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ORIGINAL PAPER

Prioritising Targets for School-Based ADHD Interventions: A Delphi Survey

Roisin Carlotta Perry[1] · **Tamsin Jane Ford**[2] · **Heather O'Mahen**[3] · **Abigail Emma Russell**[4]

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Abstract

Many studies have investigated the effectiveness of school-based ADHD interventions at modifying different social, emotional and behavioural target outcomes. However, there is a lack of evidence about which targets stakeholders perceive to be most important. This study sought to obtain consensus on which outcomes are perceived to be most important. A total of 114 people with ADHD, educational professionals, parents of children with ADHD, clinicians and researchers participated in a Delphi survey with 3 rounds. The importance of 52 intervention targets was rated on a scale from 0 to 8 (8 being extremely important). Consensus was reached if >70% of a stakeholder group rated a target as between 6–8 and <15% rated it as 0–2. Targets were dropped from subsequent rounds if more than 50% of stakeholder groups rated it as 0–5. Targets that all four stakeholder groups reached consensus on in any round were automatically included in our final outcome set. Comments were analysed using Thematic Analysis. All four stakeholder groups reached consensus on the importance of seven targets: ability to pay attention, conflict with teachers and peers, executive functioning, global functioning and quality of life, inattention symptoms, organisation skills and self-esteem. Four overarching themes were identified: *Complexity of ADHD, Relationships, School Context,* and *What ADHD means to me*. School-based ADHD interventions should target outcomes identified as most important to those who stand to benefit from such interventions. Some outcomes prioritised by our participants have not yet been targeted in school-based ADHD interventions. Implications of our findings for intervention and research design are discussed.

Keywords ADHD · School-based intervention · Delphi survey · Intervention outcomes

Introduction

Attention deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder that affects approximately 5% of children and adolescents globally (Sayal, Prasad, Daley, Ford, & Coghill, 2018). The core symptoms are impulsivity, hyperactivity and/or inattention (American Psychiatric Association, 2013). Young people who have ADHD face many challenges in school. The core symptoms make adapting to behavioural expectations and norms at school very difficult, often resulting in academic problems and peer exclusion (ADDISS, 2005; Mikami, 2010). Children with ADHD commonly have co-occurring problems such as anxiety, depression and learning disabilities: all predict further school impairment (Larson, Russ, Kahn, & Halfon, 2011; Taanila et al., 2014). These problems are associated with negative outcomes in adulthood for individuals with ADHD, including poor occupational outcomes and persistence of ADHD symptoms (Kuriyan et al., 2013).

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✉ Roisin Carlotta Perry
roisin.perry.19@ucl.ac.uk

Tamsin Jane Ford
tjf52@medschl.cam.ac.uk

Heather O'Mahen
H.OMahen@exeter.ac.uk

Abigail Emma Russell
A.E.Russell@exeter.ac.uk

[1] Centre for Educational Neuroscience, University College London, 20 Bedford Way, London WC1H 0AL, UK

[2] Department of Psychiatry, University of Cambridge, Cambridge, UK

[3] Mood Disorders Centre, University of Exeter, Exeter, UK

[4] Institute of Health Research, University of Exeter, Exeter, UK

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Pharmacological treatments such as methylphenidate are used to help children with ADHD manage symptoms in school (NICE, 2018). However, these are not always acceptable or tolerable and many parents and young people prefer behavioural and psychosocial interventions (Schatz et al., 2015). Medication is often taken inconsistently and consistent use declines over time (Charach & Fernandez, 2013), and immediate and long-term outcomes are still worse for medicated children than matched controls without ADHD (van der Oord, Prins, Oosterlaan, & Emmelkamp, 2012). Therefore, evidence-based interventions are necessary alternative to support children with ADHD in school.

A growing number of studies have trialled school-based interventions for ADHD, including the daily report card (DRC), where the child is set and awarded for achieving specific behavioural targets; academic interventions which focus on antecedents of problems; organisational skills training; and peer interventions such as social skills training (Chronis, Jones, & Raggi, 2006; Storer, Evans, & Langberg, 2014; Evans, Owens, Wymbs, & Ray, 2018). These strategies have been used to target a wide range of outcomes ranging from core symptoms to social skills with varying degrees of success (e.g. Bikic, Reichow, McCauley, Ibrahim, & Sukhodolsky, 2017; Moore et al., 2018). The number of outcomes studied makes it hard to compare findings across studies; however, there is evidence that multiple-component interventions show some evidence of effectiveness for core symptoms (Moore et al., 2018). Recent reviews have shown that specific components of interventions for ADHD in the school setting, such as self-regulation strategies, and 1:1 delivery, were effective for specific outcomes such as academic attainment (Moore et al., 2018). Another recent synthesis of evidence concluded contingency management strategies such as DRCs were the most promising (Fabiano & Pyle, 2019). There is also substantial variation in evidence strength for different interventions, from strong for organisational skills and behavioural training to questionable for physiological interventions (Evans et al., 2018).

When evaluating the effectiveness of school-based interventions, outcomes tend to be selected by researchers, one would hope with thorough consideration of the importance of these outcomes to individuals, and relevance to clinical improvement. However, the importance of incorporating views from other groups who have valuable insight into key targets for interventions is increasingly being recognised (e.g. Fiks et al., 2012; Fiks, Mayne, DeBartolo, Power, & Guevara, 2013). These individuals have additional insight into the real-world manifestation of behavioural problems in the context of interest, and an in-depth understanding of what impairs children with ADHD most from their experience (e.g. Hartman, Rhee, Willcutt, & Pennington, 2007).

For example, Fiks et al. (2012) investigated parents' goals for pharmacotherapy for ADHD in a primary care setting. They found their key goal to be academic achievement, which was valued higher than behavioural compliance. This shows that what might appear to be intuitive treatment goals (i.e., symptom reduction) are not as important to this group as targeting academic impairment. Thus, Fiks et al. stress "the importance of measuring goals to match families with evidence-based treatments most likely to achieve the outcomes they prioritize" (Fiks et al., 2012; p. 435). We concur and also acknowledge the importance of considering views of other key groups of stakeholders relevant to the school environment. Key groups in the context of our study are individuals who stand to benefit from ADHD interventions such as people with ADHD, parents, and those who work in schools These individuals are likely to have different perspectives and understanding of the school context and the outcomes that are most important within this setting than researchers.

Critically, Richardson et al. (2015) conducted a series of four systematic reviews synthesising existing evidence for non-pharmacological school-based interventions for ADHD. The authors compared and contrasted their review of 33 qualitative studies of child, parent, educator and peer attitudes and experiences of non-pharmacological interventions with their systematic reviews of intervention studies and of quantitative studies measuring attitudes towards interventions. They noted conflict between the strength of evidence suggesting that problem areas can be improved by school-based interventions, and individuals' perceptions of useful targets. For example, teachers in qualitative studies prioritised the importance of hyperactivity/impulsivity symptoms over inattention symptoms; however, in their systematic review of 54 controlled trials, Richardson et al. found that there was stronger evidence that the latter could be improved by school-based interventions. They also found that outcomes like emotional self-regulation, which have received little research attention, were considered important by children with ADHD.

Richardson et al.'s (2015) findings are currently the only evidence indicating which school-based intervention targets are most valued by key stakeholders. Identifying the behaviour targets most important to key stakeholders will increase the likelihood that interventions will be acceptable and implemented (Yardley, Morrison, Bradbury, & Muller, 2015). It will also help to direct future work developing school-based interventions for ADHD towards outcomes that are meaningful for children, parents and schools.

Given these discrepancies highlighted by Richardson et al. (2015), the aim of the present study was to gain consensus from a stakeholder community as to which problems they considered to be most important for targeting in a school-based intervention for ADHD. Existing and possible intervention targets were identified through a systematic literature search. We also aimed to gain a deeper understanding

of stakeholders' perceptions about targeting these behaviours in children with ADHD by collecting qualitative data. The findings from this study will inform the development of a "tool-kit" of behavioural strategies to aid school staff working with children with ADHD.

Method

Design

We used a Delphi survey with three rounds to establish consensus on which problem areas are important targets for a school-based intervention for ADHD. The Delphi survey is a technique designed to obtain consensual opinions from a panel of anonymous "experts"; individuals who are knowledgeable on, or experienced with, the subject of the survey (Hasson, Keeney, & McKenna, 2000). The technique involves multiple questionnaires, referred to as rounds. Summarised responses from each round are provided to participants and the nature of the current round is determined by the outcome of the previous round (Hasson et al., 2000). Highly reliable responses in Delphi surveys can be obtained from as few as 13 participants (Ludwig, 1997), but sample sizes vary considerably across studies (Hasson et al., 2000).

Recruitment and Participants

Participants were people with ADHD, educational professionals, parents of children with ADHD, and ADHD clinicians/researchers. We chose these stakeholder groups because they meet Hasson et al.'s (2000) definition of 'expert' as they are interested in and knowledgeable about the topic and they, or individuals like them, will be directly affected by outcomes of the survey. However, we refer to participants henceforth as a 'stakeholder community' in order to avoid confusion with terminology, as clinical and academic stakeholders may also be regarded as 'experts' in other contexts.

A non-probability convenience sample of individuals from these stakeholder groups from the United Kingdom was recruited through Facebook, Twitter and by contacting schools in Devon and Hertfordshire and the ADHD Foundation. We also reached out internationally to the European Network for Hyperkinetic Disorders, the American Professional Society of ADHD and Related Disorders, and to authors of systematic reviews on psychosocial interventions for ADHD: Bikic et al. (2017), Chronis et al. (2006), Daley et al. (2014; 2017), DuPaul and Eckert (1998), Evans et al. (2018), Pelham and Fabiano (2008), Pelham, Wheeler, and Chronis-Tuscano (1998) and Richardson et al. (2015). Our inclusion criteria were very broad; individuals just had to self-report belonging to one of our stakeholder groups of interest, provide consent and fully complete the survey for their responses to be eligible.

Fifty-one individuals participated in round 1, with 52 and 24 in rounds 2 and 3. Participant retention rates from rounds 1–2 and 2–3 were 16% and 17% respectively. Each participant was assigned to a single stakeholder group, with priority given to assigning as educational professionals and people with ADHD. Figure 1 shows the respondent types for each round, and Table 1 shows the mean age of respondents at the beginning of each survey round by group.

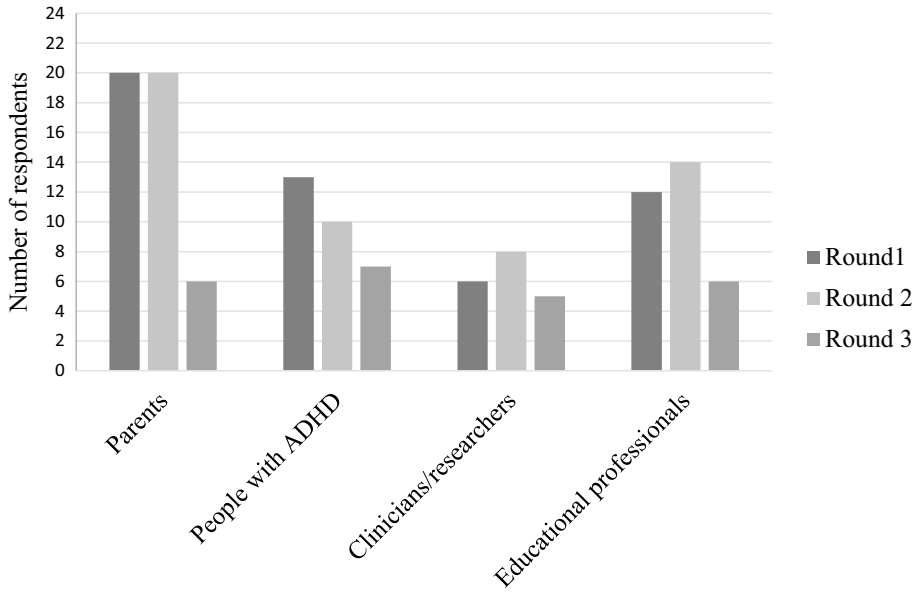


Fig. 1 Distribution of participants by stakeholder group in each round of the survey. Created in Microsoft Office

Table 1 Age of participants at the beginning of each round by group: mean (standard deviation)

	Round 1	Round 2	Round 3
Parents	42 years 2 months (7 years 0 month)	43 years 5 months (6 years 11 months)	43 years 3 months (5 years 7 months)
Adults with ADHD[a]	38 years 1 month (6 years 6 months)	35 years 6 months (6 years 10 months)	34 years 11 months (8 years 11 months)
Clinicians/researchers	37 years 5 months (12 years 1 month)	45 years 3 months (12 years 1 month)	40 years 0 month (9 years 10 months)
Educational professionals	44 years 4 months (10 years 0 month)	42 years 3 months (7 years 10 months)	42 years 3 months (9 years 10 months)

[a]We did not ask for ages of young people who completed the questionnaire with their parent, but their responses were included in our quantitative and qualitative summaries

Materials

Round 1

We conducted a literature search to identify previous intervention targets and outcomes in Medline, PsycINFO (via OVID) and Embase. Nine systematic reviews were identified (listed above). We extracted information on each intervention target reported. No relevant information could be extracted from Pelham et al.'s (1998) review. Thirty-six intervention targets were included in the survey (supplementary Table 1). On a descriptive level, some targets are similar, but were included as individual targets because they were operationalised differently. We created brief narrative syntheses of the extracted evidence for each intervention target and rated the strength of evidence from weak to strong. We classified this as strong evidence that targets were modifiable in school-based interventions if >50% of studies found evidence of improvement. We considered how many studies within reviews had included the outcome and the quality of these studies when assigning evidence strength. We additionally identified 16 unstudied ADHD-related problems experienced in schools suggested by Pfiffner and DuPaul (2018) and Richardson et al. (2015) (supplementary Table 2). Some of these were potential negative consequences of school-based interventions, for example unwanted attention. Because these had not been previously researched, we wanted to find out whether stakeholders deemed these important and worth measuring and capturing. Both unstudied problems and existing intervention targets are henceforth referred to as possible targets. We consider these together because we did not want to limit our questions to researcher-prioritised outcomes.

Questions took the format—*How important do you think x is for a school-based ADHD intervention to target?*—for the 52 possible targets. Definitions and examples were provided for targets where we thought participants may be unfamiliar with the terminology. Questions were accompanied by an indicator of evidence strength (weak/weak-moderate/moderate/moderate-strong/strong) and a sentence explaining this rating. Participants could access more detailed narrative syntheses of evidence if they chose (supplementary Table 3). Participants rated the importance of each intervention target on an 8-point Likert scale from 0 *(not at all important*) to 8 (*extremely important*) and had the opportunity to make comments to expand on their ratings and suggest missed targets (Fig. 2). We piloted this survey in early October 2018.

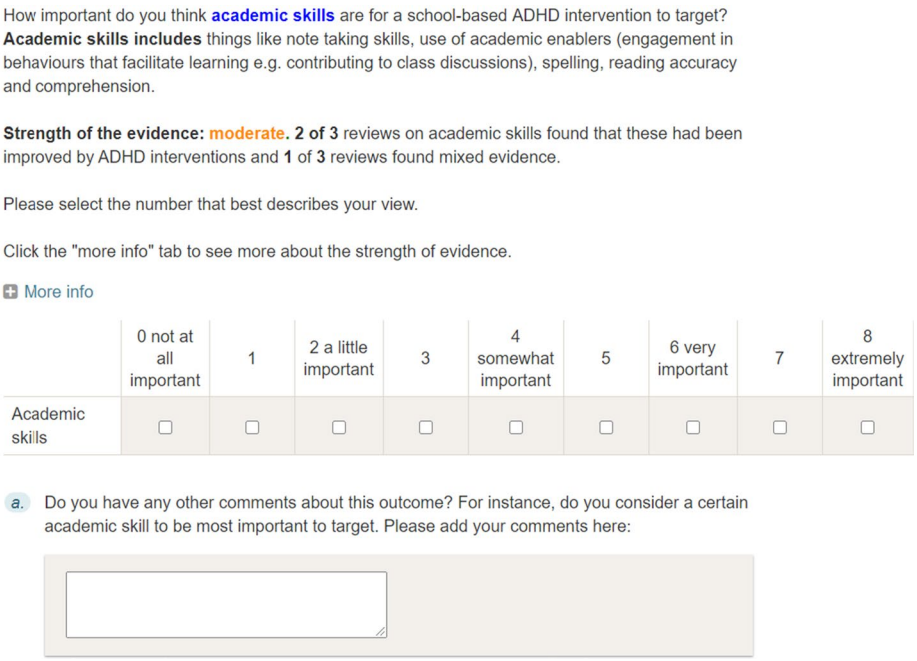
Round 2 and 3 Surveys

Question wording and the 8-point Likert scale for rating were the same as in round 1. All targets were defined and exemplified by the research team, based on definitions provided in the nine systematic reviews and other research literature, and accompanied by summaries of comments made by participants in the previous round, or the reason for inclusion in the current round. We did not include evidence strength indicators and narrative evidence summaries in these rounds, following participant feedback and consultation with colleagues. Participants could add free text comments following every question and at the end of the surveys. See Figs. 3 and 4 for examples of the question format in rounds 2 and 3.

Procedure

Participants completed the survey online (hosted by https://onlinesurveys.ac.uk/), with the three rounds taking place between October 2018 and June 2019. They provided informed consent and provided their date of birth to ensure that they were > 16 years old; younger people with ADHD could complete the survey with their parent/guardian. Participants received an electronic copy of the information sheet and consent form and indicated if they were happy to be contacted about future round(s).

Demographic information on background and stakeholder group was collected, categorised as: clinical psychologist, researcher, teacher, special educational needs coordinator, teaching assistant, other school staff, parent of person with


29. How important do you think **academic skills** are for a school-based ADHD intervention to target? **Academic skills includes** things like note taking skills, use of academic enablers (engagement in behaviours that facilitate learning e.g. contributing to class discussions), spelling, reading accuracy and comprehension.

Strength of the evidence: moderate. 2 of 3 reviews on academic skills found that these had been improved by ADHD interventions and **1** of **3** reviews found mixed evidence.

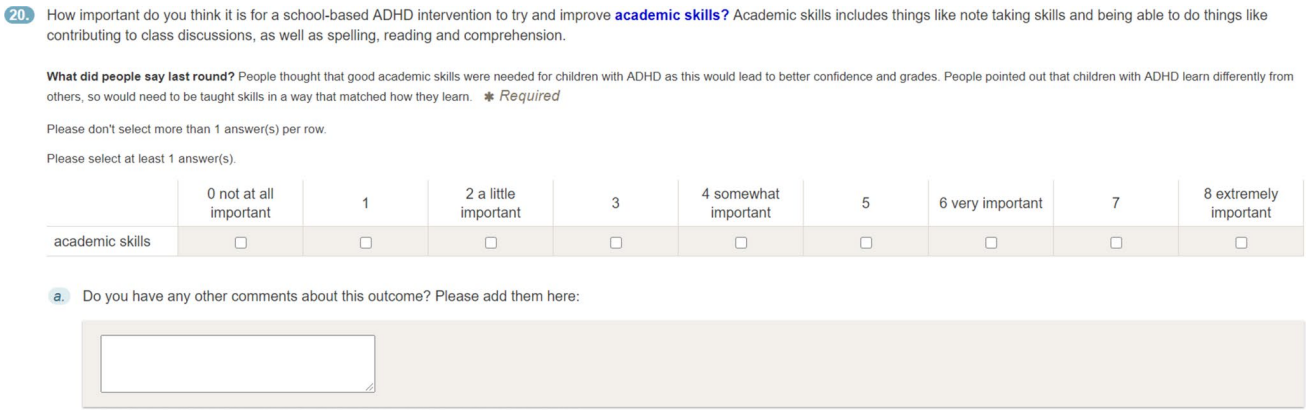
Please select the number that best describes your view.

Click the "more info" tab to see more about the strength of evidence.

More info

	0 not at all important	1	2 a little important	3	4 somewhat important	5	6 very important	7	8 extremely important
Academic skills	☐	☐	☐	☐	☐	☐	☐	☐	☐

a. Do you have any other comments about this outcome? For instance, do you consider a certain academic skill to be most important to target. Please add your comments here:


20. How important do you think it is for a school-based ADHD intervention to try and improve **academic skills?** Academic skills includes things like note taking skills and being able to do things like contributing to class discussions, as well as spelling, reading and comprehension.

What did people say last round? People thought that good academic skills were needed for children with ADHD as this would lead to better confidence and grades. People pointed out that children with ADHD learn differently from others, so would need to be taught skills in a way that matched how they learn. * *Required*

Please don't select more than 1 answer(s) per row.

Please select at least 1 answer(s).

	0 not at all important	1	2 a little important	3	4 somewhat important	5	6 very important	7	8 extremely important
academic skills	☐	☐	☐	☐	☐	☐	☐	☐	☐

a. Do you have any other comments about this outcome? Please add them here:

Fig. 2 Example question from round 1

Fig. 3 Example question from round 2

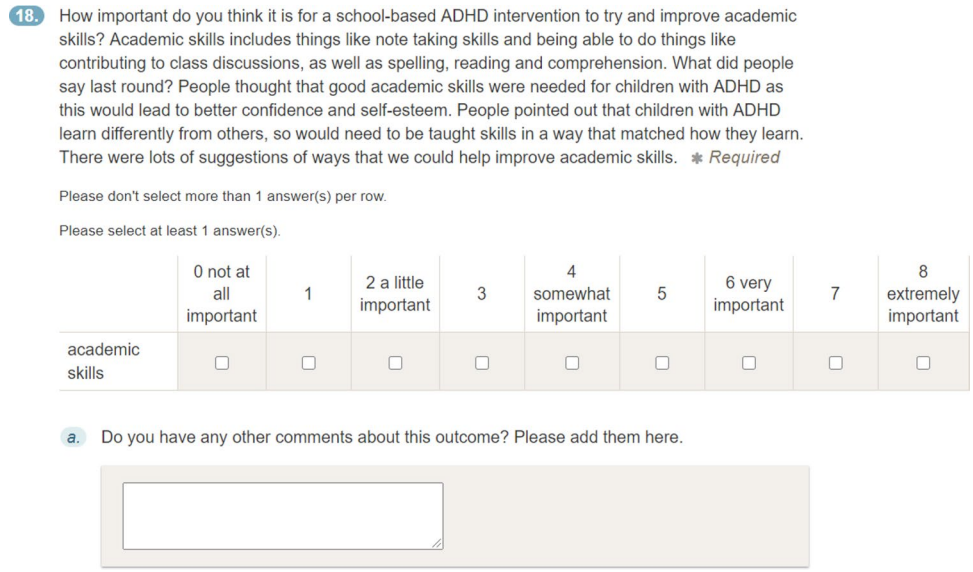
ADHD, parent and young person with ADHD (completing survey together), person with ADHD over 16, other. These were collapsed into four groups for analysis: people with ADHD, parents, school staff, and clinicians/researchers.

Analysis

Consensus and Determining Behaviour Targets for Future Rounds

Analyses were conducted on a group-by-group basis in SPSS (25). We applied the '70/15' rule (Williamson et al., 2012): where consensus was reached if more than 70% of individuals rated a target as between 6–8 and fewer than 15% rated it as 0–2 on the importance scale. Targets were dropped from subsequent rounds if >50% of stakeholder groups rated it 0–5. Targets that all four stakeholder groups reached consensus on were automatically included in our final outcome set. Intervention targets with consensus about their importance amongst at least one stakeholder group after round 1 or 2 were included in the next round.

Research suggests that children with ADHD behave quite differently at home and at school, with specific symptom triggers present in the classroom and playground, and that parents may underestimate school-based difficulties (Hartman et al., 2007; Gwernan-Jones et al., 2015; Sayal & Taylor, 2005). Hence, stakeholder groups were assigned crude weights based on their proximity to the school environment. People with ADHD and educational


18. How important do you think it is for a school-based ADHD intervention to try and improve academic skills? Academic skills includes things like note taking skills and being able to do things like contributing to class discussions, as well as spelling, reading and comprehension. What did people say last round? People thought that good academic skills were needed for children with ADHD as this would lead to better confidence and self-esteem. People pointed out that children with ADHD learn differently from others, so would need to be taught skills in a way that matched how they learn. There were lots of suggestions of ways that we could help improve academic skills. * Required

Please don't select more than 1 answer(s) per row.

Please select at least 1 answer(s).

	0 not at all important	1	2 a little important	3	4 somewhat important	5	6 very important	7	8 extremely important
academic skills	☐	☐	☐	☐	☐	☐	☐	☐	☐

a. Do you have any other comments about this outcome? Please add them here.

Fig. 4 Example question from round 3

professionals' views were prioritised and assigned a weight of 2; parents and clinicians/researchers were weighted as 1.

We considered different stakeholder groups' responses together, as a stakeholder community, because participant heterogeneity in Delphi groups is thought to provide higher quality information and solutions than homogenous groups (Boulkedid et al., 2011). This is important, as these results will inform the design of a tool-kit intervention. For each target, we summed the weights of stakeholder groups who had reached consensus and, from these, subtracted weights for groups who had reached drop criteria. Possible targets with a score of >3 were included in the subsequent round (example in supplementary material).

Qualitative Analysis

We conducted an inductive thematic analysis of the comments, following Braun and Clarke (2006). This flexible method is used to identify patterns of meaning within data and an established method for Delphi studies (Braun & Clarke, 2006; Linstone & Turoff, 1975).

RCP and AER familiarised themselves with the data by reading and re-reading comments, generating initial codes from round 1. NVivo software was used to aid analysis. After coding all comments, we derived overarching themes through exploring the content of codes. We re-coded all comments under this thematic framework, reviewing the themes throughout to ensure that they remained a good fit to the data. Comments from rounds 2 and 3 were largely consistent and coded under themes identified in round 1. Any comments that were not well captured by existing themes were reviewed, with subthemes and alternate themes added. Coding comparison queries were run to assess inter-rater reliability between RCP and AER's codes for each round, generating percentage agreement and Kappa coefficients.

Results

Survey Results

After round 1, all stakeholder groups reached consensus on two intervention targets: inattention and conflict with teachers/peers. 14 targets from round 1 were included in round 2. Participants suggested that hyperactivity and impulsivity should be considered separately and identified seven additional possible targets.

In round 2, all four groups reached consensus on: ability to pay attention, executive functioning and self-esteem. Seven potential targets were in round 3, and all stakeholder groups reached consensus on global functioning and organisational skills. Our final outcome set thus consisted of: ability to pay attention, conflict with teachers and peers, executive functioning, global functioning and quality of life, inattentive symptoms, organisation skills and self-esteem (Table 2).

For details of ratings within subgroups of stakeholders, see Table 3 and supplementary Tables 4–6.

Thematic Analysis

Inter-rater agreement for the third of the data double coded was very high in round 1 (98.32% agreement, $\kappa = 0.92$; Landis & Koch, 1977) and round 2 (95.62% agreement, kappa = 0.76), and fair in round 3 (89.12% agreement, kappa = 0.40). Thematic analysis identified four overarching themes; *Complexity of ADHD, Relationships, School context*

Table 2 Weighted scores for targets by round and their progression through the survey rounds

Possible intervention target	Weighted score round 1	Included in round 2	Weighted score round 2	Included in round 3	Weighted score round 3
Weak evidence strength					
ADHD symptoms	5	✓	1	X	
Assignment quality	− 4	X			
Inattention	6	X			
Internalising symptoms	5	✓	1	X	
Irritability	− 6	X			
Externalising symptoms	0	X			
Oppositional defiant disorder/conduct disorder symptoms	− 3	X			
Mood severity	− 3	X			
Neuropsychological functioning	− 2	X			
Parental ADHD symptoms	− 4	X			
Parental knowledge about ADHD	1	X			
Parental mental health	− 6	X			
Parental self-concept	− 6	X			
Parental stress	− 1	X			
Parent/carer–child interactions	− 1	X			
Parenting daily hassles	− 6	X			
Parent satisfaction with treatment	− 2	X			
Responsibility	− 2	X			
School adjustment	− 3	X			
Weak-moderate evidence strength					
Ability to pay attention	3	✓	6	X	
Discipline	− 3	X			
Moderate evidence strength					
Academic skills	4	✓	5	✓	5
Activity levels	0	X			
Executive functioning	4	✓	6	X	
General behaviour	2	X			
Hyperactivity and impulsivity (divided after R1)	5	✓	3	✓	0
			4	✓	4
Social functioning	3	✓	2	X	
Moderate-strong evidence strength					
Global functioning and quality of life	4	✓	4	✓	6
Strong evidence strength					
Academic functioning	2	X			
Classroom behaviour	5	✓	1	X	
Conduct problems	3	✓	1	X	
Organisation skills	5	✓	5	✓	6
Positive parenting	2	X			
Productivity	1	X			
Task engagement	4	✓	1	X	
Negative parenting	1	X			
Unstudied outcomes					
Aggravation of ADHD symptoms	0	X			
Alertness/tiredness periods			− 2	X	
Anxiety caused by symptoms			1	X	
Attitude towards school			1	X	
Avoidance	0	X			

Table 2 (continued)

Possible intervention target	Weighted score round 1	Included in round 2	Weighted score round 2	Included in round 3	Weighted score round 3
Bullying	0	X			
Burden on teachers	− 4	X			
Classmates perceiving treatment as unfair	− 6	X			
Conflict with teachers and peers	6	X			
Distraction	− 6	X			
Decrease in intrinsic motivation (R1)/motivation (R2)	3	✓	0	X	
Feeling singled out	4	✓	2	X	
Frustration, anger and disappointment	4	✓	5	✓	5
Missing out on other activities/learning	1	X			
Negative impact on classmate/classroom functioning	− 2	X			
Self-esteem			6	X	
Self-regulation			4	✓	5
Stigma	2	X			
Teacher stress and frustration	− 2	X			
Temporary increase in externalising behaviours	− 2	X			
Unwanted attention	− 3	X			

Table 3 Average number and percentage of outcomes consensus was reached on by round and group

	Round 1	Round 2	Round 3	Average % of outcomes consensus was reached on across rounds
Clinicians/researchers	7 (13%)	10 (45%)	2 (29%)	29
Parents	11 (21%)	20 (91%)	5 (71%)	61
People with ADHD	19 (37%)	6 (27%)	6 (86%)	50
Teachers	17 (33%)	12 (55%)	6 (86%)	58

Table 4 Themes and subthemes identified from thematic analysis of comments

Theme	Subthemes				
Complexity of ADHD	ADHD as different	Chains of inter-related and long-term problems	Ease of detecting and targeting problems	Strengths of children with ADHD	
Relationships	Awareness of ADHD and its impact on relationships	Impact of symptoms/related issues on relationships and vice versa	Significance of teacher–child interactions	School–home	
School context	Failures of the system	Prioritising inclusivity and understanding	School as the wrong setting	How schools could adapt	Classroom impacts
What ADHD means to me	Child's understanding about their ADHD-related problems	Perceptions of control			

and *What ADHD means to me,* each with 2–5 subthemes (Table 4, and defined further in supplementary Tables 7–10).

Complexity of ADHD

ADHD as Different A large proportion of comments highlighted that, although children with ADHD share a diagnostic label, they represent a highly heterogeneous group. Individual differences such as the child's age, gender, comorbid conditions and ADHD subtype could influence whether possible intervention targets were relevant as well as the effectiveness of interventions. Participants thought children with ADHD need alternative teaching methods and support, although considered it important to recognise the similari-

ties between children with and without ADHD in relation to some problems. They also stressed the importance of recognition that *all* children have areas of weakness.

Chains of Inter-related and Long-term Problems This was a prominent theme. These frequently involved anxiety, low self-esteem and impulsivity. Participants often expressed concern about the impact of the possible targets throughout life, particularly in relation to mental health. They perceived executive functioning as a core life skill that enables progression through school.

Ease of Detecting and Targeting Problems Participants recognised that the importance of targets does not necessarily correspond to the ease with which they can be measured; symptoms may be masked by medication, and internalising behaviours are particularly difficult to detect. There was scepticism amongst some about what a school-based intervention could realistically achieve.

Strengths of Children with ADHD Many comments were made about the strengths of children, particularly their creativity, which were not always recognised and prompted a desire for a strengths-based approach. Participants thought teachers may not recognise or acknowledge the achievements of children with ADHD because these seem minor when compared to the successes of their peers.

Relationships

Awareness of ADHD and its Impact on Relationships Teacher and peer awareness of a child's ADHD can impact on their relationships. In some participants' experiences, stigma was reported to cause difficulties forming and maintaining friendships. However, others thought that peers being aware of the child's label of ADHD would increase acceptance. There was a focus on the need to raise awareness about ADHD to improve inter-personal relationships, but a recognition from experience that awareness of the child's ADHD does not necessarily correspond to increased understanding.

Impact of Symptoms/Related Issues on Relationships and Vice-Versa Participants described how symptoms and related issues impact on relationship quality. For some, these relationship issues persisted into adulthood and resulted in loneliness and isolation. Equally, participants recognised that the opposite direction of influence occurs, with relationships sometimes influencing ADHD symptoms.

Significance of Teacher–Child Interactions Many comments related to teachers' interactions with children with ADHD. Participants said that a better understanding of ADHD would enable teachers to interact with children and manage problem behaviour more effectively. The importance of the child feeling valued and fairly treated by teaching staff was also stressed.

School–Home Participants noticed differences in children's behaviour between settings. Some had witnessed more problems at home and others in school. It was recognised that there can be an interaction between the two environments, and participants mentioned the importance of collaboration between parents/caregivers and teaching staff. Participants felt that different problems could be addressed in each setting.

School Context

Failures of the System Many people with ADHD and parents reported that they or their child had been failed by the school system, which they related to teacher workload and a lack of staff skilled working with children with ADHD. Parents discussed how schools sometimes use unhelpful strategies such as expulsion. They strongly felt the typical school structure is not suited to children with ADHD. Others reported that the one-size-fits-all approach taken in schools meant that fidget toys, perceived to be a useful outlet, were no longer allowed in the classroom.

Prioritising Inclusivity and Understanding Participants felt that social and academic inclusivity and understanding at a whole-school level were major issues needing addressing. In participants' experiences, inclusivity was closely tied to understanding. Linked to these two issues was a focus on reducing stigma.

School as the Wrong Setting It was suggested that external support might be required for some targets, while school-based interventions were perceived to be inappropriate for others. Alertness/tiredness was perceived to be the parent's responsibility to manage, and internalising symptoms were perceived to require psychologists. Participants nevertheless reported a need for all teachers to receive mental health training.

How Schools Could Adapt Participants suggested adaptations to the school context should be offered instead of, or before, interventions and believed practical or active learning opportunities would be beneficial. Common suggestions were often related to reinforcing learned behaviours and organisation. Some general strategies suggested included reducing sensory and peer distractions by considering room design and class size, and technological aids to help with organisation. Suggestions on how best to manage problem behaviour were frequently made, which was perceived to be a complex and largely context-dependent issue.

Classroom Impacts Participants commented on how the behaviour of children with ADHD can hinder academic accomplishment for their classmates, so targeting ADHD symptoms may benefit peers' outcomes.

What ADHD Means to Me

Child's Understanding About Their ADHD-Related Problems Participants explained that children with ADHD recognise that they are different from their peers but do not understand why. They suggested increasing the child's knowledge about ADHD to help them to recognise triggers and regulate their emotions and behaviours more effectively.

Perceptions of Control Some participants thought that hyperactive and impulsive behaviours were beyond the child's control. These resulted in individuals with ADHD feeling helpless to manage symptoms that led to frequent loneliness and punishment.

Discussion

This study sought to gain consensus on the relative importance of different school-based ADHD intervention targets from key stakeholders. Through consulting people with ADHD, parents of children with ADHD, teachers and ADHD clinicians/researchers, we identified six broad targets for a school-based intervention for ADHD; the ability to pay attention (and decreasing inattention), conflict with teachers/peers, executive functioning, global functioning and quality of life, organisation skills and self-esteem. The existence of so many possible target areas reiterates the many varied problems related to ADHD, which extend beyond the core symptoms. Thematic analysis of the comments made by participants provided useful context as to why these targets were important and add to our understanding of what it is like for a child with ADHD in school. Comments could be grouped under 4 overarching themes—*Complexity of ADHD, Relationships, School Context,* and *What ADHD means to me*—each with two to five subthemes. Our findings provide useful evidence of the key targets that school-based interventions for children with ADHD should focus on.

Our respondents prioritised targets that have been highlighted as significant problem domains in the wider literature. During the school years, inattention symptoms increase in prevalence amongst children with ADHD; at least 70% of school-aged children and adolescents with ADHD have the combined or inattentive subtype (Willcutt, 2012). Likewise, organisational difficulties escalate during the school years, as expectations and workloads increase (Langberg et al., 2011; Booster, DuPaul, Eiraldi, & Power, 2012). Also, large-scale studies of children with ADHD have shown that 89% are impaired in at least one domain of executive functioning and nearly half experience pathologically low self-esteem (Kofler et al., 2019; Mazzone et al., 2013). Systematic reviews have shown that ADHD has a substantial deleterious impact on quality of life (Danckaerts et al., 2010) and that conflictual child–teacher relationships are significantly associated with ADHD (Ewe, 2019). Similarly, studies have consistently shown that peer relationships of children with ADHD are characterised by high levels of conflict relative to typical friendships (Normand et al., 2011; 2013; 2019). Our findings about stakeholders' intervention priorities and the wider literature on prevalence of these problem areas converge to demonstrate the importance of targeting inattention, conflict with teachers/peers, executive functioning, global functioning and quality of life, organisation skills and self-esteem in school-based interventions.

In line with our findings, the importance of supporting the needs of children with ADHD beyond the expression of their core symptoms in schools is widely recognised (e.g. Buitelaar & Medori, 2010; Fiks et al., 2012; Wong et al., 2019). The impairment caused by core symptoms manifests in a number of ways, resulting in the majority of children with ADHD being more likely to struggle socially and academically than their typically developing peers (e.g. Larson et al., 2011; Taanila et al., 2014). Moreover, children with ADHD are six times more likely to have a mental health or other co-occurring neurological disorders (Larson et al., 2011). Comorbidities and manifestations of core symptoms can have greater implications for the child's life outcomes than core symptoms themselves (Gillberg et al., 2004). This may explain why half of the intervention targets prioritised by stakeholders were not related to the core symptoms of ADHD.

However, like Richardson et al. (2015), we found some inconsistency between the perceived importance of intervention targets and evidence of their tractability through intervention. This was especially true for targets less directly related to the core symptoms of ADHD. For instance, the strongest current evidence is for improving organisational skills, but conflict with teachers/peers has not been targeted by existing interventions, and only a few studies measured self-esteem or global functioning. This is concerning, as many students with ADHD experience problems in these areas and key groups of stakeholders all deem these to be highly important. Research into strategies that support children (and teachers) to develop the skills to manage these problems is clearly needed. We now discuss the limited evidence for interventions impacting on these outcomes and implications for future intervention design based on these findings.

Tan and Cheung (2008) suggest collaborative computer work to improve self-esteem amongst children in school. They cite a number of studies showing that this benefits

self-esteem, though do not provide evidence specifically related to children with ADHD. Participants in our study felt that technology would be a useful way to improve problem areas because *"Kids love technology"*. Computerised group-based work is a promising candidate strategy to improve self-esteem in children with ADHD which warrants further investigation.

A study by Watabe, Stewart, Owens, Andrews, and Griffeth (2013) further suggests that novel interventions for self-esteem are warranted. In their study, a well-established ADHD intervention, the DRC, showed disappointing effects on self-esteem. They found that teacher reported self-esteem in children with ADHD was lower following a school-based mental health programme that used the DRC and teacher behavioural consultation sessions. However, this change was non-significant and parent ratings showed a slight, but non-significant, improvement in self-esteem which was smaller in magnitude. Since Watabe et al.'s study is one of the only studies that has assessed self-esteem as an intervention outcome and found inconsistent and small effects, it is important to study it as an intervention outcome further. Their findings also highlight the need to actively search for adverse effects of psychological and social interventions, as well as the balancing of positive and negative impacts.

Studies have shown that poor inhibitory control, is associated with peer–child and teacher–child conflict (Acar, Rudasill, Molfese, Torquati, & Prokasky, 2015; Berry, 2012), and such deficits are common amongst children with ADHD (Ramos-Galarza & Pérez-Salas, 2017). These findings suggest that improving inhibitory control may enable improvements in school conflicts. Moreover, a study by Mautone et al. (2012) showed that an intervention for strengthening school–home relationships and parental involvement in education was associated with a greater improvement in child–teacher relationships than an intervention requiring less parental involvement. Similarly, Mikami, Jack, Emeh, and Stephens (2010) found that parents of children with ADHD can play a significant positive role in child–peer relationships via facilitation of social interactions and socialising with other parents. Mikami and Mercer (2017) also suggest that teachers highlighting the strengths of children with ADHD can promote positive peer-peer interaction. Future interventions should focus on targeting such mediators of school conflict.

Our consensus findings are novel, and the themes identified from our thematic analysis are largely consistent with the literature, suggesting the views of our participants are a reasonable representation of wider perceptions of ADHD. Baric, Hellberg, Kjellberg, and Hemmingsson (2016) found that academic, social and emotional difficulties influence learning in children with ADHD, and studies have identified creativity as a key strength associated with ADHD (Mahdi et al., 2017; Schrevel, Dedding, van Aken, & Broerse, 2016). Like our participants, teachers in Moore, Russell, Arnell, and Ford's (2017) study reported beliefs that positive teacher–child relationships and advocacy for the child are greatly beneficial for the child's outcomes. The bidirectional link between relationships and ADHD-related problems has also been acknowledged (Shea & Wiener, 2003), as has the importance of good school–home relationships (that are uncommon) (Gwernan-Jones et al., 2015).

In contrast with our findings, Moore et al.'s participants experienced labelling of ADHD negatively due to stigma, while our participants viewed awareness or labelling of ADHD in a positive light, if coupled with understanding. Gwernan-Jones et al. (2015) identified that many parents' expectations of school provisions had been breached. This is mirrored by our *Failures of the system* subtheme.

Like us, Schrevel et al. (2016) found that people with ADHD feel that they cannot control their thoughts and emotions. However, in contrast to our *Child's understanding about their ADHD-related problems* subtheme, people with ADHD in their study reported that they understood how to behave in socially acceptable ways. This could be due to a discrepancy between understanding and the ability to act and behave appropriately in line with this understanding due to ADHD, or due to the different age groups studied by us and Schrevel et al.

Strengths and Limitations

Our study included representation from four key groups of stakeholders recruited from across the UK, Europe and the USA as well as a potentially global audience via social media. There is no standard panel size for Delphi surveys, but we recruited to our target sample size akin to other similar surveys (Bishop, Snowling, Thompson, Greenhalgh, & CATALISE consortium, 2016; Ghanouni et al., 2019). Ludwig (1997) reported that highly reliable responses can be obtained from a Delphi survey with as few as 13 participants.

Nevertheless, there was significant attrition from our study, a common problem in larger electronic Delphi surveys due to response fatigue (Helms, Gardner, & McInnes, 2017). Hall, Smith, Heffernan, Fackrell, and Core Outcome Measures in Tinnitus International Delphi (COMiT'ID) Research Steering Group (2018) report that participant retention in recent international online Delphi surveys ranges from 19.5 to 81.1%, so our attrition rates are comparatively high. To counter this problem, we recruited additional stakeholders for rounds 2 and 3 as we wanted to maintain a large sample with representation from the groups comprising our stakeholder community. Hence, in the final round of the survey our sample size was comparatively large (see Hall et al., 2018). The resulting changing composition of stakeholders across rounds may have affected the outcomes of this survey. However,

our qualitative data revealed that many of our participants agreed with the outcomes from previous rounds, suggesting that limited participant retention may not have influenced findings too greatly.

A further element of our design that changed between rounds and may have influenced responses is the inclusion of evidence strength ratings in round 1 and omission from further rounds. It is difficult to ascertain what impact the continued inclusion of these indicators would have had. However, that two outcomes that progressed to round 2 of the survey had weak evidence strength and three had never been studied before suggests that respondents were not solely prioritising based on the weight of the evidence. We also provided explanatory descriptions of some of the targets. Feedback from round 1 indicated that we had not provided enough explanation for non-professional participants, so we expanded our descriptions to every target in the second and third rounds. Although it is possible that these may bias ratings, we considered it critically important that our stakeholders, many of whom would have traits of ADHD, would be able to understand the concepts of the targets that we were asking them to rate. We used widely accepted definitions reported by systematic reviews or other academic literature, described in a way that would be accessible to those with lower literacy levels.

We decided upon our weighting strategy a-priori, expecting that we would get more representation of school-aged individuals with ADHD, or those who had recently left school. However, most of our participants with ADHD were adults. It could be considered that the views of adults with ADHD may be less representative of the current experiences of children/young people with ADHD in the educational environment than parents of children currently in school. However, adults with ADHD each had highly relevant personal experience of being a young person with ADHD in school, and many of the problems they experienced or consider important to intervene on are likely to continue to impact on current students with ADHD. As parents are often heavily involved in their child's schooling, we considered them key stakeholders, but given that they do not have the direct proximal experience of ADHD and the school environment that teachers and people with ADHD do, they were weighted lower than these groups.

In addition, there was limited engagement from clinicians and researchers across rounds so their viewpoints may be less well represented by our survey findings than those of parents and people with ADHD, for whom a school-based intervention will have arguably a greater impact. Another potential weakness of our study is missing potential behaviour targets, although we conducted a comprehensive review of literature and sought additional suggestions from participants.

Conclusions

In conclusion, we have captured a comprehensive account of stakeholders' opinions about the importance of different school-based ADHD intervention targets. We identified highly important targets through a series of three Delphi surveys. Many of these have been under-researched and currently lack strong evidence that they can be improved by existing interventions, highlighting the need for further research and intervention design. Thematic analysis of comments supplemented these findings by justifying participants' opinions about the different targets, and revealed themes largely consistent with previous qualitative research about the school experience for young people with ADHD. These findings form a solid foundation on core outcomes to focus on when developing school-based interventions to support children with ADHD and the practitioners who work with them in the school setting.

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Availability of Data and Material Data are available in an online repository.

Code Availability Not applicable.

Compliance with Ethical Standards

Conflict of interest The authors have declared that they have no competing or potential conflicts of interest.

Ethics Approval Ethical approval was granted by University of Exeter Medical School Research Ethics Committee (Sept18/D/179) and University of Exeter Psychology Ethics Committee (eCLESPsy000920 v2.1).

Consent to Participate Participants consented to participating in this study by answering yes to the following statements: "I confirm that I have read the information sheet dated [September 2018] version no [3] for the above project. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily." "I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my legal rights being affected."

Consent for Publication Participants consented to their anonymised answered being published by answering yes to the following statement: "I understand that my anonymous data will be used in research reports and other documents reporting the conduct and results of this study".

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