

Experiences of children and parents in MiYoga, an embodied mindfulness yoga program for cerebral palsy: A mixed method study



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ABSTRACT

Background and purpose: A mindfulness yoga program (MiYoga) was developed and trialed with children with cerebral palsy and their parents. This mixed-method study explores the experiences of children and parents who participated in MiYoga, to assess its acceptability, feasibility and implementation.

Materials and methods: Of the forty-two child-parent dyads who participated in the MiYoga randomised control trial, 19 children and 22 parents were interviewed individually in a semi-structured way about their experiences of MiYoga. Participants rated their mood on a 5-point scale before and after each session and completed short questionnaires at the end of each session.

Results: Children and parents reported improved mood after each MiYoga session. Parents reported being more aware of their thoughts and feelings and possibly became more aware of their day-to-day mindlessness.

Conclusion: MiYoga significantly improved children and parents' mood. Parents reported gains in awareness as well as challenges of adhering to the home practice.

1. Introduction

Cerebral palsy (CP) is the most common childhood physical disability [1]. In Australia, between 1.4 and 2.1 children are diagnosed with CP per 1000 live births [2]. Approximately half the children diagnosed with CP also have cognitive difficulties, such as intellectual disabilities or attention problems [3]. Current therapy for children with CP is primarily focused on the physical aspects of the disability [4] and there are few interventions targeting cognitive difficulties in this population.

Existing evidence shows that mindfulness practice can enhance and develop attention [5]. Mindfulness-based practices have been associated with improvements in attention and working memory capacity in adults [6]. Studies investigating the use of mindfulness-based interventions for children have also shown promising results for improving cognitive functions, such as attention and executive functions [7].

An embodied mindfulness yoga program, MiYoga, was developed with the aim of enhancing attention abilities in children with CP [8]. A randomised controlled trial (RCT) was conducted to test the efficacy of MiYoga for children and adolescents with CP on a range of cognitive, physical, and behavioural outcome measures [9]. The MiYoga program

and study design have been reported in detail in the study protocol [8].

In brief, MiYoga adopted mindfulness practices and mindful movement techniques based on Hatha Yoga principles. Some of the practices included Hatha Yoga postures, or *asanas*, which involve synchronising movement and breath, with the rhythmic sensations calming the mind and training it to focus. To make the mindfulness and yoga practices accessible to modern children, an explorer theme was adopted throughout the program. The use of the explorer theme also aimed to stimulate participants' curiosity—itself is also a component of mindfulness—and was implemented with the help of games such as mindful eating. The program took place over 8 weeks, consisting of six weekly 90-min in-person group therapy sessions with children and their parents (for the first six weeks), then two phone or Zoom consultations in the last two weeks. Phone consultations helped to encourage further practice at home. Child-parent dyads undertook a minimum of 20 min of daily home practice and were provided with a MiYoga DVD and poster in the first group session to help promote home practice.

Compared to the waitlist group, children in the MiYoga group was less inattentive and less erratic and demonstrated some improvements in sustained attention [8]. There were no differences between groups on any physical and behaviour measures [8]. The average MiYoga dose

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over the 8 weeks was 7.6 h (standard deviation (SD) of 2.5) of direct MiYoga practice (84% of the potential maximum of 9 h) and 4.9 h (SD 2.8) of indirect home practice (26% of the 18.7 h of home practice encouraged in the program) [9]. The substantial difference in the percentage of total direct and indirect dosages attained indicates poor adherence to the program unless directly supervised or guided by the therapist.

To understand the acceptability, feasibility and implementation of MiYoga, this study assesses the experiences of children and parents in MiYoga with the purpose of assisting with the development and implementation of similar mindfulness-based programs in therapy and clinical settings.

2. Materials and methods

A mixed methods design was employed to assess the feasibility of MiYoga as an ongoing program to improve attentional abilities for children with CP and explore the experiences of children and parents who participated in MiYoga. A mixed methods research design comprises of elements of qualitative and quantitative research approaches [10]. The aims of utilising a mixed method design in this study were: (i) to extend the scope of exploration; and (ii) elaborate and clarify the results.

2.1. Participants

A total of 42 child-parent dyads participated in the MiYoga RCT. Out of the 42 families, 22 parents and 19 child participants also consented to partake in interviews (some children declined to participate even though their parents consented). Children were 6–16 years of age with unilateral ($n = 16$) or bilateral CP ($n = 26$). Inclusion criteria for the MiYoga study were: (i) Gross Motor Function Classification (GMFCS) I, II, III; (ii) sufficient co-operation and cognition to follow instructions. Children were excluded from the study if they had: (i) received upper-limb or lower-limb surgery in the previous 6 months; (ii) unstable epilepsy; (iii) spinal instability or other spinal problems that would prevent them participating safely in the MiYoga program; (iv) had a medical condition that would prevent them from participating safely in the MiYoga program; or (v) parents who were pregnant as a safety precaution.

2.2. Intervention

The MiYoga intervention was previously described in published work [8]. The following is a brief description of the intervention. MiYoga is an 8-week mindfulness yoga program made up of six 90-min group sessions followed by two phone consultations. Over the 8-week program, participants were asked to complete a minimum of 20 min of daily home practice. A DVD and poster depicting yoga sequences and providing child-specific modifications were provided to the participants in the first session to support their home practice [8]. Each MiYoga group session included Hatha Yoga, mindfulness meditations and informal mindfulness activities and games. The phone consultations were designed to further personalise the MiYoga techniques to each child, parent, and family, to encourage home practice. The MiYoga activities and games were developed based on literature on mindfulness and yoga for children and adults [11–26].

2.3. Data collection

The data collection methods are summarised below, while a more detailed description of the qualitative interview method and the post-session measures was previously published [8].

2.3.1. Qualitative interview

Child and parent participants were interviewed individually (i.e.,

children were interviewed without their parent present and vice-versa) by phone or in person within three weeks from the end of the MiYoga program. The interviewer was an independent student volunteer who had no prior involvement in the study and asked a standard set of questions to each participant. These questions are included in [Appendix A](#). Interviews were audio recorded.

These interview questions focused on: what participants liked about MiYoga; what they thought could be different; difficulties involved in participating; any personal improvements noticed from the program; and any effects on the parent-child relationship.

2.3.2. Quantitative outcome measures

The MiYoga session questionnaires were developed by the research team to explore how mindfulness was experienced within each MiYoga session. All 42 child-parent dyads in the RCT had the opportunity to complete the following MiYoga session scales at each session.

Mood Scale was a short scale used to measure participants' mood or how they were feeling before and after each MiYoga session. It is a 5-point Likert scale with a happy face being very good (5), a neutral face being neither good nor bad (3) and a sad face for being very bad (1) (see [Appendix B](#)). The scale was shown to child and parent individually, and they indicated on a separate form the number that best represented their mood at the time it was completed (immediately before or immediately after MiYoga session).

Mindfulness State was a 5-item scale the authors adapted from the Child and Adolescent Mindfulness Measure (CAMM) to use in this study. This scale was completed by both children and parents at the end of each MiYoga session and was used to measure participant's degree of mindfulness in the session they had just completed (see [Appendix C](#)).

Session Feedback was a short 4-item questionnaire exploring each participant's experience of the MiYoga session they just completed in regard to their comfort, enjoyment, body awareness and overall satisfaction. Each of these questions was on a 0–10 scale, with 10 being high (or very good) and 0 being low (or very bad) (see [Appendix D.1](#) for child session feedback form and [Appendix D.2](#) for parent session feedback form).

2.4. Data analysis

2.4.1. Qualitative data analysis

Interview recordings were transcribed verbatim. Transcripts were read and coded by two study investigators (First and Second Author). A descriptive thematic analysis, as per Braun and colleagues [27], was undertaken to analyze the qualitative data. Coding involved identifying thematic patterns, such as ideas, concepts, terminology or phrases. After identifying these themes, the investigators re-read the transcripts and organized the themes into categories and subcategories.

2.4.2. Quantitative data analysis

For the Mood Scale, the mean difference in mood scores before and after each MiYoga sessions was analysed in a paired sampled *t*-test to determine whether there were significant changes after MiYoga sessions for child and parent participants. The 5 items from the mindfulness state scale and the items from the session feedback questionnaire relating to comfort, enjoyment and body awareness were presented graphically so that they could be visually examined to determine what aspects of mindfulness and level of comfort, enjoyment and body awareness participants experienced within each session. In addition, the linear effect of the sessions on mindfulness state score was examined by fitting a mixed-effects linear regression model (random intercepts for each participant, restricted maximum likelihood) which adjusts for repeated measures for participants. For each of the MiYoga session scales, only the data of participants who completed all six repeated measures of that particular item were analysed.

Table 1
Participant demographics.

Variable	n
Child	19
Parent	22
Child gender, male; n (%)	13 (68)
Parent's relationship to child	
Mother	18
Father	3
Other	1
Child's Age at baseline; mean (SD)	9.1 (3.1)
Only child in home; n (%)	4 (18)
English main language; n (%)	22 (100)
Parent's Marital Status	
Married	17
Defacto	1
Divorce	2
Never married/defacto	2
Combined income	
< 25000	1
25000-50000	2
50000-75000	5
> 75000	14
Gross Motor Function Classification System level	
I	12
II	4
III	3
CP Distribution, Unilateral; n (%)	6 (35)
Previous Mindfulness experience; n (%)	7 (32)

n: Number of participants, SD: standard deviation; CP: cerebral palsy.

2.5. Ethics

Full ethical approval for this study was obtained from the Children's Health Queensland Hospital and Health Service Research Ethics Committee (HREC/12/QRCH/120) and the Behavioural and Social Sciences Ethical Review Committee of The University of Queensland (2012000993). This trial was registered with the Australian New Zealand Clinical Trials Registry (ACTRN12613000729729). All families provided written informed consent to participate before entering into the trial. Each child and parent were then given the option of participating in a semi-structured interview after their participation in the MiYoga program, and verbal consent was obtained if they wished to take part in the interviews.

3. Results

Demographic information of participants who were interviewed is presented in Table 1. Of the 19 child participants there were 13 boys and 6 girls; and of the 22 parent participants there were 18 mothers, 3 fathers and 1 step-father was interviewed.

Table 2 shows the frequency and percentage of responses to direct interview questions. Children and parents generally had a positive view of MiYoga, as indicated by the high level of reported enjoyment of the program, and likelihood of future participation.

A paired sample *t*-test showed that mood significantly improved after each of the MiYoga session, both for children ($t(35) = 2.68$, $p < 0.01$; Mean Difference (MD) = 0.25, SD = 0.56) and for parents ($t(35) = 5.93$, $p < 0.00$; MD = 0.62, SD = 0.63)(see Fig. 1).

Child and parent mindfulness experiences in each MiYoga session are illustrated in Fig. 2. Both children and parents scored higher on item 5 "I was focused on what I was doing" for all the sessions except in the Thoughts and Feelings session (session 6) which item 5 was then rated as the second highest item after item 3 "I noticed my thoughts or feelings". It is likely that this directly reflects session content. A mixed-effects linear regression model found that item 3 significantly increased across the six MiYoga sessions ($p = 0.000$) while item 4 (for clarity the item has been worded in reverse) "It was hard for me to pay attention to

what I was meant to be doing" and 5 "I was focused on what I was doing" significantly decreased across the six MiYoga sessions ($p = 0.041$ and $p = 0.009$ respectively), consistent with participants reporting less mindfulness of what they were doing. No other significant trends were found.

Children's and parents' perception of their comfort, enjoyment and body awareness in each session are illustrated in Fig. 3. The children scored highest on enjoyment for all six sessions. No other trends were found.

Three major themes emerged from interviews with participants after the qualitative thematic analysis, including (i) the perceived gains from MiYoga, (ii) how MiYoga integrated into daily life, and (iii) overall impression of participants' experience of the program, including ideas on how to potentially improve and adapt the program for better clinical implementation.

3.1. Gains from MiYoga

This theme includes items relating to the perceived personal changes after participating in MiYoga for both children and parents.

3.1.1. Gains for children

Most children were unable to identify any changes in themselves after participating in MiYoga. While 22% of the children identified physical improvements, another 22% of children identified changes in their awareness.

"I noticed my legs getting stretched more and all my muscles, which is a good thing; and it helped me with walking with my heel down." 10-year-old boy.

"I realised all the sounds that I wouldn't normally hear." 11-year-old girl.

"When I practiced MiYoga in the morning it helped me concentrate at school." 6-year-old boy.

The majority of parents reported that they noticed changes in their child after participating in MiYoga. Some of the parents noticed their child was more aware of their surroundings, while others noticed their child was calmer or easier to calm down and relax after they had been 'worked up'.

"Yes, she would point out little things in her day that she's noticed in relation to mindfulness ... she talked about when she stopped and closed her eyes and smelt her food before eating it and felt it in her mouth ..." Mother of 11-year-old girl.

"Yeah, he definitely seems to be a lot calmer, more settled and um less meltdowns." Mother of 8-year-old boy.

"Yes, we are able to talk about it (feelings) more and let her get through it as well ... now, I just sit with her and she'll just start breathing and that helps her." Mother of 6-year-old girl.

3.1.2. Gains for parents

Parents noticed changes in themselves after participating in MiYoga. The majority reported increased awareness of their actions and their bodies, and more aware of their experiences, emotions, and actions.

"There would be times where I'd stop and really enjoy an experience I was going through, and I think that was to do with the mindfulness that we learned in MiYoga." Mother of 11-year-old girl.

"I've tried to ride the feeling rather than stopping the feeling and thinking about something else completely. Now, I try to ride the wave of that actual feeling. So I guess I did become more aware in that sense." Mother of 6-year-old girl.

"I think it helped with my patience if she has a meltdown ... I'll kind of

Table 2
Response frequency and percentage to direct interview questions.

Child Questions	Yes	%	No	%	Maybe	%	Other	%
Did you (CHILD) enjoy participating in MiYoga?	17	94	1	6	0	0	0	0
What was it like to do MiYoga with your mum/dad?	Good/Fun/Liked it	72	Tricky/disliked it:	22	0	0	Don't know	1
	13		4					
Would you (CHILD) recommend MiYoga to other children or families?	14	78	2	11	1	6	0	0
			“Keep it a secret.”	5				
			1					
Would you (CHILD) participate in this program again?	11	92	0	0	1	8	0	0
Do you (CHILD) want to keep practicing yoga?	11	61	3	17	3	17	Don't know	1
Parent questions	Yes	%	No	%	Maybe	%	Other	%
Did you enjoy participating in MiYoga with your child?	21	91.30	1	5	1	5	0	0
Did your child enjoy participating in MiYoga?	16	72.73	2	9	4	18	0	0
Did you notice changes in mindfulness in everyday life?	20	86.96	1	4	0	0	2 ^a	9
Did you notice any changes in your child's mindfulness in everyday life?	12	55	7	32	0	0	3 ^b	14
Is your child better or worse at paying attention after participating in MiYoga?	Better	8	36	Same	12	55	Worse	0
							0	0
							Other	1
							Don't know	1
								1
Have you noticed any changes in your relationship with your child since participating in MiYoga?	6	27	14	64	0	0	2 ^d	9
Would you (PARENT) participate in this program again?	15	88	2	12	0	0	0	0
Would you (PARENT) recommend MiYoga to other children or families?	22	100	0	0	0	0	0	0
Do you want to keep practicing yoga?	13	59	2	9	2	9	Parent only	1
							Mindfulness only	4
								18

^a Parents responded to this question by saying that they appreciate things in their everyday life more – the response does not directly refer to mindfulness everyday life.

^b Parents responded to this question by referring to their child's mood and behaviour improvements – the response does not directly refer to mindfulness in everyday life.

^c Parents responded to this question by saying that their child was calmer – the response does not directly refer to paying attention.

^d Parents responded to this question by noting that they enjoyed the one-on-one time with their child participating in MiYoga provided – response does not directly refer to changes in the parent's relationship with their child since participating in MiYoga.

stop ... and be mindful of how I was reacting to her reactions.” Mother of 7-year-old girl.

3.2. MiYoga in everyday life

The second theme relates to the translation of MiYoga and includes aspects of the MiYoga program that made it challenging to integrate MiYoga into everyday life and aspects of MiYoga that were translatable.

3.2.1. Challenges of home practice

A common theme that emerged from both child and parent interviews was that home practice was a challenge to complete. School and homework made it hard for children to practice MiYoga at home.

“We'd practice in the morning, and sometimes we get a bit late for school so we can't do yoga in the morning. That's the thing why we can't do it that much.” 8-year-old boy.

“No, I didn't get time to practice much. I was going to last weekend, but then I found out we were going away and we have school on Monday,

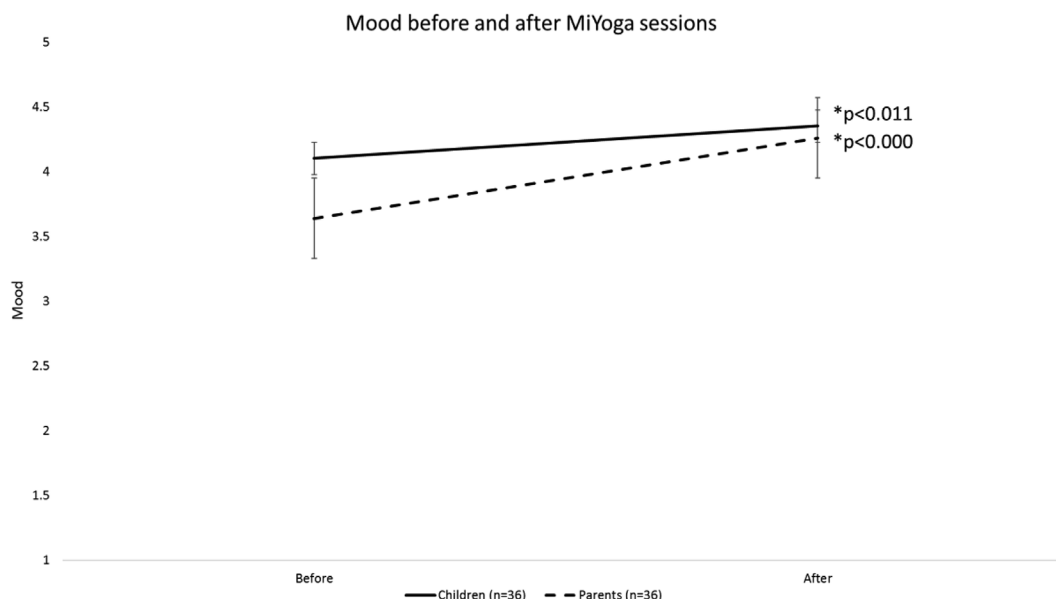


Fig. 1. Mean self-reported mood before and after MiYoga session for children and parents (higher the mood score the better). Bars are mean ± Standard Error (SE).

Mindfulness experiences per MiYoga session

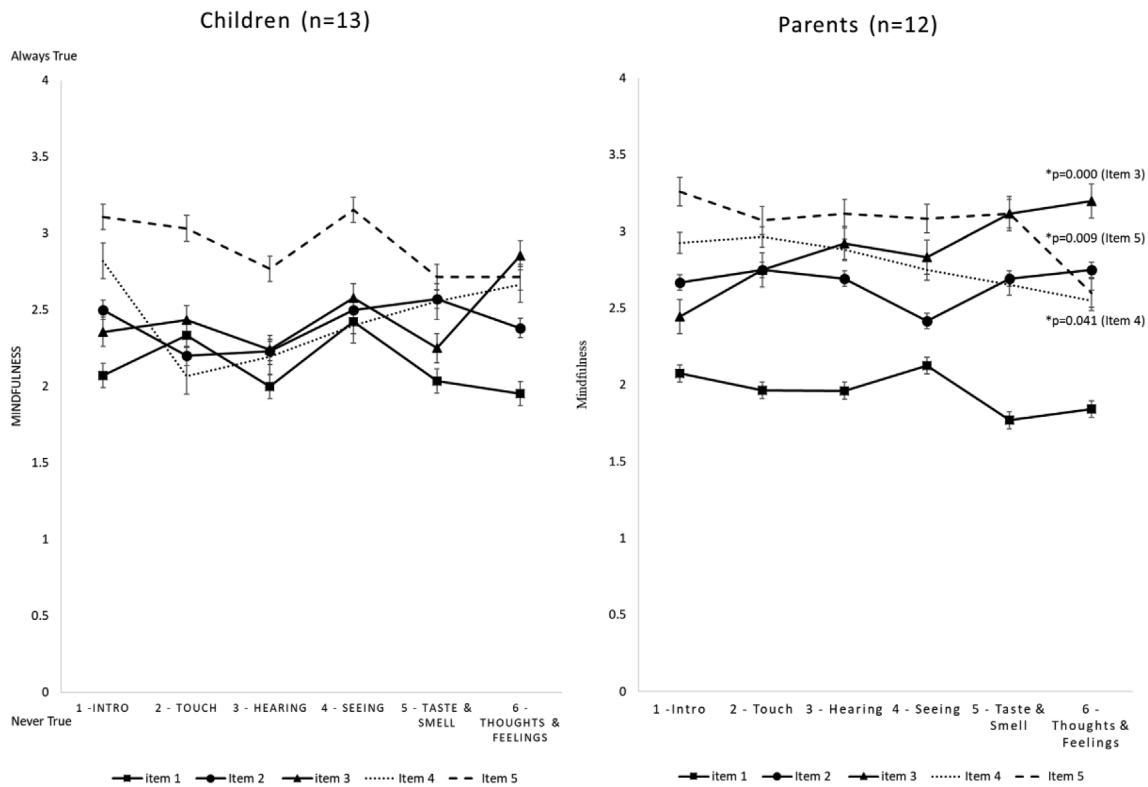


Fig. 2. Children and Parent's mean self-reported mindfulness during MiYoga session for five mindfulness items. The higher the score the better the Mindfulness; Item 1: I stopped myself having thoughts or feelings that I don't like (Reversed); Item 2: I was moving without noticing what I was doing (Reversed); Item 3: I noticed my thoughts or feelings; Item 4: It was hard for me to pay attention to what I was meant to be doing (Reversed); Item 5: I was focused on what I was doing. Bars are ± Standard Error (SE).

MiYoga Session Feedback

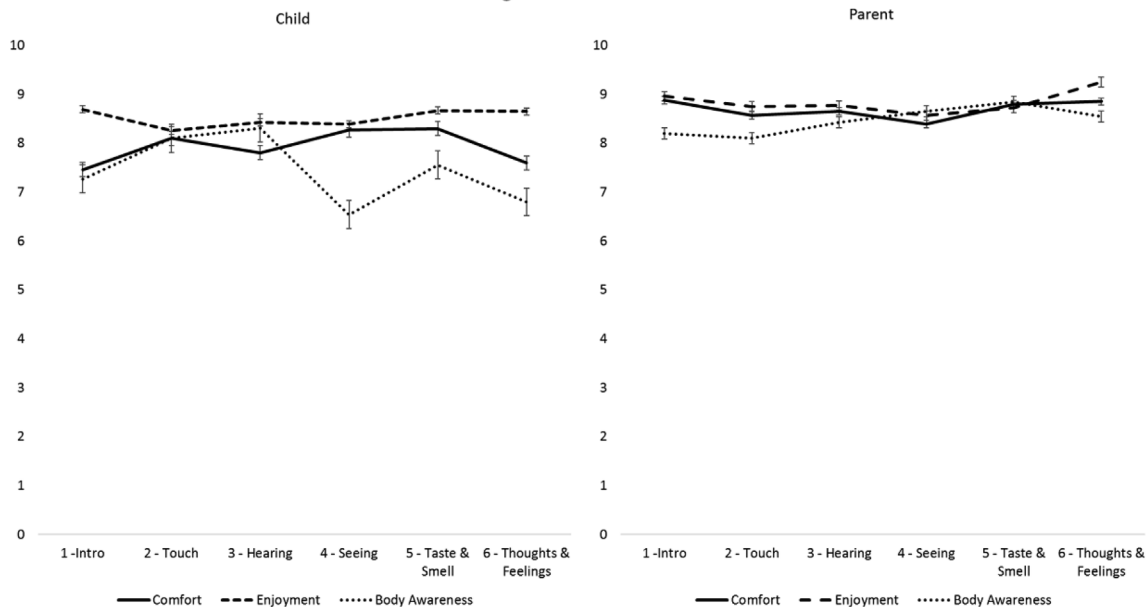


Fig. 3. Children and Parent's end of MiYoga session feedback ratings for Comfort, Enjoyment and Body Awareness. Each session feedback rating was rated on a scale from 0 to 10, with 10 being very good and 0 being very bad. Bars are ± Standard Error (SE).

Tuesday, Wednesday, Thursday, Friday.” 6-year-old boy.

Some children found practicing MiYoga at home difficult because it competed with other interests and activities they could do at home.

Children commented that “I could have done drawing, I was going to plan on doing drawing and then next day I was trying to make a house, and then the next day I was doing homework” (6-year-old girl). Parents

commented that children were more distracted when practicing MiYoga at home than in the weekly MiYoga sessions.

“Actually having the group sessions was really good ... He would do it with me at home, and he enjoyed it but he was always thinking, oh what's my brother doing or what you know how come I'm doing this and he's there watching TV. So there was always a distraction.” Mother of 10-year-old boy.

3.2.2. Mindfulness strategies were easily translatable

Parents conveyed that mindfulness strategies were easier to integrate into daily life than the physical yoga practice.

“Honestly, finding the time out to do the yoga was a bit difficult, however, the mindfulness, when I remember to do it, can be done anytime and anywhere.” Mother of 7-year-old boy.

“It was difficult. The mindfulness was okay but the putting the yoga in it was just a time issue.” Mother of 6-year-old girl.

“I've got to say that was sort of difficult ... because it's just such busy lives and active lives ... apart from school and work we've also got other sort of therapy sessions we've got to get to ... We are still trying to do it in other ways like just sort of slowing down and trying to fit it into activities that he does. We might not actually do yoga specifically, but for example, I'm encouraging him to be mindful when we play soccer to slow down and to sort of feel what he's doing. So, we don't do a lot of the actual yoga as such, but we're trying to implement them in our activities that we do.” Father of 8-year-old boy.

3.3. Participant experience and suggestions

This category includes themes relating to aspects of the MiYoga program that children and parents felt could have been different.

3.3.1. Acceptability of MiYoga

The majority of children and parents liked the mindfulness component of the program the best. Children reported that they enjoyed the mindfulness aspects of the program especially the mindfulness games and explorations through sensory experiences such as taste and smell.

“I preferred the mindfulness part more.” 16-year-old boy.

“I liked the smell and taste session because you got to taste things.” 6-year-old girl.

The children that preferred the physical aspects enjoyed practising yoga postures through adventure stories and practising specific postures, such as downward dog and superman poses.

“I liked going on adventures and relaxation.” 8-year-old boy.

Some children also enjoyed the relaxation part of the sessions, while other children said they enjoyed everything.

“I liked all of it.” 11-year-old girl.

“I liked the deep relaxation cause you got to like down and relax.” 8-year-old boy.

Parents reported they enjoyed learning about mindfulness, the mindfulness practices and the relaxation.

“I probably liked the mindfulness part of it best ... not so much the yoga, it was the mindfulness side and the relaxation techniques.” Father of a 13-year-old boy.

“The mindfulness, being aware of our surroundings ... It was good to be aware of how you eat, how you breathe ... Taking time out to do the activities that you're doing rather than thinking about a 1000 other things.” Mother of 6-year-old girl.

Parents also enjoyed the weekly MiYoga session content and

structure.

“The best part I enjoyed was the weekly sessions with the therapist and the group.” Mother of 10-year-old boy.

“I liked the array of different activities that the therapist did in the group.” Mother of 8-year-old boy.

“I just liked the structure of it ... it was explained really well, and we walked through the steps really well which was good.” Mother of 11-year-old girl.

While other parents simply appreciated the one-on-one time participating in an enjoyable activity with their child.

“Spending that time with him was great, doing something he was really keen to do.” Mother of 10-year-old boy.

“It was really nice to spend just some time with her was relaxing.” Mother of 7-year-old girl.

3.3.2. Least favourite aspects of MiYoga

This category includes themes relating to aspects of the MiYoga program that parents felt could have been different. When asked if there was anything they didn't like about MiYoga, the majority of children and parents answered that there was nothing they didn't like.

“There was nothing I did not like.” 6-year-old boy.

“No, I liked it all, it was all really good ...” Mother of 10-year-old boy.

The children who named something they did not like mostly indicated that they did not like the physical aspects of the program because it was difficult or tiring.

“I didn't like the really hard poses that made me really sweaty.” 6-year-old girl.

For the parents who indicated something they did not like about MiYoga mostly identified the challenges they experienced with the home practice.

“Maya got really exhausted and run down ... finding that extra 20 min we found it hard.” Mother of 6-year-old girl.

“It's that generalisation from class to home that I think was a bit of a challenge.” Mother of 8-year-old boy.

3.3.3. More sessions, less home practice

Children viewed MiYoga positively and expressed there is little about the program they would change. A few children requested more sessions and more games.

“Well, I would have probably liked it to be like 12 weeks.” 10-year-old boy.

“I think they could have had more games.” 6-year-old girl.

Parents also viewed MiYoga positively with few things they would change about the program. The majority of the parents reported they would like to have more sessions (either more frequent or over a longer duration) with more repetition of activities and less home practice.

“I think the frequency of the group sessions. I know everyone is really busy but maybe a second group session in the week.” Mother of 10-year-old boy.

“I think yeah probably a bit less home practice.” Mother of 11-year-old boy.

“I bit more repetition of things that they were doing so that they get used to that sort of pattern and the particular postures.” Mother of 8-year-old boy.

“If we could have had maybe two a week that would have been great.”

And then do it at home as well.” Mother of 10-year-old boy.

3.3.4. Therapist interaction was important for children's engagement

When asked if they had anything they would like to highlight about the program, the parents acknowledged that the therapist interaction was important, especially in regards to engaging the children in the session and the overall program.

“The therapist was amazing the way she reacted with the kids, her interactions with the kids was great.” Mother of 11-year-old girl.

“The therapist, the teacher, I couldn't find a better word, was great. You know, she really put an awful lot in to us, and she tried to make it something for the children ... going on a journey and what would you like to pack in your suitcase. Oh, she made it fun.” Mother of 9-year-old boy.

“The therapist was awesome. Very interactive and knowledgeable.” Mother of 7-year-old boy.

“In the actual group classes, she enjoyed them. The therapist made them fun. But, at home if I lead it she wasn't happy ...” Mother of 6-year-old girl.

“I just thought the therapist was excellent, she was really good with all the participants, and yeah she was excellent.” Mother of 8-year-old boy.

“The therapist did a great job, and she had thoroughly thought through the concepts and um ... it was a good process and interactive.” Father of 7-year-old boy.

“The therapist did an amazing job running the program, and I think she was very good at it, coming down to the kids' level and interacting with them on their level. She was very good.” Mother of 11-year-old boy.

“I just loved the way that the therapist was very gentle. She was lovely.” Mother of 16-year-old boy.

3.3.5. MiYoga DVD was helpful but can be improved

Parents appreciated having the MiYoga DVD to support their home practice because it took the pressure off the parents having to take on the therapist role of at home.

“I think having the at home DVD support, was great with the combination of yoga and mindfulness. I guess compared to doing it in a physio type of environment where I have to remember the exercises and keep clarifying it meant that she could sort of watch someone else direct and I could tweak. Yeah, so that was good.” Mother of 6-year-old girl.

Although the DVD was helpful, parents suggested that the DVD could be more streamlined.

“I liked how you could choose which of the different activities you want to do on the DVD, but this meant it'd go back to the beginning after each activity and you'll have to flick through the exercises each time to select the next one you want to do. A polished version of the DVD would be a bit better.” Mother of 6-year-old girl.

3.3.6. Importance of addressing emotional aspects in therapy

Parents also acknowledged that this was the only program they have ever been offered that considered the emotional health of their children with CP, which to them was very important yet missing in the children's typical rehabilitation programs.

“In my experience, programs for my daughter's cerebral palsy is [are] always looking at the physical and I'm starting to realise now that there's a lot more emotional stuff there than we're ever really given any therapy or support for. Well, I've personally had never ever ... These kids actually need other things as well like their emotional and anxiety levels ... So, from that point of view, MiYoga was good.” Mother of 7-year-old girl.

3.3.7. MiYoga connected families with a child with disability together and reduced feelings of isolation

Some parents acknowledged how having a child with a disability can feel isolating. They expressed their appreciation for programs such as MiYoga, which helped them connect with other families in similar situations.

“You do really get the feeling of isolation as a parent with disable [disabled] kids, I mean we're not Robinson Crusoe, but it kinda feels like that sometimes because you [are] kind of isolated. He tries to Facebook his mates and all that sort of stuff ... but at the end of the day, it's just not the same ... it's just that feeling of isolation, its good if you know more stuff like MiYoga keeps happening that's going to help us.” Father of 13-year-old boy.

3.4. Summary of data

The majority of parents and children felt that more sessions and less home practice would be easier to sustain than one weekly group session with 20 min of daily home practice. This was due to both competing activities at home, and the value placed on interaction with the therapist. Some parents thought that at least 2 sessions per week would have helped to transfer the MiYoga practices into everyday life. Parents thought that mindfulness was easier to practice at home than the physical yoga postures.

Children preferred to experience more mindfulness-based games and explore yoga postures through more adventure stories. Having a more streamlined DVD with adventure stories exploring different yoga postures on it instead of yoga practices with standard instructions may have also enhanced their motivation to practice at home.

Children and parents' moods improved after each MiYoga session. While parent's mindfulness improved across the six sessions in regards to “noticing their thoughts or feelings” (item 3), parents' ability to “pay attention to what they were doing” (item 4) and ability to “focus on what they were doing” (item 5) decreased across the six sessions.

4. Discussion

This study has undertaken a preliminary exploration of the experience of children and parents who participated in a novel mindfulness-based yoga program, MiYoga, for children with cerebral palsy. Our findings revealed that the acceptability of MiYoga was high and both parents and children reported some positive changes, such as increased mindfulness, awareness, and children's behaviour regulation after participating in the program. This was inconsistent with the results found in the randomised control trial analysis [9]. In the RCT analysis, while children's attention improvements were significant, while no significant behaviour or mindfulness changes were detected in the children. There are two possible explanations for these inconsistencies. Firstly, it could be that there was not enough power to detect significant changes in mindfulness and child behaviour. Secondly, as stated in the published results of the MiYoga RCT [9], children scored in the normal range on the behaviour measures at baseline and may reflect a ceiling effect despite possible improvements that were observable or felt by the child or parent themselves.

Parents reported in the interviews that they felt they were more mindful and aware after participating in the MiYoga program. This is supported by the significant linear trend found in the results of the mindfulness state item 3, which suggested that parents became more aware of their thoughts or feelings across the six sessions. The finding that scores for mindfulness state items 4 and 5 decreased, however, suggests that parents reported decreased ability to pay attention or focus on what they were doing. This pattern of results is similar to those found for parents on the self-reported Mindful Awareness Attention Scale from the RCT. The RCT analysis revealed that the parent's self-reported mindfulness scores on the Mindful Awareness Attention Scale

significantly decreased after MiYoga [9]. The decrease in scores on items 4 and 5 of the post-session mindfulness state scale supports an explanation previously reported. It is possible that parent assessments of their own mindfulness may be inflated at baseline and that after mindfulness training they are better able to accurately report their own mindfulness. In sum, parents became more aware of their thoughts and feelings over the duration of the MiYoga program and reported this, and in addition, parents may have also become more aware of their mindlessness, causing them to report increased difficulty in paying attention to what they are doing. The complexity of these results highlights the difficulty in assessing mindfulness by self-reporting, as the ability to accurately report mindfulness itself requires mindfulness.

The biggest challenge identified by children and their parents in completing MiYoga was the home practice component, especially the practice of physical yoga postures. This is consistent with the low levels of home practice documented [9]. Parents reported, however, that mindfulness practice (separate from physical yoga postures) and integrating mindfulness strategies into everyday life was less challenging and more manageable. The self-reported low adherence to home yoga practice is similar to the low adherence reported within rehabilitative programs for children with disabilities [28,29].

Adherence can be influenced by the style of home practice and the therapists teaching style [29], parental stress levels [30] or their emotional state [31], family problems [30], and a child's GMFCS level [31]. Additionally, factors such as a parent's perceptions of existing barriers to practice, the therapists' involvement and feedback, the justification of practice, advice on how to integrate practice into daily routine, and asking about home adherence, will affect the amount of home practice [32]. Some of these factors are related to individual children or their family and are hence outside of the therapist's control. Other factors are within the therapist's and study's control and these factors were all considered within the study design, implementation, and program facilitation.

This MiYoga RCT incorporated some design elements to enhance home practice such as a detailed justification of the practice in the first session, individualised advice on how to integrate practice into daily life, and regular therapist enquiries about home practice adherence in weekly in-person sessions. The therapist interaction also enhanced adherence to the overall program, especially the face-to-face sessions each week. It appears to have been insufficient to enhance adherence to home practice. Remaining barriers to home practice were mainly a lack of regular feedback on the child's progress, and individual factors such as parental stress and family problems and children's GMFCS level.

4.1. Barriers to home practice

More regular feedback on the child's progress could enhance adherence to home practice. Although verbal encouragements were provided to children and parents in group sessions and via phone consultations, MiYoga did not incorporate regular clinical feedback on the child's progress throughout the program. A reason for this is that MiYoga was facilitated within a research setting where clinical feedback on the child's progress was not offered until after completion of the program and post-intervention assessments to reduce biases in the children, parents, and therapist. Even though most of the parents and children identified gains from the program, it may be that they needed professional feedback to validate their observations, to motivate and enhance adherence to completing home practice.

Both children and parents reported that busy lifestyles were a barrier. This underscores the importance of providing intervention with maximum impact for minimum time investment. Although the MiYoga DVD and booklet support meant there was less demand on parents to physically instruct and facilitate the MiYoga exercises, the need for strong parental and family support was still essential in completing the home practice. It may be beneficial to deliver MiYoga alongside a mindful parenting program, as it can provide parents with additional

support, and strategies to engage their child in their home practice activities.

4.2. Study limitations

A strength of this study is that the perspectives of both children and caregivers were captured through the interviews. The interviewer was unknown to participants which promoted honest discussions. This study is limited to perspectives from children and parents who participated in the MiYoga program, and the results may not reflect all mindfulness-based programs for children and parents. Findings, however, may be relevant for the design of similar programs in the future.

4.3. Clinical implications

Future mindfulness-based programs such as MiYoga may like to incorporate an additional face-to-face session each week (e.g. 2 × 90 min sessions per week). This extra direct therapy time each week may compensate for the poor home practice adherence. This is also what the majority of parents and children felt would be easier to sustain and possibly enhance the translation of MiYoga practices into everyday life.

In addition, parents expressed that mindfulness was easier to practice at home than the physical yoga postures. Home practice components of future mindfulness-based programs may like to focus on encouraging the integration of mindfulness in participants' everyday activities, such as mindful eating, teeth brushing or soccer practice.

Children reported that they preferred experiencing mindfulness through games and exploring differing yoga postures through adventure stories. These may be important factors to keep and further develop and incorporate into future mindfulness-based programs. It may also be helpful for future programs to provide a streamlined DVD or online videos via learning platforms or via an application for mobiles and tablets with these mindfulness games and yoga adventure stories to support and enhance children's motivation to practice at home.

5. Conclusion

This study provides an exploration the experience of children with CP and their parents in a novel mindfulness-based yoga intervention, MiYoga. Both children and parents reported improved mood after each MiYoga session. While parents reported being more aware of their thoughts and feelings over the duration of the MiYoga program, they may have also become more aware of their day-to-day mindlessness. The interviews revealed that children and parents reported gains in awareness after participating in MiYoga. They also identified the challenge of adhering to the home practice component of the program despite the adherence enhancing factors that were built into the program.

Future studies and therapies should consider in their design the very difficult challenge of adherence to home-based independent therapy, exercise or mindfulness program. Since home practice still relies on parental support and involvement, even with a DVD and booklet to guide the practice, a parents' emotional experiences and parenting strategies may be an important consideration. This is more so the case where the child has a disability, and the home environment already is highly demanding of parental attention and time. As more evidence regarding the efficacy of mindfulness-based programs for children emerges, it would be helpful to consider the experience of children and parents as an important factor in developing and utilising mindfulness-based programs in therapy.

Conflicts of interest

Authors of no potential conflict of interest to disclose.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ctcp.2018.12.006>.

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