



RESEARCH ARTICLE

Barriers and Facilitators Associated with the Management of Aggressive and Disruptive Behaviour in Children: A Qualitative Study with Pediatricians

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Abstract

Background: Aggressive and disruptive behaviours are frequently observed in children. Short-term use of antipsychotics with monitoring for adverse effects is recommended when first-line interventions fail (e.g. psychosocial therapies and psychostimulants for ADHD). This study aimed to understand the barriers and facilitators to behavioural change for the management of aggressive and disruptive behaviours by pediatricians. **Methods:** This was a qualitative study with twenty community-based pediatricians. An interview guide was developed to elicit beliefs associated with practice behaviours. We used thematic content analysis with the Theoretical Domains Framework to inform knowledge translation interventions, by helping to determine what behavioural barriers and facilitators to practice exist. Key domains which influenced behaviour were identified by evaluating the frequency of beliefs across interviews, conflicting beliefs, and the strength of beliefs impacting behaviour. **Results:** Pediatricians described evaluating the impact of aggressive and disruptive behaviours, attempting to determine their cause, and using an approach that prioritized psychosocial therapies and psychostimulants. Pediatricians reported that antipsychotics were effective but that they experienced anxiety about harms, and there was a need to accept the adverse effects as a trade-off for improved function. Discontinuing antipsychotics was problematic. Despite awareness of antipsychotic-induced movement disorders and metabolic effects, there were limitations in physician skills, knowledge and resources and social influences that were a barrier to routine implementation of recommended monitoring procedures. **Conclusions:** This study identifies barriers and facilitators to evidence-based practice that can be used for knowledge translation interventions to ensure a high standard of care for children prescribed antipsychotics.

Key Words: attention deficit hyperactivity disorder, disruptive behaviour disorders, aggression, pediatricians, antipsychotics, qualitative research

Résumé

Contexte: Les comportements agressifs et perturbateurs sont fréquemment observés chez les enfants. L'utilisation à court terme d'antipsychotiques sous surveillance des effets indésirables est recommandée lorsque les interventions de première intention échouent (p. ex., les thérapies psychosociales et les psychostimulants pour le TDAH). La présente étude visait à comprendre les obstacles et les facilitateurs du changement de comportement pour la prise en charge du comportement agressif et perturbateur par les pédiatres. **Méthodes:** Il s'agit d'une étude qualitative menée avec 20 pédiatres

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communautaires. Un guide d'entrevue a été mis au point afin d'obtenir les croyances associées aux comportements de la pratique. Nous avons utilisé l'analyse du contenu thématique à l'aide du cadre des domaines théoriques pour éclairer les interventions de transmission des connaissances, en aidant à déterminer quels obstacles et facilitateurs comportementaux existent pour la pratique. Les domaines clés qui influençaient le comportement ont été identifiés en évaluant la fréquence des croyances dans les entrevues, les croyances conflictuelles et la force des croyances influant sur le comportement.

Résultats: Les pédiatres ont décrit leur évaluation de l'effet des comportements agressifs et perturbateurs, ont tenté d'en déterminer la cause, et ont eu recours à une approche qui privilégiait les thérapies psychosociales et les psychostimulants. Les pédiatres ont énoncé que les antipsychotiques étaient efficaces mais qu'ils éprouvaient de l'anxiété au sujet des effets néfastes, et qu'il existait un besoin d'accepter les effets indésirables en contrepartie d'une fonction améliorée. Discontinuer les antipsychotiques était problématique. Malgré la connaissance des troubles du mouvement et des effets métaboliques induits par les antipsychotiques, il y avait des limitations des compétences, des connaissances et des ressources des médecins et des influences sociales qui faisaient obstacle à la mise en œuvre régulière des procédures de surveillance recommandées. **Conclusions:** Cette étude identifie les obstacles et les facilitateurs de la pratique fondée sur les données probantes qui peuvent servir aux interventions de transmission des connaissances afin d'assurer une norme élevée des soins aux enfants à qui on prescrit des antipsychotiques.

Mots clés: *trouble de déficit d'attention avec hyperactivité, troubles de comportement perturbateur, agressivité, pédiatres, antipsychotiques, recherche qualitative*

Introduction

In Canada, 4.1% of school-aged children are diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) (Brault & Lacourse, 2012). From a population-based study in Quebec, 1-6% of children met criteria for Oppositional Defiant Disorder (ODD), and 0.2-2% of children met criteria for Conduct Disorder (CD) (Breton et al., 1999). Aggression and disruptive behavior in children with ADHD, ODD, and CD result in poorer quality of life for children and their families (Klassen, Miller, & Fine, 2004) and are risk factors for depression, substance use disorders, criminality, unemployment, and academic underachievement later in life (Erskine et al., 2016). Consequently, safe and effective treatments for aggression and disruptive behaviour are critically important.

There are evidence-based recommendations for the management of aggression and disruptive behavior in children with ADHD, ODD, and CD (Gorman et al., 2015). Psychosocial therapies are recommended first-line due to low risks and substantial evidence supporting efficacy. In younger children, recommended psychosocial therapies include parent training treatment programs, and multicomponent treatment approaches consisting of positive parenting skills, interpersonal and social skills training for children and classroom management for teachers (Scotto Rosato et al., 2012). In older children, family interventions to improve parent-child relationships and communication, parenting skills and school involvement, positive peer activities and cognitive behavioural therapy are recommended (Scotto-Rosato et al., 2012). When psychosocial therapy is inadequate or unavailable, psychostimulants are strongly recommended and should be offered as firstline to treat patients with comorbid ADHD (Gorman et al., 2015). The antipsychotic risperidone may be considered to treat functionally disabling

disruptive and aggressive behaviour in children with ODD or CD (Gorman et al., 2015). As the use of antipsychotics is associated with metabolic, hormonal and neurological adverse effects (Pringsheim, Lam, Ching, & Patten, 2011), short-term use is advised, with tapering and discontinuation after three months of successful treatment (Gorman, 2015).

The Canadian Alliance for Monitoring Effectiveness and Safety of Antipsychotic Medications in Children (CAMESA) developed evidence-based guidelines to improve antipsychotic safety monitoring standards (Pringsheim, Panagiotopoulos, Davidson, Ho, & Canadian Alliance for Monitoring Effectiveness and Safety of Antipsychotics in Children Guideline Group, 2011). Recommended monitoring activities include laboratory tests and physical examination. Less than 45% of children prescribed antipsychotics receive any of the recommended laboratory tests for monitoring the metabolic and hormonal effects of these medications (Chen et al., 2018). Given the potential harm of antipsychotic use in this population, this under-use of evidence based practice is concerning and suggests that there is a significant knowledge-to-action gap despite knowledge translation efforts to disseminate and implement the CAMESA guidelines.

Knowledge alone is insufficient to effect behaviour change in practice among physicians. Theoretical frameworks have shown promise in identifying targets for behavior change to translate research into practice and improve outcomes (Michie et al., 2005; Cane, O'Connor, & Michie, 2012; Nilsen, 2015). The theoretical domains framework (TDF) consists of 14 domains which are assessed to identify barriers and facilitators to behavior change (Michie et al., 2005; Cane et al., 2012). The TDF has been independently validated (Cane et al., 2012), and used in various areas, including

dementia (Goodarzi et al., 2018), schizophrenia (Michie et al., 2007), and low-back pain (French et al., 2012). The TDF is linked to the Behaviour Change Wheel enabling the researcher to correlate evidence-based behaviour change interventions with identified barriers (Michie, van Stralen, & West, 2011). The Behaviour Change Wheel provides a causal analysis of behaviour and helps identify individual level factors, and social and physical environmental factors required for behavioural change. Researchers can use the Behavioural Change Wheel to select and design interventions that will yield behavioural change (Atkins, 2016).

This study aims to understand the barriers and facilitators associated with adherence to treatment recommendations from the Canadian Guidelines on Pharmacotherapy for Disruptive and Aggressive Behaviour in Children and Adolescents with ADHD, ODD or CD, and the CAMESA guidelines using the TDF. We hypothesized that facilitators to practice according to treatment recommendations would be excellent physician knowledge, and that barriers would include inadequate physician skills and resources. The results of this qualitative study will be used to inform the development of an implementation intervention aimed at improving the evidence-based care for these children, as well as the uptake of safety monitoring practices by clinicians prescribing antipsychotics to children.

Methods

Design and Ethics

This was a qualitative study using the framework method (Gale, Heath, Cameron, Rashid, & Redwood, 2013), a type of thematic content analysis. We used semi-structured interviews based on the TDF (Michie et al., 2005; Cane et al., 2012). Ethics approval was received from the University of Calgary Conjoint Health Research Ethics Board (REB15-0196).

Participants

Participants were recruited primarily through snowball sampling. Initially, two community pediatricians known to the principal investigator through clinical practice were invited to participate in this study and were asked to recommend additional pediatricians. To be included participants had to be community-based pediatricians providing care to children and youth with aggression and disruptive behaviours. We used this sampling strategy as we wished to speak to community-based pediatricians from across Canada, working in a variety of settings, including rural and remote communities, and small and large urban centres. Participants were contacted by email and invited to participate in a telephone or in-person interview and were offered an honorarium for their participation. We aimed to recruit between 15 and 30 participants, with the final number to be determined based on reaching data saturation. The researchers performing the

interviews met regularly during the data collection period to reflect on and discuss collected data, and to decide when data saturation was reached (no new themes were identified). When this occurred, three additional interviews were performed to confirm we had reached data saturation.

Data Collection

All participants provided informed consent prior to participating in this study and were informed that they could withdraw from participating in the study with no consequence. Using the TDF (Michie et al., 2005; Cane et al., 2012), an interview guide was developed to elicit beliefs about 11 domains associated with specific clinical practice behaviours, and obtain details about the role of the domain in influencing behaviour. The interview guide was informed by the Canadian guidelines on pharmacotherapy for disruptive and aggressive behaviour in children and adolescents with ADHD, ODD and CD, and the CAMESA guidelines, both of which provide evidence-based recommendations for practice (Pringsheim et al., 2011; Gorman et al., 2015). The guide was developed by the senior author (TP) and refined by a co-author (LC). See Table 1 for the interview guide. Rigour during data collection was maintained through regular meetings between the researchers conducting the interviews (TP and LC) to discuss and review interviews.

The questions were pilot tested with two pediatricians and modified based on feedback. Interviews were conducted by two researchers (TP, LC) and were audio-recorded, transcribed verbatim, and anonymized.

Analysis

We used a framework approach, a method of content analysis that involves summarizing the classifying data within a thematic framework, i.e. the TDF. The TDF can be used by researchers to inform implementation interventions, by helping to determine what barriers and facilitators to practice behaviours exist, which can then inform selection, tailoring and implementation of interventions (Atkins et al., 2017). Initial pilot interviews were used to formulate a coding strategy based on the TDF. Participant responses were carefully read and coded into the relevant theoretical domains. Two researchers (TP and NS) coded responses separately for the first six interviews and the rates of agreement across domains were consistent thus the remaining interviews were coded by NS and verified by TP. Responses coded in different domains were discussed to establish consensus. Key domains (e.g. knowledge, skills, emotion) which influence practice behaviours of participants were identified by evaluating the frequency of beliefs across interviews, if conflicting beliefs were identified, and the perceived strength of beliefs impacting the behaviour. Subcategories within each TDF domain were identified by the research team. Final coding was reviewed by the principal investigator (TP) as well as an independent researcher

Table 1. Interview Guide

<p>Recommended Practice: When psychosocial therapy provides insufficient benefit, clinicians may offer risperidone for the treatment of functionally disabling disruptive and aggressive behaviour in children and adolescents with ODD or CD. In patients with comorbid ADHD, treatment with ADHD medication, starting with psychostimulants, should be pursued before considering risperidone. Given risperidone's major side effect burden, tapering and discontinuing risperidone should be considered after 3 months of successful treatment.</p> <p>Knowledge: Which medications have you found the most effective for aggressive/disruptive behaviour in children with ADHD? Are you aware of any guideline recommendations on this topic? Tell me about any concerns you might have about adverse effects of risperidone? How do you monitor children for these?</p> <p>Skills: How proficient or skilled are you in making pharmacotherapy recommendations to families for aggressive and disruptive behaviour? Monitoring for adverse events?</p> <p>Social professional role and identity: Do you think prescribing medication for aggressive behaviour and monitoring for adverse effects is part of your role?</p> <p>Beliefs about capabilities: How confident are you in making treatment decisions for the pharmacotherapy of aggressive behaviour and monitoring for adverse effects? Do you ever fear you might miss something? Is it easy or difficult for you?</p> <p>Beliefs about consequences: Do you think the medications you prescribe are helpful for aggression/disruptive behaviour? What are the benefits to patients? What are the consequences for patients/families of prescribing or not prescribing these medications?</p> <p>Motivation and goals: Why do you prescribe medication for aggressive/disruptive behaviour? Do you feel you have to? Why do you monitor adverse effects? Do you feel you have to?</p> <p>Memory, attention and decision processes: Is monitoring medication safety something you do routinely? Do you ever forget to do this?</p> <p>Environmental context and resources: Do resources influence whether or not you prescribe medication for disruptive/aggressive behaviour or perform safety monitoring? Are there any tools you use to help you do this? Do you have enough time? Does your working environment influence your behaviour?</p> <p>Social influences: What are the views of your colleagues on prescribing medication for aggressive/disruptive behaviour and monitoring drug safety? Do you have role models? How do parents react when you recommend medications for aggressive behaviour?</p> <p>Emotion: How do you feel about prescribing medication for aggressive/disruptive behaviour? Is it something you would rather avoid?</p> <p>Behavioural regulation: What would you need to do to change your prescribing/monitoring practices? What would help?</p>
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(ZG), with charting, mapping and interpretation conducted by all members of the research team through meeting and discussion. Within the TDF domains, major themes were identified. Data analysis was facilitated using NVivo, Version 12.0.0.71, 2018. Credibility of the study was established through investigator and environmental triangulation of the data, with the study investigators coming from the fields of medicine and social work, and the data obtained from participants from a variety of practice settings. The characteristics of our sample also helped to establish transferability of findings across pediatricians treating children with disruptive and aggressive behaviour in Canada.

Results

Twenty community-based pediatricians were interviewed over a period of twelve months. Pediatricians from across Canada were recruited, with two pediatricians from the Yukon/North West Territories, two from British Columbia, six from Alberta, three from Saskatchewan, four from Ontario, one from Quebec, one from Nova Scotia, and one from Newfoundland. Thirteen pediatricians were female and seven were male. Six pediatricians had been in practice for less than five years.

Three major themes were identified in our analysis. Additional physician quotes are available from the author.

Theme 1.0 Assessment and Treatment Planning for Children with Disruptive and Aggressive Behaviour (see Table 2 for physician quotes)

1.1 Impact of aggressive and disruptive behaviour on child and family life

Pediatricians reported that aggressive and disruptive behavior negatively impacts child and family life (TDF: Social Influences). Some participants reported significant limitations to the child's functioning at home and in school. Physicians noted that these behaviours create a stressful environment for parents in the home setting.

1.2 Understanding the cause of aggressive and disruptive behavior

It was important for pediatricians to try to determine the cause of the behavior before a treatment plan was devised, but sorting through the different behavioural and psychiatric symptoms was often reported as

Table 2. Assessment and Treatment Planning for Children with Disruptive and Aggressive Behaviour

1.1 Impact of aggressive and disruptive behavior on child and family life	<p>“...most often these kids are frustrated with not being able to stay on task. They’re constantly in trouble and can’t come up to their peers and they become aggressive as a result of being frustrated...” (Participant 19)</p> <p>“...there are some parents who just struggle so much with those nonverbal aggressive kids at home...” (Participant 13)</p>
1.2 Understanding the cause of aggressive and disruptive behavior	<p>“...I really think so many times that if we try and understand the child differently, then we’re less likely to medicate and try and figure out where the parent is coming from and what we can do.” (Participant 18)</p> <p>“...I think part of the challenge for me is that inattention can in and of itself cause anxiety which can cause aggression and so where do you start? Do you start by treating the ADHD and then looking at really the causes of that...or do you primarily go with the anxiety - where do you start?” (Participant 19)</p>
1.3 Recommending psychosocial therapies	<p>“...I also mention to them, even if we are on medication, that we have to do that psychosocial piece as well and most parents want that, they want to make sure that it’s just not medication without the other piece.” (Participant 18)</p> <p>“I feel like most parents come in one of two types, right, like they’re either the, I’m here because I think my kid needs medication or like I really, I think my child has behavioral issues and I really don’t want medication, I want other coping techniques...If they’re in one camp, it’s hard to get them out of that camp...and I find like it’s a struggle for, if the parents are in the pro, like we can put my kid on medications and we could have done it yesterday.” (Participant 17)</p> <p>“...if it is difficult to get those (psychosocial) resources and if a family is in crisis...I’m a little bit quicker than, in an ideal world I would want to maybe start stimulants” (Participant 17)</p>
1.4 Prescribing psychostimulants for ADHD and disruptive behaviour	<p>“...I have zero hesitation, like I have no qualms about that; I’m very, very comfortable with stimulant use.” (Participant 2)</p> <p>Regarding stimulant use - “...most of the time families come back saying I can have a conversation with my kid now or they’re doing more at school, their teachers are happy...” (Participant 10)</p>

challenging (TDF: Skills). Some physicians noted that factors such as anxiety, learning disabilities, and home environment may contribute to aggressive behaviour and voiced concerns that the use of medication might make it difficult to identify triggers or precipitants for aggressive behavior.

1.3 Recommending psychosocial therapies

Pediatricians reported that parents were usually receptive to psychosocial therapies (e.g., parent training programs, cognitive behavioural therapies), either alone or in combination with medication (TDF: Social influences). Psychosocial therapies were preferred by parents who were resistant to using medications. In these circumstances, parents were more receptive to medication if psychosocial therapies were tried previously and failed. Pediatricians preferred trying psychosocial therapies prior to using medication for aggression, but some physicians reported feeling pressured by parents to prescribe medication first, particularly by those in crisis situations (TDF: Social influences). There was difficulty in accessing psychosocial resources which influenced prescribing practices (TDF: Environmental context and resources). Training

in psychosocial therapies was reported as limited (TDF: Knowledge).

1.4 Prescribing psychostimulants for ADHD and disruptive behaviour

Pediatricians agreed that psychostimulants had the potential to significantly improve aggressive and disruptive behavior (TDF: Beliefs about consequences). Stimulants were reported as an effective first-line medication. In contrast to the uncertainty and anxiety associated with prescribing antipsychotic medications, pediatricians reported being comfortable prescribing psychostimulants and that this was something they did without hesitation in children with ADHD (TDF: Beliefs about capabilities).

Theme 2.0 Ambivalent Feelings Toward the Use of Antipsychotic Medications (see Table 3 for physician quotes)

2.1 Feeling compelled to act

Despite being hesitant towards prescribing antipsychotics, practitioners reported a desire to help improve challenging family situations, particularly those in

crisis, through the use of antipsychotics in children with aggressive and disruptive behavior (TDF: Emotion). Participants agreed that antipsychotic medications had the potential to improve quality of life and functional abilities of children (TDF: Beliefs about consequences). Many practitioners noted significant improvements to family-life.

2.2 Antipsychotics as a temporary solution

Pediatricians felt that antipsychotic use was only part of the solution towards managing aggressive and/or disruptive behavior in children (TDF: Beliefs about consequences). In particular, many physicians reported that medication should only be used temporarily to manage the child's disruptive behavior while potential environmental causes of the behaviour are investigated (e.g., parenting style, anxiety) and behavioural therapies are started. Antipsychotic medications helped facilitate behavioural interventions by decreasing the acuity and severity of symptoms, allowing the child to more actively engage in these therapies.

2.3 Anxiety about harms of antipsychotics and over-using medication

Pediatricians reported anxiety over the potential treatment harms of antipsychotic medication (TDF: Emotion). They reported a fear of overusing antipsychotics (TDF: Emotion) and reported a need for decision support (TDF: Environmental context and resources). Despite knowing of the potential benefits of antipsychotics, most reported being uncomfortable prescribing them (TDF: Beliefs about capabilities). Many participants noted that they consult with colleagues, psychiatrists in particular, when prescribing antipsychotics due to concerns about potential adverse effects and an overall lack of training with the medication (TDF: Skills).

2.4 Accepting adverse effects of antipsychotics as a trade-off

Pediatricians were willing to accept adverse effects of antipsychotics as a trade-off for improved function in children with aggressive and/or disruptive behavior (TDF: Beliefs about consequences). Participants noted that parents were also willing to accept this trade-off (TDF: Social influences). Specifically, adverse metabolic side-effects such as weight gain were reported as an acceptable trade-off for improved function in children.

2.5 Discontinuing antipsychotics

Despite being aware that antipsychotic medications should eventually be discontinued and tapered after successful treatment, some pediatricians found it difficult to do this (TDF: Skills). Some physicians also reported that they struggled with discontinuing

medication due to resistance from both the parents and children due to perceived benefits (TDF: Social Influences).

Theme 3.0 Monitoring and Detecting Adverse Effects of Antipsychotic Medications (see Table 4 for physician quotes)

3.1 Awareness of metabolic side effects

Pediatricians reported that antipsychotic medications have the potential to cause adverse metabolic side effects (TDF: Knowledge). Many physicians noted observing metabolic issues, particularly weight gain and hyperlipidemia.

3.2 Awareness of drug-induced movement disorders

Pediatricians knew that antipsychotic medications had the potential to cause drug-induced movement disorders (TDF: Knowledge), however very few physicians had actually observed drug-induced movement disorders in their patients. Physicians who reported observing these adverse effects noted that they were uncommon and minor in severity.

3.3 Deciding what and when to monitor for adverse effects

Pediatricians reported that there is a need for tools to help them remember what and when to monitor for adverse effects (TDF: Memory, attention and decision processes). Many physicians noted clinician summaries from evidence-based guidelines and electronic medical record (EMR) forms as potential tools. Specifically, physicians reported that both EMRs and summary charts had the potential to improve retention of best practices by acting as a reminder.

Some pediatricians agreed that patients should be regularly monitored for adverse effects and described different strategies for their detection (TDF: Knowledge). For drug-induced movement disorders, pediatricians noted that they may educate parents about these symptoms, and reported using narrative history to detect symptoms, with some describing the use of the general neurological exam (TDF: Skills). Many pediatricians reported that they were not comfortable monitoring and detecting drug-induced movement disorders (TDF: Skills; Beliefs about capabilities). Specifically, participants reported limited skills for monitoring and detecting subtle side effects.

Pediatricians had greater confidence in their abilities to monitor metabolic and hormonal adverse effects, and used lab work (e.g. lipids and prolactin), height, weight, BMI, waist circumference, and blood pressure to monitor for these. Additionally practitioners also discussed more frequent clinic visits as a monitoring strategy.

Table 3. Ambivalent Feelings Toward the Use of Antipsychotic Medications

2.1 Feeling compelled to act	<p>“...When it does work, it makes their lives so much better” (Participant 2)</p> <p>“It’s a go-to drug, you know, it’s not going to let you down in terms of does it deliver that control. Absolutely it does and are there kids that we still use it for, absolutely, and they’re kids where I say to parents, I would like to move you from Risperdal to Intuniv and they say no way. He has missed a dose and I have seen what happens and I am not going to go through that.” (Participant 3)</p> <p>“...Antipsychotics - I find I’m always a bit reluctant but sometimes some parents just need some help.” (Participant 15)</p>
2.2 Antipsychotics as a temporary solution	<p>“It slows things down but it’s not the cure.” (Participant 9)</p> <p>“...there are some kids where it’s just, their symptoms are so strong, you are not going to be able to get anywhere unless you start to manage the behavior symptoms with medications...” (Participant 9)</p> <p>“...it’s with using both that you really get your biggest result and that sometimes if you can, you know, you have a really anxious child who really can’t engage in any kind of behavioral therapy but if you can get their anxiety down with a little bit of medication, then they can actually really do well with behavioral therapy and over time you might be able to really decrease the medication or get rid of it...” (Participant 8)</p> <p>“...usually the medications are to also give an opportunity to look at other environmental, if you like, approaches as well...” (Participant 6)</p>
2.3 Anxiety about harms of antipsychotics and over-using medication	<p>“...the effect on the lipids and the weight gain to me is scary sometimes.” (Participant 12)</p> <p>“... I know that it’s generally well tolerated, um, just the possibility of extrapyramidal side effects worries me...” (Participant 16)</p> <p>“...it’s been prescribed elsewhere like candy and there’s a lot of articles on that but for me personally, I just feel like I need some backup when it comes to that. When I get to that point, I just, I usually ask for consult because to be frank, I’m not comfortable.” (Participant 16)</p>
2.4 Accepting adverse effects of antipsychotics as a trade-off	<p>“And parents will tell you, “you know doc, he is really, really hungry but if he is happier and he is better, we can live with it. If it is a choice between an overweight child who is not kicking us and attacking us, we will live with that.” It’s a trade-off for the family, right. If I am going to save this child from going to foster care and the price of it is Risperdal, I will do that.” (Participant 3)</p> <p>“...I don’t think anyone is comfortable with it but we know that the quality of life for some of these children is so limited... and it has made a big difference in, you know, certainly in kids’ lives.” (Participant 8)</p>
2.5 Discontinuing antipsychotics	<p>“At some point we will want to try them off of it and see how they do. When is that time? Well, I don’t know that there’s an objective time to do that.” (Participant 17)</p> <p>“...I had one kid cry, saying, “you can’t take me off, I’m so much better on it.” (Participant 14)</p> <p>“...I always tell parents I am really reluctant to start this medication, first of all because of its long term side effects and secondly, because no one wants to get off it.” (Participant 6)</p>

3.4 Barriers to monitoring (patient & physician)

Practitioners described numerous barriers to monitoring, despite the knowledge that these adverse effects need monitoring (TDF: Social Professional Role and Identity). Specifically, many practitioners expressed a need for support staff (e.g., nurse practitioner, advance care nurse) to help with monitoring, although some noted that this might not be realistic due to limited resources (TDF: Environmental Context and Resources). Time was cited as a barrier to monitoring (TDF: Environmental Context and Resources).

Many physicians reported that their attention for monitoring for adverse effects is influenced by the

frequency of adverse effects seen in their patients and the frequency of medication use (TDF: Memory, attention and decision processes). Specifically, some participants noted that they simply forget about monitoring for adverse effects, particularly when patients have no visible side effects (e.g., weight gain, extrapyramidal symptoms), or they only have a few patients in their practice taking an antipsychotic.

Participants reported patient barriers that influenced their monitoring for adverse effects (TDF: Social influences). Many physicians noted that some parents and children experienced difficulties cooperating with monitoring procedures, particularly with assessments involving blood work. Autistic children in particular

Table 4. Monitoring and Detecting Adverse Effects of Antipsychotic Medications

3.1 Awareness of metabolic side effects	<p>"The biggest has been the obesity, has been the weight." (Participant 3)</p> <p>"Weight and triglycerides accordingly. We don't usually see one without the other." (Participant 4)</p>
3.2 Awareness of drug-induced movement disorders	<p>"So I haven't witnessed any in mine. Certainly there are case reports, obviously, that we see that are part of the guidelines..." (Participant 19)</p> <p>"The akathisia. I have certainly some of those, some of them have been really subtle and it's been a challenge to convince parents about what we need to do about that..." (Participant 3)</p> <p>"...I really haven't seen too many extrapyramidal side effects." (Participant 7)</p>
3.3 Deciding what and when to monitor for adverse effects	<p>"...if you're talking about educational things and making it more accessible for practitioners to follow best practices, I think, you know, being able to provide those things for some of the common EMRs would be a really worthwhile thing." (Participant 2)</p> <p>"As with everything in our world, if it is incorporated in my EMR at all, it will get done." (Participant 3)</p> <p>Regarding what to monitor to detect drug-induced movement disorders:</p> <p>"I would say probably it's not a skill that I'm super comfortable with." (Participant 1)</p> <p>"...if there's kind of really early subtle signs, I agree. I think, you know, that might be tough and I think that's where my confidence won't be that awesome either." (Participant 12)</p> <p>"...I just do a basic neuro exam." (Participant 12)</p> <p>"I'm simply asking and watching during my 20 minutes." (Participant 7)</p> <p>Regarding what to monitor to detect metabolic and hormonal adverse effects:</p> <p>"I tend to see them early, more often, until we're really settled and have all the potential side effects ironed out..." (Participant 18)</p> <p>"...there are guidelines and obviously because I see enough weight gain with those particular medicines, I think I should be checking them regularly." (Participant 7)</p>
3.4 Barriers to monitoring (patient & physician)	<p>"I try my best but I'm sure if I had someone who was able to do a little bit more background checking on things, it would be better for them." (Participant 14)</p> <p>"...in a perfect world you could have a nurse practitioner and advanced care nurse or someone who could help, you know, maybe once we had a kid that we had started on treatment would be one that could follow them up and take a bit more time ..." (Participant 13)</p> <p>"...time is the big one..." (Participant 7)</p> <p>"And you don't learn about the side effects or, I mean you hear about them but you don't see them, if you don't see the kids coming back." (Participant 10)</p> <p>"...it either hasn't happened to any of my patients or it happened to a small degree that I've never become aware of it." (Participant 1)</p> <p>"...I try to follow those guidelines but I don't always get the blood pressure, I don't always get the blood work done as much as I should and part of that is with autistic kids..." (Participant 18)</p>
3.5 Consequences of monitoring	<p>"...having parents drag the kids to go get a needle for a test I'm not convinced I know what I'm going to do with the result, you know, I don't want to get a marginally elevated prolactin." (Participant 3)</p> <p>"...so let's say I found cogwheeling or something and I would say, oh my God, what am I going to do with this..." (Participant 7)</p> <p>"If their weight gain is 20 kg like this kid, I would suggest that we try to stop it and see what happens..." (Participant 14)</p> <p>"I do the lipid profiles and the liver enzymes and all that stuff and it's always normal, normal, normal except for maybe prolactin that's, you know, supposed to be lower than 20 and it's 24. So at one point of a prolactin should you worry?" (Participant 13)</p> <p>Regarding measurement of waist circumference "...I guess no one has ever convinced me I should do it or what the value would be because I'm not sure it's a bad idea." (Participant 8)</p>

were noted as being the most challenging for this assessment.

3.5 Consequences of monitoring

Some physicians reported that it was not clear to them how the results of recommended monitoring activities would change clinical management of their patients, and this influenced their decision to order these tests. Pediatricians employed a number of strategies to manage adverse metabolic effects, particularly diet/exercise counselling, reducing the medication dose, switching medication, and/or discontinuing the medication. Some pediatricians were unsure of the proper course of action when faced with an elevated prolactin level or abnormalities on the neurological exam. One pediatrician questioned the value of assessing some metabolic indicators such as lipid profiles and liver enzymes (TDF: Beliefs about Consequences), as they are often within normal ranges. Many physicians reported that the added value of assessing waist circumference in particular was unclear, with some believing that the assessment is redundant if BMI is already assessed.

Discussion

Disruptive and aggressive behaviour is commonly seen by pediatricians. We found in our interviews that pediatricians have a diagnostic and treatment approach that is in-line with current Canadian evidence-based guidelines, which prioritizes use of psychosocial therapies and psychostimulants, and using antipsychotics only when these first-line treatment strategies fail. Overall, it appeared that the participants had good knowledge and skills in this area, with the main experienced barriers to implementation of treatment recommendations being environmental – with problems accessing psychosocial therapies limiting their treatment options and influencing their prescribing practices, or due to social influences – when patients were in crisis and there was a need to get control of the situation quickly. While pediatricians knew it was recommended to limit the use of antipsychotic medications to the short-term, in practice this was difficult to enforce due to the challenging nature of the behaviours and the needs of their patients and families.

The decision to proceed with prescription of an antipsychotic was difficult for physicians, who experienced conflicting emotions. They possessed knowledge on the efficacy and harm of antipsychotics, and felt compelled to help their patients. Much of their fear in prescribing antipsychotics was due to their awareness of possible serious adverse effects and the limitations in their skills and resources to monitor for these. In particular, many pediatricians felt they lacked skills in how to detect antipsychotic-induced movement disorders. While many physicians reported witnessing weight gain in their patients, some were unsure which lab tests to perform to monitor metabolic effects because they did not order these tests frequently. Some physicians were unsure

of the proper course of action if an abnormal test result was obtained, which de-motivated them from ordering tests.

These findings suggest that pediatricians require skill development in the examination for antipsychotic-induced movement disorders and that this is a possible target for intervention. Children on antipsychotics can develop several types of drug-induced movement disorders. While the risk of drug-induced movement disorders with second generation antipsychotics is lower than with older agents, a significant risk remains, with 23% of children treated with risperidone developing symptoms or signs of an extrapyramidal disorder in randomized controlled trials (Pringsheim et al., 2011). Our own prospective study of children treated with risperidone or aripiprazole found that 35% developed drug-induced movement disorders (Pringsheim, Ho, Sarna, Hammer, & Patten, 2017) detected using the Extrapyramidal Symptom Rating Scale (Chouinard & Margolese 2005), although overall severity was mild. The development of a validated, abbreviated screening examination for antipsychotic-induced movement disorders for pediatricians may be worthwhile to improve skills and promote implementation.

The difficulties pediatricians face in understanding the short and long-term consequences of abnormal test results could be addressed through the use of case-based learning activities, using real-life anonymized cases to illustrate the appropriate course of action when an abnormality is discovered during routine monitoring. The trio of CAMESA guidelines consist of a guideline document on what and when to monitor in children who are prescribed antipsychotic medications, a guideline on what to do when abnormal metabolic or hormonal adverse effects are detected, and a guideline on what to do when a drug-induced movement disorder occurs (Ho et al., 2011; Pringsheim, Doja, Belanger, Patten, & Canadian Alliance for Monitoring and Safety of Antipsychotics in Children Guideline, 2011; Pringsheim et al., 2011). It appears that these guideline documents are inadequate in providing the advice and education required by physicians to confidently manage these situations. A worldwide review investigating the effects of case-based learning on a number of learning outcomes demonstrated that case-based learning is an effective strategy for improving clinical skills and knowledge, and practice behavior, and results in a greater level of relevance and learning (McLean, 2016).

Lack of support staff, time, and the challenging nature of patients were also identified as barriers to monitoring for adverse effects. Overall, similar findings have also been reported in a recent systematic review of 32 qualitative studies assessing physicians' and nurses' barriers to effective management of type 2 diabetes in a primary care setting (Rushforth, McCrorie, Glidewell, Midgley, & Foy, 2016). The clinicians reported a lack of confidence in their knowledge of guidelines and skills, particularly with facilitating behavior change in patients and initiating insulin.

Clinicians were frustrated with the compromises in treatment due to limited time and available resources. Patient compliance to treatment was also reported as a barrier to effective management of type 2 diabetes. This comparison is important because it suggests that the issues physicians face with adherence to guidelines are not unique to behavioural problems.

An EMR form would allow the performance of these monitoring activities to be automatically built into the physician's workflow when a child is on an antipsychotic medication, rather than relying on the memory and attention of the prescribing physician. Research investigating the use of EMR in U.S. office-based physicians on numerous clinical outcomes found that use of EMR was associated with improved clinical outcomes such as ordering appropriate clinical tests, providing recommended care, and facilitating patient communication (King, Patel, Jamoom, & Furukawa, 2014). These findings suggest that developing EMR forms specific to recommended physical examinations and laboratory tests when children are prescribed antipsychotics may help to facilitate the physician's workflow and performance of these activities. Research investigating the use of EMR in Canadian private medical practices on numerous performance outcomes found that extended use of EMR was associated with greater physician efficiency and quality of care (Raymond et al., 2015). Patient, parent, health professional and health system factors that may contribute to gaps in adherence to antipsychotic safety monitoring in children and possible remedial strategies in a Canadian setting have been proposed by Javaheri and McLennan (Javaheri & McLennan, 2019).

The emotional aspects to prescribing medications for behavioural symptoms is a major barrier. Physicians spoke to us about their fears of causing harm from using antipsychotics, and the empathy they felt for the children and families they were caring for, for whom everyday life was a major struggle. Previous qualitative research by Murphy et al. (2016) found that physicians prescribing antipsychotics to children also had major concerns regarding adverse effects. Physicians also struggled to help children and families due to health system gaps and societal pressures, and used antipsychotics to augment or substitute alternative treatments depending on the availability of resources. Rushforth et al. (2016) also reported a strong emotional component towards the management of type 2 diabetes in a primary care setting. Clinicians were anxious towards treatment intensification and frustrated with patient compliance. Future training that targets the skills and knowledge required to safely prescribe antipsychotics and conduct appropriate monitoring may help to alleviate the negative emotions surrounding the prescription of antipsychotics and in turn improve physician confidence and patient care.

There are a number of limitations in this study to consider. First, the study was conducted in Canada, which has a

predominantly public health care system and findings may not generalize to systems with different funding mechanisms. Second, as healthcare is administered at the provincial level, there are variations across provinces such as the extent of access to specialists (pediatricians) and psychosocial therapies, but this study was not designed to examine this type of variation. We used a snowball sampling method to recruit participants, making it possible that physicians who are acquainted with each other may share similar opinions and may not therefore capture some variation that might be identified by a differently sampled group of pediatricians. Finally, the use of an analytic framework may have prevented us from developing alternate explanations for our results.

This study identifies barriers and facilitators to evidence-based practice that can be used for educational programs and knowledge translation interventions. Future research to test targeted interventions aimed at improving adherence to recommended prescribing and safety monitoring practices are needed to ensure a high standard of care for children and youth taking antipsychotics.

Acknowledgements / Conflicts of Interest

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