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# Exploring the Physical Activity and Screen Viewing-Related Knowledge, Training, and Self-Efficacy of Early Childhood Education Candidates

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**Abstract and Keywords**

Early childhood educators (ECEs) greatly influence young children's physical activity (PA) and screen viewing (SV) behaviours. This study explored the PA and SV-related knowledge (i.e., of important PA/SV concepts), training (i.e., PA/SV courses/content received), and self-efficacy (i.e., to facilitate PA and limit SV in childcare) of early childhood education candidates. A sample of 1,292 candidates from 61 Canadian colleges/universities completed the online survey. In general, candidates exhibited the least amount of knowledge regarding the link between SV and health. Further, 67.8% and 73.3% of candidates had not completed PA or SV courses during their post-secondary training, respectively, and candidates who completed 1 or more PA/SV courses exhibited greater self-efficacy than those without such training. Findings from this work highlight the potential of supplementary PA/SV content in ECEs' post-secondary training to benefit their related knowledge and self-efficacy prior to entering a childcare-based profession.

*Keywords:* physical activity, early childhood education, screen viewing, training, young children

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## Chapter 1: Introduction and Literature Review

The rising prevalence of inactivity among children worldwide is concerning, as approximately 62-96% of this population is not regularly active (Kalman et al., 2015). The World Health Organization (WHO; 2004) recognizes this trend as a pertinent international health crisis among children ages 0 to 17, including young children (2.5 – 5 years), noting the link between physical inactivity and non-communicable diseases, and mortality. This physical inactivity crisis is echoed nationally; in 2012, 87% of boys and 94% of girls (ages 6 to 19 years) were not engaging in adequate levels of physical activity as per national recommendations (60 minutes of moderate-to-vigorous physical activity [MVPA] per day; Canadian Society for Exercise Physiology [CSEP], 2012a; Colley, Janssen, & Tremblay, 2012). Caspersen and colleagues (1985) defined physical activity as "any bodily movement produced by skeletal muscles that requires energy expenditure" (p.126), and this behaviour is consistently associated with more favourable physical, cognitive, and psychosocial health outcomes (Colquitt et al., 2016), including healthy weight maintenance (Ekelund, Luan, Sherar, Esliger, & Griew, 2012), and increased mental wellness (Ahn & Fedewa, 2011). Unfortunately, similar low trends of physical activity are being noted among the Canadian preschooler population (age 2.5 to 5 years; Garriguet et al., 2016). This warrants great concern, as physical activity habits developed during the early years often predict activity habits in later childhood (Reilly et al., 2004), thus emphasizing the need for early intervention.

Sedentary behaviour, which refers to "any waking behaviour characterized by an energy expenditure of ≤1.5 metabolic equivalents (METs) in a sitting, reclining or lying

posture" (Sedentary Behavior Research Network, 2017, p. 75), is markedly high among preschoolers. In fact, Canadian Health Measures Survey (CHMS) data have revealed that young Canadian children 3 to 5 years spend approximately 61% of their waking hours being sedentary (Statistics Canada, 2013). Consistent with these dismal levels, are the findings from Reilly et al. (2004) and Vale and colleagues (2010) who reported that young children (ages 3 to 6 years) spend approximately 73-84% of their waking hours in this behaviour (Reilly et al., 2004; Vale, Silva, Santos, Soares-Miranda, & Mota, 2010). Noted as an independent risk factor for a number of health complications, including decreased psychosocial health and cognitive abilities (LeBlanc et al., 2012; Saunders, Chaput, & Tremblay, 2014), the high levels of sedentary behaviours among young children are alarming. With such concerning health trends evolving in Canada among the preschool population (Tucker, 2008; Colley et al., 2013), wide-scale health promotion efforts are warranted to encourage the early development and uptake of positive physical activity behaviours and limited sedentary time. Adopting such preventative strategies may be the key to deterring adverse health outcomes from arising, and more positively, promoting healthy outcomes (Ebbeling, Pawlak, & Ludwig, 2002).

**Health Benefits and Consequences of Physical Activity and Sedentary Behaviours among Preschoolers**

A breadth of literature supports the value of physical activity in maintaining health across the lifespan (Humphreys, McLeod & Ruseski, 2014; Reiner, Niermann, Jekauc, & Woll, 2013). Not only does regular physical activity promote healthy

bodyweights (Ekelund et al., 2012) and improve cardiometabolic biomarkers (Timmons et al., 2012), but it also supports psychological (Lees & Hopkins, 2013; Timmons et al., 2012), social (Lees & Hopkins, 2013; Timmons et al., 2012), and cognitive (Howie & Pate, 2012; Lees & Hopkins, 2013; Timmons et al., 2012) development, which all undergo rapid transformation during the early years (Keenan, Evans, & Crowley, 2016). Such psychosocial and cognitive benefits include increased attention (Timmons et al., 2012), higher intellectual functioning (Carson et al., 2016), increased mental wellness (Ahn & Fedewa, 2011), and improved social skills (Lees & Hopkins, 2013). Participation in physical activity also helps scaffold preschoolers' self-esteem, which enhances their confidence and ability to engage in this behaviour in more complex and diverse environments (Liu, Wu, & Ming, 2015).

Bearing in mind the abundant benefits of physical activity, which have been well documented (Humphreys et al., 2014; Timmons et al., 2012), the low levels of this behaviour and tendency to engage in high levels of sedentary behaviours present substantial health consequences for young children (Barton, 2012; Goel, 2015). Physical inactivity is associated with numerous comorbidities, including obesity, which is currently affecting over 42 million children worldwide under the age of 5 (WHO, 2015), and approximately 22% of young Canadian children (Shields, 2006). These behaviours have also been linked to an increased likelihood of developing type II diabetes (Barton, 2012; Goel, 2015), sleep apnea (Goel, 2015; Tripuraneni, Paruthi, Armbrecht, & Mitchell, 2013), asthma (Black, Takayanagi, Jacobsen, & Koebnick, 2013), hyperlipidemia (Goel, 2015), hypertension (Barton, 2012; Goel, 2015), and cardiovascular disease (Barton,

2012; Goel, 2015). LeBlanc and colleagues (2012) concluded from their systematic review that increased levels of sedentary behaviours, particularly television viewing, were associated with gains in adiposity and unfavourable measures of both psychosocial health and cognitive development. Additionally, obesity in the early years inhibits the development of normal movement patterns due to the additional load on the musculoskeletal system (Shultz, Byrne, & Hills, 2014). This excess weight-bearing makes it increasingly difficult for young children to participate in physical activity, emphasizing the critical need to intervene in the early years before such devastating health complications arise.

**Preschoolers' Physical Activity and Sedentary Behaviours**

The *Canadian 24-Hour Movement Guidelines for the Early Years* suggest that preschoolers age 3 to 4 years should accumulate a minimum of 180 minutes of total physical activity (TPA) per day at *any* intensity, 60 minutes of which should be MVPA (i.e., energetic play), in order to gain health benefits (CSEP, 2017a; Tremblay et al., 2017). These guidelines also detail that this population should not engage in prolonged sitting for more than an hour at a time, and that screen time should be limited to less than one hour per day (CSEP, 2017a). Although various researchers have reported that this cohort engages in adequate levels of physical activity (e.g., Colley et al., 2013; Obeid, Nguyen, Gabel, & Timmons, 2011), there is conflicting literature regarding this matter, with many researchers reporting the contrary (e.g., Temple, Naylor, Rhodes, & Wharf Higgins, 2009; Tucker, 2008). For example, Tucker (2008) reported in a systematic review of 39 studies that only 23% of preschoolers were engaging in 120 minutes of

physical activity per day, an activity level still one hour short of the Canadian guideline of 180 minutes per day. However, recent CHMS data reflect that while only 12.7% of young children met the overall *Canadian 24-Hour Movement Guidelines*, the majority (61.8%) did meet the physical activity recommendations (Chaput et al., 2017). While inconsistencies may be present concerning Canadian preschoolers' physical activity levels (Obeid et al., 2011), it is critical that this population is not overlooked when developing interventions to promote and support physical activity.

Contrastingly, the findings regarding preschoolers' levels of sedentary behaviours have been more conclusive. A number of studies have demonstrated that preschoolers spend the majority of their waking hours being sedentary (Reilly et al., 2004; Statistics Canada, 2013; Vale et al., 2010). However, Hnatiuk and colleagues (2014) reported in their systematic review that variability among the preschool population still exists. In this review, sedentary behaviours accounted for as little as 34% to as much as 94% of preschoolers' waking hours. Preschoolers' sporadic bouts of physical activity between sedentary periods make it challenging to capture their true levels of sedentary behaviour (Welk, Corbin, & Dale, 2000), possibly contributing to some of this variability in measurement (Hnatiuk et al., 2014). While a number of sedentary behaviours (such as reading, drawing, and circle time) do serve a purpose to this cohort (i.e., for early language and literacy development; Carson et al., 2015), behaviours such as excessive screen viewing are of concern. Chaput and colleagues (2017) reported that 75.6% of young Canadian children engaged in more than the recommended amount of daily screen viewing (i.e., $\leq$ 1 hour/day; CSEPa, 2017).

Regardless of preschoolers' exact time spent in sedentary behaviours, less is best for optimal health (CSEP, 2017a). Initiatives to move young children away from this behaviour in favour of more energetic pursuits will be beneficial to this population's development and maintenance of positive health behaviours long-term.

The low levels of physical activity and markedly high levels of sedentary time of this population are concerning, especially considering physical activity participation declines with age, while sedentary time sees further increases (Taylor, Williams, Farmer, & Taylor, 2013). In a study by Taylor and colleagues (2013), physical activity levels of children (*n* = 242) at 5 years of age had declined to half the value of that observed at 3 years. The prevalence of poor activity behaviours at such a young age is worrying, as it progressively increases the likelihood of early onset obesity and chronic disease (Sahoo et al., 2015), which track from childhood to adulthood (Kelsey, Zaepfel, Bjornstad, & Nadeau, 2014). Physical activity behaviours have also been shown to track from childhood to adulthood (Reilly et al., 2004), highlighting the critical need to intervene in the early years while children's behaviours are still quite malleable (Goldfield, Harvey, Grattan, & Adamo, 2012). The receptiveness to such interventions also becomes more challenging with age (Goldfield, Raynor, & Epstein, 2002; Ory, Jordan, & Bazzarre, 2002). As such, interventions targeting preschoolers are needed to promote the development of a strong foundation in physical activity.

**Intervening in the Early Learning Environment**

While physical inactivity is a growing concern among the preschool cohort, the levels of physical activity in the childcare environment are exceptionally low (Vanderloo

et al., 2014). Of particular importance, Hinkley and colleagues (2016) discovered that preschool children were substantially less active during childcare hours than out-of-care hours (Hinkley, Salmon, Crawford, Okely, & Hesketh, 2016). Additionally, compared to preschoolers in parent care, those who attend early learning centres specifically are 1.65 times more likely to be overweight or obese in later childhood (Geoffroy et al., 2013). Although alarming, this relationship is not surprising, considering the results of numerous studies which have echoed the poor physical activity levels of preschoolers in childcare (Gubbels, Van Kann, & Jansen, 2012; Pate, McIver, Dowda, Brown, & Addy, 2008; O'Brien, Vanderloo, Bruijns, Truelove, & Tucker, under review; Reilly, 2010; Sturm, 2005; Tandon, Saelens, & Copeland, 2016; Tucker & Irwin, 2010; Tucker, Maltby, Burke, Vanderloo, & Irwin, 2016; Vanderloo, Tucker, Johnson, & Holmes, 2013; Vanderloo & Tucker, 2015). Vanderloo and colleagues (2014) found that young children in childcare accumulated only 1.54 minutes per hour of MVPA, while Tucker and colleagues (2016) reported that this cohort engaged in up to 41 minutes per hour of sedentary time. Vanderloo (2014) also reported in her systematic review that in over half of the studies that reported rates of screen viewing in childcare, preschoolers surpassed the recommended amount. Given that the majority of Canadian preschoolers (approximately 80%; Cleveland, Forer, Hyatt, Japel, & Krashinsky, 2008) attend some form of non-parental care for an average of 29 hours per week (Bushnik, 2006), coupled with the fact that children in this environment consistently exhibit low levels of physical activity (Vanderloo et al., 2014) and high levels of sedentary behaviour (Tucker et al., 2016), particularly screen viewing (Vanderloo, 2014), the early learning environment

represents a feasible avenue for intervention to target the health behaviours of this population.

Despite the low physical activity levels of preschoolers in childcare, Canadian parents believe their children are engaging in high levels of daily physical activity while in care (Irwin, He, Bouck, Tucker, & Pollett, 2005). Pate and colleagues (2008) have postulated that this inaccurate assumption could reduce the amount of physical activity opportunities parents provide their children in the home, further contributing to preschoolers' high levels of sedentary time. However, the childcare environment does have the capacity to largely influence the health behaviours of preschoolers; in fact, Finn and colleagues (2002) noted that the early learning environment itself accounted for approximately 50% of the variation in preschoolers' physical activity levels, proving to be even more influential than demographic factors such as age and sex. This environment offers the possibility for interventions that can target: 1. the physical environment; 2. staff behaviours; and, 3. daily physical activity programming, among other environmental aspects, such as playground density. A recent cluster randomized controlled trial by Tucker and colleagues (2017), the Supporting Physical Activity in the Childcare Environment (SPACE) study, explored the effectiveness of an evidence-based physical activity intervention for preschoolers ($n$ = 338) that targeted the three aforementioned modifiable aspects of the childcare environment. The success of this intervention was attributed to its evidence-based, multi-component design and the efficacy of the childcare environment as a platform for intervention. Significant increases in preschoolers' TPA and MVPA were observed post-intervention, as well as a

significant reduction in sedentary time (i.e., time spent in sedentary behaviours). These results mirror the findings of a meta-analysis by Gordon and colleagues (2013), who found there to be a small-to-moderate and moderate effect size for physical activity interventions on both preschoolers' TPA and MVPA, respectively. The authors highlighted that the most successful interventions were conducted in early learning environments and were led by childcare staff (Gordon et al., 2013).

With sedentary behaviour and screen viewing research only recently emerging in the early year's literature, evidence of the effectiveness of interventions targeting these behaviours is not yet conclusive (Vanderloo, 2014). However, authors of past interventions in early learning environments have attributed their success to the strong influence this setting has on the health behaviours of preschoolers (Finn et al., 2002; Pate et al., 2008; Tucker et al., 2017). Young children are still in the process of forming habits and, therefore, are receptive to behavioural-lifestyle interventions (Goldfield et al., 2012; Reilly, 2004). Following the settings approach to health promotion, which recognizes the significance of environmental influences on behaviour (Dooris et al., 2007), it is not surprising that early learning environments that promoted and encouraged physical activity exhibited higher levels of physical activity among preschoolers than environments not promoting this behaviour (Tandon, Garrison, & Christakis, 2012). Considering preschoolers enrolled in centre-based childcare are least active when compared to those enrolled in home-based childcare and full day kindergarten (Vanderloo et al., 2015), the centre-based childcare environment's current obesogenic nature (i.e., unique environmental factors that increase one's likelihood of

becoming obese; Ward et al., 2008) is concerning. Thus, it is important to identify which aspects of this particular environment act as barriers to physical activity. If these barriers can be overcome, and early learning environments reduce sedentary experiences in favour of more energetic pursuits, preschoolers' health and wellness will benefit greatly.

**Physical Activity Policies in the Early Learning Environment**

Unfortunately, not all childcare centres create environments supportive of physical activity. Researchers have postulated these disparities in physical activity promotion are likely due, in part, to the lack of nationwide regulations regarding scheduled physical activity for preschoolers in childcare (Vanderloo et al., 2014). Ott, Vanderloo, and Tucker's (under review) nationwide childcare policy analysis confirmed that physical activity regulations in Canada continue to vary among centres. Further, a provincial/territorial legislative review of physical activity and sedentary behaviour policies in Canadian childcare centres revealed that while all provinces/territories had outdoor play requirements, only three provinces (Northwest Territories, Nunavut, and Nova Scotia) actually stipulated the amount of daily physical activity required (Vanderloo & Tucker, 2018). Additionally, Vanderloo and Tucker (2018) noted that only one province (New Brunswick) referenced screen time. If more provinces moved toward creating childcare legislation with daily physical activity requirements and limitations for screen viewing, early childhood educators (ECEs) would have greater direction in creating early learning environments supportive of healthy activity behaviours.

In the United States, a few state initiatives have been explored, with the most notable effects demonstrated by South Carolina (O'Neill, Dowda, Neelon, Neelon, & Russell, 2017). Statewide childcare policy changes included mandatory staff training for ECEs on physical activity for preschoolers, standards for active play and physical activity, and promotion of physical activity in the centre. When compared to North Carolina (where no such policy changes were made), modest, yet, significant increases in physical activity regulatory practices were observed (O'Neill et al., 2017). The authors note that while ECEs' physical activity-related knowledge improved following training, providers expressed their desire for additional resources and training to better implement such physical activity policies. It is clear efforts are warranted to provide ECEs with greater support in this initiative.

**The Role of Early Childhood Educators (ECEs)**

With respect to the strong influence of the early learning environment on young children's physical activity levels (Finn et al., 2002), ECEs play an important role in this setting (Bower et al., 2008; Vanderloo et al., 2014). ECEs (also known as childcare staff, childcare providers, etc.) are often responsible for creating the daily programming in their classrooms within childcare centres (Robinson, Webster, Logan, Lucas, & Barber, 2012), and the amount of physical activity they incorporate often reflects the importance they place on this behaviour (Copeland, Sherman, Kendeigh, Kalkwarf, & Saelens, 2012; Dyment & Coleman, 2012; Hesketh, Lakshman, & van Sluijs, 2017). Parents have even expressed that they depend on ECEs to provide ample opportunities for physical activity during childcare hours (Tucker, Irwin, Sangster Bouck, & Pollett,

2006). As the frontline of the childcare environment, ECEs are viewed as role models for the preschoolers in their care and can have a large influence on these children's health behaviours (Derscheid, Umoren, Kim, Henry, & Zittel, 2010). Brown and colleagues (2009) found that when ECEs encouraged physical activity during indoor play periods, preschoolers engaged in more MVPA (Brown, Googe, McIver, & Rathel, 2009). Similarly, Gubbels and colleagues (2011) found physical activity prompts by ECEs to be effective at increasing preschoolers' physical activity levels in early learning environments, while Vanderloo et al. (2014) also noted that, together with sedentary opportunities and portable and fixed play equipment, staff behaviours accounted for almost half of the variability in preschoolers' MVPA.

Not only is verbal encouragement of physical activity an important influence on children's activity levels, but also participation in activities (via co-participation and role modeling) by ECEs themselves (Bell et al., 2015; Gehris, Gooze, & Whitaker, 2015). Bell and colleagues (2015) observed a significant increase in young children's step counts when ECEs participated in physical activity alongside the preschoolers in their care. Hesketh, Lakshman, and van Sluijs (2017) echoed this finding, and determined from their systematic review that co-participation of children and ECEs in physical activity helped facilitate higher activity levels in children. Yet, of concern, a study by McWilliams and colleagues (2009) revealed that 61% of childcare centres either had minimal or a complete lack of participation by ECEs during active play (McWilliams et al., 2009). Despite the prominent influence ECEs have on the health behaviours of preschoolers, many ECEs remain unaware of their role as facilitators of physical activity during care

hours (Vives-Rodriguez, 2005). Copeland and colleagues (2012) noted that a number of ECEs self-reported themselves to be “safety chaperones” as opposed to “activity facilitators” during outdoor play time. However, there were mixed responses, underlining the variability in staff engagement in physical activity both within and between early learning centres. This research highlights the importance of positive activity role modeling by ECEs when striving to increase preschoolers’ participation in physical activity at childcare.

**The Role of Training and Self-Efficacy**

The level of engagement of ECEs in the provision and facilitation of physical activity in the early learning environment has been noted to vary depending on the level of training, education, and experience of ECEs in physical activity-related domains, in addition to whether they value physical activity personally (Bower et al., 2008; Copeland et al., 2012; Dyment & Coleman, 2012; Martyniuk & Tucker, 2014). Such preparatory knowledge increases ECEs’ self-efficacy, or the confidence in one’s ability to complete a task (Bandura, 1997), when implementing physical activity programs (Altunsöz, 2015; Martyniuk & Tucker, 2014). ECEs have communicated that their lack of physical activity training is a major contributor to their low self-efficacy in leading physical activities in the childcare setting (Dyment & Coleman, 2012; Chow & Humbert, 2011), emphasizing a potential critical gap in current early childhood education training.

According to Prochaska and Velicer’s (1997) transtheoretical model of behaviour change, self-efficacy plays an important role in altering behaviour (Prochaska & Velicer, 1997). Self-efficacy is strongly tied to motivation; thus, those with higher self-efficacy

are more likely to make stronger and more persistent efforts to complete a task or change a behaviour (Schunk, 1990). Following this notion, Derscheid and colleagues (2014) reported that in order for ECEs to prioritize and promote health behaviours such as physical activity in their classrooms, they require a sufficient level of self-efficacy to do so (Derscheid, Kim, Zittel, Umoren, & Henry, 2014). Bandura (2004) noted in the social cognitive theory that knowledge levels are also tied to self-efficacy; perhaps this explains why many ECEs lack confidence to lead physical activity opportunities for preschoolers in their care. Bellows and colleagues (2008) found that after interviewing 79 preschool teachers from 34 childcare programs about their health promotion practices, insufficient training was reported as a barrier to implementing such practices (Bellows, Anderson, Gould, & Auld, 2008). As such, it is vital that ECEs receive sufficient physical activity and sedentary behaviour-related education, as the knowledge acquired through such training is likely to improve their self-efficacy to promote physical activity and reduce sedentary time in the early learning environment.

While ECEs have indicated a lack of physical activity-specific training as a barrier to facilitating physical activity opportunities in the early learning environment, they have also requested additional resources and professional development opportunities to increase their effectiveness in their role (Tucker, van Zandvoort, Burke, & Irwin, 2011; van Zandvoort et al., 2010). Physical activity training through professional development for ECEs has been linked to increased physical activity levels of preschoolers (Bower et al., 2008; Dowda et al., 2009, Hesketh et al., 2017; Tucker et al., 2017). Dowda and colleagues (2009) noted increased MVPA (an additional 13 minutes per day) and

decreased sedentary behaviours in preschoolers enrolled in childcare centres where staff had recently completed physical activity training. Physical activity interventions for preschoolers are most effective when led by ECEs (Gordon et al., 2013), therefore, the current lack of support, training, and provision of physical activity resources for ECEs is a major concern. Given the prominent influence ECEs have in both programming for preschoolers in childcare (Robinson et al., 2012), and as role models (Derscheid et al., 2010), interventions targeting ECEs are necessary to have a significant and lasting impact on the health behaviours of preschoolers in their care.

**Early Childhood Education Training at the College/University Level**

A growing body of literature is emphasizing the need for physical activity promotion (and minimizing screen time) in the early learning environment, yet ECEs continue to express that they are not equipped with the proper training nor the tools necessary to implement such initiatives (Copeland et al., 2012; Tucker et al, 2011, van Zandvoort et al., 2010). While some interventions have incorporated workshops and training for ECEs (Adamo et al., 2017; Goldfield et al., 2012; O'Neill et al., 2017; Tucker et al., 2017), yielding increased physical activity-related knowledge of ECEs (O'Neill et al., 2016; Van Stan, Lessard, & Dupont-Phillips, 2013) and activity levels of preschoolers (Bower et al., 2008; Dowda et al., 2009; Tucker et al., 2017), the impact of such initiatives can be limited by location, funding, and willingness of ECEs to engage in such opportunities outside of work hours (Goldfield et al., 2012; Trost, Ward, & Senso, 2010). Although ECEs have requested more professional development opportunities related to physical activity (McWilliams et al., 2009; Tucker et al., 2011; van Zandvoort et al.,

2010), Kim and colleagues (2011) noted that they may not be as inclined to seek out such additional training when it is not compulsory (Kim, Shim, Wiley, Kim, & McBride, 2011). In Kim et al.'s (2011) study, which assessed the training of ECEs in east central Illinois, 66.7% of home-based childcare providers (*n* = 88) and only 43% of centre-based childcare providers (*n* = 94) reported having engaged in physical activity training in the past year. Studies in Kansas (Trost, Messner, Fitzgerald, & Roths, 2009) and Australia (Wolfenden et al., 2011) have produced similar findings, suggesting that physical activity training through professional development in the workplace may not be the most effective (or feasible, due to time and ratio requirements) avenue to ensure all ECEs receive a comprehensive education surrounding appropriate physical activity (and screen time) in the early years.

With the goal of providing a more extensive and well-rounded education for future childcare providers, a grassroots approach has been suggested, calling for the addition of physical activity-related content to the early childhood education curriculum (Goldfield et al., 2012; Obeng, 2009; Vives-Rodriguez, 2005). Undertaking such changes could elicit wide-scale public health benefits, as it would target the next generation of childcare providers before they enter the workforce, maximizing the influence on preschoolers across a variety of early learning environments (Goldfield et al., 2012). Gehris and colleagues (2015) conducted focus groups with ECEs in eastern Pennsylvania, who communicated that they did not receive adequate physical activity-related training during their education, making them feel underprepared when faced with the task of leading gross motor activities for preschoolers. Further, Trost and colleagues (2009)

noted that childcare centres exhibiting higher levels of physical activity among preschoolers were more likely to both employ ECEs with a higher level of education and also provide their staff with more professional development opportunities. This literature supports the addition of physical activity-related content to the early childhood education curriculum, where it can provide a larger reach of future childcare providers and effectively prepare them with a more comprehensive education. Goldfield and colleagues (2012) concurred that if such training were provided at the post-secondary level, graduates would be well positioned to positively influence preschoolers' physical activity behaviours in whichever childcare-based vocation they pursue.

Before college/university-based curriculum changes can be proposed, a better understanding of the health and physical education training that ECEs currently receive in their post-secondary program is required. This preliminary assessment is crucial, as it will provide information regarding the need for additional physical activity training for ECEs at the college/university level. Currently, a paucity of research has been noted regarding the physical activity-related training of early childhood education candidates at the college/university-level; however, a recent study by Martyniuk and Tucker (2014) examined the physical activity knowledge, training, and self-efficacy of early childhood education candidates enrolled in college diploma programs in Ontario. Of the 1,113 candidates who participated in the study, 72.1% had not completed any physical activity-specific training, while only 2% and 6.8% accurately reported the *Canadian Physical Activity Guidelines for the Early Years* and the *Canadian Sedentary Behaviour*

*Guidelines for the Early Years*, respectively. These results are worrying, as being familiar with the physical activity and sedentary behaviour guidelines increases the likelihood that these guidelines will be promoted, and that programming will be designed in line with behavioural guidelines (Martyniuk & Tucker, 2014). These data also reflect the prominent gap in early childhood education curricular content pertaining to physical activity and the importance of this behaviour for healthy child development. Further, Martyniuk and Tucker (2014) found that candidates who had completed one or more physical activity-related courses had greater self-efficacy levels when asked how confident they would be in leading physical activities for preschoolers. This relationship highlights the potential for mandatory physical activity training at the post-secondary level to influence the quality and quantity of physical activity programming for preschoolers in childcare. This pilot study provides valuable insight into the current state of health and physical education training of Ontario early childhood education candidates; yet, these alarming results warrant a larger scale investigation into how widespread this gap in physical activity training might be across Canada.

**Health Promotion and the Precede-Proceed Model**

According the *Ottawa Charter for Health Promotion* (1986), "health promotion is the process of enabling people to increase control over, and to improve their health" (WHO, 1986, p. 351). Consequently, it is paramount that health-promoting interventions strive to include the target population in the process of intervention, as this may increase the likelihood of long-term change (Green & Kreuter, 2005). As such, following Green and Kreuter's (2005) *PRECEDE-PROCEED Model for Health Promotion* allows for

effective intervention planning, implementation, and evaluation by utilizing this evidence-based step-by-step process that addresses the multi-level factors affecting the desired change.

*PRECEDE* involves four phases: 1. social assessment (i.e., identifying the social issues and needs of the population to determine the desired change; *Phase 1*); 2. epidemiological assessment (i.e., identifying the health problems and their determinants to set objectives; *Phase 2*); 3. educational and ecological assessment (i.e., determining the predisposing, enabling, and reinforcing factors that can be targeted to support the desired change; *Phase 3*); and, 4. administrative and policy assessment (i.e., surveying the organizational and policy-level factors that may influence the success of the program, and tailor interventions accordingly; *Phase 4*). The present study will contribute to *Phase 4* of this model by examining the current organizational practices at the college/university-level in providing physical activity training for early childhood education candidates, as well as assessing organizational factors that could support the desired change (i.e., increased physical activity-related curricular content for early childhood education candidates). Synthesis of previous literature will also contribute to multiple phases of the *PRECEDE* stage, such as the request for additional physical activity training at the college level by ECEs themselves (*Phase 1*; e.g., O'Neill et al., 2017), and the knowledge that such training facilitates both ECEs' confidence and ability to implement active opportunities for preschoolers (*Phase 3*; e.g., Martyniuk & Tucker, 2014), as well as increased physical activity levels of preschoolers (*Phase 3*; e.g., Dowda et al., 2009).

*PROCEED* also has four phases, including implementation (i.e., the health promotion program is designed and executed; *Phase 5*), followed by process, impact, and outcome evaluations (i.e., various levels of program evaluation; *Phases 6, 7,* and *8*). The present study will inform the potential need for an intervention targeting physical activity-related training for early childhood education candidates at the college-level.

**Study Purpose**

Although a pilot study has assessed the physical activity knowledge, training, and self-efficacy of early childhood education students in Ontario colleges (Martyniuk & Tucker, 2014), no study has explored the health education differences present in early childhood education programs across the country. Given the great variability in physical activity legislation for childcare centres among Canadian provinces/territories (Vanderloo, Tucker, Ismail, & van Zandvoort, 2012; Vanderloo & Tucker, 2018), coupled with the absence of a daily time requirement for physical activity in the childcare environment across the country (Vanderloo et al., 2012), an analysis of the physical activity-related training early childhood education candidates receive during their college/university education nationwide is necessary to ensure these future childcare providers receive the appropriate health education to promote physical activity for the preschoolers for whom they care. Building on Martyniuk and Tucker's (2014) work, the purpose of the present study was to examine the knowledge (i.e., of important physical activity/sedentary behaviour documents and concepts), training (i.e., the physical activity and screen viewing-related courses offered and concepts covered), and self-efficacy (i.e., confidence to facilitate active opportunities for preschoolers and limit

screen viewing) of Canadian early childhood education candidates to garner a better understanding of their confidence and ability to implement physical activity programs and limit screen viewing in childcare.

After reviewing the results from Martyniuk and Tucker's (2014) study and conducting an initial scan of the early childhood education curriculum content provided on each institution's website, it was hypothesized that physical activity and screen viewing-specific training would be lacking from the majority of early childhood education curricula, and physical activity-related self-efficacy levels would be low among early childhood education candidates. More specifically, it was hypothesized that, consistent with previous literature (Bower et al., 2008; Copeland et al., 2012; Dyment & Coleman, 2012) and the findings from Martyniuk and Tucker's (2014) pilot study, candidates' self-efficacy would be higher if they had completed one or more physical activity-related courses, or if they engaged in the recommended levels of physical activity themselves. Gathering early childhood education candidates' perceived physical activity training highlights the physical activity and screen viewing content covered, regardless of where it is embedded within the curriculum, and reveals concept retention of early childhood education candidates as it pertains to physical activity and screen viewing. This study provides a national picture of the physical activity-related educational experience of early childhood education candidates, a first step to understand if there is a subsequent need for intervention to better serve this population prior to them entering the workforce.

# Chapter 2: Methods

## Study Design and Procedures

Cross-sectional in design, this study followed a similar protocol to Martyniuk and Tucker's (2014) pilot study, to examine the physical activity and screen viewing-related knowledge, training, and self-efficacy of early childhood education candidates enrolled in Canadian colleges/universities. Ethical approval was provided by the Non-Medical Research Ethics Board at The University of Western Ontario (Appendix A; approval number 110246).

**College/university recruitment.** All Canadian colleges/universities offering an early childhood education program were identified (*n* = 110) by cross-referencing each province's/territory's college/university website with the Child Care Human Resources Sector Council website (http://www.ccsc-cssge.ca). Request for participation was initially in the form of email (Appendix B) to program personnel (e.g., early childhood education program coordinator, associate Dean/Chair of the program, etc.), with a reminder email (Appendix C) circulated if no response was received within 2 weeks. A follow-up phone call (telephone script: Appendix D) to invite participation was made to colleges/universities not responding by email. Study protocols were also submitted to colleges'/universities' respective Research Ethics Board for approval (*n* = 13), if requested.

**Student recruitment.** All students enrolled in their respective early childhood education program at participating colleges/universities were invited to complete the online survey, disseminated through email or a program website (Appendix E) by

college/university program personnel. The email provided the link to Qualtrics® and directed students to read the Letter of information and Consent (LOI/C; Appendix G) prior to commencing the survey. Consent to participate was indicated by the voluntary completion of the survey. A reminder email (Appendix F) was circulated to students 3 weeks after the initial invitation email.

**Participants**

**Inclusion and exclusion criteria.** Students enrolled in an early childhood education program at a participating Canadian college/university were invited to participate, regardless of enrolment status (e.g., full-time/part-time), year in program, or program type (e.g., certificate, diploma, or degree). As such, students were excluded if they were not enrolled in an early childhood education program at a participating Canadian college/university.

**Sample size.** Due to the exploratory nature of the study, a sample size calculation was not completed. All students meeting the specified inclusion criteria were invited to participate in the study. Class sizes from each college/university were documented in order to calculate provincial/territorial and national response rates.

**Instruments and Tools**

A modified version of the survey entitled "An Exploration of Early Childhood Education Students' Physical Activity-Related Knowledge and Preparation" (Martyniuk & Tucker, 2014) was completed by study participants. This 112-item tool (Appendix H) measured students': 1. physical activity and screen viewing-related courses completed/ forthcoming and concepts covered during their education (*n* = 4 items); 2. their

knowledge of the relationship between physical activity/screen viewing and health (*n* = 15 items); 3. whether they were familiar with important physical activity and screen viewing-related documents and guidelines (*n* = 14 items); 4. their self-efficacy to lead physical activity opportunities and minimize screen viewing in childcare (*n* = 17 items); 5. their awareness of the role they play in modeling behaviours (*n* = 2 items); 6. their views regarding helpful resources and interest in furthering their knowledge on physical activity and sedentary behaviour-related concepts (*n* = 12 items); 7. their values regarding physical activity and screen viewing (*n* = 34 items); 8. their own physical activity and screen viewing behaviours (*n* = 5 items); and, 9. demographic characteristics (*n* = 9 items). For the 17 self-efficacy items, candidates rated their confidence to facilitate physical activity opportunities and limit screen viewing in childcare on an 11-point self-efficacy scale, and answers ranged from '0' to '10'. Candidates rated whether they had knowledge of physical activity and screen viewing-related concepts (15 items) on a 6-point scale, and answers ranged from '1 = strongly disagree' to '6 = strongly agree'. Candidates' interest in furthering their knowledge on physical activity and sedentary behaviour-related concepts was also rated on a 6-point scale, with answers ranging from '1 = strongly disinterested' to '6 = strongly interested'.

This tool was specifically adapted for the present study by the research team and differed from Martyniuk and Tucker's (2014) survey by including screen viewing, sedentary behaviour, and appropriate sleep (Appendix J) concepts, adding additional knowledge and self-efficacy items, as well as updating document versions and guidelines. A number of physical activity and screen viewing-related documents and

resources were referenced in the development of this modified survey, including: CSEP's *Canadian 24-Hour Movement Guidelines for the Early Years* (2017a); the ParticipACTION Report Card (2016); the Environment and Policy Assessment and Observation Self-Report (EPAO-SR) tool (Ward et al., 2008); the Guide for Constructing Self-Efficacy Scales (Bandura, 2006); the Physical Activity Questionnaire Book (modified from the Self-Efficacy Scale; McAuley & Mihalko, 1998); the CAN Teach Questionnaire (Derscheid et al., 2014); the Physical Education Teaching Efficacy Scale (Humphries, Hebert, Daigle, & Martin 2012); as well as provincial/territorial childcare policy documents and additional academic research articles. The Tailored Design Method (Dillman, Smyth, & Christian, 2014) was used in the tool's creation to promote full completion of the survey; questions were designed to be relatable and interesting to survey respondents and participants were informed of how the results would benefit their future profession. To ensure face validity (i.e., the tool appears to measure what it intends to measure), this tool was reviewed by research experts in young children's physical activity and sedentary behaviours, as well as early childhood education professionals.

The survey was translated into French to maximize participation across the country. The survey content was identical in both language versions of the survey, with both allowing participants to skip questions and still submit. The survey took students approximately 20 minutes to complete, and the online survey link was active from January 2018 to May 2018.

**Data Analysis**

All statistical analyses were completed in SPSS (version 25). Descriptive statistics were used to report demographic characteristics and current physical activity-related knowledge, training, and self-efficacy of early childhood education candidates. Frequencies were run to examine the number of candidates who reported having completed/anticipated completing physical activity and sedentary behaviour courses, as well as whether they received related content in other mandatory/elective courses. Furthermore, frequencies were performed to report candidates' personal physical activity and screen viewing experiences/behaviours, their familiarity with important physical activity and screen viewing-related documents and guidelines, as well as their perspectives regarding helpful physical activity and screen viewing resources. Candidates' interest level in furthering their knowledge on various physical activity and sedentary behaviour topics was collapsed into '1 and 2 = not interested', '3 and 4 = neutral', and '5 and 6 = interested' prior to running frequencies. Mean scores and standard deviations were calculated for all knowledge (15) and self-efficacy (17) items. Shapiro-Wilk tests were run and because these data were non-normal, non-parametric tests were conducted. Two Mann-Whitney *U* tests were performed to compare candidates' self-efficacy to facilitate physical activity opportunities and minimize screen viewing in childcare, dependent on: 1. if they had completed any physical activity/screen viewing-related courses (i.e., 1 or more); and, 2. their own physical activity habits (i.e. whether they were engaging in sufficient physical activity as per the Canadian Physical Activity Guidelines for Adults [150 minutes of MVPA per week]; CSEP,

2012b). Also using the aforementioned grouping variables, two chi-square tests were performed to compare candidates' physical activity and screen viewing-related knowledge. In order to account for familywise error within multiple comparisons, the Holm-Bonferroni method was applied to adjust the *p*-values (Holm, 1979).

## Chapter 3: Results

A total of 61 colleges/universities, of the eligible 110 institutions contacted, agreed to participate. Between January and May 2018, a total of 1,292 early childhood education candidates (of a potential 8,089 invited candidates) completed the online survey, resulting in a response rate of 16%. The mean age of participating students was $25.67 \pm 8.65$ years, the majority were female (96.1%), Caucasian (55.1%), and enrolled full-time (89.1%) in a diploma program (71.5%). Most candidates (85.2%) were in year one or two of their respective early childhood education programs, and 89.0% had previous work, volunteer, or placement experience in a childcare setting. Please refer to Table 2 for complete participant demographics.

Generally speaking, participants were not active; only 11.3% of candidates self-reported engaging in at least 150 minutes of MVPA per week (the adult recommendation as per the Canadian Physical Activity Guidelines; CSEP, 2012b), while 69.1% engaged in 60 minutes or less of MVPA per week (Table 3). In terms of screen viewing, 61.9% of candidates self-reported engaging in less than 150 minutes per day of recreational screen time (i.e., screen viewing for non-school or work-based use while sedentary; CSEP, 2017b), while 14.2% reported engaging in 4 hours or more of this behaviour per day (Table 3).

### Early Childhood Education Candidates' Physical Activity and Screen Viewing-Related Knowledge

When students were asked about their familiarity with a number of physical activity and screen viewing-related documents (Table 4), the large majority (73.4%) of

candidates had knowledge of their respective provincial/territorial childcare regulation; however, they were largely unaware of other important physical activity or sedentary behaviour-specific documents of relevance for young children (see Table 4). Of note, only 15.1% of candidates were familiar with the *Canadian 24-Hour Movement Guidelines for the Early Years* (36.9% and 17.0% of candidates had knowledge of its preceding documents, the *Canadian Physical Activity Guidelines for the Early Years* and the *Canadian Sedentary Behaviour Guidelines for the Early Years*, respectively).

Of the 15 knowledge items, the highest average score reported by candidates was regarding their knowledge of key features of gross motor development ($M$ = 5.30, $SD$ = .80; Table 9), while the lowest knowledge score was for the link between screen viewing and high blood pressure ($M$ = 4.55, $SD$ = 1.26; Table 9). After performing two chi-square tests, no significant ($p > .05$) differences in any of the knowledge items were evident between those who had/had not completed physical activity/screen viewing courses, nor between those who were/were not meeting the physical activity guidelines. See Table 9 for knowledge means and standard deviations, and Tables 9 and 10 for candidates' knowledge based on number of physical activity/screen viewing courses and their own physical activity behaviours, respectively.

Candidates rated their interest level in furthering their knowledge on a number of physical activity and sedentary behaviour-related concepts. While interest rates across all 11 topics were high (range = 82.1% to 93.3%; Table 11), the highest interest levels reported were for active play (93.3%), healthy growth and development (91.0%), and appropriate sleep (90.7%). Candidates also expressed keen interest in a number of

resources (*n* = 7) to aid them in facilitating physical activity and minimizing screen viewing in childcare (range = 66.1% to 84.6%; Table 12), and were most interested in age/developmentally-appropriate ideas for games/activities/exercises (84.6%) and active opportunity ideas in various weather climates (81.4%).

**Physical Activity and Sedentary Behaviour-Related Training**

When asked about their physical activity and sedentary behaviour-related training during their college/university education, 550 candidates (67.8%) indicated they had not completed or anticipated completing any physical activity-specific courses, while 586 candidates (73.3%) reported having no sedentary behaviour-specific courses (Table 5). According to provincial frequencies, Nova Scotia and Quebec had the highest percentage of candidates with some (i.e., one or more) physical activity courses, with rates of 68.4% and 66.7%, respectively (Table 6). Northwest Territories (0%), Prince Edward Island (0%), and Yukon (0%) exhibited the lowest rates, with no candidates having completed any physical activity-specific courses.

With regard to sedentary behaviour courses, provincial frequencies were generally low; Alberta had the highest percentage (45.5%) of candidates with some sedentary behaviour-specific courses, followed by Quebec (41.0%; Table 6). However, 86.9% of candidates reported having covered physical activity and/or sedentary behaviour-related content in other mandatory course lessons; the large majority of candidates reported that physical activity-related concepts such as gross motor development (86.6%), active play (81.4%), outdoor risky play (69.0%), and physical activity (68.3%) were covered in early childhood education curricula (Table 5).

Conversely, only 41.5% and 47.3% of reported indicated having covered sedentary behaviour and screen viewing-related content, respectively. See Table 5 for specifics regarding candidates' physical activity and sedentary behaviour-related courses and concepts, and Table 6 for provincial variation in training.

**Early Childhood Education Candidates' Self-Efficacy to Instruct Physical Activity and Limit Screen Viewing in Childcare**

Across the 17 items, the highest average self-efficacy score was for candidates' ability to create a childcare environment that encourages active play ($M$ = 8.43, $SD$ = 1.77; Table 7). Candidates had the least confidence when rating their self-efficacy to lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat; $M$ = 7.24, $SD$ = 2.44; Table 7).

When comparing candidates' self-efficacy based on the number of physical activity courses they completed, candidates with increased physical activity training (i.e., one or more courses) had greater confidence (mean rank = 369.32) to ensure children were engaging in adequate MVPA as per the Canadian Guidelines ($U$ = 44,441.00, $z$ = -2.70, $p$ = .035) than candidates without such physical activity training (mean rank = 326.53; Table 7).

Candidates' own physical activity levels had an even greater influence on their self-efficacy; candidates who were sufficiently active as per the Canadian adult guidelines had greater confidence (mean rank = 391.63 and 399.09, respectively) to both create an environment that encourages active play ($U$ = 17,546.50, $z$ = -3.08, $p$ = .008) and make good use of the environment and available equipment for physical

activity and play ($U$ = 16,979.50, $z$ = -3.44, $p$ = .005) than those not meeting the guidelines (mean rank = 322.55 and 321.57, respectively; Table 8). Of importance, candidates meeting the guidelines had greater confidence (mean rank = 385.62, 398.53, and 398.07, respectively) for all three items within the 'self-efficacy to overcome barriers to physical activity' item group: 1. facilitate active play for young children in a limited space ($U$ = 17,728.50, $z$ = -2.75, $p$ = .006); 2. lead outdoor active play opportunities even if I am tired ($U$ = 16,718.00, $z$ = -3.50, $p$ = .000); and, 3. lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat; $U$ = 17,209.00, $z$ = -3.26, $p$ = .002), than their less active counterparts (mean rank = 322.86, 319.32, and 322.87, respectively; Table 9). Please refer to Table 7 for means and standard deviations, and Tables 7 and 8 for candidates' self-efficacy based on number of physical activity/screen viewing courses and their own physical activity/screen viewing behaviours (Mann-Whitney $U$ statistics), respectively.

Table 1

*Institutional and Early Childhood Education Candidate Provincial and Territorial Representation*

| Province/ Territory | # of Institutions Contacted | # of Participating Institutions | Institutional Participation (%) | Enrolment # at Participating Institutions | # of Participants | Response Rate (%) |
|---|---|---|---|---|---|---|
| British Columbia | 20 | 12 | 60 | 1085 | 184 | 17 |
| Alberta | 11 | 6 | 55 | 637 | 76 | 12 |
| Saskatchewan | 5 | 2 | 40 | 78 | 66 | 85 |
| Manitoba | 4 | 3 | 75 | 99 | 51 | 52 |
| Ontario | 27 | 20 | 74 | 5073 | 554 | 11$^{\phi}$ |
| Québec | 31 | 9 | 29 | 683 | 90 | 13 |
| Nova Scotia | 4 | 4 | 100 | 223 | 26 | 12 |
| New Brunswick | 1 | 1 | 100 | 161 | 44 | 27 |
| Prince Edward Island | 2 | 1 | 50 | 6 | 2 | 33 |
| Newfoundland & Labrador | 2 | 1 | 50 | 35 | 28 | 80 |
| Yukon | 1 | 1 | 100 | 4 | 4 | 100 |
| Northwest Territories | 1 | 1 | 100 | 5 | 5 | 100 |
| Nunavut | 1 | 0 | 0 | -- | -- | -- |
| **TOTAL** | 110 | 61 | 55 | 8,089 | 1,292 | 16 |

*Note.* # of participants does not equal 1,292, total completion rate of survey due to skipped question. Percentages were rounded to the nearest percent. $^{\phi}$Slightly higher response rate due to college non-reporting.

Table 2

*Early Childhood Education Candidates' Demographic Information (n* = 1,292)

| Participant Characteristic | *N* | % |
|---|---|---|
| Sex | | |
| Male | 12 | 1.8 |
| Female | 645 | 96.1 |
| Ethnicity | | |
| Caucasian | 370 | 55.1 |
| African Canadian | 12 | 1.8 |
| Aboriginal/First Nations | 53 | 7.9 |
| Hispanic | 11 | 1.6 |
| Asian | 105 | 15.6 |
| Arab | 16 | 2.4 |
| Other | 64 | 9.5 |
| Enrolment Status | | |
| Full-time | 1048 | 89.1 |
| Part-time | 128 | 10.9 |
| Type of Early Childhood Education Program | | |
| Certificate | 190 | 16.5 |
| Diploma | 768 | 71.5 |
| Degree | 115 | 9.9 |
| Other | 13 | 2.0 |
| Year of Study | | |
| 1 | 582 | 49.3 |
| 2 | 424 | 35.9 |
| 3 | 71 | 6.0 |
| 4 | 42 | 3.6 |
| Other | 61 | 5.2 |
| Placement/Work/Volunteer Experience in a Childcare Setting | | |
| Yes | 1055 | 89.0 |
| No | 131 | 11.0 |

*Note.* Column total per section may not always match the total number of participants due to skipped questions.

Table 3

*Early Childhood Education Candidates' Personal Physical Activity and Screen Viewing Experiences/Behaviours*

| Item | *N* | % |
|---|---|---|
| How physically active were you during your *childhood*? | | |
| Not at all active | 4 | .6 |
| Somewhat inactive | 18 | 2.7 |
| Moderately active | 90 | 13.5 |
| Somewhat active | 140 | 20.9 |
| Very active | 417 | 62.3 |
| How physically active were you during your *adolescence*? | | |
| Not at all active | 8 | 1.2 |
| Somewhat inactive | 60 | 9.0 |
| Moderately active | 172 | 25.9 |
| Somewhat active | 234 | 35.3 |
| Very active | 189 | 28.5 |
| How important is physical activity in your life? | | |
| Not at all important | 16 | 2.4 |
| Somewhat unimportant | 33 | 4.9 |
| Neither important nor unimportant | 54 | 8.0 |
| Somewhat important | 272 | 40.4 |
| Very important | 299 | 44.4 |
| How many minutes of MVPA do you accumulate in a typical week? | | |
| <30 | 147 | 21.8 |
| 30-59 | 206 | 30.6 |
| 60-89 | 99 | 14.7 |
| 90-119 | 80 | 11.9 |
| 120-149 | 65 | 9.7 |
| 150+ | 76 | 11.3 |
| How many minutes of recreational screen viewing do you engage in each day? | | |
| <60 | 104 | 15.4 |
| 60-100 | 197 | 29.2 |
| 101-149 | 117 | 17.3 |
| 150-199 | 94 | 13.9 |
| 200-239 | 67 | 9.9 |
| 240+ | 96 | 14.2 |

*Note.* MVPA = moderate-to-vigorous physical activity.

Table 4

*Early Childhood Education Candidates' Familiarity with Physical Activity and Sedentary Behaviour-Related Documents*

| Document | Yes (%) | No (%) |
|---|---|---|
| Your provincial/territorial childcare regulation | 73.4 | 26.6 |
| ParticipACTION Report Card on Physical Activity for Children and Youth | 19.6 | 80.4 |
| ParticipACTION Position Statement on Active Outdoor Play | 23.7 | 76.3 |
| Canadian Physical Activity Guidelines for the Early Years | 36.9 | 63.1 |
| Canadian Sedentary Behaviour Guidelines for the Early Years | 17.0 | 83.0 |
| Canadian 24-Hour Movement Guidelines for the Early Years$^{\phi}$ | 15.1 | 84.9 |
| I have never heard of any of these documents | 20.3 | 79.7 |

*Note.* $^{\phi}$The *Canadian 24-Hour Movement Guidelines for the Early Years* were only released 3 months prior to the dissemination of this survey.

Table 5

*Physical Activity and Sedentary Behaviour-Related Training During Early Childhood Education Candidates' College/University Education*

| **Physical Activity and Sedentary Behaviour Courses Completed/Forthcoming** | | | | |
|---|---|---|---|---|
| Topic | No courses | | 1+ courses | |
| | *N* | % | *N* | % |
| Physical Activity (*n* = 811) | 550 | 67.8 | 261 | 32.2 |
| Sedentary Behaviour (*n* = 799) | 586 | 73.3 | 213 | 26.7 |
| **Concepts Covered in Mandatory and Elective Courses (*n* = 810)** | | | | |
| Topic | Mandatory | | Elective | |
| | *N* | % | *N* | % |
| Physical education | 367 | 45.3 | 78 | 9.7 |
| Physical activity | 553 | 68.3 | 64 | 7.9 |
| Physical literacy | 374 | 46.2 | 76 | 9.4 |
| Gross motor development | 703 | 86.6 | 33 | 4.1 |
| Locomotor & non-locomotor movement | 463 | 57.2 | 56 | 6.9 |
| Outdoor risky play | 559 | 69.0 | 63 | 7.8 |
| Active play | 661 | 81.4 | 34 | 4.2 |
| Screen viewing | 383 | 47.3 | 75 | 9.3 |
| Sedentary behaviour | 336 | 41.5 | 70 | 8.6 |
| Appropriate sleep | 437 | 54.0 | 59 | 7.3 |
| No courses discussed these topics | 106 | 13.1 | 73 | 9.0 |

Table 6

*Physical Activity and Sedentary Behaviour-Related Courses Completed/Forthcoming by Province*

| Province | **Physical Activity Courses Completed/Forthcoming** | | | | **Sedentary Behaviour Courses Completed/Forthcoming** | | | |
|---|---|---|---|---|---|---|---|---|
| | No Courses | | 1+ Courses | | No Courses | | 1+ Courses | |
| | *N* | % | *N* | % | *N* | % | *N* | % |
| Alberta | 34 | 61.8 | 21 | 38.2 | 30 | 54.5 | 25 | 45.5 |
| British Columbia | 88 | 68.2 | 41 | 31.8 | 89 | 69.5 | 39 | 30.5 |
| Manitoba | 23 | 53.5 | 20 | 46.5 | 29 | 69.0 | 13 | 31.0 |
| New Brunswick | 13 | 61.9 | 8 | 38.1 | 18 | 85.7 | 3 | 14.3 |
| Newfoundland & Labrador | 20 | 74.1 | 7 | 25.9 | 23 | 85.2 | 4 | 14.8 |
| Northwest Territories | 3 | 100 | 0 | 0 | 3 | 100 | 0 | 0 |
| Nova Scotia | 6 | 31.6 | 13 | 68.4 | 12 | 70.6 | 5 | 29.4 |
| Ontario | 281 | 75.5 | 91 | 24.5 | 287 | 78.6 | 78 | 21.4 |
| Prince Edward Island | 1 | 100 | 0 | 0 | 1 | 100 | 0 | 0 |
| Quebec | 13 | 33.3 | 26 | 66.7 | 23 | 59.0 | 16 | 41.0 |
| Saskatchewan | 40 | 66.7 | 20 | 33.3 | 38 | 63.3 | 22 | 36.7 |
| Yukon | 3 | 100 | 0 | 0 | 2 | 100 | 0 | 0 |

Table 7

*Physical Activity and Sedentary Behaviour-Related Self-Efficacy of Early Childhood Education Candidates, Total Sample and by Frequency of Course Content*

| Item | Total Sample | | No courses | | 1+ Courses | | Mean Rank | | Mann-Whitney *U* | *z* | Adj. *p*† |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | No courses | 1+ Courses | | | |
| **Self-Efficacy to Promote Physical Activity** | | | | | | | | | | | |
| Ensure children are engaging in adequate light physical activity | 7.93 | 2.04 | 7.82 | 2.12 | 8.15 | 1.84 | 333.60 | 357.55 | 47,801.00 | -1.53 | .254 |
| Ensure children are engaging in adequate moderate-to-vigorous physical activity | 7.37 | 2.20 | 7.19 | 2.30 | 7.73 | 1.95 | 326.53 | 369.32 | 44,441.00 | -2.70 | .035* |
| Create a childcare environment that encourages active play | 8.43 | 1.77 | 8.33 | 1.83 | 8.65 | 1.60 | 326.80 | 359.14 | 45,461.00 | -2.11 | .140 |
| Make good use of the environment and available equipment for play and physical activity | 8.32 | 1.82 | 8.20 | 1.94 | 8.60 | 1.51 | 326.63 | 357.93 | 45,508.50 | -2.03 | .126 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Create opportunities for outdoor risky play (e.g., tree climbing, less 'hovering' on the playground, balancing activities) | 7.26 | 2.46 | 7.25 | 2.53 | 7.34 | 2.26 | 339.35 | 336.76 | 50,008.50 | -.16 | .870 |
| **Self-Efficacy to Teach Physical Activity** | | | | | | | | | | | |
| Model appropriate physical activity/movement behaviours | 8.27 | 1.86 | 8.17 | 1.94 | 8.52 | 1.64 | 329.44 | 361.60 | 46,027.00 | -2.07 | .228 |
| Lead activities to improve children's fitness development (e.g., cardiovascular endurance, muscular strength, flexibility, & coordination) | 7.71 | 2.17 | 7.64 | 2.22 | 7.87 | 2.06 | 332.93 | 351.37 | 47,863.50 | -1.17 | .723 |
| Teach about the relationship between physical activity and health | 7.66 | 2.11 | 7.62 | 2.17 | 7.79 | 1.97 | 335.55 | 346.07 | 48,936.50 | -.67 | .505 |
| Teach locomotor skills, traveling actions (jump, gallop, hop) | 8.29 | 1.94 | 8.19 | 2.06 | 8.54 | 1.65 | 330.46 | 353.28 | 46,991.50 | -1.48 | .690 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Teach play skills (bike riding, sliding, swinging, climbing) | 8.02 | 2.10 | 7.93 | 2.23 | 8.26 | 1.82 | 333.06 | 352.64 | 47,803.00 | -1.25 | .840 |
| Teach rhythm skills | 7.73 | 2.16 | 7.65 | 2.23 | 7.92 | 1.99 | 330.54 | 348.75 | 47,025.50 | -1.16 | .492 |
| Use a variety of methods that encourage physical activity | 8.11 | 1.94 | 7.98 | 2.01 | 8.39 | 1.76 | 325.36 | 363.62 | 44,685.00 | -2.46 | .098 |
| **Self-Efficacy to Overcome Barriers to Physical Activity** | | | | | | | | | | | |
| Facilitate active play for young children in a limited space | 7.96 | 2.00 | 7.85 | 2.10 | 8.23 | 1.74 | 327.87 | 354.00 | 46,065.50 | -1.68 | .094 |
| Lead outdoor active play opportunities even if I am tired | 7.98 | 2.00 | 7.85 | 2.11 | 8.24 | 1.76 | 324.62 | 355.91 | 44,975.00 | -2.02 | .132 |
| Lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat) | 7.24 | 2.44 | 7.11 | 2.55 | 7.58 | 2.15 | 328.14 | 357.99 | 45,940.00 | -1.89 | .116 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Self-Efficacy to Minimize Screen Viewing** | | | | | | | | | | | |
| Limit the amount of screen time children in my class engage in to less than 40 minutes per day (*2/3 of the daily recommendation) | 8.21 | 2.41 | 8.20 | 2.39 | 8.36 | 2.38 | 331.33 | 346.60 | 42,530.00 | -.962 | .336 |
| Minimize the use of screens as a reward for good behaviour | 7.96 | 2.54 | 7.92 | 2.60 | 8.19 | 2.50 | 330.36 | 351.04 | 41,900.00 | -1.29 | .394 |

*Note. M* = mean; *SD* = standard deviation; Mann-Whitney *U* comparisons were between those with (1+ Courses) and without (No Courses) physical activity/screen viewing courses. 'Adj.' = Adjusted; †The Holm-Bonferroni Method was applied to adjust the *p*-values for each set of multiple comparisons. *$p$ <.05.

Table 8

*Early Childhood Education Candidates' Self-Efficacy Based on Candidates Meeting the Physical Activity Guideline for Adults*

| Item | Mean Rank | | Mann-Whitney *U* | *z* | Adjusted *p*† |
|---|---|---|---|---|---|
| | Meeting Guideline | Not Meeting Guideline | | | |
| **Self-Efficacy to Promote Physical Activity** | | | | | |
| Ensure children are engaging in adequate light physical activity (as per the Canadian guidelines) | 365.83 | 330.48 | 20,115.00 | -1.537 | .124 |
| Ensure children are engaging in adequate moderate-to-vigorous physical activity (as per the Canadian guidelines) | 377.82 | 327.22 | 18,975.50 | -2.192 | .056 |
| Create a childcare environment that encourages active play | 391.63 | 322.55 | 17,546.50 | -3.081 | .008* |
| Make good use of the environment and available equipment for play and physical activity | 399.09 | 321.57 | 16,979.50 | -3.441 | .005* |
| Create opportunities for outdoor risky play (e.g., tree climbing, less 'hovering' on the playground, balancing activities) | 380.64 | 325.70 | 18,609.00 | -2.381 | .051 |
| **Self-Efficacy to Teach Physical Activity** | | | | | |
| Model appropriate physical activity/movement behaviours | 386.30 | 326.70 | 18,407.50 | -2.62 | .036* |

| | | | | | |
|---|---|---|---|---|---|
| Lead activities to improve children's fitness development (e.g., cardiovascular endurance, muscular strength, flexibility, & coordination) | 401.68 | 323.56 | 17,086.00 | -3.40 | .005* |
| Teach about the relationship between physical activity and health | 380.97 | 326.23 | 18,660.00 | -2.38 | .051 |
| Teach locomotor skills, traveling actions (jump, gallop, hop) | 395.96 | 323.14 | 17,369.00 | -3.24 | .006* |
| Teach play skills (bike riding, sliding, swinging, climbing) | 375.07 | 327.57 | 19,184.50 | -2.08 | .076 |
| Teach rhythm skills | 349.22 | 327.53 | 20,458.50 | -.945 | .345 |
| Use a variety of methods that encourage physical activity | 398.72 | 322.78 | 17,159.50 | -3.34 | .005* |
| **Self-Efficacy to Overcome Barriers to Physical Activity** | | | | | |
| Facilitate active play for young children in a limited space | 385.62 | 322.86 | 17,728.50 | -2.75 | .006* |
| Lead outdoor active play opportunities even if I am tired | 398.53 | 319.32 | 16,718.00 | -3.50 | .000* |
| Lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat) | 398.07 | 322.87 | 17,209.00 | -3.26 | .002* |

*Note.* Not meeting guideline indicates <150 minutes of moderate-to-vigorous physical activity per week (CSEP, 2012b). Meeting guideline indicates ≥150 minutes of moderate-to-vigorous physical activity per week (CSEP, 2012b). †The Holm-Bonferroni Method was applied to adjust the *p*-values for each set of multiple comparisons. *$p$ <.05.

Table 9

*Physical Activity and Sedentary Behaviour-Related Knowledge of Early Childhood Education Candidates, Total Sample and by Frequency of Course Content*

| Physical Activity-Related Knowledge Item | Total Sample | | No courses | | 1+ Courses | | $X^2$ | Gamma | Gamma *SE* | T | Adj. *p*† |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | | | | | |
| Key features of gross motor development | 5.30 | .80 | 5.24 | .86 | 5.46 | .66 | 8.891 | .122 | .075 | 1.603 | .872 |
| Age appropriate movement skills for children | 5.22 | .84 | 5.16 | .87 | 5.37 | .77 | 2.504 | .084 | .073 | 1.135 | 1.000 |
| The link between physical activity and cardiovascular health | 5.00 | .98 | 4.94 | 1.02 | 5.12 | .89 | 5.376 | .078 | .065 | 1.186 | 1.000 |
| The link between physical activity and muscular health | 5.04 | .96 | 5.00 | .98 | 5.14 | .93 | 1.881 | .046 | .067 | .691 | .489 |
| The link between physical activity and psychosocial health | 5.05 | .94 | 5.01 | .96 | 5.16 | .92 | 1.382 | .068 | .067 | 1.014 | 1.000 |
| The link between physical activity and learning | 5.26 | .84 | 5.20 | .87 | 5.42 | .73 | 5.847 | .130 | .073 | 1.768 | .770 |
| The link between physical activity, brain development, and preparing children for learning at school | 5.22 | .87 | 5.18 | .90 | 5.31 | .80 | 2.185 | .077 | .072 | 1.068 | 1.000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| The link between physical inactivity and type II diabetes | 4.82 | 1.18 | 4.82 | 1.17 | 4.84 | 1.19 | 11.282 | .066 | .070 | .945 | 1.000 |
| My college/university training has helped me understand important information about children's physical activity needs | 5.15 | .96 | 5.03 | 1.02 | 5.38 | .79 | 14.989 | .118 | .069 | 1.701 | .801 |
| I have the skills and abilities I need to support children's physical activity | 5.17 | .93 | 5.08 | 1.00 | 5.35 | .77 | .724 | .044 | .063 | .700 | .968 |

| Screen Viewing-Related Knowledge Item | Total Sample | | No courses | | 1+ Courses | | $X^2$ | Gamma | Gamma *SE* | T | Adj. $p$† |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | | | | | |
| The link between screen viewing and rates of childhood obesity | 5.09 | 1.02 | 5.09 | 1.00 | 5.14 | 1.01 | .092 | -.020 | .112 | -.181 | 1.000 |
| The link between screen viewing and psychosocial health | 4.98 | 1.05 | 4.98 | 1.02 | 5.03 | 1.08 | 1.883 | .007 | .102 | .067 | .947 |
| The link between screen viewing and cognition | 4.94 | 1.03 | 4.93 | 1.01 | 5.05 | 1.06 | .696 | .064 | .100 | .642 | 1.000 |
| The link between screen viewing and high blood pressure | 4.55 | 1.26 | 4.53 | 1.24 | 4.67 | 1.28 | 2.011 | .072 | .086 | .845 | 1.000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| The link between screen viewing and irregular sleep patterns | 4.96 | 1.12 | 4.96 | 1.08 | 5.02 | 1.11 | .177 | .013 | .102 | .128 | 1.000 |

*Note*. *M* = mean; *SD* = standard deviation; *SE* = Standard Error; 'Adj.' = Adjusted; †The Holm-Bonferroni Method was applied to adjust the *p*-values for each set of multiple comparisons.

Table 10

*Early Childhood Education Candidates' Knowledge Based on Candidates Meeting the Physical Activity Guideline for Adults*

| Physical Activity-Related Knowledge Item | $X^2$ | Gamma | Gamma *SE* | T | Adj. *p*† |
|---|---|---|---|---|---|
| Key features of gross motor development | 1.609 | .272 | .245 | 1.279 | 1.000 |
| Age appropriate movement skills for children | 2.667 | .338 | .211 | 1.855 | .576 |
| The link between physical activity and cardiovascular health | 3.817 | .312 | .152 | 2.223 | .260 |
| The link between physical activity and muscular health | 1.901 | .136 | .151 | .946 | 1.000 |
| The link between physical activity and psychosocial health | 1.611 | .101 | .153 | .691 | 1.000 |
| The link between physical activity and learning | 1.096 | .150 | .202 | .801 | 1.000 |
| The link between physical activity, brain development, and preparing children for learning at school | 1.344 | .166 | .189 | .949 | 1.000 |
| The link between physical inactivity and type II diabetes | 1.233 | .118 | .134 | .907 | 1.000 |
| My college/university training has helped me understand important information about children's physical activity needs | 1.717 | -.104 | .144 | -.681 | .496 |
| I have the skills and abilities I need to support children's physical activity | .843 | .109 | .167 | .685 | .986 |

*Note. SE* = Standard Error; †The Holm-Bonferroni Method was applied to adjust the *p*-values for each set of multiple comparisons.

Table 11

*Early Childhood Education Candidates' Interest in Furthering Their Physical Activity and Screen Viewing-Related Knowledge*

| Topic | Not interested | | Neutral | | Interested | |
|---|---|---|---|---|---|---|
| | *N* | % | *N* | % | *N* | % |
| Healthy growth and development | 6 | .9 | 54 | 8.1 | 610 | 91.0 |
| Physical activity promotion | 8 | 1.2 | 79 | 11.8 | 580 | 87.0 |
| Physical activity interventions | 14 | 2.1 | 104 | 15.7 | 543 | 82.1 |
| Physical activity evaluation | 22 | 3.3 | 128 | 19.2 | 516 | 77.5 |
| Leading physical activities for young children | 9 | 1.3 | 60 | 9.0 | 598 | 89.7 |
| Outdoor risky play | 16 | 2.4 | 78 | 11.7 | 574 | 85.9 |
| Active play | 5 | .7 | 40 | 6.0 | 622 | 93.3 |
| Fitness | 9 | 1.3 | 89 | 13.3 | 570 | 85.3 |
| Reducing screen viewing | 13 | 1.9 | 87 | 13.0 | 568 | 85.0 |
| Reducing sedentary behaviour | 9 | 1.4 | 92 | 13.8 | 565 | 84.8 |
| Appropriate sleep | 5 | .7 | 57 | 8.5 | 607 | 90.7 |

Table 12

*Early Childhood Education Candidates' Perceptions of Helpful Resources to Increase Physical Activity Participation and Minimize Screen Viewing in Childcare*

| Resource | Yes (%) | No (%) |
|---|---|---|
| Instructional strategies to promote physical activity | 79.2 | 20.8 |
| Instructional strategies to reduce the use of screens (e.g., computer, iPad) | 66.1 | 33.9 |
| Active opportunity ideas in various weather climates | 81.4 | 18.6 |
| Active opportunity ideas in small spaces | 80.2 | 19.8 |
| Age/developmentally-appropriate ideas for games/activities/exercises (e.g., types of ball games, moving to music, dances, structured activities) | 84.6 | 15.4 |
| Physical activity workshops or professional development programs | 80.8 | 19.2 |
| Guest physical activity instructors | 64.4 | 35.6 |

## Chapter 4: Discussion

The purpose of the present study was to explore the physical activity and screen viewing-related knowledge, training, and self-efficacy of early childhood education candidates across Canada to better understand their confidence and ability to promote physical activity and limit screen time in childcare. This was the first national study to examine these outcomes within early childhood education programs and contributes to the literature by providing a more comprehensive understanding of the physical activity and screen viewing training that ECEs receive during their post-secondary education. Multiple findings from this work warrant discussion.

While candidates in the present study, on average, had high self-reported physical activity knowledge, they scored lower when rating their knowledge of screen viewing-related concepts. This finding is likely due to the infancy of this field of study; screen time recommendations for young children were only introduced in the past 6 years (CSEP, 2012c). As such, related education may not yet be integrated into the early childhood education curriculum, representing an opportunity to enhance this type of training in post-secondary programs. Additionally, despite most candidates self-reporting to be knowledgeable about various physical activity concepts, the majority indicated that they would like to further their education on more specific physical activity and screen viewing-related topics, such as leading physical activities for young children, physical activity promotion, and reducing sedentary behaviours. Candidates even noted that physical activity workshops and professional development sessions would be welcomed. These findings may warrant consideration from

colleges/universities and childcare centres alike with regard to curriculum and policy development and modification to offer ECEs supplementary course content and training in their post-secondary education, as well as helpful resources to refer to when creating daily programming in childcare.

With the provision and facilitation of active opportunities for preschoolers largely dependent upon both ECEs' physical activity training (Bower et al., 2008; Dowda et al., 2009; Tucker et al., 2017) and personal preferences (Copeland et al., 2012), it is essential that ECEs be provided with related education. Unfortunately, results from the present study revealed that 67.8% and 73.3% of candidates reported not completing nor anticipated completing physical activity and sedentary behaviour courses during their post-secondary education, respectively. These results mirror the findings from Martyniuk and Tucker's (2014) pilot study, where 72.1% of candidates lacked physical activity-specific courses. Conversely, most (86.9%) candidates indicated that they had received some physical activity and/or sedentary behaviour content in other courses; however, some concepts (e.g., gross motor development, active play) were covered more than others (e.g., sedentary behaviour, physical education), confirming that variability still exists among Canadian colleges/universities regarding the amount and comprehensiveness of such training. This comes as no surprise, as each province/ territory is regulated differently, both in terms of post-secondary education and childcare legislation. Interestingly, Nova Scotia (one of the three provinces/territories that actually stipulates a physical activity time requirement in its childcare regulation; Vanderloo & Tucker, 2017) had the highest percentage of candidates (68.4%) with some

(i.e., one or more courses) physical activity-specific training. Noting the influence of policy on young children's physical activity, Finch and colleagues (2012) implemented an intervention in Australia to support childcare centres' adoption of physical activity promoting policies and practices; of the centres in the intervention group, a significant increase in centres adopting a written physical activity policy, as well as having staff trained in physical activity, was observed post-intervention (Finch et al., 2012). While centre-based policies and interventions have great potential, Ott et al. (under review) reported that only 44% of Canadian childcare centres had a written physical activity policy, and very few had a policy surrounding physical activity training for staff. Perhaps if physical activity policies for childcare centres were introduced (as in Nova Scotia) at the provincial/territorial level, colleges/universities would be inclined to provide physical activity-related training when designing curriculum to complement this requirement; fostering such knowledge and confidence positively influences behaviour (Bandura, 2004; Prochaska & Velicer, 1997) and would produce graduates better able to carry out these policies in childcare settings.

Another interesting finding that warrants discussion is candidates' familiarity of various physical activity and sedentary behaviour-related documents. Notably, only 15.1% of candidates had heard of the *Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years)*; however, this document was only released 3 months prior to the initial dissemination of the survey. Nevertheless, only 36.9% and 17.0% of candidates were familiar with its preceding documents, the *Canadian Physical Activity Guidelines for the Early Years* and the *Canadian Sedentary Behaviour Guidelines for the Early Years*,

respectively, indicating that the majority of candidates may not be familiar with appropriate movement behaviour guidelines for young children. This suggests the need for more targeted sharing of physical activity guidelines among practitioners, as these individuals are responsible for the programming offered in childcare centres, which ideally, would align with these movement requirements. In contrast, most (73.4%) early childhood education candidates were familiar with their respective provincial/territorial childcare regulation. As such, if provincial/territorial-level childcare legislation integrated components of the *Canadian 24-Hour Movement Guidelines*, it is more likely this information would be relayed to candidates during their training. Duffey and colleagues (2014) conducted a study to examine how well U.S. state childcare regulations incorporated national physical activity recommendations from the Institute of Medicine and found that the average number of recommendations included was 4.1 (*SD* = 1.4) out of 15. Interestingly, 40% of states had regulations regarding the amount of screen time allowed, whereas just 7% of states stipulated appropriate time spent in physical activity (Duffey, Slining, & Neelon, 2014). The authors agreed that state childcare policies should be more consistent with national physical activity recommendations in order to promote increased physical activity and decreased screen viewing in early learning settings.

The integration of physical activity-related content into the early childhood education curriculum may prove beneficial, as previous studies have linked physical activity training to ECEs' self-efficacy to facilitate active opportunities for young children in childcare (Derscheid et al., 2010). In the present study, candidates who completed

physical activity and screen viewing courses scored higher on all 17 self-efficacy items than those without such training; however, the only item reaching significance was regarding candidates' confidence to ensure children were engaging in adequate MVPA as per the Canadian guidelines. It seems logical that students with increased physical activity training scored higher on this item, as knowing what MVPA entails and how to incorporate it into daily programming requires physical activity-specific knowledge. In a review by Trost and colleagues (2009), which examined how childcare policies and the environment impacted preschoolers' physical activity, staff education and training, as well as staff behaviours, were strong predictors of children's MVPA. With staff training being such a strong influence on young children's MVPA (Trost et al., 2009), it is important to effectively prepare ECEs with related education. In Ontario, the College of Early Childhood Educators' *Code of Ethics and Standards of Practice* stipulates that educators must "promote physical and mental health and well-being by encouraging good nutrition [and] physical activity" (College of Early Childhood Educators, 2017, p. 28); as such, related education in their post-secondary program should be present. A review by Peden and colleagues (2018) regarding ECEs' physical activity training via professional learning indicated that while no clear length, mode, or content of such training proved superior, exploration into multi-modal forms of professional learning (e.g., combination of online and face-to-face training) may be more effective (Peden, Okely, Eady, & Jones, 2018). Driediger and colleagues (2018) suggest that the college/university setting would serve as a feasible platform for this initiative (Driediger, Vanderloo, Truelove, Bruijns, & Tucker, 2018).

Regardless of physical activity courses completed, candidates exhibited some of the lowest self-efficacy scores for all 'overcoming barriers to physical activity' items, which may indicate that this type of practical instruction is generally lacking across all early childhood education programs. This is an important concern, as van Zandvoort and colleagues (2010) conducted focus groups with ECEs (*n* = 54) in London, Ontario and found that inadequate equipment, insufficient space, safety concerns, daycare requirements, and weather were all recurrent barriers to facilitating physical activity opportunities for preschoolers in their care. Overcoming barriers to physical activity in early learning environments may be one way to effectively support increased physical activity and limited sedentary time among young children in these settings, yet if ECEs lack the training and resources to do so this may be challenging, and potentially result in active play being replaced with more sedentary experiences. ECEs have also indicated that their own physical activity-related knowledge, and that of their colleagues, acted as a resource to overcome barriers to physical activity; however, participants also noted that they were limited by the number of ideas they could come up with (van Zandvoort et al., 2010). Consistent with this finding, 81.4% and 80.2% of candidates in the present study indicated that they would like to have access to resources that included active opportunity ideas in various weather climates and in small spaces, respectively. Providing ECEs with physical activity-related training and resources to overcome such barriers may be an effective way to increase children's physical activity levels in childcare.

While providing ECEs with additional training and resources may help increase their confidence and likelihood of incorporating more physical activity into their programming, it is important to recognize the influence of ECEs' own physical activity levels on their physical activity-related self-efficacy. Early childhood education candidates who were sufficiently active as per the Canadian guidelines had significantly greater physical activity-related self-efficacy than those not meeting the guidelines for 10 of the 17 self-efficacy items rated, including all three 'overcoming barriers to physical activity' items (e.g., inclement weather, fatigue, and limited space). It is concerning, then, that even though 84.8% of the population indicated that physical activity was 'somewhat' or 'very important' in their present lives, only 11.3% of candidates were achieving the recommended level of MVPA per week. Of noted importance, van Zandvoort et al. (2010) and O'Connor and Temple (2005) conducted focus groups with ECEs and found that the more active ECEs were at childcare, the more active the children in their care tended to be. Moreover, recent studies by Bell et al. (2015) and Hesketh and colleagues (2017) reported increased physical activity of preschoolers in childcare when ECEs were active alongside them. While it may not be necessary for ECEs to meet physical activity recommendations, it is important they be made aware of the strong influence they can have on preschoolers' movement behaviours.

Despite the multitude of important findings from this study, there exists a number of limitations that must be considered. One limitation includes the exploratory cross-sectional nature of this study, as no inferences can be drawn. Additionally, despite efforts to recruit as many candidates as possible, the nationwide response rate was only

16%, and while typical online survey response rates tend to be lower than paper surveys, rates of 33% have been reported in the literature (Nulty, 2008; Shih & Fan, 2008). Sax, Gilmartin, and Bryant (2003) highlighted that college students may be less inclined to participate in online surveys due to a multitude of factors, including survey length, being overrun with the educational demands of their program, excessive junk mail, or infrequently checking their campus email (Sax, Gilmartin, & Bryant, 2003). Additionally, the majority of participating colleges disseminated the survey recruitment email at the end of the term (a busy time for students), which may have also affected response rates. Due to the geographical spread of the 110 schools, as well as ease of administration for participating institutions, paper surveys were not made available. While offering paper surveys may have improved response rates (as demonstrated by Martyniuk and Tucker [2014], where 1,113 participants were recruited from Ontario alone), utilizing online surveys lessened the burden on staff and faculty (e.g., class time and mailing completed surveys were not required), and allowed participants to complete the survey at their own convenience. The variation in response rates among provinces/territories may also be a limitation, as this may have created a national sample not equally representative of all Canadian institutions. Low provincial/territorial response rates may also limit the within-province/territory generalizability of findings; however, half of the participating provinces/territories met or exceeded the typical response rate. Despite lower than anticipated participation, the large overall sample size of 1,292 provides preliminary understanding of the physical activity and screen viewing-related education provided to ECEs in Canadian post-secondary programs.

Although the survey utilized for the present study was not tested for validity or reliability, it was created for this unique sample population by drawing from a number of previously validated and reliable tools (e.g., the EPAO-SR). The tool was also tested for face validity and was reviewed by research experts from across Canada in young children's physical activity, as well as early childhood education professionals, to ensure the survey accounted for provincial/territorial and profession-specific differences in verbiage. Additionally, while the survey took candidates approximately 20 minutes to complete, the length of the survey, coupled with the number of rating scales used, could have affected the attention levels of survey respondents (e.g., candidates sometimes checked every box for the 'check all that apply' document familiarity question, even though the last box was for 'I am not familiar with any of these documents'). Additionally, the self-report nature of the survey may be a limitation, as the data collected reflects candidates' retention of course concepts and knowledge rather than actual content covered in the curriculum. The survey length also resulted in incomplete data, so questions later in the survey produced a lower response rate. Furthermore, candidates may have been subject to social desirability bias, as some survey questions may have been leading (e.g., 'My college/university training has helped me understand important information about children's physical activity needs') or candidates may have felt pressured to select a more desirable answer (e.g., 'How important is physical activity in your life?'). Finally, volunteer bias may have been present for colleges who opted to offer students class time to complete the survey, and even though participation was

voluntary and anonymous, the presence of the professor may have created undue influence on students to participate.

**Summary and Future Implications**

As the first Canadian study to examine the physical activity and sedentary behaviour-related knowledge, training, and self-efficacy of early childhood education candidates nationwide, important contributions are made to early year's physical activity literature. Although curriculum development at the post-secondary level is governed provincially and institutionally, the national scope of this research provides an interesting outlook on the comprehensiveness of ECEs' physical activity and sedentary behaviour-related training received during their formal education. Findings from the present study may encourage provincial Ministries of Education, as well as college/university faculty and staff, to consider making modifications to current early childhood education curricula requirements and/or course content. Considering ECEs can find employment in a variety of childcare settings (e.g., childcare centres, full day kindergarten classrooms, etc.), it is important that they be appropriately trained regarding young children's physical activity and screen viewing behaviours prior to graduation. Intervening at the post-secondary level may be a productive way to ensure all ECEs are effectively prepared to support healthy activity behaviours in early learning settings.

This work provides a strong foundation of knowledge on which future physical activity and screen viewing-related studies and interventions with ECEs can be based. While this research provides the perspectives of a large sample of early childhood

education candidates regarding this type of training, it may be useful to gather the perspectives of course instructors in these programs to determine if they match those of their students. Such investigation would shed light on whether there is actually a gap in physical activity and screen viewing-related training in early childhood education programs, or if candidates simply missed or did not retain the information relayed to them. Additionally, considering provincial comparisons were unable to be conducted in the present study, gathering this information would provide Ministries of Education with more comprehensive evidence to consider when developing curriculum requirements. Moreover, piloting supplementary physical activity and screen viewing-related training in select Canadian early childhood education programs would provide useful information about whether this addition would be effective at increasing candidates' physical activity and screen viewing-related knowledge and self-efficacy. It is clear from the present study's findings that more can be done to support ECEs as they work to promote physical activity and limit screen viewing among young children in childcare.

The importance of instilling healthy physical activity and sedentary behaviours in early childhood is well documented (Reilly et al., 2004). With the current low rates of physical activity and high sedentary time of young children in childcare (Tucker et al., 2015; Vanderloo et al., 2014), innovative ways to address this crisis are needed. Given that ECEs are important role models within this environment (Derscheid et al., 2010) who are responsible for daily programming (Robinson et al., 2012), it is essential that they be provided with the tools necessary to create early learning environments supportive of physical activity. Physical activity training for ECEs has been noted to

foster their confidence in and likelihood of leading physical activity opportunities for preschoolers in their care (Dyment & Coleman, 2012; McWilliams et al., 2009), thus the current lack of attention to this type of training within their post-secondary program is concerning. In light of the findings from the present study, ECEs are in need of additional training regarding the *Canadian 24-Hour Movement Guidelines for the Early Years*, facilitating MVPA opportunities for young children in childcare, overcoming barriers to physical activity, as well as sedentary behaviour and screen viewing-related education. Considering this type of training for ECEs, in combination with other factors, has been linked to increased physical activity levels of young children in early learning environments (Tucker et al., 2017), working to improve ECEs' physical activity and screen viewing-related knowledge and self-efficacy should be of high importance. The best way to ensure all ECEs are equipped with physical activity and screen viewing-related knowledge and self-efficacy is to provide this type of training within formal education, where it can effectively train all ECEs regardless of the childcare-based profession they pursue post-graduation.

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## Appendix A:
Non-Medical Research Ethics Board Approval Letter

Western Research

**Date:** 18 January 2018

**To:** Dr. Patricia Tucker

**Project ID:** 110246

**Study Title:** Exploring the Physical Activity and Screen Viewing-Related Knowledge, Training, and Self-Efficacy of Early Childhood Education Students

**Application Type:** NMREB Initial Application

**Review Type:** Delegated

**Full Board Reporting Date:** 02/Feb/2018

**Date Approval Issued:** 18/Jan/2018 17:17

**REB Approval Expiry Date:** 18/Jan/2019

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Dear Dr. Patricia Tucker

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

**Documents Approved:**

| Document Name | Document Type | Document Date | Document Version |
|---|---|---|---|
| ECE Student Survey FINAL | Paper Survey | 09/Jan/2018 | 2 |
| Email Scripts | Recruitment Materials | 30/Oct/2017 | 1 |
| Examinant_la_Connaissance_la_Formation_et_lAuto-Efficacit_Lie__lActivit_Physique_et_le_Vi (1) | Online Survey | 09/Jan/2018 | |
| Exploring_the_Physical_Activity_and_Screen_Viewing-Related_Knowledge_Training_and_Self-Efficacy_of (1) | Online Survey | 09/Jan/2018 | |
| French ECE Survey | Paper Survey | 09/Jan/2018 | 2 |
| Letters of Information | Implied Consent/Assent | 11/Dec/2017 | 2 |
| Reminder Email to ECE Students | Recruitment Materials | 18/Dec/2017 | 1 |
| Telephone Script | Recruitment Materials | 18/Dec/2017 | 1 |
| Verbal Recruitment Script | Oral Script | 18/Dec/2017 | 1 |
| Volition to Enter Draw or Receive Study Results | Paper Survey | 14/Dec/2017 | 1 |
| Volition_to_Enter_Draw_and_Receive_Study_Results | Online Survey | 09/Jan/2018 | |
| Volont_dEntrer_le_TirageRecevoir_les_Rsultats_de_ltude | Online Survey | 09/Jan/2018 | |

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

**Appendix B1:**

Invitation Email to Early Childhood Education Program Coordinator and/or Dean/Chair of the Program - English

Subject Line: Possible Research Study

Hello,

My name is Trish Tucker and I am a faculty member in Health Sciences at Western University. My research efforts are focused on supporting physical activity among preschool-age children. Early Childhood Educators play an important role in encouraging preschoolers' physical activity levels within early childhood settings. We have previously conducted focus groups with childcare educators, as well as conducted a pilot study in Ontario assessing the physical activity-related knowledge, training, and self-efficacy of Early Childhood Education (ECE) students enrolled in college/university programs. With results of the pilot study highlighting a gap in physical activity knowledge among ECE students, our hope is to conduct a similar nationwide study to explore the physical activity and screen viewing-related knowledge and training among ECE students across the country. With the low levels of physical activity often seen in young children, as well as their high levels of screen viewing within this environment, we are trying to identify ways in which we can support childcare providers in engaging preschoolers in physical activity. In order to do this, having an understanding of the knowledge and training ECE students have is necessary to determine next steps.

We are contacting you today to see if *(insert college/university name)* would be interested participating in our study. We are contacting all Canadian colleges/universities offering an ECE program. If you are willing to participate, we would be looking to circulate an anonymous survey with all of the students enrolled in your ECE program (e.g., full-time or part-time, any year), using a method you deem to be most convenient (online via Qualtrics or on paper in the classroom). The survey will take approximately 20 minutes to complete and will gather information relating to ECE students' knowledge and training to facilitate physical activity and limit screen viewing with young children.

Thank you very much for your consideration and if there is someone else we should contact, I would appreciate if you could direct me accordingly. We would be more than happy to share the survey with you beforehand and/or share the results of the study. Please let me know if you have any questions or require any more information. We would be happy to address any of your inquiries, and we look forward to hearing from you.

Warm regards,

Trish Tucker

**Appendix B2:**

Invitation Email to Early Childhood Education Program Coordinator and/or Dean/Chair of the Program - French

Bonjour,

Je m'appelle Trish Tucker et je suis membre de la faculté en Sciences de la Santé à l'Université de Western Ontario. Mes efforts de recherche se concentrent sur soutenant l'activité physique chez les enfants d'âge préscolaire. Les éducateurs de la petite enfance jouent un rôle important pour encourager l'activité physique des enfants préscolaires au milieu de garde. Précédemment, nous avons mené des groupes de discussion avec des éducateurs de la petite enfance et aussi mené une étude pilote en Ontario qui a évalué la connaissance, la formation et l'auto-efficacité liée à l'activité physique des étudiants du programme technique de l'éducation à l'enfance. Avec les résultats de l'étude pilote qui ont mis en évidence un écart de connaissance lié à l'activité physique chez les étudiants du programme technique de l'éducation à l'enfance, notre espoir est de mener une étude nationale similaire pour explorer la connaissance et la formation liée à l'activité physique et le visionnement à l'écran chez les étudiants de ce programme à travers le pays. Avec les faibles quantités de l'activité physique souvent observées chez les petits enfants et aussi leurs grosses quantités du visionnement à l'écran dans cet environnement, nous essayons à identifier les façons dont nous pouvons soutenir les éducateurs de la petite enfance à engager les enfants préscolaires dans l'activité physique. Pour le faire, il faut d'abord une compréhension de la connaissance et la formation que les étudiants du programme technique de l'éducation à l'enfance possèdent pour déterminer les prochaines étapes.

Nous vous contactons aujourd'hui pour voir si (*Cégep/collège)* se serait intéressé à participer dans notre étude de recherche. Nous contactons tous les collèges/CÉGEPS canadiens qui offrent un programme technique de l'éducation à l'enfance. Si vous vous êtes intéressé à participer, nous chercherions à circuler une enquête anonyme avec tous les étudiants qui se sont inscrits à ce programme (à plein-temps, à temps partiel, année 1 ou année 2), utilisant une méthode que vous jugez plus pratique (en ligne via Qualtrics ou sur papier dans la classe). L'enquête prendra à peu près de 15 minutes à compléter et recueillera d'information liée à la connaissance et la formation des étudiants du programme technique de l'éducation à l'enfance pour faciliter l'activité physique et limiter le visionnement à l'écran pour les petits enfants.

Merci beaucoup pour votre considération et s'il y a d'autre personne que nous devrions contacter, j'apprécierais si vous pouvez me diriger en conséquence. Nous serions plus qu'heureux de partager l'enquête avec vous préalablement et/ou partager les résultats de l'étude de recherche. S'il vous plaît, dites-moi si vous avez des questions ou avez besoin de plus d'information. Nous serions ravis de répondre à vos questions et nous attendons avec impatience de vous entendre.

Cordialement,
Trish Tucker

**Appendix C1:**

Reminder Email to Early Childhood Education Program Coordinator and/or Dean/Chair of the Program - English

Subject Line: Nationwide ECE Research Study

Hello,

I am just following up to see if you have received and/or thought about participation in our research study that is looking to explore the physical activity and screen viewing-related knowledge, training, and self-efficacy of Canadian Early Childhood Education students. I have attached the Letter of Information and Consent, as well as our ethics approval letter from Western University, for your records. If you would like to review the survey itself, I would be happy to share this with you prior to circulation.

If you could please let me know your college's/university's decision regarding participation at your earliest convenience it would be much appreciated. Data collection will be ongoing until _____.

Thank you, and have a wonderful day,

Brianne Bruijns

**Appendix C2:**

Reminder Email to Early Childhood Education Program Coordinator and/or Dean/Chair of the Program - French

Lien de Sujet: Étude de Recherche Nationale de TÉE

Bonjour,

Je voudrais donner suite à mon courriel précédent pour voir si vous avez reçu notre demande de participer à notre étude de recherche. L'étude va explorer la connaissance, la formation et l'auto-efficacité liée à l'activité physique et le visionnement à l'écran des étudiants canadiens du programme technique d'éducation à l'enfance. La lettre d'information et consentement est jointe, avec aussi l'approbation d'éthique de l'Université de Western, pour vos dossiers. Si vous souhaitez examiner le sondage lui-même avant de le circuler avec les étudiants, je serais heureux de le partager avec vous.

Veuillez me laisser savoir la décision de votre cégep concernant la participation dès que possible. La collecte de données se poursuivra jusqu'au ____.

Merci, et passez une merveilleuse journée,

Brianne Bruijns

**Appendix D1:**

Telephone Script - English

Telephone Script:

Hello *(insert program coordinator name)*, my name is Brianne Bruijns and I am a Research Assistant with the Child Health and Physical Activity Laboratory at Western University. I am just calling to follow up on my previous email regarding your Early Childhood Education program's possible participation in our research study. We are looking to administer an online survey to students in the program, which will capture their physical activity and screen viewing-related knowledge, training, and self-efficacy. Additional information can be found in the email I sent to you on *(insert date)*. I am contacting you today to see if I can answer any questions you might have and discuss whether your program would be interested in facilitating this research study?

**Appendix D2:**

Telephone Script - French

Le Texte de Téléphone :

Bonjour *(insérer le nom du coordonnateur/-trice du programme)*, je m'appelle _____ et je suis assistante de recherche au Laboratoire de santé et d'activité physique des enfants à l'Université de Western Ontario. Je vous appelle simplement pour donner suite à mon précédent courriel concernant la participation possible de votre programme technique d'éducation à l'enfance dans notre étude de recherche. Nous cherchons à administrer une enquête en ligne aux étudiants du programme, qui captureront leur connaissance, formation et auto-efficacité liée à l'activité physique et le visionnement à l'écran. D'information supplémentaire peut être trouvée dans le courriel que je vous ai envoyé *(insérer la date)*. Votre programme, serait-il intéressé à faciliter cette étude de recherche?

**Appendix E1:**

Invitation Email to Early Childhood Education Students - English

Subject Line: Have Your Say! - Research Study

Dear student:

Researchers at the University of Western Ontario are conducting a study to explore Early Childhood Education (ECE) students' physical activity and screen viewing-related knowledge, training, and self-efficacy.

We are looking for students who are enrolled in ECE programs at Canadian colleges, regardless of enrollment status (e.g., full-time or part-time, year 1 or year 2). We are asking you to complete an online survey through Qualtrics. Participation in this anonymous survey is completely voluntary, and will take approximately 20 minutes to complete. If you are interested in participating, please begin by reviewing the additional details in the Letter of Information attached to the survey. The survey can be accessed at the following link:
*(insert link here)*. We appreciate your completion of this survey, as it will provide a picture of the physical activity and screen viewing-related knowledge and training of ECE students across Canada, and will help to determine opportunities for enhanced training. The survey link will stay open until_____.

No personal information will be collected, and all data will be grouped with other participants for publishing purposes. Your decision to participate (or not) will have no bearing on your schooling or grades.

We appreciate your willingness to participate. Please note that in two weeks I will send a reminder email about the online survey.

Warm regards,

Trish Tucker

**Appendix E2:**

Invitation Email to Early Childhood Education Students - French

Lien de Sujet: S'Exprimez! Étude de Recherche

Cher/Chère étudiant(e):

Des chercheurs à l'Université de Western Ontario mènent une étude de recherche pour explorer la connaissance, la formation et l'auto-efficacité liée à l'activité physique et le visionnement à l'écran des étudiants du programme technique d'éducation à l'enfance.

Nous cherchons des étudiants qui se sont inscrits au programme technique d'éducation à l'enfance aux collèges/Cégeps canadiens, quel que soit l'état d'inscription (à plein-temps, à temps partiel, année 1 ou année 2). Veuillez compléter une enquête en ligne via Qualtrics. Participation en cette enquête anonyme est complètement volontaire et vous faudra environ 20 minutes pour la compléter. Si vous êtes intéressé(e) à participer, veuillez commencer par examiner les détails supplémentaires dans la Lettre d'Information et Consentement jointe à l'enquête. L'enquête peut être accédée par le lien suivant : (*lien*). Nous apprécions votre achèvement de cette enquête, car cela va fournira une image de la connaissance, la formation, et l'auto-efficacité liée à l'activité physique et le visionnement à l'écran des étudiants du programme technique d'éducation à l'enfance à travers le Canada et va aider à déterminer des débouchés pour la formation renforcée. Le lien de l'enquête restera ouvert jusqu'au _____.

Aucune information personnelle ne sera recueillie, et toutes les données seront regroupées avec d'autres participants pour des fins de publication. Votre décision de participer (ou pas) n'aura aucune portée sur votre scolarité ou vos notes.

Nous apprécions votre volonté de participer. Notez s'il vous plaît que dans deux semaines je vais vous envoyer un courriel de rappel pour l'enquête en ligne.

Cordialement,

Brianne Bruijns

Trish Tucker

**Appendix F1:**

Reminder Email to Early Childhood Education Students - English

Subject Line: Have Your Say! - Research Study Reminder

Dear student:

We would like to thank you for your time and effort to complete our survey regarding ECE students' physical activity and screen viewing-related knowledge, training, and self-efficacy. We very much appreciate your contribution to our research.

If you haven't already, and are still interested in completing the survey, please visit the following link: *(insert survey link)*. The survey will close in __ days, so we request that you complete this by _____. As a reminder, the survey only takes 10 minutes to complete, and you will have the opportunity to win one of 20 $25 Chapters gift cards.

Thank you again for your willingness to participate.

Warm regards,

Trish Tucker

**Appendix F2:**

Reminder Email to Early Childhood Education Students - French

Lien de Sujet : S'Exprimez! Étude de Recherche

Cher/Chère étudiant(e) :

Nous voudrons vous remercier pour votre temps et effort pour compléter l'enquête sur la connaissance, la formation et l'auto-efficacité liée à l'activité physique et le visionnement à l'écran des étudiants du programme technique de l'éducation à l'enfance. Nous apprécions beaucoup votre contribution à notre recherche.

Si vous ne l'avez pas encore, et vous êtes toujours intéressé(e) à compléter l'enquête, veuillez visiter le lien suivant : *(lien)*. L'enquête fermera dans __ jours, donc veuillez la compléter avant _____. Pour rappel, l'enquête vous faut 15 minutes à compléter et vous aurez la chance de gagner une des 25$ cartes-cadeau pour Indigo.

Merci encore pour votre volonté de participer.

Cordialement,

Brianne Bruijns

Trish Tucker

**Appendix G1:**
Letter of Information and Consent - English

**Project Title:** Examining the Physical Activity and Screen Viewing-Related Knowledge, Training, and Self-Efficacy of Early Childhood Education Students

**Principal Investigator:**
Trish Tucker, PhD, Faculty of Health Sciences, University of Western Ontario

## Letter of Information and Consent

**Invitation to Participate**
You are being invited to participate in this research study regarding the physical activity and screen viewing-related knowledge, training, and self-efficacy of Early Childhood Education (ECE) students because you are enrolled in an ECE program at a Canadian college.

**Purpose of the Letter**
The purpose of this letter is to provide you with information required for you to make an informed decision regarding participation in this research study.

**Purpose of this Study**
The purpose of this study is to explore ECE students' physical activity and screen viewing-related knowledge, training, and self-efficacy to determine their confidence and ability to implement physical activity programs and limit screen viewing opportunities in childcare.

**Inclusion Criteria**
Students enrolled in an ECE program at a Canadian college offering this program will be invited to participate in this study.

**Exclusion Criteria**
Students who are not enrolled in an ECE program at a Canadian college offering this program will be ineligible to participate in this study.

**Study Procedures**
If you agree to participate in this study you will be asked to complete a 20-minute survey online through Qualtrics.

**Possible Risks and Harms**
There are no known risks or discomforts associated with participating in this study.

**Possible Benefits**
You may not directly benefit from participating in this study; however, by participating, you will provide researchers with valuable information about the training and education that ECE students receive with regard to physical activity facilitation and limiting screen viewing.

**Compensation**
Upon completion of the survey, you will be provided with instructions on how to enter a draw to win one of twenty $25 Chapters gift cards, as appreciation for your time.

**Voluntary Participation**
Participation in this study is voluntary. You may refuse to participate, skip any survey questions or withdraw from the study at any time with no effect on your grades or academic status.

**Confidentiality**
The information collected will be used for research purposes only, and neither your name nor any personally identifiable information will be collected. All data will be grouped with other participants for publishing or presentation purposes. All information collected for the study will be kept confidential. Only the investigators of this study will have access to any data collected. All electronic files will be saved on password-protected computers. Data will be saved for 5 years before it is properly destroyed.

**Contacts for Further Information**
If you have any questions about the conduct of this study or your rights as a research participant you may contact the Office of Research Ethics at the University of Western Ontario. If you have any questions about this study, please contact Dr. Trish Tucker.

**Publication**
If you would like to receive a copy of the overall results of the study, please indicate so by answering the final question of the survey.

**Consent**
Completion of the survey is indication of your consent to participate.

*This letter is yours to keep for future reference.*

**Appendix G2:**
Letter of Information and Consent - French

**Titre du Projet :** Examinant la Connaissance, la Formation et l'Auto-Efficacité Liée à l'Activité Physique et le Visionnement à l'Écran des Étudiants du Programme Technique de l'Éducation à l'Enfance

**Chercheur Principal :**
Trish Tucker, PhD, Faculté de Sciences de la Santé, L'Université de Western Ontario

## Lettre D'Information et Consentement

**Invitation à Participer**
Vous êtes invité(e) à participer dans cette étude de recherche concernant la connaissance, la formation et l'auto-efficacité liée à l'activité physique et le visionnement à l'écran des étudiants du programme technique de l'éducation à l'enfance parce que vous vous êtes inscrit(e)s à ce programme à un collège/CÉGEP canadien.

**Objet de la Lettre**
L'objet de la lettre est de vous fournir l'information nécessaire pour que vous puissiez prendre une décision éclairée concernant votre participation dans cette étude de recherche.

**But de l'Étude de Recherche**
Le but de cette étude est d'explorer les connaissances, la formation et l'auto-efficacité liées à l'activité physique et l'affichage de afin de déterminer la confiance des élèves et leur capacité à mettre en œuvre des programmes d'activité physique et à limiter l'utilisation des écrans de dans les garderies.

**Critères d'Inclusion**
Des étudiants qui se sont inscrits à un programme technique de l'éducation à l'enfance à un collège/Cégep canadien qui offre ce programme se seront invités à participer dans cette étude de recherche.

**Critères d'Exclusion**
Des étudiants qui ne se sont pas inscrits à un programme technique de l'éducation à l'enfance à un collège/Cégep canadien qui offre ce programme ne seront pas éligibles à participer dans cette étude de recherche.

**Procédures de l'Étude de Recherche**
Si vous acceptez de participer dans cette étude de recherche nous allons vous demander de compléter une enquête qui dure 15 minutes en ligne via Qualtrics.

**Risques et Inconvénients Possible**
Il n'y a aucun risque ou inconfort connu associé à la participation dans cette étude de recherche.

**Avantages Possible**
Vous ne pouvez pas bénéficier directement de votre participation dans cette étude de recherche; toutefois, en participant, vous fournirez des chercheurs avec d'information importante à propos de la formation et l'éducation que les étudiants du programme technique de l'éducation à l'enfance reçoivent concernant la facilitation de l'activité physique et la limitation du visionnement à l'écran.

**Compensation**
À la fin de l'enquête, vous recevrez des instructions sur la façon d'entrer un tirage pour gagner une des vingt 25$ cartes-cadeau, pour l'appréciation de votre temps.

**Participation Volontaire**
La participation à cette étude est volontaire. Vous pouvez refuser de participer, ignorer toute question d'enquête ou retirer de l'étude à tout moment sans effet sur vos notes ou votre statut académique.

**Confidentialité**
Les informations recueillies seront utilisées uniquement à des fins de recherche, et ni votre nom ni aucune information personnelle ne sera recueillie. Toutes les données seront regroupées avec d'autres participants à des fins de publication ou de présentation. Toutes les informations recueillies pour l'étude resteront confidentielles. Seuls les enquêteurs de cette étude auront accès à toute donnée recueillie. Tous les fichiers électroniques seront enregistrés sur des ordinateurs protégés par mot de passe. Les données seront sauvegardées pendant 5 ans avant qu'elles ne soient correctement détruites.

**Contacts pour Information Supplémentaire**
Si vous avez des questions sur la conduite de l'étude ou vos droits comme participant de recherche vous pouvez contacter le Bureau d'Éthique de la Recherche à l'Université de Western Ontario. Si vous avez des questions sur cette étude de recherche, veuillez contacter Dr Trish Tucker.

**Publication**
Si vous souhaitez recevoir une copie des résultats de l'étude, veuillez l'indiquer en répondant à la question finale de l'enquête.

**Consentement**
L'achèvement de cette enquête est indication de votre consentement à participer.

*Cette lettre est à vous de garder pour référence future*

**Appendix H1:**

# Exploring Early Childhood Education Students' Physical Activity and Sedentary Behaviour-Related Knowledge, Training, and Self-Efficacy

**Objective:** Researchers from Western University are inviting Early Childhood Education (ECE) students enrolled in a Canadian college/university to complete the following survey. We are seeking information regarding ECE students' knowledge, training, and confidence with regard to promoting physical activity and minimizing screen-viewing among young children in childcare.

**Instructions:** Please answer all questions by choosing the most appropriate response option. You may skip any questions or choose to withdraw from the study at any time. Please note that voluntary completion of this anonymous survey implies your consent, which will allow researchers to use these data for analyses and publication. No personal information will be linked with any of your answers and all data will be grouped with other participants for publishing purposes. The survey will take approximately 20 minutes to complete. We appreciate your willingness to participate and thank you for your time.

## Section A: ECE Program Information

1. In which province/territory is your college/university located?

- ❑ Alberta
- ❑ British Columbia
- ❑ Manitoba
- ❑ New Brunswick
- ❑ Newfoundland & Labrador
- ❑ Northwest Territories
- ❑ Nova Scotia
- ❑ Nunavut
- ❑ Ontario
- ❑ Prince Edward Island
- ❑ Québec
- ❑ Saskatchewan
- ❑ Yukon

2. In what type of Early Childhood Education program are you currently enrolled?

a) Type of program:
   - ❑ Certificate
   - ❑ Diploma
   - ❑ Degree
   - ❑ Other:_____

b) Title of program:
   - ❑ Early Learning and Childcare
   - ❑ Early Childhood Education and Care
   - ❑ Early Childhood Education
   - ❑ Early Childhood Leadership
   - ❑ Other:_____

3. In which year of your ECE Program are you currently enrolled?

- ❑ Year 1
- ❑ Year 2
- ❑ Year 3
- ❑ Year 4
- ❑ Other, please specify: _____

4. What is your current enrollment status?

- ❑ Full-Time
- ❑ Part-Time

5. In general, do you have any work, volunteer, and/or placement experience at a childcare centre?

- ❑ Yes
- ❑ No

**Section B: Physical Activity and Sedentary Behaviour-Related Education and Training During the College/University Years**

For the purpose of this study, we have adopted the Canadian Society of Exercise Psychology's (CSEP) definition of **physical activity** as: *any bodily movement produced by skeletal muscles that requires energy expenditure.* Examples for young children include: active play (e.g., running, playground activities, playing sports, dancing, etc.) and/or active transportation (e.g., crawling, bicycle riding, skipping, hopping, etc.). We have adopted the CSEP's definition of **sedentary behaviour** as: *postures or activities that require very little movement.* Examples include: **screen-viewing** (e.g., television, computer, iPad use, etc.) while sitting, reclining, or lying; reading/drawing/painting while sitting, and/or sitting in a stroller/car/bus.

6. What **physical activity** or **physical education** training have you completed (or are currently taking) during your college/university Early Childhood Education program?

- ❑ No formal physical activity/education training completed
- ❑ 1 course – Course name:
  _____
- ❑ 2 courses – Course names:
  _____
- ❑ 3+ courses – Course names:
  _____

7. What **screen-viewing** or **sedentary behaviour**-related training have you completed (or are currently taking) during your college/university Early Childhood Education program?

- ❑ No formal screen-viewing/sedentary behaviour-related training completed/forthcoming
- ❑ 1 course – Course name:
  _____
- ❑ 2 courses – Course names:
  _____
- ❑ 3+ courses – Course names:
  _____

8. Have any of the following physical activity/sedentary behaviour concepts been covered during your current program? (please check all that apply)

**A.** Mandatory **ECE course lessons:**

- ❑ **Physical education**
- ❑ **Physical activity**
- ❑ **Physical literacy**
- ❑ **Gross motor development**
- ❑ **Locomotor & non-locomotor movement**
- ❑ **Outdoor risky play**
- ❑ **Active play**
- ❑ **Screen-viewing**
- ❑ **Sedentary behaviour**
- ❑ **Appropriate sleep**
- ❑ **Other:_____**
- ❑ **No** mandatory **courses discussed these topics**

B. **Elective** ECE course lessons:

- ❑ Physical education
- ❑ Physical activity
- ❑ Physical literacy
- ❑ Gross motor development
- ❑ Locomotor & non-locomotor movement
- ❑ Outdoor risky play
- ❑ Active play
- ❑ Screen-viewing
- ❑ Sedentary behaviour
- ❑ Appropriate sleep
- ❑ Other:_____
- ❑ No **elective** courses discussed these topics

9. Which of the following items have you discussed during your coursework or work placement as having an influence on young children's:

a) **Physical activity behaviours** (please check all that apply):

- ❑ Amount of fixed equipment (e.g., play structure)
- ❑ Amount of portable equipment (e.g., balls, push/pull toys)
- ❑ Amount of free space
- ❑ Adult/teacher prompts to engage in physical activity
- ❑ Adult/teacher participation in activities
- ❑ Behaviour modeling by adults/teachers
- ❑ Duration of outdoor time
- ❑ Physical activity training/professional development of childcare staff
- ❑ We have not discussed any of these in relation to physical activity

b) **Screen-viewing behaviours** (please check all that apply):

- ❑ Presence of computer/tv/dvd player/tablets in the room
- ❑ Whether young children should be permitted to use electronic devices
- ❑ Whether time limits should be placed on using electronic devices
- ❑ If adults/teachers model appropriate screen viewing behaviours
- ❑ The health consequences of excessive screen viewing
- ❑ We have not discussed any of these in relation to sceen-viewing

10. Which of the following **documents** have you been introduced to during your coursework or fieldwork placement? (please check all that apply)

- ❑ Your provincial/territorial childcare regulation/act
- ❑ ParticipACTION Report Card on Physical Activity for Children and Youth
- ❑ ParticipACTION Position Statement on Active Outdoor Play
- ❑ Canadian Physical Activity Guidelines for the Early Years
- ❑ Canadian Sedentary Behaviour Guidelines for the Early Years
- ❑ Canadian 24-Hour Movement Guidelines for the Early Years
- ❑ I have never heard of any of these documents

11. Are you are familiar with your provincial/territorial childcare regulation?

- ❑ Yes
- ❑ No (please proceed to question #13)

12. Does your provincial/territorial childcare regulation articulate or stipulate any of the following? If so, please describe the regulation:

**a) Outdoor Playtime:** If yes, please describe:
- ❑ **Yes**
- ❑ **No**
- ❑ **I am not familiar with this regulation**

**b) Physical Activity Time/Opportunities:** If yes, please describe:
- ❑ **Yes**
- ❑ **No**
- ❑ **I am not familiar with this regulation**

**c)** Infrastructure (e.g., equipment, space, etc.) If yes, please describe:

**i.** Indoors**:**
- ❑ **Yes**
- ❑ **No**
- ❑ **I am not familiar with this regulation**

**ii.** Outdoors**:**
- ❑ **Yes**
- ❑ **No**
- ❑ **I am not familiar with this regulation**

**d) Screen-Viewing Time/Opportunities:** If yes, please describe:
- ❑ **Yes**
- ❑ **No**
- ❑ **I am not familiar with this regulation**

13. Are you are familiar with the **Canadian 24-Hour Movement Guidelines for the Early Years**?

- ❑ Yes
- ❑ No (Please proceed to question #24)

*The following three questions (14-16) are referring to **infants**:*

14. The Canadian guidelines suggest that infants be physically active several times a day in a variety of ways, particularly through interactive floor-based play; more is better. How much tummy time is recommended for infants each day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ I don't know how many minutes

15. What do you recall as being the amount of **screen time** infants should be **limited to** per day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ Screen time is not recommended
- ❑ I don't know how many minutes

16. What do you recall as being the **amount of good quality sleep** infants should get each day?

- ❑ Less than 5 hours
- ❑ 5 to 7 hours
- ❑ 7 to 10 hours
- ❑ 10 to 13 hours
- ❑ 14 to 17 hours
- ❑ I don't know how many hours

*The following three questions (17-19) are referring to **toddlers**:*

17. What do you recall as being the **minimum amount** of time that toddlers should be **physically active** each day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ I don't know how many minutes

18. What do you recall as being the amount of **screen time** toddlers should be **limited to** per day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ Screen time is not recommended
- ❑ I don't know how many minutes

19. What do you recall as being the **amount of good quality sleep** toddlers should get each day?

- ❑ Less than 5 hours
- ❑ 5 to 7 hours
- ❑ 7 to 10 hours
- ❑ 11 to 14 hours
- ❑ 15 or more hours
- ❑ I don't know how many hours

*The following four questions (20-23) are referring to **preschool-age children***:

20. What do you recall as being the **minimum amount** of time that preschool-age children should be **physically active** each day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ I don't know how many minutes

21. What do you recall as being the **minimum amount** of time that preschool-age children should spend in **moderate-to-vigorous physical activity** (i.e., energetic play) each day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ I don't know how many minutes

22. What do you recall as being the amount of **screen time** preschool-age children should be **limited to** per day?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ I don't know how many minutes

23. What do you recall as being the **amount of good quality sleep** preschool-age children should get each day?

- ❑ Less than 5 hours
- ❑ 5 to 7 hours
- ❑ 7 to 10 hours
- ❑ 10 to 13 hours
- ❑ 14 or more hours
- ❑ I don't know how many hours

**Section C: Confidence to Instruct Physical Activities and Limit Screen-Viewing in Childcare**

*For the following question (24a-q), please record a number from 1 to 10 for each of the concepts, using the following confidence rating scale:*

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Cannot do at all | | | | | Moderately can do | | | | | Highly certain can do |

**24. Based on your training to date, how would you rate your** *confidence* **in your ability to instruct young children in childcare settings, for each of the following:**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **a. Ensure children are engaging in adequate** light physical activity **(as per the Canadian guidelines)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **b. Ensure children are engaging in adequate** moderate-to-vigorous physical activity **(as per the Canadian guidelines)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **c. Create a childcare environment that encourages active play** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **d. Model appropriate physical activity/movement behaviours** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **e. Lead activities to improve children's fitness development (e.g., cardiovascular endurance, muscular strength, flexibility, & coordination)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **f. Teach about the relationship between physical activity and health** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **g. Teach locomotor skills, traveling actions (jump, gallop, hop)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **h. Teach play skills (bike riding, sliding, swinging, climbing)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **i. Teach rhythm skills** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **j. Use a variety of methods that encourage physical activity** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **k. Make good use of the environment and available equipment for play and physical activity** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **l. Facilitate active play for young children in a limited space** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **m. Lead outdoor active play opportunities even if I am tired** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **n. Lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **o. Create opportunities for outdoor risky play (e.g., tree climbing, less 'hovering' on the playground, balancing activities)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **p. Limit the amount of screen time children in my class engage in to less than 40 minutes per day (*2/3 of the daily recommendation)** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **q. Minimize the use of screens as a reward for good behaviour** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

**Section D: Physical Activity and Screen-Viewing Knowledge Acquired During College/University Training**

25. *For the following question (a-q), please mark the response which most closely describes how much you **agree** or **disagree** with each statement. If you are not certain, make your best guess.*

| | **strongly disagree** | **disagree** | **slightly disagree** | **slightly agree** | **agree** | **strongly agree** |
|---|---|---|---|---|---|---|
| ***It is important to…*** | | | | | | |
| a. Ensure children are engaging in adequate **light physical activity** (as per the Canadian guidelines) | O | O | O | O | O | O |
| b. Ensure children are engaging in adequate **moderate-to-vigorous physical activity** | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| c. Create a childcare environment that encourages active play | O | O | O | O | O | O |
| d. Model appropriate physical activity/movement behaviours | O | O | O | O | O | O |
| e. Lead activities to improve children's fitness development (e.g., cardiovascular endurance, muscular strength, flexibility, & coordination) | O | O | O | O | O | O |
| f. Teach about the relationship between physical activity and health | O | O | O | O | O | O |
| g. Teach locomotor skills, traveling actions (jump, gallop, hop) | O | O | O | O | O | O |
| h. Teach play skills (bike riding, sliding, swinging, climbing) | O | O | O | O | O | O |
| i. Teach rhythm skills | O | O | O | O | O | O |
| j. Use a variety of methods that encourage physical activity | O | O | O | O | O | O |
| k. Make good use of the environment and available equipment for play and physical activity | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| l. Facilitate active play for young children in limited space | O | O | O | O | O | O |
| m. Lead outdoor active play opportunities even if I am tired | O | O | O | O | O | O |
| n. Lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat) | O | O | O | O | O | O |
| o. Create opportunities for outdoor risky play (e.g., tree climbing, less 'hovering' on the playground, balancing activities) | O | O | O | O | O | O |
| p. Limit the amount of screen-viewing children in my class engage in to less than 40 minutes per day (*2/3 of the daily recommendation) | O | O | O | O | O | O |
| q. Minimize the use of screens as a reward for good behaviour | O | O | O | O | O | O |

26. *For the following question (a-q), please mark the response which most closely describes how much you **agree** or **disagree** with each statement. If you are not certain, make your best guess.*

| ***It is my responsibility to…*** | **strongly disagree** | **disagree** | **slightly disagree** | **slightly agree** | **agree** | **strongly agree** |
|---|---|---|---|---|---|---|
| a. Ensure children are engaging in adequate **light physical activity** (as per the Canadian guidelines) | O | O | O | O | O | O |
| b. Ensure children are engaging in adequate **moderate-to-vigorous physical activity** (as per the Canadian guidelines) | O | O | O | O | O | O |
| c. Create a childcare environment that encourages active play | O | O | O | O | O | O |
| d. Model appropriate physical activity/movement behaviours | O | O | O | O | O | O |
| e. Lead activities to improve children's fitness development (e.g., cardiovascular endurance, muscular strength, flexibility, & coordination) | O | O | O | O | O | O |
| f. Teach about the relationship between physical activity and health | O | O | O | O | O | O |
| g. Teach locomotor skills, traveling actions (jump, gallop, hop) | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| h. Teach play skills (bike riding, sliding, swinging, climbing) | O | O | O | O | O | O |
| i. Teach rhythm skills | O | O | O | O | O | O |
| j. Use a variety of methods that encourage physical activity | O | O | O | O | O | O |
| k. Make good use of the environment and available equipment for play and physical activity | O | O | O | O | O | O |
| l. Facilitate active play for young children in limited space | O | O | O | O | O | O |
| m. Lead outdoor active play opportunities even if I am tired | O | O | O | O | O | O |
| n. Lead active play opportunities in challenging weather climates (e.g., rain, snow, extreme heat) | O | O | O | O | O | O |
| o. Create opportunities for outdoor risky play (e.g., tree climbing, less 'hovering' on the playground, balancing activities) | O | O | O | O | O | O |
| p. Limit the amount of screen-viewing children in my class engage in to less than 40 minutes per day (*2/3 of the daily recommendation) | O | O | O | O | O | O |
| q. Minimize the use of screens as a reward for good behaviour | O | O | O | O | O | O |

27. *For the following question (a-m), please mark the response which most closely describes how much you **agree** or **disagree** with each statement. If you are not certain, make your best guess.*

| | **strongly disagree** | **disagree** | **slightly disagree** | **slightly agree** | **agree** | **strongly agree** |
|---|---|---|---|---|---|---|
| ***I have knowledge of…*** | | | | | | |
| a. Key features of gross motor development | O | O | O | O | O | O |
| b. Age appropriate movement skills for children | O | O | O | O | O | O |
| c. The link between **physical activity** and cardiovascular health | O | O | O | O | O | O |
| d. The link between **physical activity** and muscular health | O | O | O | O | O | O |
| e. The link between **physical activity** and psychosocial health | O | O | O | O | O | O |
| f. The link between **physical activity** and learning | O | O | O | O | O | O |
| g. The link between **physical activity**, brain development, and preparing children for learning at school | O | O | O | O | O | O |
| h. The link between **physical inactivity** and type II diabetes | O | O | O | O | O | O |
| i. The link between **screen-viewing** and rates of childhood obesity | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| j. The link between **screen-viewing** and psychosocial health | O | O | O | O | O | O |
| k. The link between **screen-viewing** and cognition | O | O | O | O | O | O |
| l. The link between **screen-viewing** and high blood pressure | O | O | O | O | O | O |
| m. The link between **screen-viewing** and irregular sleep patterns | O | O | O | O | O | O |

28. *For the following question (20a-b), please mark the response which most closely describes how much you **agree** or **disagree** with each statement. If you are not certain, make your best guess.*

| | **strongly disagree** | **disagree** | **slightly disagree** | **slightly agree** | **agree** | **strongly agree** |
|---|---|---|---|---|---|---|
| a. My college/university training has helped me understand important information about children's physical activity needs | O | O | O | O | O | O |
| b. I have the skills and abilities I need to support children's physical activity | O | O | O | O | O | O |

**Section E: Additional Physical Activity and Sedentary Behaviour Training and Resources**

29. For the following question (21a-k), using the scale provided, please rate **your interest in furthering your knowledge** on the following concepts:

| Strongly disinterested | Disinterested | Slightly disinterested | Slightly interested | Interested | Strongly interested |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **a.** | **Healthy growth and development** | **1** | **2** | **3** | **4** | **5** | **6** |
| **b.** | **Physical activity promotion** | **1** | **2** | **3** | **4** | **5** | **6** |
| **c.** | **Physical activity interventions** | **1** | **2** | **3** | **4** | **5** | **6** |
| **d.** | **Physical activity evaluation** | **1** | **2** | **3** | **4** | **5** | **6** |
| **e.** | **Leading physical activities for young children** | **1** | **2** | **3** | **4** | **5** | **6** |
| **f.** | **Outdoor risky play** | **1** | **2** | **3** | **4** | **5** | **6** |
| **g.** | **Active play** | **1** | **2** | **3** | **4** | **5** | **6** |
| **h.** | **Fitness** | **1** | **2** | **3** | **4** | **5** | **6** |
| **i.** | **Reducing screen-viewing** | **1** | **2** | **3** | **4** | **5** | **6** |
| **j.** | **Reducing sedentary behaviour** | **1** | **2** | **3** | **4** | **5** | **6** |

**k. Appropriate sleep** **1 2 3 4 5 6**

30. In an effort to increase physical activity participation and minimize screen-viewing among young children attending childcare, what would be a helpful resource for you as an Early Childhood Educator?

- ❑ Instructional strategies to promote physical activity
- ❑ Instructional strategies to reduce the use of screens (e.g., computer, iPad)
- ❑ Active opportunity ideas in various weather climates
- ❑ Active opportunity ideas in small spaces
- ❑ Age/developmentally-appropriate ideas for games/activities/exercises (e.g., types of ball games, moving to music, dances, structured activities)
- ❑ Physical activity workshops or professional development programs
- ❑ Guest physical activity instructors

□ Other:_____

**Section F: Personal Physical Activity and Screen-Viewing Habits**

31. Please indicate on the scale provided how important physical activity is in your life:

| Not at all important | Somewhat unimportant | Neither important or unimportant | Somewhat important | Very Important |
|---|---|---|---|---|
| O | O | O | O | O |

32. How many minutes of **moderate-to-vigorous** physical activity (e.g., cycling, jogging, swimming, playing sports, etc.) do you obtain during a typical week*?*

- ❑ Less than 30 minutes
- ❑ 30-59 minutes
- ❑ 60-89 minutes
- ❑ 90-119 minutes
- ❑ 120-149 minutes
- ❑ 150 minutes or more

33. How many minutes of **recreational screen-viewing** (e.g., television-viewing, personal computer/iPad use) do you engage in each day?

- ❑ Less than 60 minutes
- ❑ 60-100 minutes
- ❑ 101-149 minutes
- ❑ 150-199 minutes
- ❑ 200-239 minutes
- ❑ 240 minutes or more

34. Please indicate on the scale provided how physically active you were during your:

**a) Childhood**

| Not at all active | Somewhat inactive | Moderately active | Somewhat active | Very active |
|---|---|---|---|---|
| O | O | O | O | O |

**b) Adolescence:**

| Not at all active | Somewhat inactive | Moderately active | Somewhat active | Very active |
|---|---|---|---|---|
| O | O | O | O | O |

**Section G: Participant Information**

35. Please select your sex:
- ❑ Male
- ❑ Female
- ❑ Prefer not to disclose

36. Please state your age (in years): _____

37. Please indicate your ethnicity:
- ❑ Caucasian
- ❑ Asian
- ❑ African Canadian
- ❑ Arab
- ❑ Aboriginal/First Nations
- ❑ Hispanic
- ❑ Other, please specify: _____
- ❑ I prefer not to answer

**Thank you for completing this survey.**
Please return to a researcher or professor in your classroom.

Please fill out the separate survey if you would like us to send you a copy of the survey's results, or if you would like to enter the draw to win a $25 Chapters gift card, as appreciation of your time.

**Appendix H2:**

# Examinant la Connaissance, la Formation et l'Auto-Efficacité Liée à l'Activité Physique et le Visionnement à l'Écran des Étudiants du Programme Technique d'Éducation à l'Enfance

**Objectif:** Des chercheurs à l'Université de Western Ontario invitent des étudiants qui se sont inscrits au programme technique d'éducation à l'enfance aux collèges/CÉGEPS/universités canadiens à remplir l'enquête suivante. Nous cherchons d'information à propos de la connaissance, la formation et l'auto-efficacité liée à la promotion de l'activité physique et la minimisation du visionnement à l'écran chez les petits enfants aux garderies.

**Instructions:** Veuillez répondre à toutes les questions en choisissant la réponse la plus appropriée. Vous pouvez louper n'importe quelle question ou retirer de l'étude à n'importe quel moment. Veuillez noter que l'achèvement volontaire de cette enquête anonyme est indication de votre consentement à participer et va permettre les chercheurs d'utiliser ces données pour l'analyse et la publication. Ni votre nom ni aucune information personnelle ne sera pas recueillie. Toutes les données seront regroupées avec d'autres participants à des fins de publication ou de présentation. L'enquête vous faut 20 minutes à compléter. Nous apprécions votre volonté de participer et merci pour votre temps.

## Section A: Information du Programme Technique d'Éducation à l'Enfance

1. Dans quelle province/territoire est votre collège/CÉGEP/université situé?

- ❑ Alberta
- ❑ Colombie Britannique
- ❑ Manitoba
- ❑ Nouveau Brunswick
- ❑ Terre-Neuve-et-Labrador
- ❑ Les Territoires du Nord-Ouest
- ❑ Nouvelle Écosse
- ❑ Nunavut
- ❑ Ontario
- ❑ L'Isle du Prince-Édouard
- ❑ Québec
- ❑ Saskatchewan
- ❑ Yukon

2. Auquel type du programme technique d'éducation à l'enfance êtes-vous vous inscrit?

c) Type du programme:
- ❑ Certificat
- ❑ Diplôme
- ❑ Degrès
- ❑ Autre:_____

d) Titre du programme:
- ❑ Programme technique d'éducation à l'enfance
- ❑ Diplôme d'éducation à la petite enfance
- ❑ Autre:_____

3. Dans laquelle année de votre programme êtes-vous vous inscrit?

- ❑ Année 1
- ❑ Année 2
- ❑ Année 3
- ❑ Année 4
- ❑ Autre, veuillez préciser: _____

4. Qu'est-ce que c'est votre statut d'inscription?

- ❑ Plein-Temps
- ❑ Mi-Temps

5. En générale, est-ce que vous avez d'expérience de travail, bénévolat, ou stage à une garderie?

- ❑ Oui
- ❑ Non

**Section B: L'Éducation et la Formation Liée à l'Activité Physique et le Comportement Sédentaire Pendant les Années de Collège/CÉGEP/Université**

Pour les besoins de cette étude, nous avons adopté la définition de la Société canadienne de la physiologie et de l'exercice (SCPE) pour l'activité physique: *tout mouvement corporel produit par les muscles squelettiques qui entraîne une augmentation de la dépense énergique.* Des exemples pour les petits enfants inclurent : jeu actif (p.ex., jouer dans la cour de récréation, jouer aux sports, danser, etc.) et/ou transport actif (p.ex., courir, ramper, faire de la bicyclette, sauter, etc.). Nous avons adopté la définition de la SCPE pour le comportement sédentaire: *postures ou activités qui ne nécessitent pas beaucoup de mouvement.* Des exemples inclurent: le visionnement à l'écran (p.ex., la télévision, l'ordinateur, l'iPad, etc.) en position assise, allongée, ou couchée; lire/dessiner/peindre en position assise et/ou dans une poussette/voiture/bus.

6. Quel type de formation à propos de l'activité physique ou l'éducation physique avez-vous complété (ou êtes en train de compléter) pendant votre programme technique d'éducation à l'enfance?

- ❑ Rien de formation à propos de l'activité/éducation physique complété
- ❑ 1 cours – Nom de cours:
  _____
- ❑ 2 cours – Noms des cours:
  _____
- ❑ 3+ cours – Noms des cours:
  _____

7. Quel type de formation à propos du visionnement à l'écran ou le comportement sédentaire avez-vous complété (ou êtes en train de compléter) pendant votre programme technique d'éducation à l'enfance?

- ❑ Rien de formation à propos du visionnement à l'écran/comportement sédentaire complété
- ❑ 1 cours – Nom de cours: _____
- ❑ 2 cours – Noms des cours: _____
- ❑ 3+ cours – Noms des cours: _____

8. Est-ce que ces concepts d'activité physique/de comportement sédentaire suivants ont été couverts pendant votre programme? (Veuillez cocher tout ce qui s'applique):

| A. **Leçons** obligatoires: | B. Leçons **électives**: |
|---|---|
| ❑ **L'Éducation physique**<br>❑ **L'Activité physique**<br>❑ **Savoir-faire physique**<br>❑ **Développement de la motricité globale**<br>❑ **Mouvement locomoteur et non locomoteur**<br>❑ **Jeu actif à l'extérieur comportant un risque**<br>❑ **Jeu actif**<br>❑ **Visionnement à l'écran**<br>❑ **Comportement sédentaire**<br>❑ **Sommeil appropriée**<br>❑ **Autre:_____**<br>❑ **Aucune leçon obligatoire a discuté ces sujets** | ❑ L'Éducation physique<br>❑ L'Activité physique<br>❑ Savoir-faire physique<br>❑ Développement de la motricité globale<br>❑ Mouvement locomoteur et non locomoteur<br>❑ Jeu actif à l'extérieur comportant un risque<br>❑ Jeu actif<br>❑ Visionnement à l'écran<br>❑ Comportement sédentaire<br>❑ Sommeil appropriée<br>❑ Autre:_____<br>❑ Aucune leçon élective a discuté ces sujets |

9. Lesquels des éléments suivants avez-vous discutés au cours de votre éducation ou de votre stage comme ayant une influence sur les petits enfants:

c) **Comportements de l'activité physique** (veuillez cocher tout ce qui s'applique):

- ❑ Quantité d'équipement fixe (p.ex., structure de jeu)
- ❑ Quantité d'équipement portable (p.ex., balles, jouets pousser/tirer)
- ❑ Quantité d'espace libre
- ❑ Des incites d'adulte/enseignant à faire de l'activité physique

- ❑ Participation des adultes/enseignants aux activités
- ❑ Modélisation des comportements par les adultes/enseignants
- ❑ Durée du temps en plein air
- ❑ Formation/perfectionnement professionnel liée à l'activité physique pour les éducateurs aux garderies
- ❑ On n'a discuté aucun de ces sujets en relation de l'activité physique

d) **Comportements du visionnement à l'écran** (veuillez cocher tout ce qui s'applique):

- ❑ Présence d'ordinateur/télé/lecteur DVD/tablettes dans la classe
- ❑ L'autorisation des petits enfants d'utiliser des appareils électroniques
- ❑ Si des limites de temps doivent être imposées à l'utilisation d'appareils électroniques
- ❑ Si les adultes/enseignants modélisent des comportements d'écran appropriés
- ❑ Les conséquences pour la santé à cause d'un visionnement excessif à l'écran
- ❑ On n'a discuté aucun de ces sujets en relation du comportement du visionnement à l'écran

10. Lesquels de ces documents suivants avez-vous été présenté lors de vos travaux de cours ou de votre stage? (veuillez cocher tout ce qui s'applique):

- ❑ Votre règlement provincial/territorial sur la garde d'enfants
- ❑ Le Bulletin de l'activité physique chez les jeunes de ParticipACTION
- ❑ Position sur le jeu actif à l'extérieur de ParticipACTION
- ❑ Directives canadiennes en matière d'activité physique pour la petite enfance de 0 à 4 ans
- ❑ Directives canadiennes en matière de comportement sédentaire pour la petite enfance de 0 à 4 ans
- ❑ Directives canadiennes en matière de mouvement sur 24 heures à l'intention de la petite enfance de 0 à 4 ans
- ❑ Je n'ai jamais entendu parler de ces documents

11. Connaissez-vous votre règlement provincial/territorial sur la garde d'enfants?

- ❑ Oui
- ❑ Non (veuillez passer à la question #13)

12. Est-ce que votre règlement provincial/territorial sur la garde d'enfants énonce ou stipule les éléments suivants? Si oui, veuillez décrire le règlement:

| | |
|---|---|
| e) Du temps pour jouer à l'extérieur:<br>❑ Oui<br>❑ Non<br>❑ Je ne connais pas ce règlement | Si oui, veuillez décrire: |
| f) Du temps/des opportunités pour l'activité physique:<br>❑ Oui<br>❑ Non<br>❑ Je ne connais pas ce règlement | Si oui, veuillez décrire: |
| g) **Infrastructure (p.ex., équipement, espace, etc.)**<br>iii. **À l'intérieur**:<br>❑ Oui<br>❑ Non<br>❑ Je ne connais pas ce règlement<br><br>iv. **À l'extérieur**:<br>❑ Oui<br>❑ Non<br>❑ Je ne connais pas ce règlement | Si oui, veuillez décrire: |
| h) Du temps/des opportunités pour le visionnement à l'écran:<br>❑ Oui<br>❑ Non<br>❑ Je ne connais pas ce règlement | Si oui, veuillez décrire: |

13. Connaissez-vous les directives canadiennes en matière de mouvement sur 24 heures à l'intention de la petite enfance de 0 à 4 ans?

❑ Oui
❑ Non (Veuillez passer à la question #24)

*Les trois questions suivantes (14-16) sont en référence aux nourrissons:*

14. Les directives canadiennes suggèrent que les nourrissons devraient être actifs plusieurs fois par jour de différentes façons, notamment par le jeu interactif au sol; plus c'est mieux. Combien de temps sur le ventre est recommandé pour les nourrissons chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ Je ne sais pas combien de minutes

15. Qu'est-ce que vous rappelez-vous de la quantité du visionnement à l'écran auquel les nourrissons devraient être limités chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ Le visionnement à l'écran n'est pas recommandé
- ❑ Je ne sais pas combien de minutes

16. Qu'est-ce que vous rappelez-vous de la quantité de sommeil de qualité que les nourrissons devraient recevoir chaque jour?

- ❑ Moins de 5 heures
- ❑ 5 à 7 heures
- ❑ 7 à 10 heures
- ❑ 10 à 13 heures
- ❑ 14 à 17 heures
- ❑ Je ne sais pas combien d'heures

*Les trois questions suivantes (17-19) sont en référence aux **tout-petits**:*

17. Qu'est-ce que vous rappelez-vous de la quantité minimum de l'activité physique que les tout-petits devraient atteindre chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ Je ne sais pas combien de minutes

18. Qu'est-ce que vous rappelez-vous de la quantité du visionnement à l'écran auquel les tout-petits devraient être limités chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ Le visionnement à l'écran n'est pas recommandé
- ❑ Je ne sais pas combien de minutes

19. Qu'est-ce que vous rappelez-vous de la quantité de sommeil de qualité que les tout-petits devraient recevoir chaque jour?

- ❑ Moins de 5 heures
- ❑ 5 à 7 heures
- ❑ 7 à 10 heures
- ❑ 11 à 14 heures
- ❑ 15 ou plus d'heures
- ❑ Je ne sais pas combien de minutes

*Les quatre questions suivantes (20-23) sont en référence aux **enfants à l'âge préscolaire***:

20. Qu'est-ce que vous rappelez-vous de la quantité minimum de l'activité physique que les enfants à l'âge préscolaire devraient atteindre chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ Je ne sais pas combien de minutes

21. Qu'est-ce que vous rappelez-vous de la quantité minimum de l'activité physique d'intensité moyenne à élevée (jeu actif) que les enfants à l'âge préscolaire devraient atteindre chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ Je ne sais pas combien de minutes

22. Qu'est-ce que vous rappelez-vous de la quantité du visionnement à l'écran auquel les enfants à l'âge préscolaire devraient être limités chaque jour?

- ❑ 30 minutes
- ❑ 60 minutes
- ❑ 90 minutes
- ❑ 120 minutes
- ❑ 180 minutes
- ❑ Je ne sais pas combien de minutes

23. Qu'est-ce que vous rappelez-vous de la quantité de sommeil de qualité que les enfants à l'âge préscolaire devraient recevoir chaque jour?

- ❑ Moins de 5 heures
- ❑ 5 à 7 heures
- ❑ 7 à 10 heures
- ❑ 10 à 13 heures
- ❑ 14 ou plus d'heures
- ❑ Je ne sais pas combien d'heures

**Section C: Confiance pour Instruire des Activités Physiques et Limiter le Visionnement à l'Écran dans les Garderies**

*Pour la question suivante (24a-q), veuillez encercler un numéro de 0 à 10 pour chaque concept, utilisant l'échelle de confiance suivante:*

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Ne peux pas faire du tout | | | | | Modérément peux faire | | | | | Très certain peux faire |

24. Selon votre formation jusqu'à maintenant, comment évaluez-vous votre confiance en votre capacité d'instruire les petits enfants au milieu de garde, pour chacun des éléments suivants:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique de faible intensité (selon les directives canadiennes) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| b. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique d'intensité moyenne à élevée (selon les directives canadiennes) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| c. Créer un environnement de garde qui encourage le jeu actif | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| d. Modeler d'activité physique/des comportements de mouvement appropriés | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e. Diriger des activités pour améliorer le développement de la condition (p.ex., l'endurance cardiovasculaire, la force musculaire, la souplesse et la coordination) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| f. Enseigner sur la relation entre l'activité physique et la santé | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| g. Enseigner des compétences locomotrices, des actions itinérantes (saut, galop) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| h. Enseigner des compétences de jeu (vélo, glissade, balançoire, escalade) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| i. Enseigner des compétences rythmiques | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| j. Utiliser une variété de méthodes qui encouragent l'activité physique | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| k. Mieux utiliser l'environnement et l'équipement disponible pour le jeu et l'activité physique | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| l. Faciliter le jeu actif pour les petits enfants dans un espace limité | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| m. Diriger des opportunités pour des jeux actifs à l'extérieur même si je suis fatigué(e) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| n. Diriger des occasions pour des jeux actifs dans des climats météorologiques difficiles (p.ex., pluie, neige, chaleur extrême) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| o. Créer des occasions pour des jeux actifs à l'extérieur comportant un risque | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| p. Limiter la durée du visionnement à l'écran pour les petits enfants dans ma classe à moins de 40 minutes par jour (*2/3 de la recommandation quotidienne) | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| q. Minimiser l'utilisation des écrans comme récompense d'un bon comportement | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |

**Section D: La Connaissance de l'Activité Physique et le Visionnement à l'Écran Acquise Pendant la Formation Collégiale/Universitaire**

25. Pour la question suivante (a-q), veuillez marquer la réponse qui décrit la mesure de laquelle vous êtes d'accord ou en désaccord avec chaque déclaration*. Si vous n'êtes pas certain, faites votre meilleure estimation.*

| ***Il est important de…*** | **fortement en désaccord** | **désaccord** | **légèrement en désaccord** | **légèrement en accord** | **accord** | **fortement en accord** |
|---|---|---|---|---|---|---|
| a. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique de faible intensité (selon les directives canadiennes) | O | O | O | O | O | O |
| b. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique d'intensité moyenne à élévée (selon les directives canadiennes) | O | O | O | O | O | O |
| c. Créer un environnement de garde qui encourage le jeu actif | O | O | O | O | O | O |
| d. Modeler d'activité physique/des comportements de mouvement appropriés | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| e. Diriger des activités pour améliorer le développement de la condition (p.ex., l'endurance cardiovasculaire, la force musculaire, la souplesse et la coordination) | O | O | O | O | O | O |
| f. Enseigner sur la relation entre l'activité physique et la santé | O | O | O | O | O | O |
| g. Enseigner des compétences locomotrices, des actions itinérantes (saut, galop) | O | O | O | O | O | O |
| h. Enseigner des compétences de jeu (vélo, glissade, balançoire, escalade) | O | O | O | O | O | O |
| i. Enseigner des compétences rythmiques | O | O | O | O | O | O |
| j. Utiliser une variété de méthodes qui encouragent l'activité physique | O | O | O | O | O | O |
| k. Mieux utiliser l'environnement et l'équipement disponible pour le jeu et l'activité physique | O | O | O | O | O | O |
| l. Faciliter le jeu actif pour les petits enfants dans un espace limité | O | O | O | O | O | O |
| m. Diriger des opportunités pour des jeux actifs à l'extérieur | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| n. Diriger des occasions pour des jeux actifs dans des climats météorologiques difficiles (p.ex., pluie, neige, chaleur extrême) | O | O | O | O | O | O |
| o. Créer des occasions pour des jeux actifs à l'extérieur comportant un risque | O | O | O | O | O | O |
| p. Limiter la durée du visionnement à l'écran pour les petits enfants dans ma classe à moins de 40 minutes par jour (*2/3 de la recommandation quotidienne) | O | O | O | O | O | O |
| q. Minimiser l'utilisation des écrans comme récompense d'un bon comportement | O | O | O | O | O | O |

26. Pour la question suivante (a-q), veuillez marquer la réponse qui décrit la mesure de laquelle vous êtes d'accord ou en désaccord avec chaque déclaration*. Si vous n'êtes pas certain, faites votre meilleure estimation.*

| ***Il est ma responsabilité de…*** | **fortement en désaccord** | **désaccord** | **légèrement en désaccord** | **légèrement en accord** | **accord** | **fortement en accord** |
|---|---|---|---|---|---|---|
| a. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique de faible intensité (selon les directives canadiennes) | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| b. Assurez-vous que les enfants participent à une quantité suffisante de l'activité physique d'intensité moyenne à élévée (selon les directives canadiennes) | O | O | O | O | O | O |
| c. Créer un environnement de garde qui encourage le jeu actif | O | O | O | O | O | O |
| d. Modeler d'activité physique/des comportements de mouvement appropriés | O | O | O | O | O | O |
| e. Diriger des activités pour améliorer le développement de la condition (p.ex., l'endurance cardiovasculaire, la force musculaire, la souplesse et la coordination) | O | O | O | O | O | O |
| f. Enseigner sur la relation entre l'activité physique et la santé | O | O | O | O | O | O |
| g. Enseigner des compétences locomotrices, des actions itinérantes (saut, galop) | O | O | O | O | O | O |
| h. Enseigner des compétences de jeu (vélo, glissade, balançoire, escalade) | O | O | O | O | O | O |
| i. Enseigner des compétences rythmiques | O | O | O | O | O | O |
| j. Utiliser une variété de méthodes qui encouragent l'activité physique | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| k. Mieux utiliser l'environnement et l'équipement disponible pour le jeu et l'activité physique | O | O | O | O | O | O |
| l. Faciliter le jeu actif pour les petits enfants dans un espace limité | O | O | O | O | O | O |
| m. Diriger des opportunités pour des jeux actifs à l'extérieur même si je suis fatigué(e) | O | O | O | O | O | O |
| n. Diriger des occasions pour des jeux actifs dans des climats météorologiques difficiles (p.ex., pluie, neige, chaleur extrême) | O | O | O | O | O | O |
| o. Créer des occasions pour des jeux actifs à l'extérieur comportant un risque | O | O | O | O | O | O |
| p. Limiter la durée du visionnement à l'écran pour les petits enfants dans ma classe à moins de 40 minutes par jour (*2/3 de la recommandation quotidienne) | O | O | O | O | O | O |
| q. Minimiser l'utilisation des écrans comme récompense d'un bon comportement | O | O | O | O | O | O |

27. Pour la question suivante (a-q), veuillez marquer la réponse qui décrit la mesure de laquelle vous êtes d'accord ou en désaccord avec chaque déclaration*. Si vous n'êtes pas certain, faites votre meilleure estimation.*

| | **fortement en désaccord** | **désaccord** | **légèrement en désaccord** | **légèrement en accord** | **accord** | **fortement en accord** |
|---|---|---|---|---|---|---|
| ***J'ai de la connaissance de…*** | | | | | | |
| a. Les caractéristiques principales du développement de la motricité globale | O | O | O | O | O | O |
| b. Les compétences de mouvement adaptées à l'âge des enfants | O | O | O | O | O | O |
| c. Le lien entre l'activité physique et la santé cardiovasculaire | O | O | O | O | O | O |
| d. Le lien entre l'activité physique et la santé musculaire | O | O | O | O | O | O |
| e. Le lien entre l'activité physique et la santé psychosociale | O | O | O | O | O | O |
| f. Le lien entre l'activité physique et l'apprentissage | O | O | O | O | O | O |
| g. Le lien entre l'activité physique, le développement du cerveau et la préparation des enfants à l'apprentissage à l'école | O | O | O | O | O | O |
| h. Le lien entre l'inactivité physique et le diabète de type II | O | O | O | O | O | O |
| i. Le lien entre le visionnement à l'écran et les taux d'obésité infantile | O | O | O | O | O | O |

| | | | | | | |
|---|---|---|---|---|---|---|
| j. Le lien entre le visionnement à l'écran et la santé psychosociale | O | O | O | O | O | O |
| k. Le lien entre le visionnement à l'écran et la cognition | O | O | O | O | O | O |
| l. Le lien entre le visionnement à l'écran et l'hypertension artérielle | O | O | O | O | O | O |
| m. Le lien entre le visionnement à l'écran et les habitudes de sommeil irrégulières | O | O | O | O | O | O |

28. Pour la question suivante (a-q), veuillez marquer la réponse qui décrit la mesure de laquelle vous êtes d'accord ou en désaccord avec chaque déclaration*. Si vous n'êtes pas certain, faites votre meilleure estimation*

| | **fortement en désaccord** | **désaccord** | **légèrement en désaccord** | **légèrement en accord** | **accord** | **fortement en accord** |
|---|---|---|---|---|---|---|
| a. Ma formation collégiale/universitaire m'a aidé à comprendre d'information importante sur les besoins d'activité physique des enfants | O | O | O | O | O | O |
| b. J'ai les compétences et les capacités dont j'ai besoin pour soutenir l'activité physique des enfants | O | O | O | O | O | O |

**Section E: Formation et Ressources Supplémentaire sur l'Activité Physique et le Comportement Sédentaire**

29. Pour la question suivante (21a-k), en utilisant l'échelle fournie, veuillez évaluer votre intérêt à approfondir vos connaissances sur les concepts suivants:

| Fortement désintéressé | Désintéressé | Légèrement désintéressé | Légèrement intéressé | Intéressé | Fortement intéressé |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| l. Croissance et développement sains | **1** | **2** | **3** | **4** | **5** | **6** |
| m. Promotion de l'activité physique | **1** | **2** | **3** | **4** | **5** | **6** |
| n. Interventions d'activité physique | **1** | **2** | **3** | **4** | **5** | **6** |
| o. Évaluations d'activité physique | **1** | **2** | **3** | **4** | **5** | **6** |
| p. Mener des activités physiques pour les petits enfants | **1** | **2** | **3** | **4** | **5** | **6** |
| q. Des jeux à l'extérieur comportant des risques | **1** | **2** | **3** | **4** | **5** | **6** |
| r. Jeux actifs | **1** | **2** | **3** | **4** | **5** | **6** |
| s. Être en forme | **1** | **2** | **3** | **4** | **5** | **6** |
| t. Réduire le visionnement à l'écran | **1** | **2** | **3** | **4** | **5** | **6** |
| u. Réduire le comportement sédentaire | **1** | **2** | **3** | **4** | **5** | **6** |

| | | | | | | |
|---|---|---|---|---|---|---|
| v. Sommeil appropriée | **1** | **2** | **3** | **4** | **5** | **6** |

30. Avec le but d'augmenter la participation à l'activité physique et de réduire le visionnement à l'écran chez les petits enfants aux garderies, qu'est-ce qui serait utile pour vous en tant qu'éducateur de la petite enfance?

- ❑ Stratégies d'enseignement pour promouvoir l'activité physique
- ❑ Stratégies d'enseignement pour réduire l'utilisation des écrans (p.ex., ordinateur, iPad)
- ❑ Des idées pour des opportunités actives dans différents climats
- ❑ Des idées pour des opportunités actives dans les petits espaces
- ❑ Des idées appropriées pour l'âge/développement pour des jeux/activités/exercices (p.ex., les types de jeux de balle, musique et mouvement, les danses, les activités structurées)
- ❑ Ateliers d'activité physique ou programmes de perfectionnement professionnel
- ❑ Les instructeurs invités pour l'activité physique
- ❑ Autre :_____

**Section F: Habitudes Personnelles de l'Activité Physique et du Visionnement à l'Écran**

31. Veuillez indiquer sur l'échelle fournie l'importance de l'activité physique dans votre vie :

| Pas du tout important | Un peu sans importance | Ni important ni sans importance | Un peu important | Très important |
|---|---|---|---|---|
| O | O | O | O | O |

32. Combien de minutes d'activité physique **à l'intensité modérée à élevée** (p.ex., faire du vélo, faire du jogging, nager, faire du sport, etc.) obtenez-vous pendant une semaine typique?

- ❑ Moins de 30 minutes
- ❑ 30-59 minutes
- ❑ 60-89 minutes
- ❑ 90-119 minutes
- ❑ 120-149 minutes
- ❑ 150 minutes ou plus

33. Combien de minutes du **visionnement à l'écran récréatif** (p.ex., visionnement à la télévision, utilisation d'un ordinateur personnel/iPad) vous engagez-vous chaque jour?

- ❑ Moins de 60 minutes
- ❑ 60-100 minutes
- ❑ 101-149 minutes
- ❑ 150-199 minutes
- ❑ 200-239 minutes
- ❑ 240 minutes ou plus

34. Veuillez indiquer sur l'échelle fournie comment vous avez été physiquement actif/active pendant:

**c) L'enfance:**

| Pas du tout actif/active | Un peu inactif/inactive | Modérément actif/active | Un peu actif/active | Très actif/active |
|---|---|---|---|---|
| O | O | O | O | O |

**d) L'adolescence:**

| Pas du tout actif/active | Un peu inactif/inactive | Modérément actif/active | Un peu actif/active | Très actif/active |
|---|---|---|---|---|
| O | O | O | O | O |

**Section G: Information du Participant**

35. Veuillez sélectionner votre sexe:
- ❑ Mâle
- ❑ Femelle
- ❑ Préfère de ne pas divulguer

36. Veuillez indiquer votre âge (en années): _____

37. Veuillez indiquer votre ethnicité:

- ❑ Caucasien
- ❑ Asiatique
- ❑ Afro-Canadien
- ❑ Arabe
- ❑ Autochtones/Premières Nations
- ❑ Hispanique
- ❑ Autre, veuillez préciser: _____
- ❑ Je préfère de ne pas répondr

**Merci pour compléter cette enquête.**

Veuillez suivre le lien suivant si vous souhaitez que nous vous envoyions une copie des résultats de l'enquête, ou si vous souhaitez participer au tirage pour gagner une carte-cadeau de 25$ pour une librairie comme appréciation pour votre temps.

**Appendix I1:**

Survey – Volition to Enter Draw/Receive Study Results - English

**Volition to Enter Draw/Receive Study Results**

1. Would you like to enter into the draw to win one of twenty $25 Chapters gift cards? If yes, please provide your email address:
    - Yes:_____
    - No

2. Would you like to receive the study results? If yes, please provide your email address:
    - Yes:_____
    - No

**Appendix I2:**

Survey – Volition to Enter Draw/Receive Study Results - French

**Volonté d'Entrer le Tirage/Recevoir les Résultats de l'Étude**

1. Souhaitez-vous participer au tirage pour gagner l'une des vingt cartes-cadeaux Chapters de 25$? Si oui, veuillez indiquer votre adresse email:
    - Oui:_____
    - Non

2. Aimeriez-vous recevoir les résultats de l'étude? Si oui, veuillez indiquer votre adresse email:
    - Oui:_____
    - Non

**Appendix J:**

Table 13

*Early Childhood Education Students' Knowledge of the Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years)*

| Recommendation | % Correct | % Incorrect | % I don't know |
|---|---|---|---|
| **Toddlers (1-2 years)** | | | |
| Total Physical Activity | 18.1 | 73.4 | 8.5 |
| Screen Time | 42.6 | 45.7 | 11.7 |
| Sleep | 53.2 | 37.2 | 9.6 |
| **Preschoolers (3-4 years)** | | | |
| Total Physical Activity | 20.7 | 71.7 | 7.6 |
| Moderate-to-Vigorous Physical Activity | 46.2 | 40.7 | 13.2 |
| Screen Time | 33.0 | 47.9 | 19.1 |
| Sleep | 46.2 | 44.1 | 9.7 |

*Note.* Since the toddler recommendation differs for 1- and 2-year-olds, we have used the 1-year-old recommendation of "Screen time is not recommended" for the purposes of this question.

**Appendix K:**

Table 14

*Influences on young children's physical activity and screen viewing behaviours discussed within Early Childhood Education programs*

| Factor | Yes (%) | No (%) |
|---|---|---|
| **Physical Activity Behaviours** | | |
| Amount of fixed equipment (e.g., play structure) | 72.3 | 27.7 |
| Amount of portable equipment (e.g., balls, push/pull toys) | 69.6 | 30.4 |
| Amount of free space | 86.2 | 13.8 |
| Adult/teacher prompts to engage in physical activity | 76.0 | 24.0 |
| Adult/teacher participation in activities | 80.2 | 19.8 |
| Behaviour modeling by adults/teachers | 82.8 | 17.2 |
| Duration of outdoor time | 83.2 | 16.8 |
| Physical activity training/professional development of childcare staff | 48.4 | 51.6 |
| We have not discussed any of these in relation to physical activity | 8.0 | 92.0 |
| **Screen Viewing Behaviours** | | |
| Presence of computer/tv/dvd player/tablets in the room | 68.2 | 31.8 |
| Whether young children should be permitted to use electronic devices | 65.6 | 34.4 |
| Whether time limits should be placed on using electronic devices | 65.7 | 34.3 |
| If adults/teachers model appropriate screen viewing behaviours | 52.9 | 47.1 |
| The health consequences of excessive screen viewing | 65.4 | 34.6 |
| We have not discussed any of these in relation to screen viewing | 17.5 | 82.5 |

**Appendix L:**

# CURRICULUM VITAE – Brianne A. Bruijns

## PERSONAL INFORMATION

Name: Brianne Aimée Bruijns Citizenship: Canadian

Place of Birth: London, Ontario Email:

## EDUCATION, SCHOLARHIPS, & AWARDS

### Education

**Master of Science - Health and Rehabilitation Sciences** 2016 - Present
Field: Health Promotion
University of Western Ontario, London, ON

*Exploring the Physical Activity and Screen Viewing-Related Knowledge, Training, and Self-Efficacy of Early Childhood Education Students* (Thesis Title)

**Honours Bachelor of Physical Education** 2011 – 2016
Specialization in Physical Education
Brock University, St. Catharine's, ON

### Additional Training and Education

**Cours Intensif - B1** 2014
Alliance Française - Rouen, France

- An intensive oral and grammar French course designed to prepare students for the Diplôme D'Études en Langue Française (DELF) examinations.

**Trois-Pistoles Summer Exchange Program** 2011
University of Western Ontario – Trois-Pistoles, QB

- In this exchange program, I completed a first year full-credit French Studies course at the University of Western Ontario's Trois-Pistoles campus. I attended classes and workshops and lived with a French host family. Only French was allowed to be spoken for the entire duration of the 6 weeks.

## Awards and Honours

A. GRADUATE LEVEL

***Scholarships***

1. 2018 Ontario Graduate Scholarship. Value: $15,000 (competitive)
2. 2017 Ontario Graduate Scholarship. Value: $15,000 (competitive)
3. 2016 Ontario Graduate Scholarship. Value: $15,000 (competitive)

***Awards and Distinctions***

1. 2018 North American Society for Pediatric Exercise Medicine Marco Cabrera Student Research Award. Value: $1,500 (USD)
2. 2017 Conference Travel Award, The Lawson Foundation/Children's Health Research Institute. Value: $100

B. UNDERGRADUATE LEVEL

***Scholarships***

1. 2011 Brock Scholar's Award. Value: $9,000

***Awards and Distinctions***

1. 2016 Brock Distinguished Graduating Student Award – Physical Education (highest major average). Value: $100
2. 2016 Dean's Honour's List
3. 2015 National Grant Winner – Physical and Health Education Canada Student Leadership Initiative. Value: $5,000
4. 2015 Conference Travel Award, Faculty of Applied Health Sciences. Value: $384
5. 2014 Dean's Honour's List
6. 2013 Dean's Honour's List
7. 2012 Dean's Honour's List

**WORK EXPERIENCE**

## Student Supervision & Mentorship

**Undergraduate Student Co-Supervision:**

- Saadia Abdel Wahab (2017-2018)

## Additional Work Experience

**Manager**[1] May 2012 – Present
**Supervisor**[2] August 2008 – May 2012
Marble Slab Creamery, London, ON

- [1]Store manager overseeing all operations; ordering of supplies; staff scheduling and supervision; customer service; attended to customer complaints; catering special events; preparation of goods
- [2]Shift supervisor; managed junior employees; customer service; attended to onsite customer complaints; catering special events; preparation of goods

**Au Pair** August 2014 - April 2015
Rouen, France

- Cared for two children (ages 6 and 8 years) before and after school; helped with homework; meal preparation; English tutoring

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**Research Experience**

**Research Assistant** Sept 2016 – Present
Child Health and Physical Activity Lab, University of Western Ontario, London, ON

*Supervisor: Dr. Patricia Tucker*

- Experience using Actical accelerometers and taking children's anthropometric measurements; assist with literature searches, writing manuscripts, and drafting abstracts; experience conducting quantitative and qualitative studies (including related analyses), as well as systematic reviews; aid with the dissemination of study results and other knowledge translation activities

**PUBLICATIONS AND PRESENTATIONS**

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**Publications**

A. ACCEPTED OR IN-PRESS PAPERS

1. Truelove, S., **Bruijns, B.A.**, O'Brien, K.T., Vanderloo, L.M., & Tucker, P. (2018). Physical activity and sedentary time during childcare outdoor play sessions: A systematic review and meta-analysis. *Preventive Medicine*. 108, 74-85.

2. Driediger, M., Vanderloo, L.M., Truelove, S., **Bruijns, B.A.**, & Tucker, P. (in-press). Encouraging kids to hop, skip, and jump: Emphasizing the need for higher intensity physical activity in childcare. *Journal of Sport and Health Sciences.*

B. SUBMITTED PAPERS

1. O'Brien, K.T., Vanderloo, L.M., **Bruijns, B.A.**, Truelove, S., Tucker, P. (resubmitted Sep 20, 2018). Physical activity and sedentary time among preschoolers in centre-based childcare: A systematic review. *International Journal of Behavioural Nutrition and Physical Activity*.

2. **Bruijns, B.A.**, Adamo, K.B., Burke, S.M., Carson, V., Irwin, J.D., Naylor, P.J., Timmons, B.W., Vanderloo, L.M., & Tucker, P. (submitted Sep 17, 2018). Exploring the physical activity and screen-viewing-related knowledge, training, and self-efficacy of early childhood education candidates. *BMC Pediatrics*.

C. STUDENT BLOG PUBLICATIONS

1. **B Bruijns** (2017, Aug 16). Is exercise prescription in primary care the key to health promotion?. Ivey International Centre for Health Innovation. Retrieved from https://www.ivey.uwo.ca/healthinnovation/blog/2017/8/is-exercise-prescription-in-primary-care-the-key-to-health-promotion/

2. **B Bruijns** (2017, Feb 15). Obesity and the science of sitting. Health Science Inquiry. Retrieved from https://www.healthscienceinquiry.com/blog-1

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**Conferences and Presentations**

A. REFEREED ACADEMIC CONFERENCE PRESENTATIONS

1. Truelove, S., **Bruijns, B.A.**, O'Brien, K.T., Vanderloo, L.M., & Tucker, P. (2018, Aug 23). *Physical Activity and Sedentary Time during Childcare Outdoor Play Sessions: A Systematic Review and Meta-Analysis*. North American Society for Pediatric Exercise Medicine (NASPEM). Oakland, CA. *Abstract and Poster Presentation*.

2. STUDENT CONFERENCES AND PRESENTATIONS

1. **Bruijns, B.A.** & Tucker, P. *Exploring the physical activity and screen viewing-related knowledge, training, and self-efficacy of Early Childhood Education students*. (2018, Feb 1). Health and Rehabilitation Sciences Graduate Research Conference, University of Western Ontario. London, ON. *Abstract and Oral Presentation*

2. **Bruijns, B.A.** & Tucker, P. *Physical activity training, knowledge, and self-efficacy of Early Childhood Education students*. (2017, Jun 23). Exercise is Medicine on Campus National Student Research Conference, University of Western Ontario. London, ON. *Abstract and Oral Presentation*

3. **Bruijns, B.A.** *Physical activity training, knowledge, and self-efficacy of Early Childhood Education students.* (2017, Mar 14). Canadian Obesity Network – Student and New Professional Group Research Blitz, University of Western Ontario. London, ON. *Oral Presentation*

4. **Bruijns, B. A.** & Tucker, P. *Physical activity training, knowledge, and self-efficacy of Early Childhood Education students*. (2017, Feb 1). Health and Rehabilitation Sciences Graduate Research Conference, University of Western Ontario. London, ON. *Abstract and Oral Presentation*

5. **Bruijns, B. A.** & Statler, J. M. (2016, Nov 2). *To sample or to specialize: An exploration of youth sport participation*. An invited lecture for the graduate level course, HS9721a – Current Topics in Health Promotion. University of Western Ontario. London, ON. *Oral Presentation.*

6. **Bruijns, B.A.** (2016, Oct 20). *A systematic review of the determinants of sedentary behaviour in youth.* An invited lecture for the graduate level course, KIN9231a – Selected Topics in Exercise Psychology. University of Western Ontario. London, ON. *Oral Presentation*.

7. **Bruijns, B.A.** (2016, Sept 28). *The association between time spent in sedentary behaviours and blood pressure: A systematic review and meta-analysis.* An invited lecture for the graduate course, KIN9231a – Selected Topics in Exercise Psychology. University of Western Ontario. London, ON. *Oral Presentation*.

B. CONFERENCES ATTENDED

1. Children's Health and the Environment Workshop and Symposium (Jun 2017). University of Western Ontario, London, ON.
2. Exercise and Nutrition Symposium (Mar 2017). University of Western Ontario, London, ON.
3. Physical and Health Education Canada Student Leadership Conference (Sep 2015). Bancroft, ON.
4. The Kinesiology Games: National Undergraduate Kinesiology Conference (Mar 2014). McMaster University. Hamilton, ON.

**SERVICES & ADMINISTRATION**

**Scholarly and Administrative Activities**

**Vice President, Master of Science Representative** Jun 2017 – May 2018
Health and Rehabilitation Sciences Graduate Student Society, Faculty of Health Sciences, University of Western Ontario, London, ON

**2017 Health and Rehabilitation Sciences Graduate Research Conference Planning Committee** Oct 2016 – Feb 2017
Faculty of Health Sciences, University of Western Ontario, London, ON

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## Community Service

**Graduate Advocacy Committee Member** Dec 2016 – Apr 2017
Sit Less Western - University of Western Ontario, London, ON

**Volunteer – Combined Fitness & Dynamic Balance Classes** Sep 2016 – Dec 2016
The Canadian Centre for Activity and Aging – University of Western Ontario, London, ON

**Volunteer Undergraduate Representative** April 2016
Faculty of Applied Health Sciences Community Partners Reception – Brock University, St. Catharine's, ON

**Lead Facilitator** Sept 2015 – April 2016
Females Interactively Exercising to Regain Confidence and Esteem (FIERCE) Active Living Program – Brock University, St. Catharine's, ON

**Activity Leader** Sept 2015 – Dec 2015
Children's Movement Program – Brock University, St. Catharine's, ON

**English Language Co-Instructor** Sept 2014 – April 2015
École Maternelle Jacques Prévert – Préaux, Haute-Normandie, France

**Movement Partner** Sept 2013 – Dec 2013
Special Needs Activity Program – Brock University, St. Catharine's, ON

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## Professional Memberships & Affiliations

- Student Member (2018 – Present) - International Society for Physical Activity and Health (ISPAH)
- Student Member (2016 – Present) – North American Society for Pediatric Exercise Medicine (NASPEM)
- Member (2016 – Present) – Canadian Obesity Network, Student and New Professional Group – University of Western Ontario
- Member (2016 – Present) – Exercise is Medicine on Campus (EIMC) – University of Western Ontario
- Supporter Member (2015 – Present) – Physical and Health Education Canada

## PROFESSIONAL DEVELOPMENT AND ADDITIONAL TRAINING

The Hospital for Sick Children Aug 2017

- Introduction to Knowledge Translation Module – SickKids Knowledge Translation Program (Aug 2017)
- How to Prepare a Knowledge Translation Plan – SickKids Knowledge Translation Program (Aug 2017)

Public Health Ontario Oct 2016 – Aug 2017

- Interactions Among Sleep, Sedentary Behaviour, Physical Activity and Overall Health – Webinar (Aug 2017)
- Promoting Early Childhood Development Through Multi-Sectoral Intervention Packages Anchored in Nurturing Care – Webinar (Jan 2017)
- Evaluating Health Promotion Programs Course (Nov 2016)
- Planning Health Promotion Programs Course (Nov 2016)
- Health Promotion Foundations Course (Oct 2016)

Early Care and Education Webinar Feb 2017
Physical Fitness in Young Children (Preschool Years): Importance, Measurement, and Intervention
International Society for Behavioural Nutrition and Physical Activity (ISBNPA)

Physical Activity Resource Centre (PARC) Feb 2017

- Healthy Children on the Move: Physical Activity and the Childcare Setting - Webinar (Feb 2017)
- Kids, Have You Played Today? Promoting Active Play for Children Aged 0-12 Years Through Community-Based Interventions - Webinar (Feb 2017)
- Physical Literacy Webinar (Feb 2017)

Keep Moving! Physical Activity in Schools Webinar Jan 2017
Action for Healthy Kids

National Collaborating Centre for Methods and Tools Jan 2017

- Quantitative Research Designs 101 (Jan 2017)
- Searching for Research Evidence in Public Health (Jan 2017)
- Implementing KT Strategies in Public Health (jan 2017)

Introduction to Motivational Interviewing, Level One Jan 2017
University of Western Ontario

Health Impact Assessment: When to Use It and What to Expect Dec 2016
National Physical Activity Society

Development of Executive Function in Children Module — Nov 2016
Washington State Department of Early Learning

Physical Activity Policy Research Network Course — Oct 2016
National Physical Activity Society

WHO Growth Chart Training Program (Modules 1-5) — Oct 2016
World Health Organization

Active, Healthy Lifestyles Course — Oct 2016
The Open University

Public Health in Community Settings Course — Sept 2016
The Open University

Tri-Council Policy Statement: Course on Research Ethics, Ethical Conduct for Research Involving Humans — Sept 2016
Panel on Research Ethics

Diplôme D'Études en Langue Française (DELF), Niveau B2 — Mar 2015
Ministère Chargé de L'Éducation Nationale

**LANGUAGES**

1. English (native)
2. French (highly proficient, verbal and written)