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According to the World Health Organization, physical inactivity in children has become a global epidemiological concern [1]. In Canada, data collected using accelerometers in the Canadian Health Measures Survey show that only 8% of 5- to 17-year-olds accumulate at least 60 min of moderate to vigorous physical activity [2]. The same World Health Organization report estimated that in 2016, 41 million children under the age of 5 years were considered overweight [1]. Physical inactivity combined with tripling obesity rates over the past three decades (from 5% to 15%) [3] and shifting social norms toward more sedentary activities raise concern for children's health and well-being. Even society's youngest generation (0–4 years) faces challenges with increasing rates of obesity and engagement in sedentary activities [4].

The early years (0–4 years) are a critical period for growth and development for infants, toddlers, and preschoolers. Although the benefits of physical activity for school-aged children have been well established [5], there has been less focus on the 0–4 age range. As described in this special issue, accumulating research demonstrates a positive relationship between higher levels of physical activity and positive health outcomes [6]. There is also increasing evidence to show the importance of minimizing screen time in the early years [7], getting good-quality sleep in these years [8], and showing how physical activity, sedentary behaviour, and sleep interact to produce optimal health benefits [9].

As toddlers and preschoolers transition into childhood and adolescence, physical activity tends to decrease [10] while sedentary behaviours, such as watching television, are introduced into the daily schedule [11]. It is therefore important to help children develop healthy lifestyle habits early on, and promoting a physically active lifestyle at an early age may help children carry these healthy habits into adulthood [12]. A preliminary step to combatting the complex issues of physical inactivity and increasing sedentary behaviours is the development of guidelines. These provide evidence-based recommendations and standards that have the potential to contribute significantly to overall health, and can also be used for surveillance purposes [13]. Engaging stakeholders and end users is a crucial step, as this can help to ensure effective knowledge translation [14], determine if guidelines are relevant to the stakeholders' and end users' needs [15], and identify strategies for effectively communicating the guidelines [16].

Limited research has examined perceptions of physical activity and sedentary behaviour guidelines for children's early years. In the United Kingdom, in-depth interviews were conducted with mothers of preschoolers to examine their attitudes toward the UK physical activity and

sedentary guidelines for the early years [17]. The results demonstrated a low awareness of the guidelines among the majority of mothers. Although participants felt the guidelines were appropriate for the general population, some mothers felt the guidelines were unnecessary; they believed their children were already meeting the physical activity and sedentary behaviour recommendations. Additionally, some participants raised concerns that the guidelines could place undue pressure or stress on mothers if they could not provide additional physical activity opportunities for their children due to time constraints [16].

In Canada, parents of children who were younger than 4 years and were enrolled in child care were invited to participate in semi-structured focus groups to examine parental perceptions of the new Canadian Sedentary Behaviour Guidelines for the Early Years [18]. Overall, there was support for the content of the guidelines and participants found the information clear and helpful. However, there were concerns that the guidelines 'lumped' together all sedentary activities (including activities like colouring and reading) as 'bad'. Previous research also suggests that the guidelines could be a source of guilt among parents, in light of demanding family obligations, the omnipresence of screens, and cold weather conditions [17]. Overall these studies suggest that although parents support and value the development of guidelines for physical activity and sedentary behaviour for their children's early years, meeting the recommendations in their totality may be challenging.

In June 2016, the first 24-Hour Movement Guidelines for Children and Youth (5–17 years) were released in Canada [19]. These novel guidelines encompassed three movement behaviours: physical activity (light, moderate, and vigorous); sleep; and sedentary behaviours within a 24-h period. In response to the development of these

The current study, which was conducted concurrently with the development of the Canadian 24-Hour Movement Guidelines for the Early Years (0–4 years) [21], was designed to replicate the process described by Faulkner and colleagues [20] and had the following objectives: (1) to explore stakeholder (experts in pediatric and family medicine, physical activity knowledge translation, and child care) and end user (parents and child care professionals) perceptions of the Movement Guidelines, and (2) to identify their acceptability, perceived barriers to implementation, and recommended methods and credible messengers of dissemination.

Data collection for this study involved two distinct phases. In phase 1, telephone interviews were conducted with leading stakeholders from a range of relevant fields (e.g., pediatric medicine, knowledge translation, and child care). In phase 2, focus groups were conducted with primary end users including parents and practising early childhood educators (ECEs).

Phase 1: Data collection interviews

Key stakeholders who worked with children 0–4 years of age were purposefully recruited for their expertise from the areas of pediatric and family medicine, early childhood education, physical activity communication, and early childhood physical activity research to participate in telephone interviews. Four of the stakeholders were members of the research panel who contributed to the creation of the Canadian 24-Hour Movement Guidelines for the Early Years (“Movement Guidelines”), four were recruited through snowballing techniques, and the remaining two were identified through an online search for ECEs representing national and local organizations.

Participants were provided with a plain-text draft of the Movement Guidelines [21] by email and subsequently asked in a telephone interview about their first impressions of the guidelines, challenges and barriers to implementing the guidelines, and methods and messengers for dissemination. Given that key stakeholders were selected because of their likelihood to be messengers for the Movement Guidelines, interviews concentrated on gathering specific dissemination strategies (e.g., What are the best ways to communicate the new guidelines to your particular constituency? How is information shared within your professional network? What resources do you need as a [interviewee’s job title] in order to provide information about the guidelines to parents?). Interviews ranged between 25 and 47 min, and were conducted between February and March 2017.

Ethics approval was obtained from the University of British Columbia Research Ethics Board. All of the telephone interviews were held in English, and were

conducted by one researcher (Ramanathan). Informed consent was obtained in English at the beginning of the interview, and all interviews were audio-recorded and transcribed verbatim.

Participants

A total of 10 key stakeholders consisting of physicians (1 family physician, 2 paediatricians), ECEs in administrative

Guidelines (data not reported here). They were then invited to discuss the compatibility of these guidelines for daily life and the work environment (e.g., How practical do you think these guidelines are for your work?); the challenges and barriers to implementing the guidelines (e.g., Are there any barriers to implementing these guidelines?); and the best methods and messengers for disseminating these guidelines (e.g., What are the best ways to present or communicate these guidelines? Who would be the best individuals to provide information to you about the guidelines?). Probes were used to encourage discussion throughout the focus groups.

Three authors (Faulkner, Riazi, O'Neill) led the focus groups and interviews in British Columbia, and an additional researcher was hired to lead the francophone focus group in Ontario. Two of these three authors were present at each focus group in British Columbia, with one researcher leading the focus group and the other assisting in taking notes and follow-up questions. A single researcher led and took notes during the francophone focus group in Ontario. All focus groups were audio-recorded and transcribed verbatim.

Participants

A total of 92 end users consisting of parents, ECEs, and

activities (e.g., reading, drawing), and the recommenda-

new to me". A future challenge in raising awareness of and implementing the Movement Guidelines stems from the

the guidelines were important goals to strive toward, but that realistically, they might not meet them every day given household chores. One mother (Parent;F;FG;F) expressed the need to face “reality”:

Say that I have to clean the house, it's [screen time] sometimes the only way to capture their attention. It gives them something to watch. [...] Yeah, the government should send a housecleaner. Someone to prepare dinner. It's [screen time] just a way to distract them, because we have too much on our plate, we work full-time, we have to clean the house and do chores, our houses are becoming bigger now... it's a lot.

Physical activity in the older age groups (toddlers and preschoolers) raised some concerns among parents who found 180 min of physical activity including energetic play to be overwhelming. However, after clarifying that the 180 min could be accumulated throughout the day, parents felt that the recommendations were achievable. One stakeholder (Physical Activity Communicator;F;I;E) explained that one needs to make “connections to other things so that physical activity is not at the expense of something else. If it is integrated into your healthy, active day, then it is easier to achieve”. Even when a parent feels tired, said one stakeholder (Researcher/Parent;-F;I;E), it is important to incorporate physical activity in daily life without it feeling like an ‘add-on’:

Recognition and education around how activities can be embedded within a day is important. It doesn't have to be a set 60 minutes for going outside and playing; it doesn't have to be that structured... Trying to think about creative ways to embed it within their daily activities that are already happening, so it doesn't feel like an add-on, but rather a build-in, will be helpful.

In contrast, a few focus group parents felt that their children were exceeding the recommended levels of activity. One parent (Parent;F;FG;E) said, “Mine never stop moving, so I've never considered there being any guidelines. They have so much energy”. At the same time, interviewees who were engaged in physical activity advocacy and research noted the issue of overestimation: “Sometimes people will just break it down into active or not active, and we tend to overestimate how active we are in retrospect and how active kids are” (Physical Activity Communicator;F;I;E).

Shifting social norms

Several participants explained that as a society, we may need to shift our social norms in order to successfully implement the Movement Guidelines, particularly for screen time and energetic play. Screens and technology

were described as ubiquitous in today's society, and respondents said they were used as rewards and substitute babysitters for even the youngest children. As one researcher (Researcher;M;I;E) pointed out, “It is socially acceptable to be using screens. Parents may feel like they are not good parents if they are not providing the latest technology to their child”.

With respect to recommendations for energetic play, physicians, parents, ECEs and physical activity communicators noted that there are competing priorities within families and child care settings, where physical activity often gets pushed aside. A physician (Physician/Parent;-F;I;E) explained that she often sees “patients that have culturally placed an emphasis on reading and achievement in the preschooling group. An increasing focus is placed on learning instead of the importance of energetic play”. ECEs offered the perspective that as a society, we have moved away from “a culture of the children being participants in the house” (Early Childhood Educator;F;FG;E) where they can accumulate physical activity by helping with physically demanding chores. Children in today's society are so busy in structured programs and activities, even as preschoolers, that parents claim there simply is not enough time for active play. To meet recommendations for energetic play, greater value will need to be

behaviours (such as physical activity and adequate sleep) was viewed as the “business” of physicians, and partly due to the frequency of visits among Canadian infants and preschoolers to receive publicly funded immunizations. Physicians also felt that it was their responsibility to discuss the importance of energetic play, adequate sleep, and minimizing screen time as part of preventive health care that promotes healthy growth and development.

Child care settings were seen as another natural conduit for sharing the Movement Guidelines as these settings serve families with infants, toddlers, and preschoolers. ECEs and daycare staff generally said they endeavoured to build trusting relationships with families, often shared

going to moms, and nurses may [even] model the appropriate behaviours" (Physician;F;I;E).

A physical activity advocate (Physical Activity

encompassing guideline was well received. This is an encouraging finding as the uptake of a new innovation is strongly related to its perceived acceptability by potential adopters [32].

The majority of expert stakeholders and end users perceived the Movement Guidelines as providing a set of healthy goals that were largely achievable. In comparison to the 24-Hour Movement Guidelines for Children and Youth [20], there appeared to be less tension among participants, particularly parents, regarding the likelihood of their child meeting the Movement Guidelines. Parents discussed how their toddlers and preschoolers were 'naturally' active. This perception may be accurate, as 70% of Canadian 3- to 4-year-olds meet the daily recommendation of at least 180 min of physical activity at any intensity [33]. Parents also described having control and awareness of their child's sleep patterns and access to screen time. Additionally, licensing regulations at child care centres were congruent with the Movement Guidelines with respect to nap times, minimal screen time, and scheduled outdoor time. Meeting the Children and Youth Guidelines, on the other hand, raised more concerns regarding feasibility since physical activity, screen time, and sleep in this age group were affected by numerous factors such as school structure (e.g., more time spent sitting), ubiquity of screen time (e.g., video games, screens in school), and time spent doing homework (e.g., may affect hours of sleep in older youths).

Despite the overall acceptability of the Movement Guidelines for the early years, participants cited a number of challenges to uptake. Such challenges were largely centred on discussions about screen time – suggesting that screen time was increasingly creeping into the lives of their children, and was inevitable. In the examination by Carson and colleagues of parental perceptions of the

the current Canadian physical activity guidelines for adults has been recognized as potentially explaining low awareness of their recommendations [16]. It is important to develop evidence-based guidelines, which act as a basis for planning, policy, and evaluation; however, equally crucial are the efforts to “promote awareness, acceptance, adoption, and adherence to guidelines” (p. 1) [39]. Nevertheless, there appears to be a gap between the development of guidelines and their translation into policy or practice [40, 41]. Future dissemination of the Movement Guidelines, with dedicated funding, will require consideration of the recommendations suggested by participants.

Interactions with the medical system and/or medical professionals were obvious points of contact when information about the Movement Guidelines could be conveyed. Parents also identified child care settings as important for receiving information about the guidelines. In 2011, more than half (54%) of Canadian parents with children under 4 years of age indicated they used child

Availability of data and materials

The dataset used during the current study is available from the corresponding author on reasonable request.

About this supplement

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