Early Child Development and Mental Health

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Anxiety disorders are the most common mental health problems that children experience. We investigate what can be done to prevent these problems.

WELCOMING NURSE-FAMILY PARTNERSHIP
The CHPC will be conducting a scientific evaluation of the first Nurse-Family Partnership program to be launched province-wide in Canada. Please see our video.

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 social and emotional well-being, or children’s mental health. 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.sfu.ca

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Children’s Mental Health Research Quarterly
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Overview

Laying the foundation for lifelong mental health

Children make remarkable social and emotional gains during their early years. We discuss how children's early experiences can encourage or inhibit positive social and emotional development.

Review

ECD programs and children’s mental health

Can early childhood development programs enhance children's mental health? We present findings from a systematic review of recent research on this important question.

Feature

Making kindergarten more engaging

Teachers in 12 BC kindergartens are being trained to deliver an ECD program called Tools of the Mind. We speak with UBC neuroscientist Adele Diamond about the program.

Letters

Carefully counting cases, carefully choosing words

We respond to a reader's question about the prevalence of oppositional defiant disorder. We also address a letter about the importance of conveying compassion for families who are struggling.

Appendix

Research methods

References

We provide the references cited in this issue of the Quarterly.

Links to Past Issues

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:

Laying the foundation for lifelong mental health

Over the last decade, mounting evidence has made it clear that the foundations of mental health are shaped from the earliest days of life.\textsuperscript{1}

Children undergo tremendous developmental changes during their first six years. In addition to physical and cognitive development, there are numerous social and emotional — or mental health — gains in the early years. Table 1 highlights just a few of the important early mental health milestones. These interconnected developmental gains lay the foundation for subsequent lifelong learning, healthy relationships and contributions to society.\textsuperscript{2}

Table 1: Sample Early Mental Health Milestones\textsuperscript{3}

<table>
<thead>
<tr>
<th>Age</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 3 months</td>
<td>Identifies mother (or primary parent) by sight, responds more to mother (or primary parent) than to others, coos responsively</td>
</tr>
<tr>
<td>3 – 6 months</td>
<td>Smiles responsively, grasps and explores objects, laughs, shows excitement, expresses displeasure when thwarted</td>
</tr>
<tr>
<td>6 – 12 months</td>
<td>Begins using “Mama” and “Dada” as names, waves goodbye, expresses a variety of emotions (e.g., affection, anger, anxiety, sadness), begins to show separation anxiety</td>
</tr>
<tr>
<td>12 – 18 months</td>
<td>Imitates parents’ behaviour, points to wanted objects, returns a hug, likes to please parents, likes to explore (e.g., closets, cabinets)</td>
</tr>
<tr>
<td>18 – 24 months</td>
<td>Follows simple directions, recognizes self in mirror, uses words to request things, engages mainly in solitary play</td>
</tr>
<tr>
<td>2 – 3 years</td>
<td>Calls self by name, starts engaging in fantasy play, plays at helping (e.g., with household chores), expresses pride in accomplishments</td>
</tr>
<tr>
<td>3 – 4 years</td>
<td>Plays with other children, uses words to describe uses for objects, uses objects to represent people in play</td>
</tr>
<tr>
<td>4 – 5 years</td>
<td>May attempt to regulate emotions (e.g., crying), follows the rules of simple games, begins showing a sense of values (e.g., what is right, wrong or fair)</td>
</tr>
<tr>
<td>5 – 6 years</td>
<td>Tells stories, begins to develop ability to regulate behaviour (e.g., waiting their turn or limiting aggression)</td>
</tr>
</tbody>
</table>

Source: Adapted from Morrison & Anders (2001).

Some of the most profound influences on children’s social and emotional development are their early experiences within their families and their communities. Positive early experiences such as nurturing and responsive care promote healthy development.\textsuperscript{4} For example, parental sensitivity during infancy significantly predicts “emotional resilience” or a child’s ability to recover and generate positive emotions when faced with adversity.\textsuperscript{5} Greater emotional resilience during the preschool years, in turn, is associated with significantly lower levels of anxiety and depression in later childhood.\textsuperscript{5}
In contrast, difficult early experiences, such as exposure to parental substance abuse or to child maltreatment, can be detrimental to development. Being raised in a neighbourhood that is socio-economically disadvantaged can also carry a price. Recent surveys in British Columbia of all children entering kindergarten have found that those from poorer neighbourhoods demonstrate lower social competence and emotional maturity than peers from more affluent neighbourhoods. Similarly, longitudinal Canadian surveys have found that preschoolers from poorer neighbourhoods with less social cohesion have poorer language abilities and more behaviour problems than peers from more affluent neighbourhoods.

Nevertheless, it is children’s cumulative experiences with multiple, interacting risk and protective factors that ultimately influence social and emotional development, rather than exposure to any single factor. Thus there are numerous opportunities to provide children with experiences that promote positive development and reduce risk in the early years. Many children receive such experiences by participating in early child development (ECD) programs.

The ABCs of ECD

ECD programs often involve providing children with educational experiences at centre-based preschools. Parenting interventions and other forms of assistance for families are often provided as well. While the specific goals may vary, the overarching aim is usually to improve children’s school readiness. ECD programs therefore commonly target children from disadvantaged families—who are more likely to enter school with poorer cognitive skills. Still, some researchers suggest that ECD programs should be provided universally, to all children, given that many children from more advantaged families also have developmental vulnerabilities.

Over the 50 years since researchers began measuring the impact of ECD programs on early learning, compelling evidence has been amassed showing that targeted ECD programs lead to fewer developmental delays, better language capabilities and better overall school readiness for disadvantaged children. These programs have also yielded far greater returns than interventions provided later in the lifespan, such as improving teacher-student ratios, providing job training or enhancing policing.

Having documented the early learning benefits of ECD programs, particularly for disadvantaged children, researchers are now investigating the potential benefits for other aspects of child development, namely mental health. In the following review article, we examine the mental health outcomes of ECD programs and the implications of this research.
ECD programs and children’s mental health

Can early child development programs improve children’s mental health? To answer this question, D’Onise and colleagues\textsuperscript{10} conducted a systematic review of original studies published between 1980 and 2008 that met the following criteria:\textsuperscript{i}

- Described evaluations of centre-based preschool ECD programs
- Measured outcomes in both intervention and comparison groups
- Reported outcomes at one year (or longer) following the start of the intervention

Based on these criteria, D’Onise and colleagues accepted 37 original studies for their review, including five randomized controlled trials (RCTs), 12 quasi-experimental studies and 20 studies of other designs.

D’Onise’s group then carefully evaluated the methods used in all 37 studies according to accepted critical appraisal standards.\textsuperscript{15} They determined that eight studies were “higher” quality, while 29 were “moderate” or “lower” quality. Significant methods problems in the weaker 29 studies included high dropout rates and unreliable or unvalidated outcome measures. Given these reported weaknesses, we chose to focus on the eight strongest studies, which described evaluations of these four programs:

- Better Beginnings, Better Futures (BBBF)
- Chicago Child Parent Center (CCPC)
- Mauritius
- Perry Preschool

While these four ECD programs were all targeted, the methods for identifying populations at risk varied. Evaluators for CCPC and Perry Preschool identified children on the basis of living in socio-economically disadvantaged families.\textsuperscript{16, 17} Meanwhile researchers for Mauritius identified children on the basis of risk for developing mental disorders.\textsuperscript{18} In contrast, for BBBF, communities were identified as being socio-economically disadvantaged, then the program was provided universally to all children within those communities.\textsuperscript{19} Table 2 describes other characteristics of these four programs.

\textsuperscript{i} Please see the Appendix for information on how we selected this review.
In their review, D’Onise and colleagues\(^{10}\) then identified short-term child mental (and physical) health outcomes for each of the four programs. They also conducted a separate systematic review in which they examined long-term outcomes — at 18 years and beyond. This companion review detailed outcomes from CCPC, Mauritius and Perry Preschool but not BBBF because adult outcomes were not yet available. To capture both child and adult outcomes, we report all significant findings identified in both systematic reviews in Table 3.

### Table 2: Targeted ECD Programs and Mental Health Benefits\(^{10, 16–20}\)

<table>
<thead>
<tr>
<th>Program (Country)</th>
<th>Intervention(s)</th>
<th>Age at Start</th>
<th>Program Duration</th>
</tr>
</thead>
</table>
| Better Beginnings, Better Futures* (Canada) | • Preschool children: Academic programs, food + toy libraries  
• School-age children: Academic enrichment + food  
• Parents: Support programs, home visits + child care  
• Community: Collective kitchens + gardens | 4 years | 4 years |
| Chicago Child Parent Center (US) | • Preschool children: Academic programs, food + health screening  
• School-age children: Academic programs, food + health screening  
• Parents: Support programs, home visits + high-school courses | 3 – 4 years | Up to 6 years |
| Mauritius (Mauritius) | • Preschool children: Academic programs, food, exercise programs, health screening + referrals  
• Parents: Home visits + engagement in preschools | 3 – 4 years | 2 years |
| Perry Preschool (US) | • Preschool children: Academic programs  
• Parents: Support programs + home visits | 3 – 4 years | Up to 1 year, 2 months |

* Community members participated in developing/implementing the program so content varied across sites.

### Table 3: Mental Health Benefits of Targeted ECD Programs*\(^{10, 21}\)

<table>
<thead>
<tr>
<th>Program</th>
<th>Age at Follow-Up</th>
<th>Significant Outcomes</th>
</tr>
</thead>
</table>
| Better Beginnings, Better Futures | 8 years | ↓ Anxiety symptoms  
↑ Self-control |
| Chicago Child Parent Center | 20 years | ↓ Violent arrests  
↓ Non-violent arrests  
22 – 24 years | ↓ Depressive symptoms |
| Mauritius | 17 years | ↓ Conduct symptoms  
↓ Cognitive disorganization  
↓ Psychotic behaviour  
↓ Unusual perceptual experiences |
| Perry Preschool | 15 years | ↑ Positive classroom behaviours  
40 years | ↓ Likelihood of marijuana use in last 15 years  
↓ Likelihood of heroin use in last 15 years |

* Programs may have had beneficial outcomes not presented in these reviews.
ECD programs improve children’s mental health

As Table 3 shows, all four ECD programs led to statistically and clinically significant mental health benefits — both short-term and long-term. At age eight, BBBF children had fewer anxiety symptoms and more self-control. By age 20, CCPC children had fewer arrests for violent and non-violent crimes, then by their mid-20s, fewer depressive symptoms. At age 17, Mauritius children had fewer mental health symptoms, including problems with conduct and psychosis. Meanwhile, Perry Preschool children demonstrated more positive behaviours early on, followed by a reduced likelihood of using marijuana or heroin in adulthood.

Three of the four featured ECD programs (BBBF, CCPC and Perry Preschool) also assessed related physical health outcomes, including tobacco use, exercise, health services use and overall health status. CCPC children did not show significant physical health gains. However, by age eight, BBBF children had significantly better general health.10 By adulthood, Perry Preschool participants were significantly more likely to engage in healthy behaviours.21

D’Onise and colleagues’ adult outcomes review10 did omit some important findings — namely criminal offending. For example, by the time Mauritius participants reached their mid-20s, they reported engaging in significantly less criminal offending than comparison participants.22 By age 37, Perry Preschool participants also had significantly higher employment earnings and significantly less criminal activity.23

Common elements of successful ECD programs

The four featured ECD programs had important common elements that likely contributed to their success. Most notably, all four were delivered to children living in socio-economically disadvantaged circumstances. (Although participants in the Mauritius study were not chosen based on socio-economic disadvantage, the country experienced high levels of poverty in general during the early 1970s, when the program was delivered.) It is perhaps unsurprising then that many of the gains were found for variables strongly associated with socio-economic disadvantage, such as behaviour problems including substance use.21 These findings suggest that from the perspective of children’s mental health, targeted ECD investments should be the priority.

A better future for parents too?

The evaluators of Better Beginnings, Better Futures (BBBF) found that the program helped not only the children but also their parents. Participating parents, from three disadvantaged Ontario neighbourhoods, showed significant improvements in their relationships with their child’s teachers as well as significantly increased involvement with their child’s school.19 Strikingly, parents also made gains independent of their roles as caregivers. BBBF parents had improved satisfaction in their intimate-partner relationships along with reduced stress and reduced smoking. Parents’ satisfaction with the condition of their home even increased. This Canadian community-based ECD program was therefore a success story for families.

When spending makes sense

The long-term gains with Perry Preschool extended beyond the participating children and families. An economic evaluation found that every dollar spent on the program saved Americans between $6.87 and $16.14 because of reduced criminal activity.22 For more information on the economic evaluation of Perry Preschool, please see our previous Quarterly at www.childhealthpolicy.sfu.ca/research_quarterly_08/rq-pdf/RQ-1-09-Winter.pdf.
All four featured ECD programs also provided comprehensive services to families. Children participated in well-resourced centre-based preschools, and parents received home visiting and concrete supports such as child care and high-school courses. Additionally, CCCP provided health screening services, and Mauritius provided both health screening and referrals for children.

Program duration was another crucial element. In these programs, children and families received the interventions over long periods — ranging from 14 months for Perry Preschool to six years for CCCP.

The four featured ECD programs were implemented and evaluated in three different countries (the US, Mauritius and Canada) over three different decades (from the 1960s to the 1990s). Therefore, their applicability to Canadian children warrants careful examination. Only BBBF was delivered in Canada, making its outcomes potentially more relevant.

Beyond the issue of baseline health care and social services being arguably better in Canada, BBBF was delivered in three Ontario communities with diverse demographics, languages and cultures, making results generalizable to the many other Canadian communities that are diverse in these ways. As well, with BBBF, each community played an active role in defining specific program activities according to local needs, suggesting a flexibility that could make the program portable to other Canadian communities.

This review highlights the considerable potential of targeted ECD programs to improve children’s mental health. While these programs may not always be designed with mental health in mind, they clearly can promote positive social and emotional development, particularly for disadvantaged children. This means that targeted ECD programs should be regarded as a crucial component of a public health strategy for improving children’s mental health.
Making kindergarten more engaging

Here’s a question from neuroscientist Adele Diamond: “Put a driver and a passenger in the same car, give them a destination, and who do you think will learn the route better?”

The correct answer — the driver — is obvious because that person has the advantage of making all the decisions, visualizing the process and achieving the result. The passenger, quite literally, is just along for the ride.

“So why do we send our kids to school and have them simply be passengers?” asks Diamond, who is the Canada Research Chair in Developmental Cognitive Neuroscience at the University of British Columbia. “We’ve known for decades that hands-on is the best way to learn. Still, a vast amount of what happens in schools is lecturing.”

A firm believer in investing in early childhood, Diamond believes ECD programs help make kids drivers. She says economists put the return on investment for early years education at between 15 and 17%. But she’s concerned that British Columbia — home to numerous world leaders on the subject — is slow in showing much commitment to such early training.

One notable exception: In September 2011 the provincial government began funding an early childhood development pilot program in 12 kindergartens, four each in Surrey, Vancouver and Coquitlam. Known as Tools of the Mind, the program was developed by two educational psychologists, Elena Bodrova and Deborah Leong, and is based on the theories of Russian psychologist Lev Vygotsky.

Helping build better brains

Tools of the Mind, which is delivered by teachers and fully integrated into all aspects of the kindergarten program, aims to develop “executive functioning.” This is a collection of brain processes that activate, organize, integrate and manage other functions. Kids with good executive functioning have robust working memories, excellent inhibitory control and strong cognitive flexibility.

In everyday language, kids with good executive functioning are able to do things such as:

- Wait their turn and resist grabbing other children’s toys
- Ignore distractions and keep their attention focused on what they’re supposed to be doing
- Follow multi-step instructions such as “Let’s get ready for bed now. So take off your clothes and put on your pyjamas. Then brush your teeth.”
Putting the fun in fundamental

For Diamond, the secret to working with kids in these areas is to make the process fun — as *Tools of the Mind* aims to. “Vygotsky felt that the best way to improve self-regulation [executive functioning] in little children is to do social dramatic play,” she says. “[In such play] children have to use working memory to remember what role they picked and what role their friends picked.” As well, they have to inhibit acting out of character (thereby exercising self-control) and adjust to wherever their friends go with the story (thus learning to exercise cognitive flexibility).

When *Tools of the Mind* focuses on a subject such as arithmetic — by having children count teddy bears — one child will count and another child will check. “A three-year-old can check a five-year-old,” Diamond says. This process echoes one of the core principles of the program: that children learn self-regulation by regulating others first. It naturally follows that children then start to correct themselves, by talking to themselves.

Program to be evaluated in BC

Teachers in the 12 randomly selected BC kindergartens will begin training this year in how to use the program. Next fall, one year later, Diamond hopes to begin studying children in those classes compared with children in matched classes randomly selected not to receive the program. She then hopes to follow the children longitudinally. Anyone wanting more information on Diamond’s research can contact her via her webpage: www.devcogneuro.com/AdeleDiamond.html.

Building executive functioning at home

For parents who want to help boost their children’s executive functioning at home, Diamond suggests engaging them in any activity — from tae kwon do to music lessons to yoga — that requires practice, effort and concentration. “It’s the time the children spend and the pushing of themselves to improve that really matters,” she says. “There’s no substitute for time and sustained practice.”

And for parents who need to settle excited, noisy children, Diamond recommends a game of follow the leader with bells. Each person is given a bell and is to walk single file following the leader (any family member). The goal is that no one should make a sound with their bell. “It’s really a walking meditation exercise, but of course you don’t call it that,” Diamond says.

According to Diamond, education at any level “should be fun, rather than torture.” This is for a simple reason. “We know that if you’re happy, your executive functioning works better,” she says.

Measuring early learning

Given the positive results of evaluations of *Tools of the Mind* in the United States, there are good reasons to be optimistic that BC children may benefit from this program. When the program was evaluated in a low-income school district, children who received it did significantly better than those receiving a more traditional curriculum, according to two measures of executive functioning.25 Three- and four-year-olds who received the program also showed significantly fewer behavioural problems than children who received a standard curriculum.26 By evaluating this program in BC, researchers will be able to determine whether these positive results can be replicated in Canada.
Letters

Carefully counting cases, 
Carefully choosing words

To the Editors:
In a previous issue of the Quarterly focused on children’s behavioural wellbeing, you provide prevalence information for conduct disorder but not for oppositional defiant disorder (ODD). How common is ODD?

Allison McLeod, Victoria, BC

As you are likely aware, the term ODD refers to a persistent pattern of negative and defiant behaviours, while conduct disorder (CD) refers to a more serious and persistent pattern of behaviour that violates others’ basic rights or serious age-appropriate rules.27 ODD has been less well conceptualized than CD for measurement purposes. Nevertheless, we found two studies assessing ODD’s prevalence in the general population. One American survey of children ages 9 to 16 found that 2.7% met diagnostic criteria for ODD.28 Similarly, one British survey of children ages 5 to 16 found that 3.0% had ODD.29 In comparison, multiple rigorous epidemiologic surveys have found that an estimated 4.2% of children ages 4 to 17 meet diagnostic criteria for CD at any given time.24

We welcome your questions
If you have a question relating to children’s mental health, please email it to chpc_quarterly@sfu.ca or write to the Children’s Health Policy Centre, Attn: Jen Barican, Faculty of Health Sciences, Simon Fraser University, Room 2435, 515 West Hastings St., Vancouver, BC V6B 5K3.

To the Editors:
I’m really excited to hear about the Canadian trial of the Nurse-Family Partnership program. [Eds.—See announcement on the CHPC website, available at http://bit.ly/ryP7wy.] Congratulations on taking this next step after years of advocating for this approach based on the scientific evidence. I was discouraged, however, to see the phrase “family environment is dysfunctional” in the last issue of the Quarterly [Overview, p. 5]. It concerns me that we continue to use the antiquated term “dysfunctional,” which stems from years of blaming families for their children’s problems. In contrast, terms such as “family adversity” or “family conflict” are more accurate and more likely to promote families’ engagement in interventions.

Sue Ward, Victoria, BC

We greatly appreciate you raising this concern. We agree that “family adversity” or “family conflict” would have been much better terms for describing the circumstances that many families experience, and for conveying compassion for families who are facing adversity.

It is important to use terms that convey compassion for families who are facing adversity.
Research methods

To identify the best systematic reviews on the topic of whether early child development (ECD) interventions can improve children’s mental health outcomes, we adapted methods from the Cochrane Collaboration. We first applied the following search strategy.

Using this approach, we identified 10 systematic reviews that were retrieved and assessed. We then applied the following inclusion criteria. For acceptance, reviews had to meet all criteria.

1) For systematic reviews
   - Methods clearly described, including database sources and inclusion criteria
   - Methodologic quality of included individual studies reported and assessed

2) For individual studies reported within systematic reviews
   - Interventions were primarily focused on early child development
   - At least two included studies used randomized controlled trial methods
   - At least two included studies were published within the past five years
   - Detailed information reported on children’s social and emotional outcomes
   - Levels of statistical significance reported for primary outcomes
   - Effect sizes reported for primary outcomes

One team member assessed each retrieved review and prepared a short list of the best reviews for assessment by a second team member. We then reached consensus on selecting the final included review and its companion review on long-term follow-up outcomes.
References

BC government staff can access original articles from BC’s Health and Human Services Library (www.health.gov.bc.ca/library/).


2011 / Volume 5
3 - Helping Children Overcome Trauma
2 - Preventing Prenatal Alcohol Exposure
1 - Nurse-Family Partnership and Children's Mental Health

2010 / Volume 4
4 - Addressing Parental Depression
3 - Treating Substance Abuse in Children and Youth
2 - Preventing Substance Abuse in Children and Youth
1 - The Mental Health Implications of Childhood Obesity

2009/ Volume 3
4 - Preventing Suicide in Children and Youth
3 - Understanding and Treating Psychosis in Young People
2 - Preventing and Treating Child Maltreatment
1 - The Economics of Children's Mental Health

2008/ Volume 2
4 - Addressing Bullying Behaviour in Children
3 - Diagnosing and Treating Childhood Bipolar Disorder
2 - Preventing and Treating Childhood Depression
1 - Building Children’s Resilience

2007/ Volume 1
4 - Addressing Attention Problems in Children
3 - Children's Emotional Wellbeing
2 - Children's Behavioural Wellbeing
1 - Prevention of Mental Disorders