Understanding the “battleground” of homework and ADHD: A qualitative study of parents’ perspectives and experiences

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ABSTRACT

Children with Attention deficit hyperactivity disorder (ADHD) are known to have poorer academic outcomes and experience challenges with homework. The aim of this research is to explore parents’ subjective experiences and perspectives of the challenges presented by ADHD and homework and consider what type of intervention may be helpful to parents. In-depth semi-structured interviews were conducted with participants (n = 13). Transcripts were analysed for thematic content. Results showed homework was experienced by parents of children with ADHD as a persistently stressful part of their family’s daily life. Eight themes were identified. Given the poorer academic outcomes of children with ADHD together with the challenges parents experience, a targeted parenting intervention to address these challenges is needed and warrants further research.

1. Introduction

The US National Institute of Mental Health defines ADHD as being “marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development” (2022). Children with ADHD are less likely than their peers to achieve academic success due to the characteristics of the condition which typically converge to negatively impact the child’s academic potential (Merrell & Tymms, 2001). A high prevalence of comorbid conditions such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) also impairs academic performance (Barbaresi et al., 2007; Lee & Hinshaw, 2006; Massetti, Lahey, Pelham et al., 2008; Sayal et al., 2015). Homework is usually defined as “any tasks assigned to students by school teachers that are meant to be carried out during non-school hours” (Cooper, 1989a, p. 7). It is a feature of the school system in most countries and is assigned by all countries that participated in the Programme for International Student Assessment (OCED, PISA 2014). Attributes to homework within the educational sector (both teachers and educationalists) have varied from being seen as a key element to creating ‘disciplined minds’ to potentially having an adverse impact on students’ mental health (Gill & Schlossman, 2000; Marzano & Pickering, 2007, p.1). The scholastic evidence for setting compulsory homework is inconsistent and the role that homework plays in contributing to overall academic success continues to provoke debate both in the scientific literature and in the popular media (Cooper, 1989b; Cooper, Robinson, & Patall, 2006; Cooper, 2007; Czerniawski & Kidd, 2013; Marzano & Pickering, 2007; Matei & Giască, 2015; Ronning, 2008) (Time Magazine, 2016). Key benefits of homework are postulated to include the fostering of positive attitudes to school, developing good study habits and promoting the idea that learning takes place in the home as well as in the school environment (Cooper, Robinson, & Patall, 2006). The amount of homework completed and time spent on homework are positively correlated with achievement test scores (Cooper, Robinson, & Patall, 2006). Consideration of the potential negative impacts of homework, however, is increasing, particularly in how it impacts family time (Bennett & Kalish, 2006; Kohn, 2006a). Furthermore, there is growing recognition that homework that is inappropriately assigned to students may be detrimental to student achievement (Kohn 2006b; Marzano & Pickering, 2007) (see Tables 1–3).

The extant data suggests that children with ADHD can have particular difficulty relative to their peers with any or all of the key elements of the homework process (Power et al., 2006) such as accurately writing down prescribed assignments, remembering the correct books, starting work and remaining seated, maintaining focus, completing assignments and managing frustration which may be inherent to the task (Du Paul et al., 2012; Langberg, Epstein, Urbanowicz, Simon, & Graham, 2008; Pelham et al., 2005; Pelham & Fabiano, 2008; Raggi & Chronis, 2006). The fact that these components of the homework process are generally...
Table 1
A selection of quotes which showcase this theme.

<table>
<thead>
<tr>
<th>Quote</th>
<th>Parent</th>
</tr>
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<tbody>
<tr>
<td>I would lose my temper probably with the child. And I find that I hate myself for it.</td>
<td>H</td>
</tr>
<tr>
<td>The second one is very good at doing her homework. Then I try and get her not to answer a question. And then he's really upset, because he knows the answer when she is only eight and he doesn't know it.</td>
<td>B</td>
</tr>
<tr>
<td>I would start crying. The tension was horrendous and especially the older he got, I cried a lot.</td>
<td>B</td>
</tr>
</tbody>
</table>

Table 2
A selection of quotes which showcase this theme.

<table>
<thead>
<tr>
<th>Quote</th>
<th>Parent</th>
</tr>
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<tbody>
<tr>
<td>I feel stress because there's just such resistance to it, massive, massive resistance... So emotional. And it's really tiring.</td>
<td>F</td>
</tr>
<tr>
<td>I don't want to get frustrated... because then, when he starts to get frustrated or he won't accept my help, you know and he is getting upset, and he is hurting himself, then obviously that, that affects me.</td>
<td>A</td>
</tr>
<tr>
<td>... And then I could say, is there something wrong that I'm doing or is it the environment?... and it might be a failing on my part where we're pushing him to get his homework done.</td>
<td>H</td>
</tr>
</tbody>
</table>

Table 3
A selection of quotes illustrating this theme.

<table>
<thead>
<tr>
<th>Quote</th>
<th>Parent</th>
</tr>
</thead>
<tbody>
<tr>
<td>And he'll say things like - my friends do this in 10 min- you know. So, he really sees that it's much more difficult for him and he feels it shouldn't be. And he does get frustrated.</td>
<td>E</td>
</tr>
<tr>
<td>It ended up into aggression because if we tried to push it at all, he would get really, really angry... his self-esteem was rock-bottom, totally rock bottom.</td>
<td>C</td>
</tr>
<tr>
<td>This is primary school. And then it is like, 'Oh! What is it going to be like?'</td>
<td>A</td>
</tr>
</tbody>
</table>

This is primary school. And then it is like, 'Oh! What is it going to be like?' (Parent A).

2. Materials and methods

2.1. Participants

A purposeful sampling strategy was used by sending an email invitation to all members of ADHD-Ireland (National ADHD Support Group). Fourteen parents indicated they wished to participate in the study. Participant numbers were based on previous literature and are typical for studies of this sort (Creswell, 1998; Morse, 1994).

The criteria were purposefully framed to be as inclusive as possible to reflect the real world of clinical practice as per Medical Research Council guidelines (MRC 2006 Developing and evaluating complex interventions: new guidance, ) and to align with the overall aim of this research programme to develop an ADHD Homework Intervention which is accessible to all parents. Initial stakeholder interviews, which preceded study design, highlighted the huge barriers for parents to access services or interventions for ADHD particularly for children with dual diagnoses. Stakeholders emphasised the need to foreground accessibility and inclusion to any proposed ADHD intervention and thus this was key to all aspects of this research programme. Therefore, the only criterion for inclusion in the study was to be the parent of a child in primary or secondary school with a diagnosis of ADHD and there were no criteria of exclusion.

2.2. Data collection

Seven face-to-face qualitative focus group interviews were carried out at a university location in Ireland with 13 parents using a semi-structured topic guide based on a systematic review of the literature pertaining to ADHD, homework and parents (Gavin et al., 2023, pp. 1–21). Given that the primary aim of the research was to collate lived experience expertise in as inclusive a manner as possible and to avoid biasing interpretations with information on participants, minimal information on participants was requested. Eleven of the participants were female with a varying level of parental educational attainment and experience and a mix of stay at home parents and those who worked outside the home. The majority of parents resided in urban settings. The
topics were: experiences of homework and its impact; school involvement; awareness of the impact of ADHD on homework among health-care/educational professionals; child’s response; strategies employed and helpful inputs. Finally, parents were asked for their thoughts on participating in a homework-focused parenting programme. Prior to the group interviews commencing, all participants were advised as to the confidential nature of the material discussed by other group participants. Participants were reminded before the discussion started that they could skip their turn in the group if they did not want to talk about the topic. They were reminded that if they did not feel comfortable either physically or emotionally they could let the facilitator know and that they would be supported to identify what they needed. The group facilitator (BG) is a consultant child and adolescent psychiatrist and psychotherapist and is therefore trained in reflective listening, in containing distressing emotions calmly and in debriefing. The facilitator supported all participants who became distressed and offered the possibility of a break or discontinuing the interview. All participants settled with containment and opted to proceed. Debriefing took place following the interviews and all participants were offered the opportunity to follow-up with the facilitator.

2.3. Analysis

The audiotaped interviews (N = 7) ranged from 35 min to 1 h and 35 min, and the transcripts were analysed using Quality Data Analysis Miner 5 (QDA Miner 5). Thematic analysis was selected due to its flexibility and established validity in qualitative studies of this sort (Braun & Clarke, 2006). This included familiarisation; initial code generation; searching for themes; reviewing themes; defining and naming themes and producing the report (Braun & Clarke, 2006). Initially, two interviews were independently coded (BG, IH) and an open coding session was used to discuss and develop themes. These themes formed the basis of the coding of subsequent transcripts with new themes added as they emerged. A close reading was carried out by BG and IH independently. The responses were coded according to category. The relevant code was applied to each section of meaningful text. The responses were then grouped into themes. Perspectives that did not appear to fit with other responses were sought and themes were modified to incorporate these views. ‘Deviant Case Analysis’ was utilised to explore data that appeared to contradict emerging themes. The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was utilised to ensure explicit and comprehensive reporting of data in line with best practice (Tong et al., 2007).

3. Results

Participants (n = 13) were predominantly female (n = 11) and, in some cases, more than one child had a diagnosis of ADHD. Children’s ages ranged from 6 to 17 and spanned from second year in primary school to final year of secondary school. Eight themes were identified: Conflict/Myriad Negative Emotions; Implications: Immediate and Future; Enablers: Understanding and Advice; Parental Self-Judgement; Demands on parents; Interpretation of ADHD; Education System; Role of Homework. Within these themes, twenty-eight categories were identified with fifty-six codes.

Due to the extensive data that emerged, it was not deemed appropriate to discuss all the themes within one paper as to do so would permit only a superficial exploration of the data. For the purposes of this paper, the following themes are discussed: Conflict/Negative Emotions and Implications: Immediate and Future.

3.1. Conflict/negative emotions

All parents viewed homework as negative and spoke of the conflict which homework caused, with the majority describing it as a ‘battle, a struggle’ (Parent D). The conflict was repetitive, ‘Groundhog day’ (Parent A), consuming all family members and marred routine family life. In some cases, this conflict involved the whole family (husband and siblings) and created a cascade of disruptive events. The impact of this conflict on relationships within the family was clearly evident as the challenges emanating led to divergent opinions between parents as to the best approach to take. In addition, managing siblings was experienced by parents as having additional complexity which they feared compounded the challenges experienced by the child with ADHD. Basic family routines were disrupted and integration of homework time within the wider demands of family activity was a source of tension as parents juggled competing demands.

Parents lacked information regarding the specific aims, objectives and value of the assigned work which contributed to their characterisation of homework as futile. This sense of futility was heightened by parents’ belief that homework was merely teaching their children conflict behaviours: ‘In my house, they definitely learned nothing except how to have a big fight’ (Parent B). This conflict which was precipitated by a demand (homework) seen at times as futile created an ambivalence in parents as to how worthwhile it was to set particular expectations for their child at homework time; at the same time, parents struggled with the belief that the academic outcomes for their child would be damaged in the long term were they not to achieve proficiency.

The impact of the conflict on multiple dyads within the family system was evident; parent and child, sibling and child, parent and parent. Conflict also impacted on participants’ views of themselves as competent parents. Parents also consistently negatively appraised their own capacity to effectively manage the existing difficulties and were equally self-critical as to their likely future competency. The consequences of persistent conflict on the child’s future psychological development was a recurrent source of anxiety for all participants.

Negative emotions and emotional descriptions dominated the focus group discussions with repeated reference to stress. Parents often spoke of failing: “I can’t help him, which is terrible, because I’m his mom and I’m supposed to” (Parent A). The data from the focus groups suggests that the self-perception of parental failure is common and that a cascade of negative, self-critical frequently catastrophic thoughts ensue, resulting in potentially more extreme emotional and behavioural responses on the part of parents. Parents frequently spoke of becoming frustrated by the reciprocal cycle of conflict, describing feelings of persistent self-doubt due in part to their perception that they had failed to successfully facilitate this ‘normal’ home life for their child while constantly second guessing their actions in relation to the most basic of tasks.

3.2. Implications: immediate and future

All parents considered their children to display characteristics which significantly impaired their capacity to complete homework with the ease expected. They spoke of a constellation of characteristics that adversely impacted the homework process including resistance to starting; inaccuracy of the written information in homework journals; forgetting of essential books; avoidance of task completion and length of time to complete work. Participants also expressed their fears that self-awareness on their child’s part as to the deficits in their behaviour had/ would lead to self-criticism and ultimately persistent low self-esteem. Such fears as to the damaging impact of self-awareness were expressed by participants who on the other hand highlighted the incredible frustration they felt at their child’s lack of self-awareness and what they identified as the consequences of this. Parents feared for the future implications of these characteristics both in terms of the child’s future emotional well-being and in terms of their ability to function independently as adults.

While parents indicated that they understood the nature of ADHD-related academic challenges, the contrast in some children’s work in school versus the work produced at home was surprising and led parents to question their own capabilities, in addition to questioning the ADHD associated impairment itself: ‘I kinda find it hard to believe’ (Parent A).
Parents expressed alarm at the emotional response their children had to homework with the most common emotions being frustration, irritability, anger and sadness. Parents in many cases saw their lack of success in facilitating positive homework behaviours as a proxy for their overall lack of success/failure as a parent. As a result, participants were fatalistic as to their child’s future prospects.

In addition, participants experienced the variety of roles they played as having added complexity within this context: teacher-in-the-home; caregiver; ADHD expert and advocate for their child in school. Parents highlighted the demands and attendant pressures this encompassed and outlined how the varying demands of parenthood were more frequently in conflict than they perceived should be the case. Participants also identified a connection between what they experienced as a toxic mix of recurring negative emotions for parent and child at homework time with unconstructive thoughts and behaviours on their part. When considering this, participants clearly identified their own ability to regulate their emotional responses as extremely important in order to manage the homework process effectively: “...in an ideal world you stay calm, you feed him and give him what he needs and get to the next piece” (Parent F). Within this context, parents also identified behaviours that could helpfully influence their own emotional states and which could impact on their child’s emotional-behavioural reaction: “It makes a difference if I do something so that I’m more calm for him” (Parent E).

All participants described automatic thoughts which catastrophised the future implications of their child's current behaviours based on beliefs and assumptions as to the negative educational trajectory for their child. Finally, parents outlined how their assumptions as to the role of homework influenced their approach in unhelpful ways. For example, some participants viewed homework as the means by which their child would ‘catch up on everything’ that they had not focused on sufficiently during the school day, setting parents up for an unenviable task that was simply not achievable. Failure to successfully carry this out further compounded a sense of failure for both parent and child.

4. Discussion

The home is a complex social environment, particularly when the work of another complex social environment (school) is carried out within it (Pungello et al., 2010; Son & Morrison, 2010). ADHD, by its very nature, accentuates the inherent challenges of the interplay (in the form of homework) between these two environments and potentially compounds the schism which may exist between school and home (Rogers, Wiener, Marton, & Tannock, 2009). The increased vulnerability of the home system, consequent to the pressure of managing the workload and expectation of another system in the presence of ADHD create a toxicity, evident in the myriad negative emotions described by participants in this study, from which both parent and child feel there is no respite. From a goodness-of-fit perspective, there may be poor compatibility between parental attitudes to ADHD behaviours and their perception of school attitudes to same (Greene, 1995). The impact of this perceived misalignment is to fuel parental frustration, as highlighted by study participants. Furthermore, as demonstrated by the challenges illustrated by study participants, homework necessitates role diffusion by both parent and child (parent/teacher – child/student) and, while many parents fulfill this dual role, the characteristics of ADHD are such that the demands on the parent are much greater, thereby providing a context for a cycle of increased conflict, stress, frustration and disempowerment (Cussen et al., 2012; Biederman et al., 1995; Pressman et al., 2006; Paternite, Loney, & Roberts, 1995) consistent with the theme of conflict/myriad negative emotions which parents powerfully emphasised in this study.

Broadly, the role of a ‘a good enough’ parent in respect of homework is to facilitate sufficient oversight in the home such that it is a reasonable expectation that homework will be completed (Hoover-Dempsey et al., 1995). In the case of parents of children with ADHD, however, this is often insufficient due to the need for approaches over and above those typically required by parents to manage homework (Mautone et al., 2011). To cite just one example from the current study, the insufficient effectiveness of typical ‘good enough’ parenting is evidenced by the compelling accounts provided by participants illustrating the additional personal reserves required even to maintain parental emotional regulation for the duration of homework. The extant literature on parenting and ADHD clearly recognises the need for additional parent training and support to manage the general behavioural challenges that arise but fails to adequately address the particulars as they pertain to homework (Deault, 2010) with this inadequacy of existing parent training programmes emphasised by participants in this study. Unsurprisingly, given the lack of academic focus on homework within the parameters of parenting in ADHD, there has also been insufficient emphasis in clinical guidelines on interventions linked to specific skill acquisition for parents to enhance functional outcomes in regard to homework. Given the central role that homework plays in developing the skills identified, and the fact that homework is the most established mechanism for parental involvement in a child’s education, it would seem reasonable to conclude that a logical starting point is to offer a Homework Specific Parenting Intervention. Such an intervention would also address the clear challenges identified by participants in this study and the fears highlighted by parents regarding their children’s futures, which they perceived in part as driven by the challenges their children experienced with homework.

One of the most established interventions is Homework Success for Children with ADHD (HSP) (Power, 2001). This programme aims to optimise homework performance through three mechanisms: i) strengthening the parent-child relationship ii) improving parents’ behaviour management skills and iii) increasing family involvement in education which aligns with key areas of concern explored across all of the themes discussed above. A cornerstone of the HSP programme is the development of a strong parent-child relationship, focusing on rebalancing the child’s experience of frequent negative feedback with positive attention relating to homework tasks specifically; the critical importance of centring a strong parent-child relationship to any intervention in this area is brought into sharp focus by the cascading down spiral of the dyadic relationships highlighted by study participants. As discussed, the theme of ‘conflict’ points to a number of key elements necessary in any intervention designed to support parents. Firstly, this theme indicates that providing techniques and tools to promote positive homework behaviours and to allow de-escalation of negative interaction should be incorporated. Another important element of any group-based intervention designed to address the issues captured by this theme is to feature a therapeutic space for parents to share their experiences with other parents. This is necessary both to facilitate a less critical self-appraisal, which was so powerfully evoked within this theme, and to allow parents the opportunity to understand the commonality of their experience in the context of a child with ADHD. The HSP also incorporates standard behavioural techniques such as immediate positive reinforcement in a targeted manner (Barley, 1997) which are used to shape desired homework behaviours as well as reducing inappropriate homework behaviours by withdrawal of positive reinforcement (Webster-Stratton, 2005) and infrequent, judicious use of punishment (Forehand & Long, 2002). The HSP approach to increasing family involvement in education has two strands: i) promoting parental educational involvement in the home and ii) promoting family-school collaboration. This is based on the known association between parental involvement in education and the academic outcomes and educational engagement of the child (Christensen & Sheridan, 2001; Epstein, 1995). Part of the therapeutic focus must, therefore, include a mechanism by which parents can set realisable goals that can set the parent-child dyad up for success.

The need and desire of participants for explicit strategies to support their child’s homework was clearly evident across the themes identified in this study. Again, however, the empirical evidence to inform such strategies in relation to ADHD is relatively limited. The approaches
identified are based on the extant evidence base such as in HSP promoting parental involvement in education in the home is achieved through two strategies: goal setting and parent tutoring (Power et al., 2001). Parents work with their child to establish attainable goals for homework completion and quality (accuracy) while also tutoring their child in study skills using evidenced-based educational techniques. As children learn best when most of the material is already familiar to them (Shapiro, 2004), parents are taught how to set effective targets with only 20–30% unknown material per study session. It is reasonable to infer that sharing knowledge such as this with parents holds the opportunity to empower parents who, as evidenced by the thematic exploration above, struggle in their dual role as teacher-parent. Promoting family-school collaboration is achieved using the Conjoint Behavioural Consultation (CBC) Model (Sheridan & Kratochwill, 2008) which utilises the daily report card (DRC) (Kelley, 1990). There are four components to the CBC Model and each involves the parent and teacher working together to establish approaches to optimise performance. Participants in this study emphasised their concerns regarding the very real impact of their perception of a lack of understanding on the part of teachers as to their child’s challenges in regard to homework, underscoring the critical need for further exploration and development of effective models of home-school collaboration for parents of children with ADHD.

Given the degree of parental distress, self-doubt, guilt and exhaustion, coupled with parental anxiety about the negative trajectory for their child, highlighted across all themes, any parenting intervention must embody therapeutic approaches to enable solutions to these key concerns. While programmes such as the aforementioned, grounded in a clear empirical framework, are a valuable starting point to the development of a Homework Specific ADHD Parenting Intervention, the results of this study suggest that consideration of additional therapeutic elements is essential. The theme of ‘negative emotions’ indicated the intensity and regularity of negative emotions experienced by parents at homework time which fuelled a variety of negative cognitions, further disempowering parents, compounding self-doubt and precipitating further unconstructive parent-child interactions. This theme emphasises the need to enhance parental understanding of the functional impact of ADHD. The powerlessness experienced by parents underscores the need for any intervention to include a mechanism to motivate and empower parents while also facilitating increased understanding of ADHD within the school system. Furthermore, parental fear, frustration and distress at the absence/ineffectiveness of supports currently in place was foregrounded throughout all themes.

The results highlight a basic knowledge gap on the part of parents as to the supports to which children with ADHD are entitled within the educational system in general and pertaining to homework in particular and suggest that any intervention needs a comprehensive psycho-education component with clear information as to the relevant educational entitlements available. This is an essential starting point to allow parents advocate for homework to be differentiated and targeted within Individual Education Plans and is a prerequisite to any of the HSP interventions. Furthermore, it is reasonable to infer from this study that any intervention designed to help parents optimise their child’s homework performance must address parents’ particular needs as opposed to purely focusing on the child’s behaviours. Underpinning this is a need for the intervention to incorporate a therapeutic focus to help parents develop an awareness of their cognitive responses. The catastrophising of homework processes was plainly evident and the persistent, recurring self-criticism and self-blame was equally compelling, indicating a potential role for basic Cognitive Behavioural Therapy principles in any intervention developed within this context.

The experience of parents of children with ADHD compared to parents of typically developing children, however, is that the school is a less inviting place (Rogers et al., 2009). It is, therefore, essential that any homework intervention for parents encompasses strategies to aid home-school communication. It is unlikely, however, that any single intervention can achieve the necessary shift in school/teacher approaches in a uniform manner without a paradigm-shift regarding ADHD in the educational sector. Moreover, it is well recognised that a unisystemic approach on the part of parents is insufficient given the recognised role of relationships between systems in contributing to child outcomes (Bronfenbrenner, 1979, Pianta & Walsh, 1996). Despite this, at an individual therapeutic level, notwithstanding the obvious challenges, the intervention must seek to help parents to explore/enact strategies to work collaboratively with their child’s school in this regard.

Finally, further research is required to determine the optimal session number to deliver an effective intervention. A systematic review of the literature (Gavin, 2023) indicates that a once-off intervention may be as effective as a programme delivered over a number of weeks or months. Participants in this Focus Group, for example, indicated a preference for a single-session intervention with the possibility of clinician access for further advice/direction. Within the constraints of the real-world clinical setting, it is essential that any such intervention is designed to be deliverable within resource (both budgetary and staff therapeutic time) availability.

4.1. Methodological issues

The study sample was purposeful (parents who are members of a national ADHD support group) and as such may not be representative of parents of children with ADHD in general.

4.2. Implications of the study

Further research is required to develop and pilot a specifically designed homework intervention which incorporates strategies to address the key challenges identified by parents in this study.

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Ethical approval

This study was granted ethical approval by The UCD Office of Research Ethics, 18th December 2017.

CRediT authorship contribution statement

Blanaid Gavin: contributed to the manuscript through certain aspect involving, Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft, Writing – review & editing. Ingrid Holme: contributed to the manuscript through certain aspect involving, Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft, Writing – review & editing. Elisha Minihan: contributed to the manuscript through certain aspect involving, Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft, Writing – review & editing. Gary O’Reilly: contributed to the manuscript through certain aspect involving, Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft, Writing – review & editing. Fiona McNicholas: contributed to the manuscript through certain aspect involving, Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft, Writing – review & editing.
Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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