • 47 children aged 8-18 years; mean age 13.19, and 72 parents.	Themes: Social exclusion in epilepsy, Activity restrictions, Teasing/bullying, concealment, stigma coaching Stigma	Interview Child Stigma Scale (CSS)

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
5	Borggraefe et al., (2013) (5)	**Randomised Controlled Trial (RCT)** Randomised, double-blinded controlled trial (over 26 months). Non inferiority trial of LEV (Levetiricetam) compared to STM (Sulthiame). Randomly allocated to the LEV or STM treatment arm.	• 44 children between 6-12 years of age • Diagnosis of BECTS • LEV group (n=21): mean age: 8.7, 6 females • STM group (n=22): mean age: 9.0, 10 females	Primary endpoint: occurrence of a treatment failure event Dropouts related to adverse events/occurrence of a drug related adverse reaction	Occurrence of a seizure during the observation period – 24 weeks after reaching target dose. Adverse events e.g. general symptoms, pain etc. Urine analysis
6	Chong et al. (2016) (6)	**SR of Qualitative Studies** Systematic review of qualitative studies on the experiences of children and adolescence.	• 951 participants overall. • Participants aged 3-21 years • Diagnosed with epilepsy.	Themes: Loss of Bodily Control: Being overtaken, Susceptibility to physical harm, Fragility of the brain, Alertness to mortality, Bodily powerlessness, Loss of Privacy: Declarative Disease, Humiliating Involuntary Action, Unwanted special attention, Social embarrassment of medicine taking, Inescapable inferiority and discrimination: Vulnerability to Prejudice, Consciousness of abnormality, Limiting social freedom, Therapeutic Burden and Futility: Awaiting a Fabled Remission, Overwhelming Life Disruption, Social and spiritual connectedness	Interview
7	Connock et al., (2006). (7)	**SR** SR to examine the clinical effectiveness and cost-effectiveness	• Young people with epilepsy under 18 years old and mixed age groups with epilepsy if including persons less than 18 years old.	Premature discontinuation due to adverse events Seizure frequency	Adverse events e.g. vomiting, infection, headache, fever. The number of seizures during maintenance

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
		of newer anti-epileptic drugs (AEDs) for epilepsy in children. Drugs included: gabapentin, lamotrigine, levetiricetam, oxcarbazepine, tiagabine, topiramate and vigabatrin.			
8	Coppola et al., (2007) (8)	**RCT** Randomised to levetiricetam (LEV) group, and an Oxcarbazepine (OXC) group. LEV & OXC – 5mg/kg – up to a daily maximum dose of 20 mg/kg.	• 39 children aged between 3.3 to 14 years (m: 8.4) were randomised to receive monotherapy with LEV levetiricetam or OXC. • New diagnosis of BECTS according to ILAEO, absence of neurological and mental deficits.	Complete seizure freedom Awake & sleep EEG	Seizure freedom (recorded in an epilepsy diary) EEG
9	Smith et al., (2015) (9)	**Meta-Analysis** Evaluation of 22 studies of literacy and/or language skills in children with rolandic epilepsy, published after 2000.	• Children and adolescents with rolandic epilepsy, aged 5-18 years.	Language & Literacy	Reading measured with: GORT accuracy (Gray, Oral, Reading Tests), WIAT (Weschsler Individual Achievement Test), WRAT (Wide Range Achievement Test) Phonological processing measured with: TOWRE (rest of word reading efficacy) Expressive language measured with: CELF (Clinical Evaluation of Language Fundamentals) Receptive language measured with: CELF, Peabody Picture Vocabulary Test (PPVT)

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
10	Gutter et al., (2013) (10)	**Observational** Purpose of study were to explore the prevalence of sleep disturbances in a large cohort of school-age children with partial epilepsy.	• 131 children – partial epilepsy aged 4 to 10 years and 161 age and sex matched controls.	Sleep Restrictions in childhood epilepsy School environment/Peers & social support/autonomy & parent relations/psychological wellbeing/physical wellbeing	Sleep Disturbance Scale for children (SDSC), Medical Outcomes Study-Sleep Scale (MOSS –S) and Groningen Sleep Quality Scale (GSQS) Hague Seizure Severity Scale (HSSS), the Hague Side Effects Scale (HaSES) and Hague Restrictions in Childhood Epilepsy Scale (HaRCES) Kidscreen-27
11	Kim et al., (2015) (11)	**Observational** Investigate cortical thickness and gray matter volume abnormalities in BECTS.	• 20 children (14 males, mean age: 7.5), • Newly diagnosed BECTS	EEG Cortical thickness/grey matter	EEG MRI
12	Lewis et al., (2008) (12)	**Observational** E-survey and interviews	• 44 children and young people with epilepsy aged 3-23 (parent responses on behalf of child). • Interviews with a separate group of 22 children and young people with epilepsy.	Impact of epilepsy on school	E-survey
13	Liu et al., (2016) (13)	**RCT** Children were randomised into two groups Group 1: topiramate once every night	• 85 children • 54 males and 31 females aged from 3.3 years to 13 years. Diagnosed with benign childhood epilepsy	EEG Seizure frequency Adverse events	EEG Parent recorded Parent recorded/physiological measures of blood, urine.

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
		Group 2: topiramate twice a day.			
14	Loiselle et al., (2016) (14)	**Observational** Trajectories of health-related quality of life (HRQOL) among children with newly diagnosed epilepsy, and evaluate key predictors of HRQOL trajectories.	• 120 children with epilepsy and their care giver • 2-12 years old, received an epilepsy diagnosis on day of study recruitment	Paediatric epilepsy side-effects Health-related quality of life Parental fears about the impact of a child's seizures on functioning	Paediatric Epilepsy Side Effects Questionnaire (PESQ) (Mortia et al., 2012). Care-giver proxy report version of the PedsQL 4.0 (Varni, Seid & Kurtin, 2001). The Parent Report of Psychosocial Care (Austin, Dunn, Huster & Rose, 1998) – Includes the five-item Concerns and Fears subscale (assesses parental fears about the impact of the child's seizures on functioning and outcomes)
15	Melchionda et al., (1999) (15)	**Observational** Evaluate long term evolution of headaches associated with rolandic centrotemporal spikes	• 32 children with rolandic centro temporal spikes	Headache	Occurrence of symptom
16	Mitsudome et al., (1997 (16)	**Observational** Effectiveness of clonazepam on rolandic discharges.	• 32 children with centro temporal spikes (CTS) that has episodes of headache (16 females) with centro-temporal spikes (CTS) at EEF • 52 matched controls	EEG	EEG
17	Moffat et al., (2009)	**Observational**	• 22 children (11 male, 11 female) • Mean age; 9, Range: 7-12	Themes: Impact on social life, developmental/role related issues, psychological epilepsy related	Interview

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
	(17)	Impact of childhood epilepsy on quality of life	• Experiences partial seizures and some generalised seizures.	issues, peer acceptance, school-related issues, academic impact, family reactions, adjustment, compliance, seizure experience, fear, coping, the future, translational periods, medical experiences, emotional impact	
18	Nevitt et al., (2016) (18)	**SR** RCT's with a comparison of carbamazepine monotherapy with phenobarbitone monotherapy in individuals with epilepsy	• Children or adults with partial onset seizures • Individuals with a new diagnosis of epilepsy	Seizures Adverse events IQ Memory	Incidence of seizures Side effects, withdrawals, incidence of allergic reactions WISC-R Scale, Bender-Gestalt test
19	Rating et al., (2000) (19)	**RCT** Children were randomized to receive either STM or a placebo	• 66 children • Aged between 3-10 years • Diagnosis of BECTS (or has 2 ore	Adverse events	Adverse event
20	Reilly et al., (2015) (20)	**Observational** Factors associated with quality of life in childhood epilepsy.	• Children recruited from the CHESS study (identification of children with 'active' epilepsy born between 1995 and 2007'. • Children aged 5-15 years	Quality of life	QOLCE US
21	Ronen et al., (1999) (21)	**Observational/qualitative** Identifying the attributes of Health related quality of life (HRQOL) in childhood epilepsy.	• 29 children and their parents • Mean age: 9.2 • Simple/complex partial seizures	Themes: Experience of epilepsy, life fulfilment/time use, home activities, school issues, and activities, social experiences, impact of epilepsy	Interview

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
22	Sajobi et al., (2017) (22)	**Observational** Trajectories across health related quality of life domains in children with new onset epilepsy	• 373 children with new-onset epilepsy	Family life event changes Family functioning/resources Health-related quality of life Epilepsy severity	The Family Inventory of Life Event Changes (FILE) Family inventory of resources and management (FIRM) QOLCE-55 Global Assessment of Severity of Epilepsy (GASE) The Family adaptability, partnership, growth, affection and resolve (APGAR)
23	Schmitt et al., (2009) (23)	**Observational** Effects of valproic acid on sleep in children with epilepsy	• 46 children • Aged 1.7-17.4 years, mean 8.4 • History of generalised epilepsies	Sleep	Sleep habits survey
24	Schraegle et al., (2016) (24)	**Observational** Executive functioning and HRQOL in childhood epilepsy	• 130 children • Mean age: 11.6 years, SD: 3.6 years • Epilepsy diagnosis	Executive functioning Behaviour Memory Intelligence HRQOL	Behaviour rating inventory of executive functioning (BRIEF) BRIEF BRIEF Wechsler Intelligence Scales (WSI-II) (WISC-IV) Quality Of Life in Childhood Epilepsy scale (QOLCE)
25	Seidel et al., (1999) (25)	**Observational**	• 27 Children • 12 diagnosed with benign rolandic epilepsy or migraine headache, 15 with migraine	Intelligence Language	Wechsler Intelligence Scale for Children 3rd edition Boston Naming Test

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
		Cognitive and behavioural effects of carbamazepine in rolandic children.	• Mean age BECTS: 9.7, aged between 6-12 years	Memory Motor skills Behaviour	Wide Range Assessment of Memory and Learning Finger tapping test, Grooved pegboard test Child behaviour checklist (CBCL)
26	Stafstrom et al., (2012) (26)	**Observational** Art therapy focus groups for young people with epilepsy	• 16 children, mean age: 12.8 years, SD: 2.9 • Range of childhood epilepsies including rolandic	Self-concept Attitude towards epilepsy Impact of epilepsy	Piers-Harris Children's Self-Concept Scale 2 Art therapy assessments (Seizure drawing task, Formal Elements Art Therapy Scale/Picking an Apple from a Tree, Levick Emotional and Cognitive Art Therapy Assessment) Child Attitude Towards Illness Scale (CATIS) Impact of Childhood Neurologic disability scale (ICNDS)/ Impact of Paediatric Epilepsy Scale (IPES)
27	Tacke et al., (2016) (27)	**RCT** Children with BECTS Randomly allocated to LEV or STM treatment group.	• 44 children • Aged between 6 and 12 years of age • Diagnosis of BECTS	Memory	Number recall test from the Kaufman assessment battery for children (K-ABC), Verbal learning memory test (CLMT), culture free intelligence test (CFT-R)
28	Tan et al., (2014) (28)	**SR** Review of antiepileptic drug RCT in children with BECTS	• 262 children up to the age of 15 years • Diagnosis of BECTS	Proportion of patients seizure free at 3 & 12 months Adverse event	Proportion of patients seizure free at 3 & 12 months Adverse event

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
29	Tedrus et al., (2006) (29)	**Observational** EEG and intelligence in children with BECTS	• 26 children aged 8-11 years old (10 female, 16 male) & a paired control group • Diagnosis of BECTS	Intelligence EEG	Wechsler Intelligence Scale for Children (WISC-III) EEG
30	Turky et al., (2008) (30)	**Observational** Epidemiological study aimed at determining the prevalence of behavioural and emotional problems in a UK community-based population of children and adolescents with epilepsy	• 56 children and adolescents with epilepsy aged 4-17. • 25 males, 31 females. • Diagnosis of epilepsy, age at epilepsy onset: 6 years old.	Strengths & difficulties Seizure severity Moods, feelings & emotions Impact of paediatric epilepsy Quality of life in epilepsy	Strengths & difficulties questionnaire (SDQ) Revised Liverpool Seizure Severity Scale The Moods and Feelings Questionnaire (MFQ) The Impact of Paediatric epilepsy scale (IPES) Quality of Life in Epilepsy Inventory for Adolescents (QOLIE-AD-48)
31	Turner et al., (2004) (31)	**Observational** Prospective, randomized, single-blinded, crossover, placebo-controlled, pilot clinical trial investigating exposure to music on EEG of children with BECTS.	• 4 children aged 5-9 years, were selected from EEGs diagnostic of BECTS	Interictal epileptiform discharges (IED)	EEG
32	Verhey et al., (2009) (32)	**Observational** QOL in children with epilepsy and agreement between child and parent	• Children aged 8-17 years were included with a diagnosis of active epilepsy • 375 children and 378 parents	Health related quality of life	CHEQOL-25

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
33	Wille et al., (2010) (33)	**Preference based/HRQOL measure** Development of the EQ-5D-Y	• Epilepsy measure designed for young people	Mobility Looking after myself Usual activities Pain/discomfort and feeling worried Sad or unhappy	EQ-5DY
34	Stevens et al., (2011) (34)	**Preference based/HRQOL measure** Development of the Child Health Utility (CHU9D)	• 247 children recruited from general and clinical paediatric populations tested	Sad Pain Tired Annoyed School Work Sleep Daily routines and activities	CHU9D
35	Feeny et al., (2002) (35)	**Preference based/HRQOL measure** Development of the Health Utilities Index Mark 3 (HUI3)	• A random sample of the general population (≥16 years of age) in Hamilton, Ontario, Canada completed preference surveys	Vision Hearing Speech Ambulation Dexterity Emotion	HUI3

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
				Cognition Pain	
36	Mulhern et al., (2012) (36)	**Preference based/HRQOL measure** NEWQoL-6D	Epilepsy measure designed for adults • Used sample of 1611 respondents with newly diagnosed epilepsy from SANAD study to generate classification system	Worry about attacks Depression Memory Concentration Stigma Control	NewQol-6d
37	Sadeghi et al., 2014 (37)	**SR of outcome measures**	Conceptual analysis – no participants Conceptual/theoretical analysis – no participants		DISABKIDS (Epilepsy Module) ECQ (Epilepsy and children questionnaire) ELQOL (epilepsy and learning disabilities quality of life) EFA (Epilepsy Foundations of American Concerns Index) Glasgow Epilepsy Outcome Scale (GEOS-C) ICI (Impact of Childhood Illness) ICNDS (Impact of Childhood Neurologic Disability) IPES (Impact of Paediatric epilepsy scale) QOLCE

Study no.	Author (year) & (Reference no.)	Type of study/study design	Sample characteristics	Outcome domains	Outcome measures
					QOLIE-AD QOLPES (Quality of life in paediatric epilepsy) PedsQL Neuro-QOL

Table S2.2 - Provisional list of outcomes identified from systematic review and provided to the team

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
Physiological: Nervous System Outcomes	Seizures	Seizure remission	Proportion seizure free	8, 18, 28
			Proportion of patients who are seizure free at 3 months, 12 months	28
			Complete seizure freedom	8
		Seizure frequency	Seizure frequency	7, 13, 18
			Seizure frequency and severity	11
			Mean seizure frequency per month	18, 20
		Seizure duration	Mean seizure duration	20, 18
		Seizure severity	Seizure severity	10, 22, 30, 37
			Severity of epilepsy	24, 22
		Seizure control	Seizure control	18

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
Physical Functioning	Sleep	Sleep duration	Overall sleep	10
			Sleep start time & end	23
			Assumed sleep per night	23
			Actual sleep per night	23
			Assumed sleep per nap	23
			Actual sleep time per nap	23
			No. of hours of sleep	10
			Nap per day	23
			Sleep	34
		Sleep quality	Disorders of initiating and maintaining sleep	10
			Sleep breathing disorders	10
			Sleep quality	10
			Sleep hyperhidrosis	10
			Sleep disturbance/insomnia	10
			Disorders of arousal	10
			Sleep-wake transition disorders	10, 23
			Breathing problems/headache in sleep	10

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
		Sleep efficiency	Sleep adequacy	10
			Morningness/eveningness	23
		Daytime sleepiness	Sleepiness	23
			Disorders of excessive somnolence	10
			Daytime somnolence	10
			Energy/fatigue	20, 37
			Tired	34
	Physical health	Pain	Bodily pain/discomfort	1, 2
			Pain/discomfort – feeling worried	33
			Pain	34, 35, 37,
		Physical functioning	Physical functioning	1, 14, 22, 30, 37
			Physical restrictions	10, 20, 37
			Physical wellbeing	10
			Physical impact of epilepsy	21
			Role/social limitations physical	1, 2
			Change in health	1, 2, 37
				37

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Physical health	
	Manual ability	Manual ability	Mobility	33
			Ambulation	35
			Dexterity	35
			Motor skills	25
Social Functioning	Usual activities	Usual activities	Usual activities	33
		Recreation & Leisure	Activity restrictions	4
			Social activities	20, 37
		Self-care	Looking after self	33
			Independence	37
	Behaviour	Behaviour	Behaviour	1, 2, 30, 24
			Behavioural regulation	24
			Internalizing behaviour	25
			Externalizing behaviour	25
			Self-concept: behavioural adjustment	26
			Conduct problems	30

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Prosocial behaviour	30
			Peer problems	30
			Parental ratings of behaviour	25
			Social behaviour	30, 37
			Social health: sociability	37
			Social health: social role performance	37
			Role/social limitations: behavioural	1, 2
		Family functioning & cohesion	Family cohesion	1, 2
			Family activities	1, 2
			Family resources	22
			Parent impact – time/emotion	1, 2, 37
		Educational participation	School environment	10, 14
	Social	Social life/Engagement with friends & peers	Social exclusion in epilepsy	4
			Teasing/bullying	4, 21

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Social embarrassment of medicine taking	6
			Limiting social freedom	6
			Social life	17
			Social interactions	20, 37
			Peers & Social support	10
			Social functioning	14, 22, 30, 37
			Social interactions	20, 37
			Peer problems	30
			Social support	30, 37
			Interpersonal/social	32, 37
			Teasing/bullying	4, 21
			Communication	26, 30, 37
			Social impact of epilepsy/Impact on social activities	37
		Stigma	Social embarrassment of medicine taking	6
			Inescapable inferiority and discrimination: vulnerability to prejudice	6
			Unwanted special attention	6

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Stigma	4, 36, 37, 20, 30
Role functioning	Family relationships	Autonomy & relationships with parents	Family relationships & functioning	22, 37
			Autonomy & parent relations	10
			Family life event changes	22
			Autonomy	NF
			Family	NF
			Impact of epilepsy on relationships with family, peers and siblings	37
Emotional functioning/wellbeing	Mental Health	Behavioural difficulties	Behavioural difficulties	30
		Depression	Depression	20, 23, 36, 22, 34, 33
			Sad	34
			Sad or unhappy	33
		Anxiety	Anxiety	20, 37
		Self-esteem	Self-esteem	1, 2, 20, 37
			Over-all self-concept	26
			Self-concept: physical appearance and attributes	26

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
		Mental wellbeing	Mental health	1, 2
			Psychological wellbeing	10
			Emotional control	24
			Self-concept: happiness & satisfaction	26
			Moods, feelings and emotions (over 2 weeks)	30, 37
			Mood/Mood state	37
			Intrapersonal/emotional	32
			Annoyed	34, 37
			Emotion	35
			Optimism	37
			Emotional functioning	37
			Attitude towards epilepsy	26, 30, 37
			Fear of seizures	NF
			Psychological functioning	14
			Control/helplessness	20, 37
			Impact of epilepsy (psychosocial)	30, 26
			Emotional disorders	30

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Role/social limitations emotional	1, 2
			Epilepsy impact: effects of epilepsy and antiepileptic medications	30
			Disclosure & normality	6, 32, 37
		Secrecy	Secrecy	32, 4
			Concealment	4
		Fears about epilepsy	Parental fears about the impact of a child's seizure	14
			Worries/concerns	32, 34, 36, 37
			Concerns about epilepsy	37
			Future worries	37
			Fear of seizures	37
			Parental concern	37
			Impact of seizures	37
			Prospects for the future	37
Cognitive Functioning	Cognition	Language & Literacy	Reading	9
			Phonological processing	9

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Expressive language	9, 20, 25, 37
			Receptive language	9, 20, 25, 37
			Speech	35
		Memory	Memory	18, 22, 30, 25, 27, 30, 36, 37
			Working memory	24
		Intelligence	IQ scores	18, 24, 25, 29
		Concentration	Attention/concentration	20, 30, 36, 25, 37
			Hyperactivity/inattention	30
		Executive functioning	Metacognitive index	24
			Planning/organisation	24
			Executive functioning (Global executive composite)	24
		Cognition	Speeded visual search and mental flexibility	25
			Cognition	35
			Cognitive function	1, 37, 22
			Control	36

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Cognitive effects of epilepsy	37
			Applied cognition: general concerns	37
			Speeded visual search and mental flexibility	25
			Other cognitive	37
		School performance	Self-concept: Intellectual and school status	26
			School/scholastic functioning	37
			Education	37
			Impact of epilepsy on academic achievement	37
			Impact of epilepsy on school	10
			Academic self-concept:	26
Global quality of life	Global quality of life	Global quality of life	Global general health	1, 2, 14, 20, 22, 30, 32, 37
			General health perceptions	1, 2, 30, 37
			Impact of epilepsy on health	37
			General/overall health	37
			Overall impact of epilepsy	37

COMET Taxonomy	Outcome Domain	Aspects of health	Outcome identified verbatim in individual study	Study number of papers retrieved from systematic review (See Table 1)
			Total impact of childhood neurologic disability	37
			Health related quality of life	14, 20, 30, 32, 37
Adverse events/effects	Adverse events	Unintended adverse events	Routine urine test	13, 5
			Liver and renal function	13
			Weight	13
			Routine blood test	13
			Paediatric epilepsy side effects	14, 18, 10
			Adverse events	18, 19, 28, NF, 5, 7, 13, 15, 30, 35, 37, 11
			Anti-epileptic drug side effects	37, 10
			Seizure effects	37
			Headache	15
			Hearing	35
			Vision	35
			Safety/injury	37

References

1. Baca CB, Vickrey BG, Caplan R, Vassar SD, Berg AT. Psychiatric and medical comorbidity and quality of life outcomes in childhood-onset epilepsy. Pediatrics. 2011;peds-2011.
2. Baca CB, Vickrey BG, Vassar SD, Berg AT. Seizure recency and quality of life in adolescents with childhood-onset epilepsy. Epilepsy Behav. 2012;23(1):47–51.
3. Bast T, Völp A, Wolf C, For The Sulthiame Study Group DR. The influence of sulthiame on EEG in children with benign childhood epilepsy with centrotemporal spikes (BECTS). Epilepsia. 2003;44(2):215–20.
4. Benson A, O'Toole S, Lambert V, Gallagher P, Shahwan A, Austin JK. The stigma experiences and perceptions of families living with epilepsy: implications for epilepsy-related communication within and external to the family unit. Patient Educ Couns. 2016;99(9):1473–81.
5. Borggraefe I, Bonfert M, Bast T, Neubauer BA, Schotten KJ, Maßmann K, et al. Levetiracetam vs. sulthiame in benign epilepsy with centrotemporal spikes in childhood: a double-blinded, randomized, controlled trial (German HEAD Study). Eur J Paediatr Neurol. 2013;17(5):507–14.
6. Chong L, Jamieson NJ, Gill D, Singh-Grewal D, Craig JC, Ju A, et al. Children's experiences of epilepsy: a systematic review of qualitative studies. Pediatrics. 2016;138(3):e20160658.
7. Cummins C. The clinical effectiveness and cost-effectiveness of newer drugs for children with epilepsy. Inf Sci. 121(414):6769.
8. Coppola G, Franzoni E, Verrotti A, Garone C, Sarajlija J, Operto FF, et al. Levetiracetam or oxcarbazepine as monotherapy in newly diagnosed benign epilepsy of childhood with centrotemporal spikes (BECTS): an open-label, parallel group trial. Brain Dev. 2007;29(5):281–4.
9. Smith AB, Bajomo O, Pal DK. A meta-analysis of literacy and language in children with rolandic epilepsy. Dev Med Child Neurol. 2015;57(11):1019–26.
10. Gutter T, Brouwer OF, de Weerd AW. Subjective sleep disturbances in children with partial epilepsy and their effects on quality of life. Epilepsy Behav. 2013;28(3):481–8.
11. Kim E-H, Yum M-S, Shim W-H, Yoon H-K, Lee Y-J, Ko T-S. Structural abnormalities in benign childhood epilepsy with centrotemporal spikes (BCECTS). Seizure. 2015;27:40–6.
12. Lewis A, Parsons S. Understanding of epilepsy by children and young people with epilepsy. Eur J Spec Needs Educ. 2008;23(4):321–35.
13. Liu C, Song M, Wang J. Nightly oral administration of topiramate for benign childhood epilepsy with centrotemporal spikes. Child's Nerv Syst. 2016;32(5):839–43.
14. Loiselle KA, Ramsey RR, Rausch JR, Modi AC. Trajectories of health-related quality of life among children with newly diagnosed epilepsy.

J Pediatr Psychol. 2016;41(9):1011–21.
15. Melchionda D, Verrotti A, Chiarelli F, Domizio S, Sabatino G, Mucedola T, et al. Headache in children with centrotemporal spikes. Neurophysiol Clin Neurophysiol. 1999;29(1):90–100.
16. Mitsudome A, Ohfu M, Yasumoto S, Ogawa A, Hirosea S, Ogata H, et al. The effectiveness of clonazepam on the Rolandic discharges. Brain Dev. 1997;19(4):274–8.
17. Moffat C, Dorris L, Connor L, Espie CA. The impact of childhood epilepsy on quality of life: A qualitative investigation using focus group methods to obtain children's perspectives on living with epilepsy. Epilepsy Behav. 2009;14(1):179–89.
18. Nevitt SJ, Marson AG, Weston J, Tudur Smith C. Carbamazepine versus phenobarbitone monotherapy for epilepsy: an individual participant data review. Cochrane Libr. 2016;
19. Wolf C, Bast T. Sulthiame as monotherapy in children with benign childhood epilepsy with centrotemporal spikes: a 6-month randomized, double-blind, placebo-controlled study. Epilepsia. 2000;41(10):1284–8.
20. Reilly C, Atkinson P, Das KB, Chin RFM, Aylett SE, Burch V, et al. Factors associated with quality of life in active childhood epilepsy: a population-based study. Eur J Paediatr Neurol. 2015;19(3):308–13.
21. Ronen GM, Rosenbaum P, Law M, Streiner DL. Health-related quality of life in childhood epilepsy: the results of children's participation in identifying the components. Dev Med Child Neurol. 1999;41(8):554–9.
22. Sajobi TT, Wang M, Ferro MA, Brobbey A, Goodwin S, Speechley KN, et al. Multivariate trajectories across multiple domains of health-related quality of life in children with new-onset epilepsy. Epilepsy Behav. 2017;75:72–8.
23. Schmitt B, Martin F, Critelli H, Molinari L, Jenni OG. Effects of valproic acid on sleep in children with epilepsy. Epilepsia. 2009;50(8):1860–7.
24. Schraegle WA, Titus JB. Executive function and health-related quality of life in pediatric epilepsy. Epilepsy Behav. 2016;62:20–6.
25. Seidel WT, Mitchell WG. Cognitive and behavioral effects of carbamazepine in children: data from benign rolandic epilepsy. J Child Neurol. 1999;14(11):716–23.
26. Stafstrom CE, Havlena J, Krezinski AJ. Art therapy focus groups for children and adolescents with epilepsy. Epilepsy Behav [Internet]. 2012;24(2):227–33. Available from: http://dx.doi.org/10.1016/j.yebeh.2012.03.030
27. Tacke M, Gerstl L, Heinen F, Heukaeufer I, Bonfert M, Bast T, et al. Effect of anticonvulsive treatment on neuropsychological performance in children with BECTS. Eur J Paediatr Neurol. 2016;20(6):874–9.
28. Tan HJ, Singh J, Gupta R, de Goede C. Comparison of antiepileptic drugs, no treatment, or placebo for children with benign epilepsy with centro temporal spikes. Cochrane Database Syst Rev. 2014;9(9):Cd006779.
29. Tedrus GMAS, Fonseca LC, Tonelotto JMF, Costa RM, Chiodi MG. Benign Childhood Epilepsy with Centra-Temporal Spikes: Quantitative EEG and the Wechsler Intelligence Scale for Children (WISC-III). Clin EEG Neurosci. 2006;37(3):193–7.

30. Turky A, Beavis JM, Thapar AK, Kerr MP. Psychopathology in children and adolescents with epilepsy: an investigation of predictive variables. Epilepsy Behav. 2008;12(1):136–44.
31. Turner RP. The acute effect of music on interictal epileptiform discharges. Epilepsy Behav. 2004;5(5):662–8.
32. Verhey LH, Kulik DM, Ronen GM, Rosenbaum P, Lach L, Streiner DL. Quality of life in childhood epilepsy: what is the level of agreement between youth and their parents? Epilepsy Behav. 2009;14(2):407–10.
33. Wille N, Badia X, Bonsel G, Burström K, Cavrini G, Devlin N, et al. Development of the EQ-5D-Y: a child-friendly version of the EQ-5D. Qual life Res. 2010;19(6):875–86.
34. Stevens K. Assessing the performance of a new generic measure of health-related quality of life for children and refining it for use in health state valuation. Appl Health Econ Health Policy. 2011;9(3):157–69.
35. Feeny D, Furlong W, Torrance GW, Goldsmith CH, Zhu Z, DePauw S, et al. Multiattribute and single-attribute utility functions for the health utilities index mark 3 system. Med Care. 2002;40(2):113–28.
36. Mulhern B, Rowen D, Jacoby A, Marson T, Snape D, Hughes D, et al. The development of a QALY measure for epilepsy: NEWQOL-6D. Epilepsy Behav. 2012;24(1):36–43.
37. Sadeghi S, Fayed N, Ronen GM. Patient-reported outcome measures in pediatric epilepsy: A content analysis using World Health Organization definitions. Epilepsia. 2014;55(9):1431–7.

SUPPLEMENTARY 3 –

S3.1 - Demographics of participants from R2 of the Delphi survey

Characteristic	N (%)
Professionals	61 (100)
Place of residence in UK	
North East	3 (5)
North West	1 (2)
Yorkshire and The Humber	4 (7)
East Midlands	2 (3)
West Midlands	3 (5)
East of England	2 (3)
London	18 (30)
South East	5 (8)
South West	9 (15)
Scotland	3 (5)
Wales	5 (8)
Ireland	4 (7)
Outside UK	2 (3)
Ethnicity	
White	44 (72)
Black	2 (3)
Asian	11 (18)
Hispanic/Latino	1 (2)
Mixed race	1 (2)
Other	2(3)
Parents & Young people	19 (100)
Place of residence in UK	
North East	0 (0)
North West	0 (0)
Yorkshire and The Humber	1 (5)
East Midlands	1 (5)
West Midlands	0 (0)
East of England	0 (0)
London	4 (21)
South East	2 (11)
South West	3 (16)
Scotland	0 (0)
Wales	0 (0)
Ireland	4 (21)
Outside UK	4 (21)
Ethnicity	
White	16 (84)
Black	2 (11)

Characteristic	N (%)
Asian	0 (0)
Hispanic/Latino	0 (0)
Mixed race	0 (0)
Other	1 (5)
Average child age	10.5, (s.d. 1.9)

SUPPLEMENTARY 4 –

Table S4.1 – Outcomes suggested after R1 of the Delphi survey

Additional outcome suggested	Stakeholder & Score	Score	Notes
Frequency of hospital out-patient attendance for BECTS review	Professional	7	New outcome identified **Outcome:** Attendance for medical appointments in outpatients **Domain:** Seizures **Description:** Routine attendances for medical epilepsy management
seen by consultant with specialist expertise in epilepsy	Professional	7	No new outcomes represented in free-text response/already covered in outcomes.
seen by consultant paediatric neurologist	Professional	7	No new outcomes represented in free-text response/already covered in outcomes.
seen by paediatric epilepsy specialist nurse	Professional	7	No new outcomes represented in free-text response/already covered in outcomes.
taking anti-convulsant for BECTS	Professional	8	No new outcomes represented in free-text response/already covered in outcomes.
Hospital attendances	Professional	4	New outcome identified **Outcome:** Unplanned hospital attendances at Accident & Emergency **Domain:** Adverse events **Description:** Visiting the hospital

Additional outcome suggested	Stakeholder & Score	Score	Notes
			due to an acute medical emergency
Hospital admissions	Professional	4	New outcome identified **Outcome:** Unplanned epilepsy-related admission to hospital as inpatient **Domain:** Adverse Events **Description**: Unexpectedly needing to be admitted to hospital
Change in medication; e.g. withdrawal or addition of AED	Professional	5	New outcome identified **Outcome:** Drug treatment failure (adverse events or poor seizure control) **Domain:** Adverse Events **Description**: stopping medication because it's not working or causing problems
Epilepsy in this person drug resistant (by ILAE criteria)	Professional	4	No new outcomes represented in free-text response/already covered in outcomes.
list comorbidities	Professional	7	No new outcomes represented in free-text response/already covered in outcomes.
Evidence of parasomnia with awakening at night	Professional	7	No new outcomes represented in free-text response/already covered in outcomes.
Percentage of diagnosed	Professional	9	No new outcomes represented in

Additional outcome suggested	Stakeholder & Score	Score	Notes
comorbidities in children with RE			free-text response/already covered in outcomes.
The types of seizures seen in the child with the diagnosis	Professional	6	No new outcomes represented in free-text response/already covered in outcomes.
The percentage of children with RE whose epilepsy evolves or becomes uncontrollable.	Professional	9	No new outcomes represented in free-text response/already covered in outcomes.
speech regression / aphasia	Professional	9	No new outcomes represented in free-text response/already covered in outcomes.
Awareness of SUDEP	Parent	8	No new outcomes represented in free-text response/already covered in outcomes.
TICS	Parent	8	No new outcomes represented in free-text response/already covered in outcomes.
Improvement of deterioration of school work after starting treatment	Professional	6	No new outcomes represented in free-text response/already covered in outcomes.
Ability to play Sport	Parent	4	No new outcomes represented in free-text response/already covered in outcomes.

Supplementary 5 – Consensus meeting minutes and participants

Table S5.1 – Participants present at the consensus meeting

Initials	Meeting role	Stakeholder Group	Membership
CM	**Meeting facilitator/chair**	**n/a**	**Research team**
HC	**Assistant Facilitator**	**n/a**	**Research team**
SI	**Assistant**	**n/a**	**King's College London**
SL	**Family Engagement Officer**	**n/a**	**Research team**
DKP	**Participant**	**Professional (Paediatric neurologist)**	**Delphi survey participant/ Research team**
PG	**Participant**	**Professional (consultant in sleep medicine)**	**Delphi survey participant/ Research team**
BC	**Participant**	**Professor of children's nursing**	**Research team/voted in meeting**
JH	**Participant**	**Professional (Paediatrician)**	**Delphi survey participant**
DJ	**Participant**	**Professional (Consultant in sleep medicine)**	**Delphi survey participant**
CT	**Participant**	**Professional (Clinical Psychologist)**	**Delphi survey participant (R1)**
SM	**Participant**	**Professional (Physiologist)**	**Delphi survey participant**
RW	**Participant**	**Professional (Paediatric neurologist)**	**Delphi survey participant**
DG	**Participant**	**Professional (Paediatrician)**	**Delphi survey participant**
MS	**Participant**	**Parent of AS**	**Delphi survey participant**
AS	**Participant**	**Young Person**	**Delphi survey participant**
CT	**Participant**	**Parent of BT**	**Delphi survey participant**
BT	**Participant**	**Young Person**	**Parent was a Delphi survey participant**
DR	**Participant**	**Parent**	**Research team**
JC	**Participant**	**Parent**	**Research team**

S5.2 Minutes of consensus meeting

CHOICE – Core Health Outcomes in Childhood Epilepsy Consensus Meeting

Facilitators:
1. Christopher Morris
2. Holly Crudgington

Assistants:
1. SL (Family Engagement Officer)
2. SI (Assistant)

Eligible to vote:
Professionals (n=9)

1. RW (Paediatric neurologist)
2. DJ (Consultant in Sleep medicine)
3. BC (Professor of Children's Nursing)
4. CT (Clinical Psychologist)
5. PG (Consultant in Sleep medicine)
6. DP (Paediatric neurologist)
7. JH (Paediatrician)
8. DG (Paediatrician)
9. SM (Physiologist)

Parents (n=4)

1. JC
2. DR
3. CT
4. MS

Young People (n=2)

1. AS
2. BT

Total present at meeting: 19
Total voting: 15

Outcomes in from the Delphi, prior to meeting (n=11)

Outcome 1. Seizure Freedom
Outcome 2. Seizure Frequency
Outcome 3. Seizure duration
Outcome 4. Memory
Outcome 5. Self-harm
Outcome 6. Fears of having a seizure
Outcome 7. Learning
Outcome 8. Concentration
Outcome 9. Overall Quality of Life
Outcome 10. Adverse events or reactions
Outcome 11. Drug treatment failure events (adverse events or poor seizure control)

Outcomes voted in after the meeting (n= 28)

Outcome 12. Seizure Severity
Outcome 5. Total time spent asleep at night
Outcome 6. Total time spent asleep in 24 hours
Outcome 7. Awakenings from sleep
Outcome 8. Breathing difficulties
Outcome 9. Daytime Sleepiness
Outcome 13. Movement ability – Gross motor function
Outcome 14. Manual ability (fine motor function)
Outcome 16. Ability to join activities with others
Outcome 18. Friendships
Outcome 19. Engagement in school life
Outcome 16. Ability to join activities with others
Outcome 17. Experience of other people's attitudes towards epilepsy
Outcome 22. Behavioural concerns
Outcome 23. Impulsivity
Outcome 25. Feelings about having epilepsy
Outcome 31. Self-esteem
Outcome 32. Mood swings
Outcome 34. Concealment
Outcome 36. Literacy
Outcome 37. Speech & Language
Outcome 41. School attendance
Outcome 42. Academic attainment
Outcome 43. Executive functioning
Outcome 46. Relationships with parents & siblings
Outcome 47. Family life
Outcome 48. Parental health
Outcome 51. Epilepsy specific attendance at A&E and/or unplanned admission to the ward

Total: 39

Voting Results:

Outcome 4 – Seizure Severity
Definition: How bad seizures are in terms of effects on the person during and after seizures – such as falls or injuries, incontinence, confusion and time to recover afterwards

Comments:
- AS (young person): 'Very important'

Votes in
Professionals: 9/9
Parents: 4/4
Young People: 2/2
Total: 15/15

Result: CONSENSUS IN

Outcome 5 – Time to fall asleep
Definition: Time it takes to fall asleep from snuggling down

Votes in
Professionals: 0/9
Parents: 0/9
Young people: 0/9
Total: 0/15

Result: CONSENSUS OUT

Outcome 6 – Time spent asleep in 24 hours
Definition: Total time spent asleep each day

Comments:
- AS (Young Person) – Time spent asleep not that important – not critical to research
- JH (Professional) – Sleep deprivation is a strong driver for seizures and probably severity
- RW (Professional) – Day and night should be split
- CM (Facilitator) – Can re define if we want to. Could change to 'total time spent asleep at night'

Vote on 'Time spent asleep each day'
Votes in
Professionals: 7/8 (BC didn't answer)
Parents: 4/4
Young People: 0/2

Total: 11/14

Result: CONSENSUS OUT

Vote on 'Time spent asleep in 24 hours': CONSENSUS IN
Vote on 'Time spent asleep at night': CONSENSUS IN

Outcome: Time spent asleep at night
Definition: Total time spent asleep at night

Votes in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 7 – Awakenings from sleep
Definition: Waking in the night that parents/carers are aware of

Comments:
- JC (Parents): Critical

Votes in
Professionals: 9/9
Parents: 4/4
Young People: 2/2
Total: 15/15

Results: CONSENSUS IN

Outcome 8 – Breathing difficulties during sleep
Definition: Might include snoring or gasping for breath

Comments: PG (Professional) Important, epilepsy or not

First vote
Votes in
Professionals:7/9
Parents: 4/4
Young People: 0/2
Total: 11/15

Second vote
Votes in
Professionals: 9/9
Parents: 4/4
Young People: 2/2
Total: 14/15

Result: CONSENSUS IN

Outcome 9 – Daytime sleepiness
Definition: Feeling sleepy or actually sleeping during the day

Votes in:
Professionals: 9/9
Parents: 3/4
YP: 2/2
Total: 14/15

Results: CONSENSUS IN

Outcome 10 – Fatigue
Definition: Lacking in energy

Votes in:
Professionals: 0/9
Parents: 0/4
Young People: 0/2
Total: 0/15

Result: CONSENSUS OUT

Outcome 11 – Pain
Definition: Unpleasant, physical sensation

Comments:
- JC (Parent) – felt pain fitted in with severity of seizure

Professionals: 0/9
Parents: 0/4
Young People: 0/2
Total: 0/15

Result: CONSENSUS OUT

Outcome 13 – Movement ability – Gross motor function

***Combined Coordination & Balance outcome and definition.**

Definition: Using parts of the body together efficiently, such as to ride a bike, or stand on one leg, catching and throwing. Running, jumping, hopping, throwing.

Comments:

- AS (Young person) felt it was very important for school especially for moving around to different lessons.

Professionals: 9/9
Parents: 4/4
Youn People: 2/2
Total: 15/15

Result: CONSENSUS IN

Outcome 14 -Manual ability (fine motor function)

Definition: Dexterity (skill) in handling objects, handwriting

Comments:

- DR (Parent) thinks movement ability, coordination & balance, and manual ability are all the same.
- CT (Professional) Wondered if it was 'critical' to measure
- CT (Parent) In order to get support for a child, anything that can support an application for parents.

Vote in
Professionals: 8/9
Parents: 4/4
Young People: 2/2
Total: 14/15

Result: CONSENSUS IN

Outcome 15: Self care

Definition: Daily routines such as eating, washing, dressing and toileting.

Note: RW left the meeting. Total out of 14 professionals.

Professionals
Parents
Young People
Total

Results: CONSENSUS OUT

Outcome 16: Ability to join activities with others
Definition: Joining in with people such as playing out with friends, sleepovers, doing sports, joining in things
*Combined Social life with this outcome, added in the word 'sleepovers'.

Vote in (when combined)
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total:

Result: CONSENSUS IN

Outcome 17: Ability to play on one's own
Definition: Reading, computer games, imaginary play etc.

Professionals: 0/8
Parents: 0/4
Young People: 0/2
Total: 0/14

Result: CONSENSUS OUT

Outcome 18: Friendships
Definition: Forming and maintaining friendships

Vote in:
Professionals: 7/8
Parents: 4/4
Young People: 2/2
Total: 13/14

Result: CONSENSUS IN

Outcome 19: Engagement in school life
Definition: Feeling part of the school community

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 21: Experience of other people's attitudes towards epilepsy
Definition: How people behave towards someone with epilepsy which could include things like bullying or social exclusion

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 22: Behavioural Concerns
***Name changed from Behaving appropriately**
Definition: Being able to control emptions and respond to situations in context

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 23: Impulsivity
Definition: Acting without thinking

Vote in
Professionals: 7/8
Parents: 3/4
Young People: 1/2
Total: 11/14

Result: CONSENSUS IN

Outcome 24: Fidgeting

Definition:

Vote in
Professionals: 0/8
Parents: 0/4
Young People: 0/2
Total: 0/14

Result: CONSENSUS OUT

Outcome 25: Feelings about having epilepsy
Definition: Feeling like other people of the same age
***combination of Feeling normal, Feelings about having epilepsy, Happiness, Sadness, Worried, Annoyed.**
Definition:

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 31: Self esteem
Definition: Overall feelings about yourself

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN
Outcome 32: Mood swings
Definition: Quick unexplained changes of mood

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 34: Concealment
Definition: Quick unexplained changes of mood

Vote in
Professionals: 6/8
Parents: 4/4
Young People: 2/2
Total: 12/14

Result: CONSENSUS IN

Outcome 36: Literacy
Definition: Reading, writing, spelling

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 37: Speech & language
Definition: Making yourself understood and understanding when spoken to

Vote in
Professionals: 7/8
Parents: 4/4
Young People: 2/2
Total: 13/14

Result: CONSENSUS IN

Outcome 41: School attendance
Definition: Turning up and engaging in school curriculum

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 42: Academic attainment
Definition: Reaching potential through studying and completing assigned tasks and projects and advancing to next stage of education

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 43: Executive functioning
Definition: The ability to plan and organise complex activities and set goals and manage your time. Executive functions help you manage life tasks such as organizing a trip, homework and school projects.

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 46: Relationships with parents & siblings
Definition: Getting along well with and feeling close to other members of the family

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 47: Family life
Definition: Impact of epilepsy on family life such as parent work opportunities or/leisure time

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 48: Parental health
Definition: Parents physical and emotional health

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

Outcome 50: Epilepsy specific attendance at A&E and/or unplanned admission to the ward
Definition: unexpectedly need to be admitted to hospital

Vote in
Professionals: 8/8
Parents: 4/4
Young People: 2/2
Total: 14/14

Result: CONSENSUS IN

SUPPLEMENTARY 6 – PRISMA CHECKLIST

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3, 5-7
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6-7
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Protocol published (7, 8)
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	9
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	9, 10, Supplementary 1
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	9, 10
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	9-10, 13

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Not relevant to this piece of work
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Not relevant to this piece of work
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Not relevant to this piece of work
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	9-10, 13-14

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Not relevant to this piece of work
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Not relevant to this piece of work
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9-10, 13-14, Figure 1, Supplementary 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Supplementary 2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Not relevant to this piece of work
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Not relevant to this piece of work

Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Not relevant to this piece of work)
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Not relevant to this piece of work
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Not relevant to this piece of work
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	15-21
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	15-21
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	15-21
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	21-22

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

SUPPLEMENTARY 7 - CHOICE – Core Health Outcomes in Childhood Epilepsy
COS STAR Checklist

SECTION/TOPIC	ITEM No.	CHECKLIST ITEM	PAGE No. IN DOCUMENT
TITLE/ABSTRACT			
Title	1a	Identify in the title that the paper reports the development of a COS	1
Abstract	1b	Provide a structured summary	3
INTRODUCTION			
Background and objectives	2a	Describe the background and explain the rationale for developing the COS	5-7
	2b	Describe the specific objectives with reference to developing a COS	5-7
Scope	3a	Describe the health condition(s) and populations(s) covered by the COS	5-7, 9
	3b	Describe the intervention(s) covered by the COS	5-7, 9
	3c	Describe the setting(s) in which the COS is to be applied	5-7, 9
METHODS			
Protocol/Registry Entry	4	Indicate where the COS development protocol can be accessed, if available, and/or the study registration details	8
Participants	5	Describe the rationale for stakeholder groups involved in the COS development	5-8, 10-12, 14-15

		process, eligibility criteria for participants from each group, and a description of how the individuals involved were identified	
Information Sources	6a	Describe the information sources used to identify an initial list of outcomes	9-10, Figure 1, Supplementary 1 & 2
	6b	Describe how outcomes were dropped/combined, with reasons (if applicable)	9, Supplementary 2 & 4
Consensus Process	7	Describe how the consensus process was undertaken	10-12, 14-15 Supplementary 5
Outcome Scoring	8	Describe how the outcomes were scored and how scores were summarised	10-12, 14-15
Consensus Definition	9a	Describe the consensus definition	10-12, 14-15
	9b	Describe the procedure for determining how outcomes were included or excluded from consideration during the consensus process	10-12, 14-15 Table 4, Supplementary 4 and 5
Ethics and Consent	10	Provide a statement regarding the ethics and consent issues for the study	8
RESULTS			
Protocol Deviations	11	Describe any changes from the protocol (if applicable), with reasons, and describe what	10, 14-15

		impact these changes have on the results	
Participants	12	Present data on the number and relevant characteristics of the people involved at all stages of COS development	14-15, Table 2 and Supplementary 2 & 5
Outcomes	13a	List all outcomes considered at the start of the consensus process	Figure 2
	13b	Describe any new outcomes introduced and any outcomes dropped, with reasons, during the consensus process	Table 4, Supplementary 4 & 5
COS	14	List all the outcomes in the final COS	Figure 2
DISCUSSION			
Limitations	15	Discuss any limitations in the COS development process	15-21
Conclusions	16	Provide an interpretation of the final COS in the context of other evidence, and implications for future research.	17-21
OTHER INFORMATION			
Funding	17	Describe sources of funding/role of funders	21
Conflicts of interest	18	Describe any conflicts of interest within the study team and how these were managed	22