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ARTICLE

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The suitability and acceptability of a co-designed prototype psychoeducational activity book for seven- to eleven-year-olds with ADHD

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ABSTRACT

Young people with Attention Deficit Hyperactivity Disorder (ADHD) can benefit from psychoeducation interventions. Co-design of these interventions increases engagement and impact. However, there are very few age-appropriate co-designed psychoeducational resources for young people with ADHD. Therefore an activity book prototype ('ADHD Hero Activity Book') was co-designed to teach 7–11-year-olds with ADHD about their condition and how to manage it more effectively. This paper describes the initial evaluation of this prototype. Nine parents and eleven children took part across nine online workshops and one phone call. The suitability and acceptability of the activity book prototype was explored, and areas of improvement identified. Sketch notes were taken for respondent validity and engagement purposes. Thematic analysis identified six themes: (1) Visual information; (2) Topic interest and engagement; (3) Importance of relatable content; (4) Importance of activity book interaction and age-appropriate content; (5) Positive aspects of ADHD and (6) The activity book as a communication aid. Improvement suggestions were also provided. Results indicate the activity book is suitable, acceptable and can act as a communication aid between young people and families. Future research may consider the development of versions of the activity book for adolescents with ADHD and young people with Autism Spectrum Disorder.

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Introduction

Neurodevelopmental disorders involve disabilities in the functioning of the brain and can affect behaviour, memory or the ability to learn (World Health Organization 2011). It is estimated that around 3–4% of children in England have a neurodevelopmental impairment (Emerson 2012) and the most common of these are Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) with ASD affecting around 1% of children (Mandell 2009) and ADHD affecting around 3.4% of school aged children (Polanczyk et al. 2015) and is characterized by three core symptoms: inappropriate levels of inattention, hyperactivity and impulsivity. Young people with ADHD are also more likely to be from socially deprived backgrounds and have ADHD related difficulties such as executive (Castellanos and Tannock 2002) and emotional dysfunction (Anastopoulos et al. 2011), academic underachievement (DuPaul, Weyandt, and Janusis 2011) and poor social relationships and functioning (Wehmeier, Schacht, and Barkley 2010). Deficits in social communication skills (Bignell and Cain 2007) can underlie strained familial (Willis et al. 2019) and peer relationships (Hoza et al. 2005). Young people with ADHD often experience low levels of self-esteem, which have also been reported to lead to symptoms of severe depression (Kita and Inoue 2017) and lower quality of life (Wehmeier, Schacht, and Barkley 2010). These difficulties can often persist into adulthood (NICE 2018).

In the UK, people with long term conditions are reported to spend around 1% of their time with a clinician (Eaton, Roberts, and Turner 2015) leaving around 99% of the remaining time to manage their condition independently or with support from others. Therefore, efforts have been made to intervene and support this population to manage their condition through psychoeducation (Powell, Parker, and Harpin 2017). Psychoeducation is defined as something that teaches an individual about their condition by providing support, information and management skills (Bai et al. 2015) and has been associated with patient empowerment and improved treatment adherence (Bäuml et al. 2006). When designing a psychoeducational resource, it is important to find out how it should be delivered, through what medium and what content it should include. Therefore, it is important to co-design such resources to increase the likelihood of it leading to impact (Greenhalgh et al. 2016).

Evidence suggests that psychoeducational interventions for young people with ADHD may be beneficial and improve knowledge and attitudes towards the condition and correct misconceptions (Nussey, Pistrang, and Murphy 2013). These include behavioural parent interventions (Fabiano et al. 2009), classroom-based interventions addressing behavioural strategies (Tarver, Daley, and Sayal 2014) focussing on academic performance (DuPaul, Weyandt, and Janusis 2011), as well as interventions aimed directly at the

young person, such as psychological therapies involving social skills training, anger management and problem solving (Tarver, Daley, and Sayal 2014). Additionally, randomized control trial evidence suggests that psychoeducation interventions with families of young people with ADHD can help reduce ADHD symptoms (Ferrin et al. 2020) and help the young person understand their condition and the treatment they receive, thus increasing ownership of the treatment (Willis et al. 2019).

Psychoeducation is also recommended in clinical guidelines worldwide including the UK National Institute for Health and Care Excellence (NICE), Canadian and Spanish clinical guidelines recommend psychoeducation for parents of young people with ADHD and age-appropriate information for the young person that is tailored to their individual needs (NICE 2018).

Despite existing evidence, there is little age-appropriate information or interventions that are accessible and available for young people with ADHD (Powell et al. 2021). It is also important to involve young people and families in the co-design such information (Sanders and Stappers 2008) as co-designed interventions are more likely to be accepted and lead to impact (Greenhalgh et al. 2016), and very little co-designed materials for this population exists. It has been demonstrated that once young people's preferences are accounted for, co-design with children and young people (CAYP) with ADHD is possible (Fekete and Lucero 2019; Powell, Wheeler, and Parker 2020). However previous attempts to undertake co-design activities with CAYP with ADHD, unlike the present study, did not involve intervention development.

The ADHD hero activity book

Young people with ADHD (end users) and key stakeholders co-designed an '*ADHD Hero Activity Book*' for young people with ADHD aged between seven to eleven years. Stakeholders included families, education professionals, local charities and specialist clinicians. The aim of the activity book is to help the young person understand their condition and manage it more effectively.

The co-design process of the activity book prototype has been documented in previous work (Powell, Wheeler, and Parker 2020). Whilst the detail of previous co-design activities is not the focus of the present paper, a brief summary is provided below.

The co-design process involved public engagement events, workshops and communications with end users and key stakeholders. These activities established psychoeducation as a clinical need of the population, the form a product should take (activity book, inspired by children's activity magazines), what it should look like and what the content should be (Powell, Wheeler, and Parker 2020). This work led to the first prototype of the activity book.

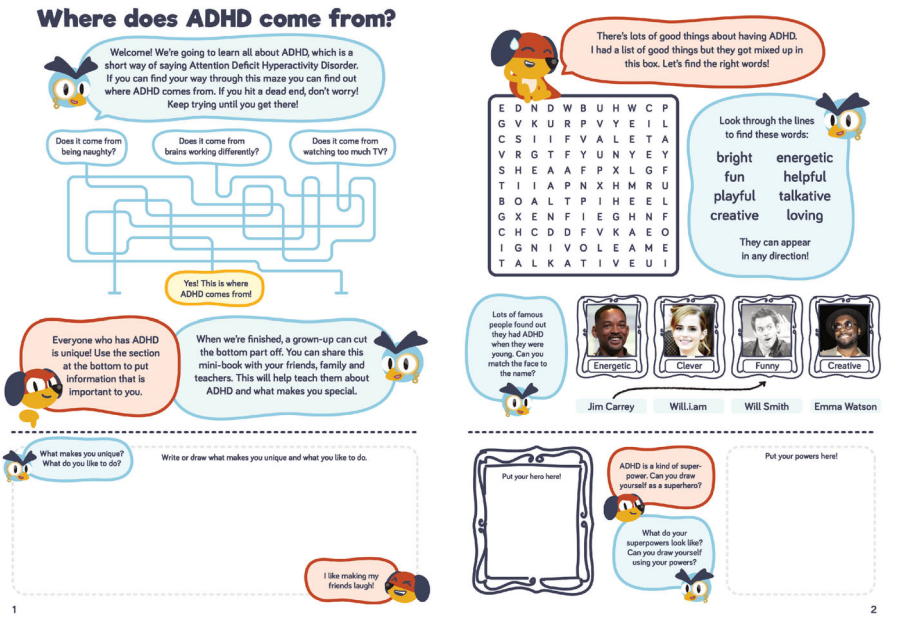

Figure 1. Illustration of the maze, word search and celebrity activities. Young people were able to record what makes them unique and things they are good at in the bottom third of the activity book.

Topics covered in the activity book prototype include where ADHD comes from, how it affects the child, medication, ADHD management, helping friends understand ADHD and addressing difficulties at school.

Examples of included activities, the layout and characters used throughout the book can be found in Figures 1–4. The activity book prototype was designed so that the top two thirds of each page gave general information about ADHD and the lower third provided space for the child to use to describe *their* experience of ADHD, making it more personal to them. This lower third could be cut away to make a separate booklet for the young person to use in conversation with family, friends, teachers, and so on.

The present study aimed to evaluate the previously co-designed activity book prototype and explore if it is suitable for and accepted by primary aged young people with ADHD, and to determine what improvements are required to increase its suitability and acceptability.

Methodological approach

An interpretivist qualitative research approach (Pope and Mays 2006) was adopted whereby open questions were asked during a series of workshops held over Zoom or the phone (see details below). The adapted Diversity for Design (D4D) Framework was adhered to as in previous development work (Fekete and Lucero 2019; Powell, Wheeler, and Parker 2020) to consider the

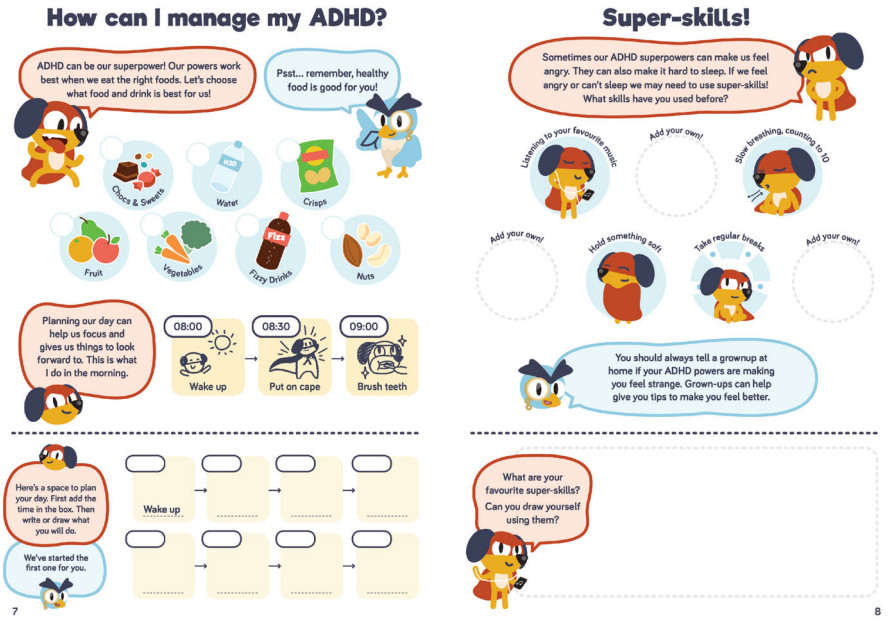

Figure 2. Illustration of how managing ADHD has been approached in the activity book. Young people are able to record their own routine and ways they like to manage their ADHD in the bottom third.

Figure 3. The true or false quiz at the end of the activity book to test the young person's knowledge of ADHD followed by the checklist of what they have learned and the certificate of completion.

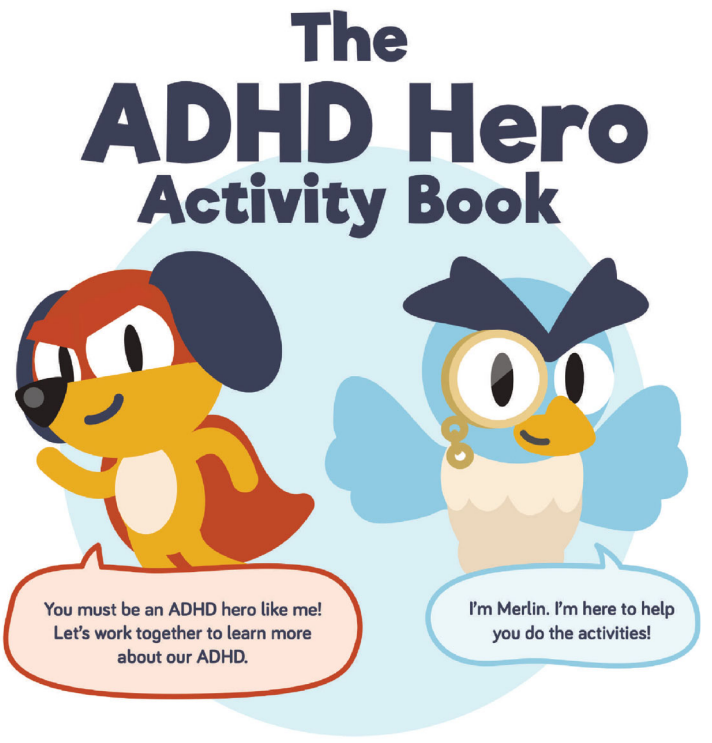

Figure 4. The characters that feature throughout the activity book.

needs and challenges faced by the population. This has proven useful in previous work related to this project. This simply involved considerations during the workshops such as the young person being in a quiet and familiar environment, explaining what the workshops will involve, starting with a task the child is interested in, implementing regular breaks and reward as well as short focussed and achievable tasks.

Methods

Participants and recruitment

To recruit CAYP with ADHD and their parents/carers, convenience sampling was adopted. Parents were recruited via a database of families who have expressed an interest of being contacted by the research team about ADHD related research. Participants were recruited until data saturation was achieved (Saunders et al. 2018). Eligibility criteria for the study was parents of young people with ADHD and primary aged (seven to eleven years) young people with a diagnosis of ADHD. The parents were also required to provide details on the ADHD medication the child is prescribed, if applicable.

Procedures

This study gained ethical approval from [author 2's host] University's ethical procedure (Reference: ER27355867). Due to Covid-19 restrictions, data collection was carried out remotely using Zoom software or a phone call to discuss the ADHD activity book prototype. Participant information sheets, instructions on how to use Zoom and two copies of the activity book prototype were posted to participants prior to the arranged Zoom/phone call. Participants were emailed a web link to provide written parental consent, consent (parents) and assent (young people) before the Zoom call. Author 1 went through the consent form with Zoom/phone call attendees before workshops commenced to ensure everybody understood the purpose of the research and that any questions were answered.

The Zoom/phone call involved one family at a time and firstly involved introducing the staff on the call; author [1] (project lead, note taking); author [2] (designer researcher, delivering the workshop); and author [3] (graphic designer, live drawing the topics discussed as 'sketch notes'). If siblings were diagnosed with ADHD, they were invited to the same Zoom/phone call. It was explained that the 'chat' function will be used to issue a star emoji for every good contribution made by the young person as a form of immediate reward. It was explained that these stars will be added up at the end of the call and will result in a treat (£10 Amazon gift voucher). Demographic information was then taken (Table 1).

[Author 2] started with a 'Zoom-ing' game to practice the reward mechanic described above. In the game, they shared their screen to show an image zoomed in too close to recognize (i.e., a dog), then slowly zoomed out until the child could guess what the image was to gain a star emoji. This process was repeated for calls involving siblings with an emphasis on turn taking. Author [3] also asked siblings for their favourite colour to enable differentiation in the sketch notes. Author [2] then commenced the workshop that comprised of a series of open questions about their thoughts and opinions, adjusting question pace based on engagement levels. Examples of questions included 'what is your overall opinion of the Activity Book?; 'What is your favourite thing about the Activity Book?; 'Would you change anything about it, if so, what would you change?' etc. Halfway through the call, [Author 3] shared the sketch notes they had taken based on the conversation so far for response validity purposes.

Each workshop took a maximum of 60 minutes with breaks. At the end of the workshops, [Author 3] shared the sketch notes, [Author 1] added up the star emojis, issued the digital Amazon voucher and emailed a scan of the sketch notes to the parents.

Table 1. Demographic information of participants.

Unique ID	Gender young person	Child age (years)	Adult attending	When child diagnosed with ADHD	Other diagnosis?	ADHD medication prescribed	Medicated for workshop?	SDI
1	F	10	Mother	2019	NF1	Concerta	Y	17, 522
2	M	10	Mother	2016	Processing difficulties	None	N	2, 476
3 (sibling of 2)	F	8		2018	Processing difficulties	None	N	2, 476
4	M	9	Mother	2020	No	None	No	28, 526
5	M	10	Mother	2017	No	Elvanse	Y	15, 509
6	M	11	Mother	2016	No	Elvanse	N	17, 290
7	M	9	Mother	2017	ASD, SPD	Equasim	Y	14, 099
8	F	10	Mother	2015	ASD	Equasim XL	N	17, 403
9	M	10	Mother	2017	N/A	None	N	4, 932
10 (sibling of 9)	F	7		2018	N/A	None	N	4, 932
11	M	10	Mother	2016	N/A	None	N	29, 649
12 (sibling of 11)	F	9		2018	ASD	None	N	29, 649
13	F	10	Mother	2017	NF1	None	N	22, 113

All participants took part in a zoom workshop apart from participant 13 who participated via a phone call. M: Male; F: Female; ASD: Autism Spectrum Disorder; SPD: Sensory Processing Disorder; Y: Yes; N: No; NF1: Naurofibromatosis type 1; SDI: Social Deprivation Index. 1 is indicative of the most deprived area in the United Kingdom and 32844 is the most affluent area in the United Kingdom.

In addition, for the phone call option:

- Only the parent and Author 1 were involved, with Author 1 taking written notes of their conversation, which focussed on how the child engaged with the activity book prototype, what worked well, and ideas for improvement.
- Live sketch notes were not taken.

Finally, an age-appropriate study summary (with visuals matching those in the activity book prototype) was forwarded to participants and stakeholders at the end of data collection.

Data analysis

Demographic information was summarized (Table 1) and participant post codes were used to determine their social deprivation index (OpenDataCommunities 2020). This indicates the deprivation level in the areas the participants currently live in. Author [1] cross checked the notes they had taken with the sketch notes used for respondent validity purposes. Thematic analysis (Mays, Pope, and Ziebland 2006) was used to seek patterns in the data. Authors [1] and [4] independently identified codes and themes from the written and sketch notes taken during the Zoom workshops and phone call. Iterative group discussions resolved discrepancies and authors discussed and verified themes [2] and [3]. Agreement between the primary coders was high. Themes identified aimed to capture and summarize participant views.

Results

Participant characteristics

Overall, thirteen young people and ten parents took part in the study in October 2020. Three young people had a sibling diagnosed with ADHD. Participant demographic information is presented in Table 1. All parents/carers were able to provide information on their child's ADHD medication, where applicable. Parents were asked if they had a diagnosis of ADHD; none did.

Six themes were identified and outlined below. The consensus was that the activity book was suitable and accepted by primary aged young people with ADHD. Participant ID's are also referred to below. 'YP' indicates 'Young Person' and 'P' indicates 'Parent'.

Theme 1: Importance of visual information

All but one of the young people believed it was important to include colour and images in the activity book prototype to make it interesting to look at. Six of the young people liked the characters (a dog and an owl, see Figure 4). YP1 described the dog character as her 'hero'. Describing the dog as 'her hero' suggests that they may have placed more importance on and engaged and related more with the activity book, highlighting why the visual of the dog was important. Two young people stated they particularly enjoyed the layout of the activity book due to its visual nature. This is because it had lots of pictures and activities to complete (YP11, YP12).

Theme 2: Topic interest and engagement

It was essential to the young people that the topics in the activity book were important to them. For example, some young people enjoyed the medication pages ($n = 7$), and some saw them as irrelevant as they did not all take medication for their ADHD, but felt it was relevant to other children. One of the latter young people (YP10) still enjoyed the explanation of ADHD in relation to medication as it 'makes sense' to them.

All young people expressed an interest in learning about celebrities with ADHD, but it became clear that some of the celebrities who were known to the authors and featured in the prototype activity book were not necessarily 'current' enough for this demographic. Parents gave suggestions for replacements, and stated their children have positive associations with the celebrities and relating ADHD to them is positive (YP/P, 1, 2, 10, 11).

Theme 3: Importance of relating to the activity book content

All but one of the young people related to the content in the word search activity (words including 'bright,' 'fun,' 'creative,' 'helpful,' 'energetic'), and the activity asking children to circle illustrations of ADHD difficulties they experienced. YP5 did not relate to the content and stated that he felt his ADHD did not impact him – his parent disagreed!

Theme 4: Importance of activity book interaction and age-appropriate content

P1 and P11 pointed out the lack of ADHD related information available for their child and welcomed the activity book for this reason. YP1, YP4 and YP6 stated they liked the 'things to do' (YP1) e.g., colouring in in the activity book. YP6, YP11 and YP12 stated that they liked that the activities were 'quick' to complete (YP6). All of the parents apart from P5 felt that the

difficulty level was suitable for their child, which helped to ensure they were able to complete the activities. P1 and P7 stated that they liked having access to age-appropriate information about ADHD to help explain it to, and discuss with, their child. YP2 likened the checklist at the end of the activity book to checking off what they had learned at the end of school lessons, which they said, 'helped me remember'. Lastly, P4 completed all of the activity book independently (prior to the workshop) and then shared it with her parents, which made her feel 'proud'.

Theme 5: Positive aspects of ADHD

P1 particularly liked that the activity book appeared to be 'confidence building' for her child due to the positive tone used throughout. This was particularly important for YP4 who said he 'gets told off every single day at school,' where ADHD is often presented in a negative way to the child. This was echoed by their parent, P4. YP10 and 11 liked learning about celebrities who also have ADHD and saw this as a positive in relation to their ADHD.

Theme 6: the activity book as a communication aid

Ps 4, 11 and 12 found that the activity book facilitated conversations about ADHD between young people and parents/carers that were not always previously possible. For example, P4 explained that the activity book helped to guide her in conversations that she was previously unsure how to have with her son, such as ADHD medication, resulting in YP4 now understanding and looking forward to starting their ADHD medication. P1 also found that the age-appropriate information helped her have ADHD related conversations with her child for the first time, adding that the activities also helped her see ADHD from her child's point of view.

Importantly, YP2 felt the activity book helped them feel comfortable to discuss their ADHD with friends. YP5, YP9, YP10, YP11 and YP12 stated they would like to tear off the bottom section of the ADHD activity book and use it to talk to their teachers about their ADHD. Moreover, P1, P5 and P6 stated the activity book would have been helpful when their children were first diagnosed with ADHD.

Improvement suggestions

All participants shared ideas of how to improve the activity book prototype. For example:

- State what ADHD stands for (YP1).

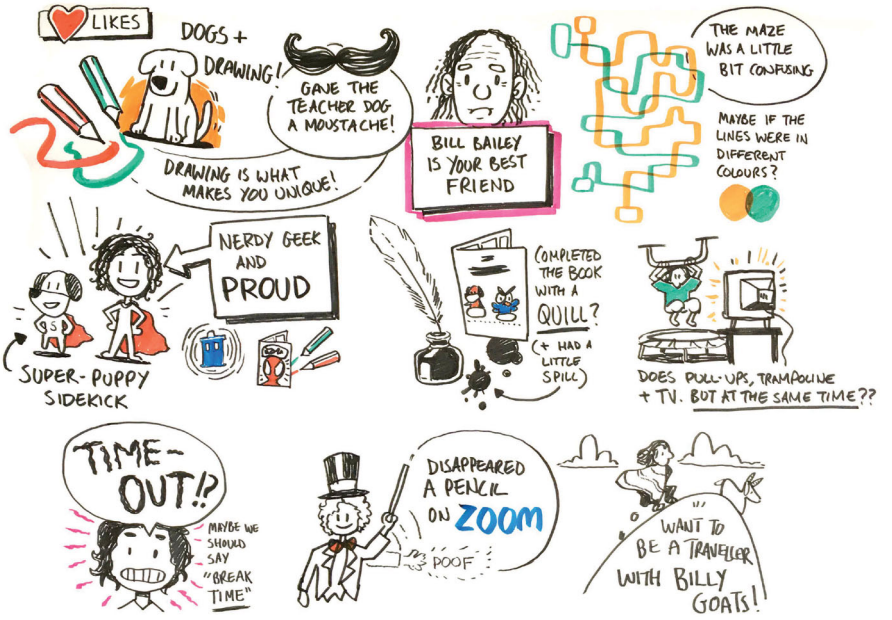

Figure 5. Graphic representation of YP4's responses.

- Suggestions for other ADHD related difficulties to present in the activity book were: difficulty in switching off their brain (YP7), go to a safe space (e.g. bedroom) when distressed (YP5), and controlling anger (YP5, YP6).
- To change some celebrities to people they know (YP2, 3, 4, 5).
- To change the term 'time out' (meaning to take a break) to simply 'break,' as the phrase 'time out' can be associated with discipline in some families (YP4).

Live sketch note observations

As well as providing data for the thematic analysis, the sketch notes enabled response validity and acted as a tool to maintain engagement during the Zoom calls. That is, the children could agree, correct, or add to the findings illustrated in the sketch notes. All participants showed enthusiasm for the sketch notes and enjoyed seeing them emerge throughout the Zoom calls. Figures 5, 6 show some examples of the illustrations.

Future implementation

When asked if and how the activity book could be shared with other young people in the future, all parents agreed that although it is helpful now (post diagnosis), it would have been most helpful when their child was first diagnosed with ADHD.

Figure 6. Graphic representation of siblings YP2 and 3's responses.

Discussion

This study aimed to answer the research question 'Is the ADHD psychoeducation activity book prototype suitable and acceptable by primary aged young people with ADHD, and what changes could be made to improve it?' Results yielded six themes and suggest that the activity book is suitable and acceptable by young people with ADHD. Further, participants collectively provided a comprehensive list of suggestions that will feed directly into the next iteration of the activity book.

Importance of visual information

Visual information was considered essential since if the young person is not willing to look at the activity book, they will not achieve what it sets out to help them achieve, that is to understand their ADHD and how to manage it more effectively. This has previously been reported as an important factor to consider when developing such materials (Powell et al. 2017; Powell et al. 2019); the individual must be engaged with a process in order for behaviour to change (Michie, Van Stralen, and West 2011).

Topic interest and engagement

Interest in the topics covered in the activity booked helped CAYP to engage with it. Evidence suggests that psychoeducational materials can improve knowledge and attitudes towards the condition, correct any misconceptions

(Nussey, Pistrang, and Murphy 2013) and help CAYP have ownership of their treatment (Willis et al. 2019). Therefore, to enhance engagement it was important that the young people felt the topics covered were relevant to them, especially as young people with ADHD are reported to exhibit significantly lower levels of engagement than their peers (Junod et al. 2006). Engagement was considered during the co-design of the activity book as it commonly reported that young people with ADHD overestimate their competence (Martin et al. 2020) and this was found to be the case in this study.

Further, adherence to the adapted D4D framework (Fekete and Lucero 2019) was helpful as it allowed the workshops to be flexible and cater for the young person's needs.

Importance of relating to content

Previous research suggests that young people with ADHD are more likely to engage with an intervention if the content is personalizable and relatable (Powell et al. 2019; Powell et al. 2017; Powell, Wheeler, and Parker 2020). During previous co-design activities, authors worked closely with young people with ADHD and stakeholders to carefully select content. These activities identified some generic information young people would like to learn about their ADHD and also a need for more personalized information. To that end, the bottom third of the activity book is designed for the young person to apply their new understanding of their ADHD to their own personal circumstances. The young people also often commented that they related to the content of the activity book which was important to them. This evidences the long-term positive working relationships with co-design participants.

Importance of interaction and Age-Appropriate content

Clinical guidelines and the wider literature recommend 'developmentally appropriate' psychoeducational information for young people with ADHD (NICE 2018; Powell, Parker, and Harpin 2017; Powell et al. 2019; Powell et al. 2017). This is what the activity book aims to achieve in order to ensure it is accessible to the target population. Results indicate that the activity book is suitable for the target population for a number of reasons including age appropriateness.

The majority of young people enjoyed completing the activity book with support from their parent/carer. The rationale of using text and activities was to help the young person learn by carrying out a physical action rather than passive reading (Dewey 1997).

It is possible that the activity book could eventually be transferred onto an online platform to increase interactivity. However, authors felt it is

important and ethical to make the activity book available (at least initially) in a printable format to avoid digital exclusion, as young people with ADHD are more likely to be from deprived backgrounds (Russell et al. 2014).

Positive aspects of ADHD

It was essential to focus upon the positive aspects of ADHD as it is widely reported that young people with ADHD frequently have negative experiences in all aspects of their lives (O'Regan 2020). Additionally, young people with ADHD often live with stigmas such as ADHD is simply an excuse for bad behaviour; can be caused by bad parenting and poor diet (O'Regan 2020). As such, the positive tone in the activity book prototype was noted by several families and well received, providing further evidence of its acceptability and suitability.

It is widely accepted that young people with ADHD respond well to immediate rewards (Powell et al. 2019). This is supported by broader theories that state reward can change behaviour (Skinner 1974). The Dynamic Developmental Theory of ADHD states that reward for young people with ADHD needs to be immediate to be effective (Sagvolden et al. 2005). It is also reported that reward can increase self-efficacy and confidence (Bandura 2000) which is reported to be reduced in young people with ADHD compared to their peers (O'Regan 2020). Therefore, a certificate for completion was provided at the end of the activity book. Immediate reward in the current paper format is difficult to achieve and could be explored in the future if a web-based platform is considered. The use of sending star emojis in the Zoom chat function whenever the child contributed to the discussion and as well as the live sketch notes, enhanced engagement during workshops and ensured participants knew their responses were valued and recorded.

The activity book as a communication aid

Further evidence of the acceptability and suitability of the activity book was provided by the fact that some participants felt it facilitated important conversations between young people and their parents/carers about their ADHD. It also boosted the young people's confidence with regards to discussing their ADHD with others (such as friends and teachers). The latter is something young people with ADHD have previously expressed an interest in exploring (Powell et al. 2020).

Also the activities gave parents/carers an insight into how their child thinks and feels about their ADHD, for the first time in some cases. These are important findings because young people with ADHD often have diminished confidence and self-esteem (Kita and Inoue 2017) and parent-child

relationships can be negatively impacted upon by their ADHD (Lifford, Harold, and Thapar 2008; Theule et al. 2013). ADHD can also be associated with higher levels of stress in individuals and siblings (Rosenqvist et al. 2019), which can negatively impact upon family functioning (Moen, Hedelin, and Hall-Lord 2016), contributing towards reduced health and wellbeing for the child and their families (Peasgood et al. 2016). It could be inferred, therefore, that greater shared understanding of a child's perspective of their own ADHD may help to address or mitigate some of these challenges.

Study limitations

The present study has a number of notable limitations. For example, the sample size is limited in terms of numbers and geography (all participants from the Yorkshire area). It is possible there could have been some subject response bias, however the young people and parents did appear to provide balanced opinions of the prototype, which is the aim of qualitative work.

The participants were known to the researchers as they had been involved in the previous co-design phases of this study (Powell, Wheeler, and Parker 2020). Although this could be deemed as introducing potential bias, i.e., if they co-designed it they are more likely to find it acceptable and usable, these processes have provided valuable information to further refine the prototype prior to future implementation. Clinicians were not involved in this initial evaluation of the prototype, however they were heavily involved in previous co-design activities that led to the production of the activity book prototype.

It must also be acknowledged that authors do not believe that the activity book will lead to CAYP having perfect ADHD knowledge and perfect strategies to manage it but will act as a tool to help them improve in these areas. It may not also be suitable for all 7–11-year-olds with ADHD for a number of reasons including comorbidities such as learning disabilities which may impact upon the young person's ability to understand the material. It is impossible to develop a single tool that is suitable for everybody. However, efforts have been made to render it suitable for as many 7–11-year-olds with ADHD as possible.

Practice implications, clinical usefulness and recommendations

The final version of the activity book is now being distributed to young people at point of ADHD diagnosis across eight NHS Trusts in the UK, a charity and a number of schools (following alterations based upon the findings of

the present study). This has been made possible, arguably, due to a number of reasons:

- Participants recommended that the activity book would be useful to distribute to young people at point of ADHD diagnosis in the future. This information has been explained to the services currently providing the activity book which has been well received.
- The evidence suggests that co-designed interventions are more likely to lead to impact (Greenhalgh et al. 2016). This could therefore be the reason why the activity book has been implemented so easily across these organizations.

The findings from this study support the findings from previous public engagement work with clinicians. It was stated that providing age-appropriate trustworthy information in the form of an activity book to CAYP with ADHD would help the young person understand their ADHD, which is supported by previous evidence (Nussey, Pistrang, and Murphy 2013).

It could also be argued that the activity book will also lead to reduction in time spent in consultations explaining the diagnosis, however this would need to be explored further in future evaluations and it must be noted that the aim of the activity book has been to supplement, rather than replace, conversations with a clinician.

Future research

It is important to accommodate the particular needs of participants and stakeholders involved across all ages (Langley et al. 2020; Wheeler, Mills, and Langley 2020) and to treat them as experts of their own experience (Sanders 2001). It is timely, that this study contributes to nascent arguments that are possible within the context of the Covid-19 pandemic (Davis et al. 2021). It also provides an example of the use of the Zoom chat function to award star emojis, facilitating the reward mechanic used in earlier workshops in a new way. This could be adopted for future remote research with this population.

One of the findings from this study was that the novel use of sketch notes can provide a way to engage and increase respondent validity and therefore warrants further research. Further, the inclusion of a design researcher in this process has been helpful in terms of their experience and empowering the participants to feel they are the experts, and their views and opinions are valued and important (Langley, Wolstenholme, and Cooke 2018). Therefore, we recommend the use of such qualified individuals in future research. In line

with the evidence and clinical recommendations (NICE 2018), further iterations of the activity book could be co-designed. For example, a version for teenagers with ADHD and a version for young people with ASD. Lastly, it will be beneficial to explore further the activity book's role as a communication aid.

Conclusions

Participants deemed the activity book as acceptable, suitable and engaging. The consensus was that the activity book would be most useful for young people and families at the point of ADHD diagnosis and could act as a communication aid between young people with ADHD and their parents/carers. This was an unexpected finding which may have resulted as a direct result of the previous co-design process. It is important to co-design such interventions to help increase the acceptability and eventual impact. The activity book prototype has resulted from previous co-design activities and the success of the present study is arguably due to the repeated, meaningful involvement of CAYP and stakeholders throughout the co-design process and the prototype evaluation. Next steps will involve continuing to implement the activity book into health care services and to develop further co-designed versions of it including for adolescents and young people with ASD.

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