CHILDREN'S MENTAL HEALTH RESEARCH

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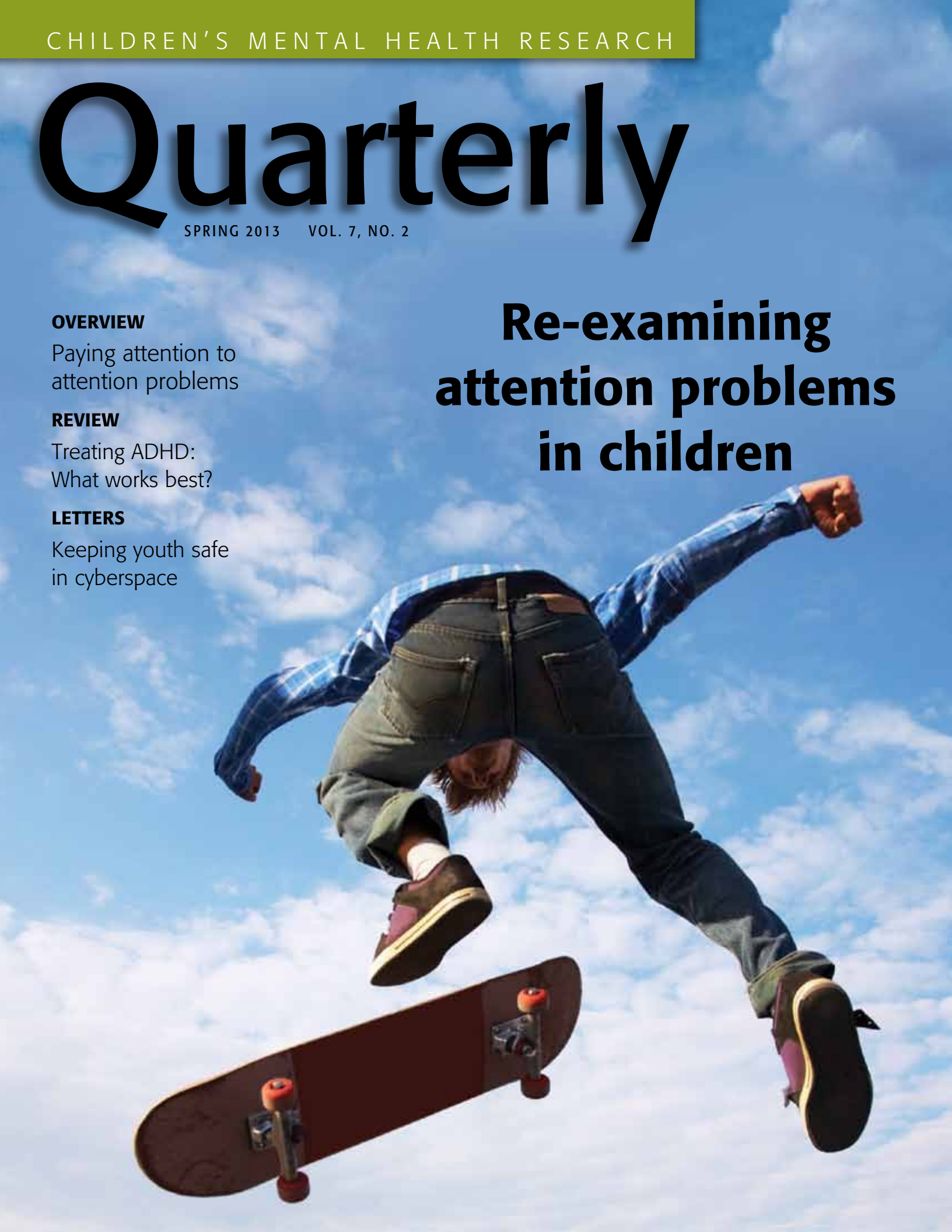
Re-examining attention problems in children



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Children's Health Policy Centre

ABOUT THE CHILDREN'S HEALTH POLICY CENTRE

As an interdisciplinary research group in the Faculty of Health Sciences at Simon Fraser University, we aim to connect research and policy to improve children's mental health. To learn more about our work, please see childhealthpolicy.ca. We advocate the following public health strategy for children's mental health: addressing the determinants of health; preventing disorders in children at risk; promoting effective treatments for children with disorders; and monitoring outcomes for all children. To learn more about our work, please see www.childhealthpolicy.ca.

ABOUT THE *QUARTERLY*

In the *Quarterly*, we present summaries of the best available research evidence on children's mental health topics, using systematic review methods adapted from the *Cochrane Collaboration* and *Evidence-Based Mental Health*. The BC Ministry of Children and Family Development funds the *Quarterly*.

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This Issue

NEXT ISSUE

When crises arise

Some children experience mental health crises severe enough to jeopardize their ability to remain safe within their homes or communities. We address what can be done to prevent and treat these crises as well as minimize distress for children and families.

Errata

On page 6, this report originally identified atomoxetine as a stimulant. Correction as of October 2016 clarifies that atomoxetine is not a stimulant.

How to Cite the *Quarterly*

We encourage you to share the *Quarterly* with others and we welcome its use as a reference (for example, in preparing educational materials for parents or community groups). Please cite this issue as follows:

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Paying attention to attention problems

It's like a disease eating on you... Like, you try to behave, but it keeps on going on in your head to stop you behaving. I always got in trouble for it.

— A young person with ADHD[1]

I think a lot of parents don't even understand the level of effort that you have to go through to work with a kid who has ADHD. It is parenting times 10. It is a lot more effort and a lot more work.

— Parent of a child with ADHD[2]

Adults may well envy the boundless energy and ease in shifting focus that many children exhibit. But for some children, the penalty for high energy is a trip to the principal's office and the consequence of shifting focus is a failed school assignment.

Most children do not experience significant ongoing difficulties with inattention, hyperactivity and impulsivity. But for approximately 4.8% (or five in 100), symptoms are severe and persistent enough to warrant a diagnosis of attention-deficit/hyperactivity disorder (ADHD).[3] ADHD is now the second most common mental disorder in childhood, after anxiety disorders.[3] (We purposely use the term "mental disorder" along with well-established criteria for these conditions, e.g., *Diagnostic and Statistical Manual of Mental Disorders*, recognizing the importance of having clear criteria to help ensure that appropriate diagnoses are applied.)

Causes of ADHD: Realities and misconceptions

ADHD appears to result from complex gene-environment interactions.[4, 5] While genetic predisposition plays an important role, precise genetic mechanisms are currently unknown.[4] Environmentally, several risk factors have also been identified: prenatal exposure to tobacco, alcohol and other toxins; extreme prematurity; and very low birth weight.[5] Although the exact role of each of these factors has yet to be determined, clearly ADHD is a neurodevelopmental disorder that affects children's brain structure and functioning — and therefore their learning and overall functioning.[4]

While ADHD's origins remain the subject of much research, misconceptions about its cause still abound. For example, many people report believing that ADHD is caused by poor parenting, inadequate effort by children and sugar consumption.[7, 8] Challenging these misconceptions can help children in two important ways. First, when we recognize that parents and children are not to blame, the stigma associated with ADHD can be reduced. Second, when we understand what *doesn't* cause ADHD, children can be spared ineffective or harmful treatments, and can also be spared delays in getting effective help.

When we recognize that parents and children are not to blame, the stigma associated with ADHD can be reduced.

What are the symptoms of ADHD?

It's normal for all children to be inattentive, impulsive or hyperactive some of the time. Children with ADHD, however, present with **at least six symptoms** from either of the categories listed below **nearly *all* of the time** and with great severity. As well, children with ADHD, experience symptoms that markedly interfere with their success — at home, at school and in the community.[6]

Inattention

- Having problems focusing on details or making careless mistakes
- Having difficulties following through on instructions and tasks
- Finding it challenging to be organized
- Avoiding tasks that require sustained mental effort
- Losing needed items
- Being easily distracted
- Being forgetful in daily activities

Hyperactivity/Impulsivity

- Fidgeting a lot
- Having difficulties remaining seated
- Running or climbing excessively
- Having trouble remaining quiet
- Talking excessively
- Blurting out answers
- Having difficulty taking turns
- Interrupting or being intrusive

They didn't work then and they don't work now

Our previous ADHD issue identified a number of treatments lacking rigorous evidence of effectiveness. These included dietary modifications, chiropractic therapy, electroencephalographic feedback, homeopathy, perceptual-motor training, pet therapy and play therapy.[9]

Since publishing that issue, we uncovered three new systematic reviews exploring the effectiveness of dietary supplements, in particular polyunsaturated fatty acids (PUFAs).[10–12] These three reviews included original studies that had serious limitations, however, including small sample sizes and difficulties concealing which children actually received the supplements (because of their strong taste and odour).[11] Still, most of the original studies did not find evidence of success.[10–12] As a result, all the review authors concluded that PUFA supplements are *not* recommended for treating children with ADHD.

Are effective treatments being used inappropriately?

In our past ADHD issue, we also identified treatments with good evidence of success, namely "stimulant" medications (such as methylphenidate) and behavioural therapy.[9] (Read new information about the relative effectiveness of these two types of treatment in the review article in this issue.)

Although ADHD medications have good evidence of success, they are not without controversy. For example, recent surveys found between 63% and 84% of adults believe that too many children are prescribed these medications.[7, 13] But does this public perception match the reality? Canadian data suggest that the answer may be yes.

In one community-based survey of 40,000 Canadian children aged three to nine years, rates of both ADHD diagnosis and ADHD medication use increased by 50% between 2000 and 2007, according to parent reports.[14] These increases are highly troubling given that we could find no high-quality epidemiological evidence that the prevalence of childhood ADHD is increasing. Even more concerning, according to these Canadian data, many children being prescribed stimulant medications did not have an ADHD diagnosis — between 24% and 47% (in 2007 and 2000, respectively).[14]

A large community-based study from BC has raised further concerns about the use of ADHD medications in children.[15] Figures from provincial health databases revealed that boys aged six to 12 who were born in December were 30% more likely to receive an ADHD diagnosis and 41% more likely to receive ADHD medications than boys born in January.[15] For girls, the numbers were even more extreme. Girls born in December were 70% more likely to receive a diagnosis and 77% more likely to receive medications than those born in January.

Before diagnosing any child with ADHD, the practitioner must determine that the difficulties began early in life and are interfering with the child's functioning in multiple settings.

Why might being born in December make such a difference? These children are typically the youngest and least mature in their grade — which may lead teachers to mistake developmentally appropriate behaviours for ADHD. The problem can be further compounded if practitioners fail to view children's behaviours within a developmental context and as a result provide both inappropriate diagnoses and inappropriate treatments.[15]

Children need a careful assessment

What can be done to ensure that children receive appropriate assessments and, if warranted, appropriate treatments? First, children need to be evaluated by a qualified practitioner, working with a multidisciplinary team where possible. The assessment team will gather information from various sources — including the child, parents and teachers — to obtain a careful developmental history and information on current symptoms, including their impact on the child's functioning.[16]

The practitioner will take the child's developmental stage into account when determining whether attention and activity levels are atypical. As well, the practitioner will ensure that other events are not being mistaken for ADHD. For example, a child with above-average learning abilities may be inattentive in class because they are bored. Alternatively, a child who is experiencing a trauma such as abuse or neglect may be highly anxious and seem inattentive for this reason. As well, before diagnosing any child with ADHD, the practitioner must determine that the difficulties began early in life and are interfering with the child's functioning in multiple settings (at home, at school and in the community).[6] The practitioner should also assess for other conditions, as most children with one mental disorder meet diagnostic criteria for more than one.[17]

After a careful diagnosis, comprehensive treatment planning starts with providing education. Families need to know about the treatment options, including the risks and benefits associated with each approach.[18] For most children, treatment planning also needs to include extra support in school.[18] Then regular reviews should be built in — to ensure that children are actually doing better over time.

"ADHD? Are you sure?"

Families can experience a multitude of reactions after hearing "The diagnosis is ADHD." For some, the initial response is relief.[19] Now, rather than seeing themselves (or having others see them) as being "bad parents" or as having "bad kids," families have a framework for understanding the behaviours they've been struggling with.[19] As well, many families feel hopeful — anticipating that they'll soon be receiving help.

On the other hand, a diagnosis can also lead to frustration, especially when parents question its accuracy.[1, 2] When this occurs, families may (rightfully) seek a second opinion. But in some BC communities, even a first opinion is hard to get because of the limited number of physicians and psychologists who are qualified to make this diagnosis. To help remedy this problem, the BC Medical Association and BC Ministry of Health with support from the Ministry of Children and Family Development launched a Practice Support Program, which provides additional training in child and youth mental health for physicians.[20] Increasing the number of practitioners qualified to assess and treat children with ADHD will help greatly to improve the accuracy of diagnoses and the number of children receiving help.

After discussing the diagnosis with their practitioner, families are typically advised about treatment choices. Ideally, they're informed of the potential benefits and risks associated with a number of effective options. In reality, however, they're often presented with only one option: medication.[1] And even when medication is not the only option discussed, some families experience pressure from school staff, physicians and family members to select this treatment.[2]

But the decision to include medication in the treatment plan is often an agonizing one for parents. Although some families may feel pressured to use medications, many also hear criticisms about them from families and friends.[2, 19, 21] This can occur in part because the popular media often fuel fears about safety concerns that do not apply when medications are prescribed at the correct doses and monitored carefully.[2, 21] Many parents also worry that their child will be stigmatized for taking these medications.[2] Given these experiences, it is not surprising that many parents consider medication a "last resort."[22] By carefully listening and by openly addressing families' concerns — and by advocating for children — practitioners can help to make difficult choices easier.[22]

Treating ADHD: What works best?

Five years ago we identified a number of effective treatments for ADHD, including the medications methylphenidate, dextroamphetamine and atomoxetine.[23] We also found that behavioural treatments could reduce symptoms — when delivered either individually or jointly to both parents and children.[9] On balance, we concluded that of all the choices, stimulant medications were the most effective treatment for children with ADHD.[9]

Since our last review, new randomized controlled trial (RCT) evaluations of ADHD treatments have been conducted. But do these recent studies lead to different conclusions, and in particular, has any new light been shed on *comparing* the different treatments? We conducted a comprehensive search for systematic reviews that could answer these questions. One review, by Van der Oord and colleagues,[24] did so — covering 26 RCTs and also meeting all our methods criteria (detailed in the Appendix).

Van der Oord's review was designed to systematically compare the effectiveness of two psychosocial treatments (behaviour therapy [BT] and cognitive-behavioural therapy [CBT]) with stimulant medication (short-acting methylphenidate) — both individually and in combination. The authors purposely limited their review to these three treatments because each had at least some high-quality evidence of effectiveness. Table 1 provides an overview of these treatments.

Methylphenidate remains a highly effective treatment for ADHD in children — not only greatly improving ADHD symptoms, but also improving behaviour and social skills.

Table 1: Description of Selected ADHD Treatments

Psychosocial

Behaviour Therapy (BT)[16]

- Typically involves teaching parents and teachers to "shape" children's behaviour and teaching children to regulate their own behaviour
- Techniques include teaching parents and teachers to reward children for "on task" behaviours using point systems, paying careful attention to appropriate behaviours, ignoring minor inappropriate behaviours, and using "time outs" for more challenging behaviours

Cognitive-Behavioural Therapy (CBT)[25]

- Typically involves teaching children specific skills and teaching parents and teachers to support children in modifying their behaviour and their thinking
- Techniques include BT strategies noted above plus teaching children problem-solving strategies, self-monitoring skills, social skills and anger management techniques

Medication

Methylphenidate[26]

- Central nervous system "stimulant" that is thought to work by selectively enhancing attention through increasing the levels of certain neurotransmitters (e.g., dopamine, noradrenaline) in the brain's prefrontal cortex
- Dosages typically vary depending on body weight and are often divided into twice-daily doses

Children who received behaviour therapy or cognitive-behavioural therapy maintained improvements in ADHD symptoms, behaviour, social skills and self-esteem from one to eight months after the interventions stopped.

Of the 26 RCTs covered in the Van der Oord review, 10 assessed methylphenidate alone, 10 assessed a psychosocial treatment (either BT or CBT) alone, and six assessed methylphenidate combined with a psychosocial treatment. Children participating in these RCTs were between six and 12 years old. While all had a primary diagnosis of ADHD, many had additional problems, such as anxiety, depression or conduct disorder.

All the psychosocial treatments involved BT or CBT or both. Still, there was considerable variety in the specific interventions used, which included self-control therapy, anger management training, social skills training, family therapy, parenting training, teacher training and teacher consultation. As well, in most of the RCTs, participants received *multiple* psychosocial interventions, such as parent training augmented by child self-control therapy. The medication approaches were far more uniform, given that only methylphenidate was assessed.

What can 26 RCTs tell us?

To determine effectiveness, the review's authors first categorized the treatment approaches into three groups: 1) medication alone (methylphenidate); 2) psychosocial alone (BT or CBT or both); or 3) combined treatment (both medication and psychosocial). (While the authors did not specify, it appears that BT and CBT were combined into a single "psychosocial" category because preliminary analyses identified no significant differences between them.)

The authors then determined effectiveness by measuring how well each of these three treatment approaches addressed four separate outcomes: 1) ADHD symptoms; 2) behaviour problems; 3) social skills; and 4) academic performance. Parents and teachers provided ratings for the first three outcomes, while academic performance was measured with tests of scholastic abilities.

Next, the authors calculated effect sizes (i.e., "Cohen's d") for each of the three treatment approaches and for each of the four outcomes. An effect size measures the degree to which a treatment makes a clinically meaningful difference in children's lives. For example, a child frequently paying attention and sitting still in the classroom, thereby learning more, after greatly struggling with these issues before receiving treatment could indicate a clinically meaningful difference.

In calculating effect sizes, the review authors used post-test assessments, a reasonable endpoint given that methylphenidate stops being effective once it is discontinued.[24] Then the authors conducted statistical analyses to determine whether the effect sizes for each treatment approach differed significantly (which would indicate that one was superior to another). The authors also used effect sizes to determine how well each individual treatment approach worked. They applied the standard interpretation of Cohen's d wherein an effect size of 0.2 is deemed small, 0.5 medium and 0.8 large. (They did not, however, conduct tests of statistical significance for each individual treatment, likely because the review was limited to ADHD treatments with established effectiveness.)

Who's footing the bill?

Many critics have been sounding the alarm bell about medical research funding. Concern stems from pharmaceutical companies extolling the benefits of medications they manufacture, based on evaluations that they fund. And the evidence suggests that this skepticism is often warranted. For example, one systematic review found that research funded by drug companies was significantly more likely to have positive outcomes than research funded by other sources.[27] The review also identified incidents wherein drug manufacturers attempted to prevent unfavourable findings from being published.[27]

A number of remedies have now been instituted to reduce these conflicts of interest and promote full and transparent reporting of research outcomes. For instance, many leading scholarly journals have established rigorous criteria for accepting research sponsored by pharmaceutical companies.[27] As well, many journals require authors to specifically identify any potential conflicts of interest, including drug company funding.[28] Other proposed solutions include adopting rigorous standards for reporting study outcomes (including all negative outcomes) and publicly registering all clinical trials in advance to prevent unfavourable results from being concealed.[28] These steps are likely to be very helpful in ensuring that children are not exposed to unsafe and ineffective treatments. (Please note that the Children's Health Policy Centre does not accept funding from pharmaceutical companies.)

Improving ADHD symptoms

Most of the 26 RCTs assessed ADHD symptoms — arguably the most important indicator of effectiveness. All treatment approaches — medication alone, psychosocial alone, and combined — led to improvements in these symptoms. However, medication alone and the combined approach were significantly more effective than psychosocial alone. Both also produced large effect sizes, indicating clinically important gains for children. Although psychosocial treatment alone was not as effective as the other two treatment approaches, it still produced effect sizes ranging from medium to large. Table 2 provides further information on these reported effect sizes (and on the findings for other outcomes as well).

Table 2: Treatment Effect Sizes*

Outcomes	**Treatment Approach**					
	Medication Alone		**Psychosocial Alone**		**Combined**	
Rater	Parent	Teacher	Parent	Teacher	Parent	Teacher
ADHD Symptoms	Large** 1.53	Large** 1.83	Large 0.87	Medium 0.75	Large** 1.89	Large** 1.77
Behaviour Problems	Medium 0.61	Large** 1.08	Medium 0.66	Small 0.43	Large 1.23	Large** 0.92
Social Skills	Medium 0.62	Large 1.06	Medium 0.54	Medium 0.71	Medium 0.71	Large 1.08
Academic Performance†	N/A	Small 0.33	N/A	Small 0.19	N/A	Small 0.35

* Effect sizes quantify the degree to which the treatment made a clinically meaningful change in children's lives — with 0.2 considered small, 0.5 medium and 0.8 large.
** Medication alone and the combined approach were significantly more effective than psychosocial alone.
† Academic performance was based on children's scores on tests of scholastic abilities.

Improving other symptoms

Beyond ADHD symptoms, 17 of the 26 RCTs also evaluated children's behaviour. When the review authors pooled these particular data, they found that all three treatment approaches decreased children's behaviour problems. However, the *degree* of improvement varied by raters. Based on teacher ratings, medication alone and the combined approach produced large effect sizes and were significantly more effective than psychosocial alone (which produced only small effect sizes). Based on parent ratings, however, the three treatment approaches were equally effective. These findings may relate to the use of short-acting methylphenidate. This medication is typically taken in the morning and may wear off by the time children return home later in the afternoon (even if children receive a second dose at noon) — making teachers more likely to detect improvements during the day.[24] Please see Table 2 for more details on these behaviour findings.

While behaviour therapy and cognitive-behavioural therapy often take considerable time and effort, many families and schools are able and willing to undertake these interventions with practitioner support.

Nine of the 26 RCTs also evaluated the impact of the three treatment approaches on children's social skills. All three helped children, producing effect sizes that ranged from medium to large. Nevertheless, no statistically significant differences were found between the three treatments. (The sidebar describes how treatments can produce different effect sizes that are still not significantly different.) Please see Table 2 for more details on these social skills findings.

Finally, seven of the 26 RCTs examined the impact of the three treatment approaches on children's academic skills. All three failed to make substantial improvements in this domain, producing only small effect sizes at best. Please see Table 2 for details on academic performance.

Effective treatment results in multiple gains for children

This review suggests that methylphenidate remains a highly effective treatment for ADHD in children — not only greatly improving ADHD symptoms, but also improving behaviour and social skills. The medication does not, however, improve children's academic skills.

Van der Oord's review also found that psychosocial treatments (BT or CBT or both) can significantly reduce ADHD symptoms and behaviour problems — just not as effectively as methylphenidate. That said, psychosocial treatments were equally effective in improving children's social skills. Perhaps surprisingly, the length of the psychosocial treatment, which ranged from ten to 165 hours, had no impact on its effectiveness.

Taken together, this new evidence shows that children with ADHD can be effectively helped — with methylphenidate, BT or CBT. Nevertheless, methylphenidate is the most effective of these choices.

Limitations in the research

Van der Oord's review fills a knowledge gap regarding the relative effectiveness of different ADHD treatments for children. However, like the research that preceded it, this review also has shortcomings. Specifically, the review authors calculated effect sizes using data from RCT treatment groups only, excluding control data, an approach that tends to inflate effect sizes. In justifying their approach, the authors noted that more stringent analyses would have been difficult due to the control/comparison groups being highly diverse. As well, this analytic process was applied consistently to all the treatment approaches being compared, allowing the authors to still derive conclusions about which one worked best.

Because the authors designed their review to evaluate the relative effectiveness of methylphenidate and psychosocial treatments, they compared outcomes only at post-test because stimulant medications stop being effective once they're

Making sense of numbers that don't seem to

The review we covered in this issue involved comparing different treatments. Van der Oord and colleagues did this by determining effect sizes as well as statistically significant differences between them. How is it possible that a *medium* effect size is statistically equivalent to a *large* one? These seemingly paradoxical results can arise because researchers need to rule out the possibility of any treatment differences being due to *chance*. They also have to be careful that they don't falsely conclude that different treatments are equally effective when one is actually superior. To avoid both these types of errors, researchers start by assuming that a proportion of their results *will* occur by chance. In Van der Oord's review, for example, the authors assumed that 5% of their results would be due to chance (5% is a percentage researchers typically use). Then researchers must determine whether the differences between the treatments being compared are large enough to exclude the possibility they're just due to chance. In Van der Oord's review, differences between the large effect size and the medium effect size were simply not great enough to make this conclusion.

discontinued.[24] This approach enabled them to answer an important question about short-term effectiveness. However, it precluded them from answering the question of whether gains might be sustained after psychosocial treatment ends, potentially offering added long-term benefits for children.

Having confidence; proceeding with care

Based on the review we have featured here, practitioners and parents can be confident that children being prescribed methylphenidate are receiving a highly effective treatment. This assumes that there has been a comprehensive assessment determining that the child actually has ADHD, and that there is ongoing monitoring of the dose, benefits and side effects of the medication. (The sidebar provides information of common side effects of methylphenidate.)

BT and CBT are also treatment options that many families may want to pursue. Although these treatments are typically not as effective as medication in the short term, they still can produce substantial improvements in many areas. Unlike medication, BT and CBT also have the potential to result in children sustaining the gains they made even after treatment ends. Specifically, our detailed evaluation of Van der Oord's review identified several RCTs showing that children who received BT or CBT maintained improvements in ADHD symptoms, behaviour, social skills and self-esteem from one to eight months after the interventions stopped.[31–36] While BT and CBT often take considerable time and effort, many families and schools are able and willing to undertake these interventions with practitioner support.

Medication and psychosocial treatments also do not have to be viewed as "either/or" options. For example, BT or CBT may be useful additions to the treatment plan for children who do not fully respond to medication.[24]

The research on ADHD treatments provides crucial information about helping children. Van der Oord's review gives strong evidence that methylphenidate, BT and CBT can all reduce children's ADHD symptoms and behavioural problems as well as improve social skills. Medication nevertheless remains the single most effective way of achieving these gains.

Avoiding and managing medication side effects

Although methylphenidate is usually associated with minimal side effects when used in appropriate doses for children who have ADHD, children may still experience side effects such as appetite suppression, weight loss, insomnia and headaches.[26] In very rare cases, adverse events such as cardiac problems can also occur, so methylphenidate and similar medications are not recommended for children who have pre-existing cardiac disease of any kind.[29] Regarding longer-term side effects, some studies have found that methylphenidate can suppress growth.[30] Close monitoring is therefore essential as long as children remain on these medications.

Keeping youth safe in cyberspace

To the Editors:
I appreciated your recent issue on teen dating violence, but was somewhat surprised that concerns about online dating were not addressed. Has the research kept pace with the technology youth are using?

Olga O'Toole
Vancouver, BC

For most adolescents, dating is no longer just a face-to-face activity. Texting, posting and tweeting are just a few of the ways youth use technology to communicate. Although limited information exists about youth using these technologies in their dating relationships, we were still able to uncover some telling data.

While many youth use technologies within their established relationships, some also use them to seek out new ones. For example, many online sites and chat rooms are designed specifically for teens seeking dating partners. And while many youth navigate the Internet without negative incident, online activity does present risks. For instance, a nationally representative study of American youth found that 17% were asked to engage in sexual activity online.[37] As well, a study of adult producers of child pornography found that 22% met their victims online, while 73% used the Internet to facilitate the sexual abuse of children who were already known to them.[38]

Technologies can also be perilous in established dating relationships. Data from a random sample of 4,400 American youth found that 12% had been subjected to electronic dating aggression — including posting threatening or embarrassing information (6%); posting humiliating or harassing pictures (4%); and receiving threatening cellphone messages (10%).[39] Victims and perpetrators of online dating aggression were frequently victims and perpetrators offline too.[39]

How can youth be protected from these negative experiences? When prevention programs provide information on dating violence, examples of abusive behaviours should always include those involving technologies. Some teens may need help understanding that someone who makes 30 cellphone calls a day asking them where they are and who they're with is controlling, not caring. As well, adults need to be skillful with the technologies themselves. They can't guide young people if they can't operate the ON switch.

When prevention programs provide information on dating violence, examples of abusive behaviours should always include those involving technologies.

Contact Us

We hope you enjoy this issue.
We welcome your letters and suggestions for future topics. Please email them to chpc_quarterly@sfu.ca
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Research methods

To identify the best systematic reviews on the topic of ADHD treatments, we adapted methods from the *Cochrane Collaboration*[40] and *Evidence-Based Mental Health*.[41] We first searched the following databases:

- Cochrane Database of Systematic Reviews
- Campbell Collaboration Library
- Medline
- PsycINFO

We limited our search to systematic reviews published between 2007 and 2012 given that our previous issue on ADHD included systematic reviews published prior to these dates. Using this approach, we identified and retrieved 20 systematic reviews. Two different team members assessed each review, identifying two that met all our inclusion criteria, as detailed in Table 3. Of the two, we selected Van der Oord et al.[24] because it included both psychosocial and medication treatments. In contrast, the other systematic review[42] assessed one type of medication only.

Table 3: Inclusion Criteria

Basic Criteria
• Peer-reviewed articles published in English about children aged 0–18 years • Articles relevant to treatment of ADHD
Systematic Reviews
• Methods clearly described, including database sources and inclusion criteria • Original study designs limited to randomized controlled trials (RCTs) • Meta-analysis conducted • Magnitude of effects reported • Publication bias assessed • Contained at least two RCTs meeting criteria listed below
Original Studies within the Systematic Reviews
• Attrition rates below 20% at final evaluation • Outcome measures assessed using two or more informant sources • Levels of statistical significance reported for primary outcomes

For more information on our research methods, please contact

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BC government staff can access original articles from BC's Health and Human Services Library.

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