




# Group-Based Parent Training Interventions for Parents of Children with Autism Spectrum Disorders: a Literature Review

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## Abstract

Parents of children with autism spectrum disorders should have access to interventions to help them understand and support their child. This literature review examines the existing evidence for group-based parent training interventions that support parents of children with autism. From the literature, core intervention processes and outcomes are identified and include parenting and parent behaviour, parent health, child behaviour and peer and social support. Results show a positive trend for intervention effectiveness, but findings are limited by low-quality studies and heterogeneity of intervention content, outcomes and outcome measurement. Future research should focus on specifying effective intervention ingredients and modes of delivery, consistent and reliable outcome measurement, and improving methodological rigour to build a more robust evidence base.

**Keywords** Autism spectrum disorder · Parent training · Psychoeducation · Interventions

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterised by pervasive difficulties in social communication and social interaction, usually accompanied by a combination of circumscribed interests, repetitive behaviour and sensory sensitivities (American Psychiatric Association 2013). Parents of children with ASD should receive help and support from healthcare professionals to better understand their child's needs and to implement interventions that improve their child's health and development. In the UK, evidence-based clinical guidelines recommend that healthcare professionals provide parents and families with advice, support and training as part of the care and management of children with ASD (National Institute for Health and Care Excellence 2013).

Recent studies of parent training interventions have focussed on behavioural interventions, delivered to parents on an individual basis, to improve health outcomes for children with ASD (Bearss et al. 2015; Postorino et al. 2017; Scahill

et al. 2016). Individual parent training interventions have been shown to improve children's disruptive and non-compliant behaviour (Bearss et al. 2015), daily living skills and socialisation (Scahill et al. 2016) but the estimated 'dose' of training for intervention effectiveness is 10–12 individual parent training sessions delivered over 16–24 weeks (Postorino et al. 2017). Individual parent training interventions are therefore time and labour intensive for both health professionals and parents. Hastings and Johnson (2001) identified high levels of stress in parents conducting intensive home-based behavioural interventions for their children with ASD. Whilst intervention factors were not found to directly increase the risk of parent stress, conducting a home-based behavioural intervention did not lower parent stress and had minimal impact on parent health. Psychological factors including coping strategies, social support and parental efficacy beliefs were found to be associated with parent stress (Hastings and Johnson 2001). Group-based parent training interventions may be a more promising way to modify parent behaviour to achieve improvements in children's behaviour, skills and socialisation whilst also providing social support and coping strategies to additionally address parent health needs.

Manualised group-based parent training interventions, for example the 'Incredible Years' and Triple-P Parenting programmes, have been shown to effectively prevent and treat children's disruptive behaviour problems and conduct disorders (Leijten et al.

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2017; Morpeth et al. 2017), improve child psychological health, emotional and behavioural adjustment, parental psychosocial health and parent-child relationships (Barlow et al. 2014). The effectiveness of manualised parent training groups has been reported in the context of a public system of child and family support where the intervention targets parents of children with a broad range of behavioural needs (Barlow et al. 2014) including, but not specifically, children with disabilities. The interventions have not been specifically investigated for children with ASD and their parents.

In the UK, National Health Service (NHS) group-based parent training interventions are commonly provided to meet the needs of children with ASD and their parents, but interventions tend to be tailored to organisational and/or service level factors, e.g. commissioning contracts and healthcare professional skills and background, rather than follow a manualised intervention programme. Group-based parent training interventions for children with ASD in the UK context can be considered a complex intervention with a high degree of flexibility and tailoring of the intervention and many child and parent outcomes (Craig et al. 2008). The effectiveness of tailored and modified group-based parent training interventions is not known. To begin to explore the core processes and outcomes of group-based parent training interventions, key to determining intervention effectiveness, we conducted a literature review to explore the existing evidence for group-based parent training interventions specifically for children with ASD, in the context of complex interventions.

The specific aims of the review were to identify the following: *what* advice, support and training (*intervention ingredients*) is reported in group-based parent training interventions to support children with ASD and their parents to self-manage autism as a long-term condition; *how* group-based interventions might work to bring about change for children with ASD and their parents (*intervention processes*) and what the expected *outcomes* from such interventions may be. Identifying core processes and outcomes of group-based parent training interventions provides a starting place to evaluate the interventions currently delivered in practice.

## Methods

### Search Strategy

An initial literature search protocol was developed by KO and further refined by the authorship team. The protocol was implemented by a clinical librarian to search published literature for evidence related to group-based training interventions for parents of children with autism. Databases searched included EMBASE (1974–Feb 2016), Psychinfo (1806–Feb 2016) and Medline (1946–Feb 2016). No limits were applied to the search.

## Study Selection and Data Collection

Inclusion criteria were as follows:

*Participants:* Parents of children with a diagnosis of autism spectrum disorder aged 3–18 years

*Intervention:* Consists of a group of parents together

Psychoeducational element to the group identified.

Specified element of knowledge and transference of knowledge (formal and/or informal).

Delivered by or facilitated by a professional (health, education, social care)

*Comparison:* Individual 1:1 intervention, usual care, combined group and 1:1 intervention and no comparison

*Outcomes:* Parent health (physical, psychological, emotional) and or well-being, knowledge (parent/professional), attitude, emotional state, health behaviours (e.g. adherence to therapy, attendance), parenting behaviours, participation in life situations, activities, relationships, child health, child development

Conference abstracts and articles not published in English were excluded. The full search protocol can be requested from the authors.

The titles and abstracts of articles identified from the literature search were initially screened against the criteria (above) for inclusion by SA and NP. References of included articles were hand searched. Articles included from the initial screening were listed in alphabetical order of authors. The authors of this review were paired (e.g. SA and SL) and included articles were sequentially divided between the pairs for full text review. Each pair reviewed a proportion of included articles, following which the authorship team met together to agree on the final article inclusion. Articles were only included through a unanimous decision amongst the authorship team.

Data was extracted from included articles by each pair of reviewing authors. Intervention descriptions (i.e. ingredients and modes of delivery) were extracted using the Template for Intervention Description and Replication checklist (Hoffmann et al. 2014). A purpose made data extraction form was used to extract data related to study design, intervention outcomes and findings. Extracted data included: research question; aims; study design; methods; sample and participants; intervention descriptions; comparison interventions; outcomes; outcome measures and summary of results. Data was extracted verbatim directly from the included articles.

### Data Analysis

Due to small sample sizes and heterogeneity of studies included in our review, it was not possible to perform a statistical analysis. A qualitative analysis was undertaken by the authorship team who met as a group to discuss the data and to

develop and refine concepts, categories and themes from the data through an iterative process (Ritchie et al. 2013). Extracted data related to intervention processes and outcomes were collated, shared and discussed by the authorship team. Data representing similar concepts were mapped onto paper and grouped into categories. Categories were named to describe the collated data set e.g. the category ‘parenting’ described a group of concepts including parent competence, self-efficacy and confidence. Categories representing similar descriptions and concepts were linked to identify broader themes within the data, e.g. ‘management strategies’ linked the categories of parenting and parent behaviour. All categories and themes were agreed by the authorship team. Intervention descriptions were heterogeneous, sometimes lacked specificity and/or were poorly reported; therefore, narrative analysis of interventions is presented.

### Results

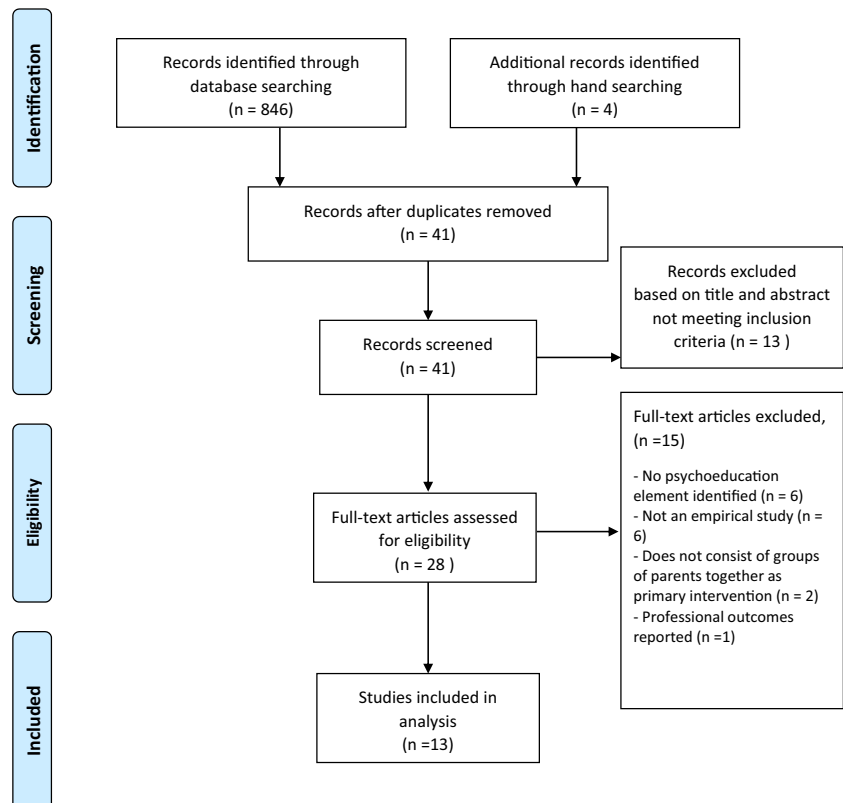
Forty-one articles were identified for inclusion from the initial literature search, of which 28 were divided between pairs of authors and included for full text review (see Fig. 1).

Following discussion between authors, 13 articles (see Table 1) unanimously met the inclusion criteria and were included for data extraction and analysis.

### Quality Assessment

The Scientific Merit Rating Scale (SMRS) (Green et al. 2009) was used to assess the quality of included studies. Authors KO and SL individually assessed each included study against the five critical dimensions for scientific rigour in the SMRS: research design; measurement of dependent variable; measurement of independent variable; participant ascertainment and generalisation. Both reviewing authors agreed on the final quality rating score. The 13 included articles represented 12 studies. Five studies were rated with a SMRS score of 1 suggesting insufficient rigour for conclusions to be drawn about treatment; six studies were rated with a SMRS score of 2 indicating that these studies provided initial evidence of treatment effects but further research is required; and two included articles reported results from one study (Tonge et al. 2006, 2014) which scored 3 on the SMRS, indicating sufficient scientific rigour (see Table 1). The highest quality rating score achieved by one study in our review was 3.1. This score is at the lowest end of the range of scores (3–5) representing scientific rigour using the SMRS. The overall quality of the included studies was therefore assessed as poor, both in terms of study design and methodology. Factors contributing to this assessment included the following: lack of a control group for comparison in eight (Clubb 2012; Cutress and Muncer 2014; Farmer and Reupert 2013; McAleese et al. 2014; Probst and Glen 2011; Reed et al. 2009; Roberts and

Fig. 1 PRISMA flow diagram



**Table 1** List of included studies

Study	Design	Sample size	Intervention	Comparison	Outcome(s)	Outcome measure(s)	Scientific Merit Rating Scale (SMRS) Score
Cuttress and Muncer (2014). Parents' views of the National Autistic Society's Early Bird Plus programme. Autism 18(6)	One group post-test questionnaire	120	The National Autistic Society (NAS) EarlyBird Plus Programme (EBPP)	None	Parent experiences of the EBPP	Post Programme Questionnaire (PPQ), developed by the National Autistic Society.	2
Farmer and Reupert (2013). Understanding autism and understanding my child with autism: An evaluation of a group parent education program in rural Australia. Australian Journal of Rural Health 21: 20–27	One group pre-test, post-test questionnaire	92	'Understanding autism and understanding my child with autism' (UA)	None	Parent 'understanding' Parent confidence Feelings of isolation Parental anxiety	Self-constructed questionnaire based on the aims of the 'Understanding Autism' intervention	1
Probst and Glen (2011). TEACCH-based interventions for families with children with autism spectrum disorders: outcomes of a parent group training study and a home-based child-parent training single case study. Life Span and Disability 2: 111–138	One group pre-test, post-test questionnaire	24	TEACCH-based	None	Parenting behaviours Parent health Family climate	Parental Evaluation of Training Effects on Daily Family Life Questionnaire (adapted from (Mattejat and Remschmidt 1998)) Home diary experience questionnaire	1
Clubb (2012). An evaluation of Earlybird Plus over 7 years: the benefits of parents and school staff being trained together: Good Autism Practice journal.	One group post-test questionnaire	129 'families' (number of individuals not reported) 48 school staff	EarlyBird and EarlyBird Plus Programme; National Autistic Society (NAS)	None	Unspecified	Parental post-intervention questionnaires (not specified)	1
Roberts and Pickering (2010). Parent training programme for autism spectrum disorder: An evaluation. Community Practitioner. 83 (10) 27–30	Service evaluation	8	Incredible Years	None	Parental mental health Child behaviour problems Child's social anxiety Child social communication profile Parent psychological well-being Quality of life	General Health Questionnaire GHQ-30 Eyberg Child Behaviour Inventory The Social Worries Questionnaire The Australian Scale Chinese Health Questionnaire-30	1
Shu and Lung (2005). The effect of support group on the mental health	Quasi-experimental pre-post control group design	8 (intervention group) 19 (control group)	Support group	Unspecified	Unspecified	Parent psychological well-being Quality of life	2

**Table 1** (continued)

Study	Design	Sample size	Intervention	Comparison	Outcome(s)	Outcome measure(s)	Scientific Merit Rating Scale (SMRS) Score
and quality of life for mothers with autistic children. <i>Journal of Intellectual disability research</i> . 49 (1) pp. 47–53						World Health Organization (WHO)—quality of life short form	
Sofronoff and Farbotko (2002). The effectiveness of parent management training to increase self-efficacy in parents of children with Asperger's syndrome. <i>Autism</i> . 6 (3) 271–286	Quasi-experimental pre-post control group design	89 (total) 33 (group-based training) 36 (individual training) 20 (control group)	Parent management training (PMT)	Wait-list control	Parent self-efficacy Child behaviour problems	Parental self-efficacy in the management of Asperger syndrome The Eyberg Child Behaviour Inventory (ECBI)	2
Hannah E. Reed, BA, Susan G. McGrew, MD, Kay Arribee, RN, MEd, Kyla Surdkya, MA, Suzanne E. Goldman, PhD, Kim Frank, MEd, Lily Wang, PhD, and Beth A. Malow, MD, MS Parent-Based Sleep Education Workshops in Autism <i>J Child Neurol</i> . 2009 August; 24(8): 936–945. <a href="https://doi.org/10.1177/088307380831348">https://doi.org/10.1177/088307380831348</a>	One group pre-test, post-test	25	Sleep education workshops	None	Children's sleep behaviour Sleep hygiene Parent developmental and behavioural concerns Children's behaviours Parent stress Children's sleep-wake patterns	Children's sleep habits Questionnaire Family inventory of sleep habits Parental concerns questionnaire Repetitive Behavior Scale—Revised Parenting Stress Index-short form actigraphy	2
Todd et al. (2010). Using group-based parent training interventions with parents of children with disabilities: a description of process, content and outcomes in clinical practice. <i>Child and adolescent mental health</i> . 15 (3) pp. 171–175	One group pre-test, post-test questionnaire	25	'Riding the Rapids: Living with Autism or Disability'	None	Parental anxiety and depression Child's behaviour and parental confidence to manage behaviours	Hospital Anxiety and Depression Scale (HADS) Behaviour Management Questionnaire (BMQ)	1
McAleese et al. (2014). Evaluating a psychoeducational, therapeutic group for parents of children with autism spectrum disorder. <i>Child</i>	Mixed methods	83	Psychoeducation groups	None	Parental understanding of ASD (presentation, associated difficulties, and	Pre-course and post-course evaluation questionnaire (Wright and Williams 2007)	2

Table 1 (continued)

Study	Design	Sample size	Intervention	Comparison	Outcome(s)	Outcome measure(s)	Scientific Merit Rating Scale (SMRS) Score
Care in Practice. 20 (2) 162–181					behavioural management		
Stuttard et al. (2014). Riding the Rapids: Living with autism or disability-an evaluation of a parenting support intervention for parents of disabled children. <i>Research in Developmental Disabilities</i> . 35 pp. 2371–2383	Pragmatic, non-randomised control trial	76 (total) 48 (intervention group) 28 (control group)	'Riding the Rapids: Living with Autism or Disability'	No intervention	Parent self-efficacy Children's problem behaviours Parent satisfaction with their role as a parent Parent self-efficacy	Eyberg Child Behaviour Inventory (ECBI) Parenting Sense of Competence Scale Parent-identified child behaviour goal	2
Tonge et al. (2006). Effects on parental mental health of an education and skills training program for parents of young children with autism: A randomised controlled trial. J.A.M.A.CAD.CHILD.ADOLESC. PSYCHIATRY. 45 (5)	Parallel-group control trial	105 (total) 35 (intervention) 35 (comparison) 35 (control)	Parent Education and Behaviour Management (PEBM)	Parent Education and Counselling (PEC) group No intervention group	Parental mental health Parental stress Family function Child psychopathology Child development	General Health Questionnaire (GHQ-28) Parenting Stress Thermometer McMaster Family Assessment Device (FAD) Developmental Behaviour Checklist (DBC) The Psychoeducational Profile—Revised	3
Tonge et al. (2014). A randomised group comparison controlled trial of pre-schoolers with autism: a parent education and skills training intervention for young children with autistic disorder. <i>Autism</i> 18 (2) pp. 166–177	Parallel-group randomised controlled trial	105 (total) 35 (Intervention) 35 (comparison) 35 (control)	Parent Education and Behaviour Management (PEBM) skill training	Parent Education and Counselling (PEAC) No intervention group	Child's daily functioning and skills Child behaviour and autism symptoms Childs cognitive development Childs language development	Vineland Adaptive Behavioural Scales (VABS) Developmental Behaviour Checklist (DBC) The Childhood Autism Rating Scale (CARS) Psychoeducational Profile—Revised (PEP-R) Reynell Developmental Language Scales III (RDLS III)	3



Pickering 2010; Todd et al. 2010) of the 13 (61%) studies; small sample sizes (range 8–129 participants) across all studies; lack of baseline measurement data in two of the studies (Clubb 2012; Cutress and Muncer 2014); and non-randomised samples in all but two of the studies (Tonge et al. 2006, 2014). A reliance on convenience sampling across studies presented a high risk of selection bias from participant self-selection. Six of the 13 articles (Clubb 2012; Cutress and Muncer 2014; Farmer and Reupert 2013; Probst and Glen 2011; Sofronoff and Farbotko 2002; Todd et al. 2010) (46%) reported idiosyncratic measurement tools to evaluate interventions presenting a risk of measurement bias. Reporting bias was also assessed as likely due to an overall reliance on parent self-report measures. From the 13 included articles, four articles representing three studies reported clinician-rated or direct observational measurement of outcomes. Clubb (2012) measured outcomes by conducting focus groups with healthcare professionals, Reed et al. (2009) reported observer-rated questionnaires and actigraphy to measure outcomes, and finally, Tonge et al. 2006, 2014 reported the use of clinician-rated questionnaire tools. Comparisons across study results were limited due to the heterogeneity of interventions, outcomes and outcome measures used and varied time points for follow-up measurements.

## Findings

The types of interventions offered to parents ranged from a simple parent support group (Shu and Lung 2005) to well-established interventions such as ‘EarlyBird’ (Clubb 2012; Cutress and Muncer 2014) and manualised interventions such as ‘TEACCH’ (Probst and Glen 2011) and ‘Incredible Years’ (Roberts and Pickering 2010). Interventions were implemented by a range of health and social care professionals including sleep specialists, paediatricians, nurse educators (Reed et al. 2009), psychiatric nurse specialists (Shu and Lung 2005) and clinical psychologists (Stuttard et al. 2014). Duration of training varied from a 1-day workshop (Sofronoff and Farbotko 2002) through to a 20-week course (Tonge et al. 2006). While the content of the interventions varied across studies, autism education and behaviour theory and management were a common intervention feature.

Four main categories were identified to represent intervention processes and outcomes: (1) parenting and parent behaviour; (2) parent health; (3) child behaviour; and (4) peer and social support.

### Parenting and Parent Behaviour

Five articles (Clubb 2012; Cutress and Muncer 2014; Farmer and Reupert 2013; McAleese et al. 2014; Todd et al. 2010) reported on parenting and parent behaviour. Parents in the Farmer and Reupert (2013), McAleese et al. (2014) and

Clubb (2012) articles reported improved ‘understanding’ of their child and the diagnosis of autism. Parent understanding emerged from access to information, shared experiences with other parents and the acquisition of knowledge including knowledge of the neurological, behavioural and practical aspects of autism (Farmer and Reupert 2013). Greater knowledge and understanding was described as leading to a sense of relief and acceptance for the parents. Parents in the McAleese et al. (2014) study reported improvements in practical knowledge related to the management techniques and strategies used to support children with ASD, for example the use of visual aids.

Parental self-efficacy was commonly reported across the articles (Farmer and Reupert 2013; McAleese et al. 2014; Sofronoff and Farbotko 2002; Stuttard et al. 2014; Todd et al. 2010). Stuttard et al. (2014) specifically measured parental self-efficacy pre- and post-intervention and reported clinically reliable improvements in parental self-efficacy for 47% ( $n = 16$ ) parents in the group-based parent training intervention. The change in scores on the parental self-efficacy measure did not, however, reach statistical significance (Stuttard et al. 2014). It is important to note that the results presented by Stuttard et al. (2014) do not exclusively represent parents of children with ASD but a much broader population including parents of children with other complex needs such as learning disability or co-morbid learning disability. Sofronoff and Farbotko (2002) also reported improved parental self-efficacy resulting from parent training, regardless of whether training was provided as a group-based intervention or individual sessions.

Clubb (2012) and Probst and Glen (2011) report improvements in parental skills following interventions. Clubb (2012) specifically reported improvements in parent observational and problem-solving skills. Parents reported applying frameworks shared in the training, for example STAR (Settings, Triggers, Actions, Results of behaviours), to challenging situations in daily life, to try and problem-solve solutions to help their child. From the Probst and Glen (2011) study, 86% ( $n = 20$ ) of parents reported improvement in skills as an outcome of the intervention and parents perceived themselves to be more effective in managing their child’s needs which, in turn, enhanced the child’s abilities and controlled problem behaviours.

### Parent Health

Seven articles (Clubb 2012; Farmer and Reupert 2013; Probst and Glen 2011; Roberts and Pickering 2010; Shu and Lung 2005; Todd et al. 2010; Tonge et al. 2006) reported parent health as an intervention outcome. In the Clubb (2012) and Probst and Glen (2011) studies, parent health was not clearly defined, and as such, information regarding specific changes in parental health beyond general ‘improvements’ was

limited. For example, Probst and Glen (2011) reported that 76% ( $n = 18$ ) of parents reported improved parent health as an outcome when defined only as physical and/or psychological health. Across the remaining studies, parent anxiety was a common measure of parent health. Both Tonge et al. (2006) and Roberts and Pickering (2010) measured parent anxiety and depression using the General Health Questionnaire and reported lower parental anxiety post-intervention. Tonge et al. (2006), however, noted that intervention effect was contingent on pre-test scores. Changes in anxiety and depression were chiefly seen in parents who were identified as having ‘pre-existing mental health problems’ and parents who did not report mental health problems prior to intervention did not show change. Conversely, Shu and Lung (2005) measured parental anxiety and depression using the Chinese version of the General Health Questionnaire (Chinese Health Questionnaire) and found no significant improvement in parents’ anxiety resulting from a parent support group intervention. Finally, Todd et al. (2010) measured parental anxiety using the Hospital Anxiety and Depression Scale and reported a reduction in scores (improvements) from means above the clinical cut-off to on or below the clinical cut-off.

### Child Behaviour

Five studies (Roberts and Pickering 2010; Sofronoff and Farbotko 2002; Stuttard et al. 2014; Todd et al. 2010; Tonge et al. 2014) reported child behaviour as an intervention outcome. Four studies (Roberts and Pickering 2010; Sofronoff and Farbotko 2002; Stuttard et al. 2014; Todd et al. 2010) focussed on problematic behaviours as a measure of child behaviour whilst one study measured children’s skills including communication, daily functioning and socialisation (Tonge et al. 2014).

Problematic behaviours were measured in three studies (Roberts and Pickering 2010; Sofronoff and Farbotko 2002; Stuttard et al. 2014) by the Eyberg Child Behaviour Inventory (ECBI) and by Todd et al. (2010) using an alternative service-specific measure. All four studies found a reduction in the frequency of children’s problematic behaviours post-intervention. When tested, the reduction in behaviours reached statistical significance immediately after intervention (Stuttard et al. 2014; Todd et al. 2010) and at 4 weeks and 3 months from the start of intervention (Sofronoff and Farbotko 2002). Sofronoff and Farbotko (2002) suggest that improvements in children’s behaviours found in their study were achieved through improving parents’ ability to cope, rather than by eliminating the behaviours directly, echoing a common theme across the studies that parental factors may be the mechanisms by which children’s outcomes can change.

Stuttard et al. (2014) also used individualised goal setting as a measure of children’s behaviour pre- and post-

intervention, with goal setting and progress towards achieving goals incorporated into the design and delivery of the parent training intervention. Mean ratings on progress towards a specific child behaviour goal significantly improved immediately after intervention and at 3- and 6-month follow-up.

Significant improvement in children’s socialisation skills were reported by Tonge et al. (2014) as an effect of both the experimental and comparison intervention compared to the control group. Communication skills improved for some children, but intervention effect was dependent on pre-test level of communication. Daily functioning improved for children but statistical significance was reached only for the comparison intervention group. Tonge et al. (2014) associated, anecdotally, children’s skills with parents’ skills, suggesting parents were more skilled in managing their child’s behaviour after intervention, thereby facilitating their child’s capacity to learn.

### Peer and Social Support

Five studies (Clubb 2012; Cutress and Muncer 2014; Farmer and Reupert 2013; Roberts and Pickering 2010; Todd et al. 2010) reported on peer and social support. Farmer and Reupert (2013) designed and delivered their parent training intervention to deliberately facilitate group processes and specifically target peer support and peer learning experiences. Parents were reported to feel less isolated as a result of the intervention. Parent feedback in the Cutress and Muncer (2014) and Clubb (2012) studies reported benefits from being with other parents in similar situations which were interpreted, by the authors, as improvements in the emotional well-being of parents. Parent emotional well-being was not, however, specifically measured or explored and so reliable data is not available to clarify improvements in parent health. Finally, parents in the study by Todd et al. (2010) reported benefits to being with other parents whose children had similar difficulties to their own but this finding was not explored or defined further.

Regardless of the significant limitations of the studies, it is reasonable to accept that a group-based parent training intervention results in some parents feeling less isolated and supported by being with other parents in a similar situation. However, adverse outcomes of peer and social support within group-based parent training interventions have not been considered or explored within the studies identified for review. Additionally, underlying theory or knowledge about the role of peer and social support in parenting practices for children with ASD or specific parental or child health outcomes would be beneficial to place this finding in the context of parent training as a healthcare intervention.



## Discussion

Our literature review focussed on group-based training interventions specifically for parents of children with autism spectrum disorder. Although most of the studies described, to varying degrees, the interventions delivered to parents, vast heterogeneity in the content and delivery of the interventions limits the implementation of the evidence in practice. Health outcomes and outcome measurement was also highly variable. For example, 22 different outcome measures were used across the 13 studies included in this review, to measure approximately 23 different outcomes. The use of clinician- or therapist-driven measures and direct observation to measure change was extremely limited. Overall quality of the included studies was assessed as poor which appears to be a common problem in this field of research where practice-based research dominates. The scope for researchers and clinicians to synthesise and combine data through more robust methods such as meta-analytic reviews to support evidence-based practice in this field is therefore limited by both quality and heterogeneity (Postorino et al. 2017).

The Medical Research Council (MRC) guidance for developing and evaluating complex interventions (Craig et al. 2008) can be drawn upon to build on the findings of this review and plan future research. Theoretical concepts about the mechanisms by which group-based parent training interventions might work, e.g. parental self-efficacy, are suggested and four categories represent potential intervention processes and outcomes: parenting and parent behaviour; parent health; child behaviour and peer and social support. The wider evidence base for interventions to support children with neurodisability more broadly supports the potential for factors such as parental self-efficacy to be a plausible mechanism for change (Armitage et al. 2016) within group-based parent training interventions. By drawing on this wider research field, some of the exploratory findings from our review such as intervention ingredients (e.g. providing information and social support), processes (e.g. knowledge and parental self-efficacy) and outcomes (e.g. parental anxiety) can be built upon in research and practice to develop a more substantive theory of group-based parent training interventions. Building firstly, an explicit theory of how group-based training interventions for parents of children with autism spectrum disorder may work and, secondly, an evidence-based intervention are necessary precursors to further investigations into the effectiveness of interventions through randomised controlled clinical trials. Exploratory qualitative research studies are recognised as essential in the early phases of intervention development (Craig et al. 2008) and our review suggests this may be a valuable next step. An in-depth qualitative study is recommended from our review to further explore with parents the processes and outcomes of parent training interventions that are suggested from our review findings. There is also a

need to capture the lived experiences of all parents invited to group-based training interventions, including parents who commence but do not complete intervention. Data related to attrition within the studies in our review was often missing but this may be important data to identify potential adverse consequences of the interventions and to develop interventions that are feasible and acceptable to parents.

Studies to systematically build an evidence-based, group-based parent training intervention for parents of children with autism spectrum disorder would also be beneficial. Within clinical practice, integrating techniques known to specifically target some of the intervention processes suggested from our review, into current group-based parent training interventions would be a practical starting point to build an evidence-based intervention and improve the quality of practice-based research. For example, specific techniques known to target parental self-efficacy, e.g. goal setting, coping skills and grading tasks (Michie et al. 2008) could be integrated into current interventions. The Stuttard et al. (2014) study in our review provides one example of the use of goal setting as both an intervention technique and outcome measure whilst Tonge et al. 2006, 2014 intervention provides an example of explicitly targeting parents' coping skills. Evidence from population-level group-based parent training interventions with known effectiveness for improving child outcomes, such as the 'Incredible Years' intervention can also be drawn upon to develop interventions specifically for parents of children with ASD but research will be required to transfer knowledge appropriately to the context of children with ASD.

Finally, future studies in this field require strong clinical and academic collaborations to improve the rigour of investigation and to capture more representative populations. To embed interventions within the clinical and financial context of healthcare systems such as the NHS, value-for-money and cost as well as clinical effectiveness of group-based parent training interventions will also need to be explored.

## Limitations

The subject headings and thesaurus mapped terms used within our literature review arose from our discussions of the complex issues around group-based parent training interventions. This limited our search strategy and review. Key terms of 'parent' and 'group training/therapy/education' and 'autism spectrum disorder' were combined to search the literature, resulting in a relatively small number of articles for initial screening (see Fig. 1). Our literature review, therefore, represents a narrow body of published evidence related to parent training interventions. Nevertheless, from the included articles, core processes and outcomes related to parent training interventions have been identified by systematic application of review methods to the available evidence and our findings

present plausible intervention mechanisms and outcomes for further study. Expanding the search terms of the review to achieve an exhaustive summary of the available literature would be beneficial to examine further and build upon the core themes identified in our study. Our study offers a unique perspective to parent training interventions by exploring the interventions within the context of the MRC framework for developing and evaluating complex interventions (Craig et al. 2008).

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**Authors' Contributions** KO, SL, JF and SA conceived the study. NP provided academic support throughout including research methodology, conceptual development and guidance on the research process. All six authors participated in study design, data collection and analysis for the study. KO and SA led manuscript development with SL, JF, and LM contributing results sections and NP overall comments and manuscript feedback. All authors read and approved the final manuscript.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** This article does not contain any studies with human participants performed by any of the authors.

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