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Injury statistics in outdoor compared to conventional early childhood education (ECE) programmes in Canada

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ABSTRACT

The benefits of outdoor play are well-established, yet safety concerns can limit outdoor play opportunities in early childhood education (ECE) programmes. Whether injury risk is higher in outdoor versus conventional ECE settings is unknown. This study examined injury rates and patterns in both settings. A survey was administered to 150 conventional and 160 outdoor ECE programmes in Canada in January-February 2023. The survey captured programme size, location, injury frequency/severity, and activity. Differences in minor, moderate and severe injury rates between settings were examined. Thirty-nine (13 conventional and 26 outdoor) programmes reported 855 minor injuries, with 72% occurring outdoors. Conventional programmes had a higher relative rate of minor outdoor injuries per hour per child compared to outdoor programmes ($p = .009$). No differences were found in moderate or high-severity injury rates ($p > .05$). Running and climbing were the most common activities linked to injuries in both settings. Boys and girls had equal prevalence of low-severity injuries, whereas boys had higher prevalence of medium and high-severity injuries. Outdoor-focused programmes had lower minor injury rates, though larger samples are needed to confirm this finding. These findings provide a foundation for future studies on injury rates in outdoor ECEs in Canada and internationally.

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Injury rates; outdoor play; risky play; early childhood education (ECE)

1. Introduction

Despite well-established evidence on the benefits of physical activity for children's health and development (Brussoni et al., 2015; Kemple et al., 2016; Tremblay et al., 2015), most children are not meeting recommended guidelines. The 2024 ParticipACTION Report Card found that only 39% of children and youth in Canada achieve recommended physical activity levels, and 73% exceed limits for recreational screen time (ParticipACTION, 2024). Even in early childhood, 38% of children aged three to four are not meeting physical activity guidelines (Kuzik et al., 2017; Logan et al., 2015). Outdoor play is an

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important contributor to physical activity and is associated with many health and developmental benefits (Gladwell et al., 2013; Tremblay et al., 2015). An essential part of outdoor play is risky play, which is defined as 'a form of play that is thrilling and exciting, which involves uncertainty, unpredictability, and varying degrees of risk-taking' (Hansen Sandseter, 2007; Lee et al., 2022, p. 12). Research shows that risky play is positively associated with physical abilities, self-esteem, risk assessment, and other aspects of social, cognitive, and physical development (Brussoni et al., 2015). Though there are several benefits to risky play, a growing risk-averse culture among caregivers and educators, along with environmental constraints like increased traffic and limited access to safe play spaces, has led to a decline in outdoor and risky play (Brussoni et al., 2015; 2017). Promoting active, outdoor, and risky play in early childhood is essential to fostering healthy development and establishing lifelong physical activity habits.

A key area to implement change in increasing outdoor and active play during early childhood is in early childhood education (ECE) settings. In Canada, 60% of children attend childcare; where they spend most of their day (Brussoni et al., 2017). As such, ensuring high-quality childcare that includes time spent outdoors is crucial. One pedagogical model where promoting outdoor play and learning is central to the educational ethos and practice is the Forest and Nature school model (Outdoor Play Canada. Outdoor Play Glossary of Terms, 2022). The origin of forest and nature schools is mainly attributed to Denmark and Norway (Harper, 2017). In the 1990s, a movement in Denmark arose in support of *udeskole*, or 'outdoor school,' which aimed to bring learning outside the school buildings (Boileau & Dabaja, 2020). This movement shaped the push toward non-conventional schools, including nature-based schools (Boileau & Dabaja, 2020; Harper, 2017). In recent years, there has been increasing attention and growth, especially in North America and select countries in Europe and Asia, in promoting forest and nature schools and increasing outdoor education and play opportunities (Boileau & Dabaja, 2020; Brussoni et al., 2015; Harper, 2017). These forest and nature schools allow children to participate in more risky play as they are situated in environments that support risk taking (Boileau & Dabaja, 2020; Harper, 2017). Shifting toward outdoor focused early childcare may be one way to rehabilitate declines in children's outdoor and risky play from an early age while acquiring the benefits such exposure provides. However, injury risk in outdoor forest and nature-type programmes remains a concern and barrier to participation in, and broader support of, these programmes (Harper, 2017; Jerebine et al., 2022).

Within the outdoor and risky play literature, there has been a substantial focus on assessing the safety of conventional ECE programmes (Bergeron et al., 2019; Carson et al., 2017; de Lannoy et al., 2023). However, there is limited knowledge regarding injury statistics in dedicated outdoor play programmes and forest and nature schools. Furthermore, the literature comparing injury rates between outdoor and conventional programmes is even more limited. One study in Washington, D.C. compared the reported injuries in nine schools: four conventional and five nature programmes (Frenkel et al., 2019). The results from this study showed no significant difference between the number of injuries in conventional and outdoor-based programmes (Frenkel et al., 2019). A study in Norway, a country known for its supportive approach to risk-taking in children's play, examined the frequency and severity of injuries in conventional ECE programmes (Sando et al., 2017). The results highlighted that 97% of

injuries were minor and did not require follow-up treatments (Sando et al., 2017). This study also reported an average of 0.16 injuries per child per year, which the researchers considered low for the number of hours children spend in ECE settings (Sando et al., 2017). While these findings are encouraging and support that nature-based risky play is not associated with increased injury rates, information in a Canadian context is missing.

This paper aims to address these gaps by exploring and comparing the prevalence of injuries in outdoor and conventional ECE programmes in Canada. Addressing these gaps will help educators, parents, and policymakers make informed decisions regarding children's outdoor play. The primary objectives of this study were to compare injury rates occurring at conventional and outdoor ECE programmes in Canada. In addition, we sought to explore and describe injury rates by sex, activity occurring when injury happened, and type of surface the injury occurred on. It was hypothesized that there would not be a statistically significant difference in injury rates between conventional and outdoor ECE.

2. Methods

2.1. Study design and participants

This study employed a cross-sectional design to examine injury rates within ECE programmes across Canada. Participants were eligible to participate in the study if they resided in Canada, were currently employed at an ECE centre and had access to injury statistics at their current ECE centre for 2022. Institutional Research Ethics Board (REB) approval was obtained prior to collecting data.

2.2. Survey development and content

An author generated survey, created using Google Forms, was used to collect data for this study. Collaborative efforts from the research team, experts in the field of risky play, and input from community partners (e.g. early childhood educators) were used to design the survey. Actively engaged in the pilot testing phase, these contributors provided essential feedback that guided refinements of the survey. These experts provided feedback on specific questions and some directional improvements to better capture appropriate data.

Comprised of four distinct sections, the survey contained 32 open-ended and multiple-choice questions. The survey took approximately 15 min to complete. Out of the 32 questions, there were three questions to confirm eligibility and an optional question asking whether participating programmes reported injury information to their respective municipality. The first section focused on centre information, including multiple-choice questions related to location and type of programme, and years since establishment. Following this, respondents provided information on whether the data pertained to an individual programme or an entire centre with multiple programmes. The second section included seven questions covering the average number of children enrolled (e.g. <10, 11–20, 21–30), the ages of the children (e.g. 0–2, 2–3, 3–4, 5+), the average daily programme length on a scale of 1–10 h, time spent outside per day also on a scale of 1–10 h, and the locations educators typically chose when taking children outside. There

was an optional open-ended question at the end of this section to add any other relevant information regarding the programme and children's demographics. The third and final section of the survey consisted of 16 questions on injury reporting. Participants were asked questions regarding the number of injuries that occurred in the year prior (i.e. January–December 2022). Participants were asked to provide details on the overall and severity-specific number of injuries, activities involved, and the number of boys affected by these injuries. Injury severity was classified using a three-tiered severity scale. Participants selected from the following three injury severities: (1) low intensity injuries requiring minor first aid attention (e.g. minor wounds, minor cuts, scrapes, nosebleeds), (2) medium intensity injuries requiring medical attention (e.g. larger cuts requiring stitches, small fractures or sprains, temporary loss of consciousness) and (3) high intensity injuries requiring immediate and serious medical attention (e.g. broken bones, serious head injuries, internal bleeding, or other lethal and near lethal experiences). These injury severity classifications were developed in consultation with research experts and ECE stakeholders to ensure alignment with typical reporting protocols within ECE.

2.3. Procedures

The primary researcher identified and contacted 160 outdoor programmes and another 150 conventional programmes via email invitation to complete the survey. The programmes were selected by conducting online searches for outdoor programmes and conventional programmes across Canada.

All programmes received an initial invitation to complete the survey and a follow-up reminder one week later. Outdoor Play Canada (www.outdoorplaycanada.ca) used their social media platforms (Facebook, Twitter, Instagram, and Mastodon) to disseminate the survey further. Programmes had the option to complete the survey in English or French. The survey was open for four weeks, after which it was closed. Data collection occurred between January and February 2022. Of the programmes contacted using the database (310) and social media platforms (unknown), 63 responded and completed the survey.

2.4. Statistical analysis

Potentially duplicated data and any data suspected to be invalid (e.g. injury rates that fell beyond three standard deviations (SD) from the mean) were flagged (though none within the dataset met this criteria). Descriptive statistics were computed; Mean and SD were used for continuous variables and frequency and percentages were used for categorical variables. To address the challenge of comparing injury rates across programmes with different amounts of outdoor time and serving different numbers of children, the researchers computed a relative injury rate based on the ratio of injuries per child in the programme by the number of hours spent at the programme. A relative injury rate was calculated for overall injuries (injuries/child*hour), and injuries that occurred outdoors (outdoor injuries/child*outdoor hours). Given that the number of children in each programme were measured using ranges (e.g. 10–20 children), we used the lowest number in each range as a conservative estimate. We used 5 for '<10 children' and 90 for '>90 children'. The injury, daily hours spent in the programme, and daily

hours outside in the programme were based on direct survey data. We applied a square root transformation to normalize injury rate values and stabilize variance across the dataset to address skew.

Independent sample t-tests were conducted to compare the mean relative injury rates of outdoor-based childcare programmes compared to conventional programmes. Since data for medium- and high-severity injuries did not meet assumptions for parametric tests, a Mann–Whitney U test was used to test the difference between conventional and outdoor ECE programmes for these variables. Significance was set at a two-tailed alpha of $p < .0.05$.

3. Results

3.1. Programme characteristics

Table 1 provides an overview of programme characteristics based on responses from the survey. Out of the 310 programmes in Canada that were contacted to participate in the study, 63 (20%) responded and of those 46 (73%) met the inclusion criteria. Seven responses were removed due to invalid responses to the injury rate items (e.g. failing

Table 1. Programme characteristics of participants in this survey.

	Conventional *n* (%)	Outdoor *n* (%)	All *n* (%)
Self-identification	13 (100)	26 (100)	39 (100)
Years in operation			
1–2	0 (0)	4 (15)	4 (10)
2–3	2 (15)	3 (12)	5 (13)
3–5	0 (0)	5 (19)	5 (13)
5+	11 (85)	14 (54)	25 (64)
Age of children in years			
0–2	9 (69)	6 (23)	15 (38)
2–3	9 (69)	19 (73)	28 (72)
3–4	11 (85)	26 (100)	37 (95)
5+	9 (69)	22 (85)	31 (79)
Number of children			
0–30	5 (38)	10 (38)	15 (38)
31–60	4 (31)	6 (23)	10 (26)
61–90	2 (15)	3 (12)	5 (13)
90+	2 (15)	7 (27)	9 (23)
Location of Program			
Urban	6 (46)	9 (35)	15 (39)
Rural	4 (31)	7 (27)	11 (28)
Suburban	3 (23)	8 (31)	11 (28)
Mixed	0.0 (0)	2 (7)	2 (5)
Outdoor play locations (number of programs reporting location)			
Playground	5 (38)	1 (4)	6 (15)
Playground as part of school	8 (62)	8 (31)	16 (41)
Urban wooded areas	3 (23)	15 (58)	18 (46)
Public Park	5 (38)	10 (38)	15 (38)
Field	4 (31)	9 (35)	13 (33)
Forest	2 (15)	21 (81)	23 (89)
Neighbourhood	2 (15)	0 (0)	2 (5)
Farm	0 (0)	7 (27)	7 (18)
	M (SD)	**M (SD)**	**M (SD)**
Average programme duration (hours)	7.9 (2.8)	4.5 (2.0)	5.6 (2.8)
Average time outside (hours)	2.9 (1.5)	3.9 (1.4)	3.6 (1.5)
Average time outside during poor weather conditions – hours	1.8 (1.1)	3.2 (1.6)	2.7 (1.6)

to provide a numeric response) resulting in a sample of 39 programmes included in the study. There was a total of 26 self-identified outdoor-focused ECE programmes and 13 self-identified conventional ECE programmes. Most programmes were from Ontario ($n = 12$, 31%) and British Columbia ($n = 12$, 31%), with a relatively even number of programmes from urban, suburban and rural areas. Most programmes reported catering to children between the ages of two and four years and 38% of programmes ($n = 15$) reported serving children under two years of age. The average daily programme length was 5.6 ± 2.8 h with outdoor-focused programmes indicating a shorter average daily programme length (4.8 ± 2.3 h) compared to conventional programmes (8 ± 2.8 h). In terms of average daily outdoor time, outdoor-focused programmes provided more outdoor time with an average of 3.8 ± 1.3 h per day despite the shorter average programme length when compared to conventional programmes with an average of 3.0 ± 1.9 h per day.

3.2. Prevalence and characteristics of minor injuries

Minor injuries were the most common type of injury reported, with 855 injuries reported across the 39 programmes. Table 2 displays the occurrence and types of injuries in conventional and outdoor ECE settings. Though the majority (72%) of low-severity injuries occurred outdoors, the outdoor injury rate per outdoor hour per child was higher in conventional programmes (0.45 injuries/child*hour) compared to the outdoor programmes (0.26 injuries/child*hour). Boys were slightly more prone to minor injuries across outdoor-focused programmes, with 59% of the reported low-severity injuries being for boys. Regarding activities occurring when minor injuries occurred, running (69%) was the most common activity across both types of programmes and biking (8%) was the least common. Asphalt/pavement was the most common surface injuries occurred on

Table 2. Low-severity (minor) injury rates and characteristics reported by the programs.

	Conventional M (SD)	Outdoor M (SD)	All M (SD)	***t*(37)**	***p-value***
Injuries/child*hour	0.35 (0.16)	0.24 (0.15)	0.28 (0.16)	2.08	0.045*
Outdoor injuries/child*outdoor hours	0.45 (0.28)	0.26 (0.15)	0.32 (0.22)	2.74	0.009*
	***n* (%)**	***n* (%)**	***n* (%)**		
Minor injuries	530	325	855		
Injuries to boys	190 (36)	191 (59)	381 (45)		
Injuries to girls	340 (64)	134 (41)	474 (55)		
Injury activity (number of programs reporting activity)					
Running	8 (62)	19 (73)	27 (69)		
Climbing	4 (31)	14 (54)	18 (46)		
Rough and tumble play	1 (8)	5 (19)	6 (15)		
Object play	0 (0)	10 (38)	10 (26)		
Biking	1 (8)	2 (8)	3 (8)		
Injury surface (number of programs reporting surface)					
Forest floor	0 (0)	12 (46)	12 (31)		
Grass	1 (8)	5 (19)	6 (15)		
Asphalt/Pavement	8 (62)	4 (15)	12 (31)		
Indoor Floor/Carpet	4 (31)	5 (19)	9 (23)		
Dirt/mud	1 (8)	9 (35)	10 (26)		
Soft playground floor	4 (31)	3 (12)	7 (18)		
Gravel	2 (15)	2 (8)	4 (10)		
Ice/snow	2 (15)	5 (19)	7 (18)		

Note: M = mean, SD = standard deviation.

in conventional programmes ($n = 8$, 21%) whereas the forest floor was the most common injury surface for outdoor programmes ($n = 12$, 31%).

3.3. Prevalence and characteristics of moderate injuries

A complete description of the occurrence and types of moderate injuries in conventional and outdoor childcare settings is presented in Table 3. Twelve different programmes reported 35 moderate or medium-severity injuries (19 indoors and 16 outdoors). While not significantly different ($U = 189$, $p = 0.566$), the medium-severity injury rate followed a similar pattern as that of the low-severity data, with injury rates being higher in conventional (0.050 injuries/child*hour) compared to outdoor (0.022 injuries/child*hour) programmes. Boys experienced more medium-severity injuries (60%) than girls. Running/walking was the most common activity occurring when injuries were reported, with 10 programmes (26%) reporting injuries during this activity across both types of programmes. Regarding the types of surfaces injuries occurred on, indoor floor/carpet was the most common surface reported, with five respondents reporting injuries on this surface, followed by pavement (three respondents), sand (one respondent), and dirt/mud (two respondents).

3.4. Prevalence and characteristics of severe injuries

The programmes reported a total of seven high-severity (severe) injuries in 2022 across a total of three programmes. Three (43%) of the severe injuries occurred outdoors and four (57%) occurred indoors. Almost all ($n = 6$, 86%) of the high-severity injuries occurred in

Table 3. Medium-severity (moderate) injury rates and characteristics reported by the programs.

	Conventional	**Outdoor**	**All**	***U***	***p*-value**
	M (SD)	**M (SD)**	**M (SD)**		
Injuries/child*hour	0.050 (0.099)	0.022 (0.039)	0.032 (0.066)	189	0.566
Outdoor injuries/child*outdoor hours	0.055 (0.155)	0.0129 (0.032)	0.027 (0.093)	173	0.918
	***n* (%)**	***n* (%)**	***n* (%)**		
Medium-severity injuries	19	16	35		
Injuries to boys	12 (63)	7 (44)	21 (60)		
Injuries to girls	7 (37)	9 (56)	14 (40)		
Injury activity (number of programs reporting activity)					
Running/walking	4 (31)	6 (23)	10 (26)		
Climbing	0 (0)	3 (12)	3 (8)		
Rough and tumble play	1 (8)	0 (0)	1 (3)		
Object play	1 (8)	0 (0)	1 (3)		
Biking	1 (8)	0 (0)	1 (3)		
Injury surface (number of programs reporting surface)					
Indoor floor/carpet	1 (8)	4 (15)	5 (13)		
Grass	0 (0)	1 (4)	1 (3)		
Pavement	3 (23)	0 (0)	3 (8)		
Sand	1 (8)	0 (0)	1 (3)		
Dirt/mud	0 (0)	2 (8)	2 (5)		
Soft playground floor	0 (0)	0 (0)	0 (0)		
Gravel	0 (0)	0 (0)	0 (0)		
Ice/snow	0 (0)	0 (0)	0 (0)		

Note: M = mean, SD = standard deviation, U = Mann–Whitney U.

conventional programmes. The injury rate per child hour was higher in conventional programmes (0.0211) compared to the outdoor programmes (0.0004), however, the injury rates were not statistically different ($U = 208$, $p = 0.255$). Boys were more prone to high-severity injuries in both settings, with 100% of high-severity injuries occurring to boys in outdoor programmes and 75% in conventional programmes. The percentage of high-severity injuries that occurred with boys overall was 86%.

The only activity where high-severity injuries occurred was running and it only occurred in a conventional programme. For surfaces where high-severity injuries occurred, indoor floor/carpet and pavement were each reported for one injury in conventional programmes. Outdoor programmes reported no high-severity outdoor injuries, with the only reported injury from this type of programme occurring indoors.

4. Discussion

This study represents one of the first comparisons of documented injury rates in conventional and outdoor ECE programmes in the Canadian context. This study contributes novel information on the safety of outdoor childcare and challenges commonly held beliefs on the safety of such programmes and the outdoors in general. The main finding from this study was that reports of relative minor injury rates were significantly lower in outdoor-focused programmes than in conventional programmes. Relative moderate and severe injuries followed the same pattern of minor injury rates in outdoor-focused programmes compared to conventional programmes; however, the differences were not found to be statistically significant, likely due to insufficient power.

Our findings support the overall safety of outdoor ECE programmes, showing that most of the injuries documented were low severity, corroborating other studies assessing injuries in ECE programmes outside of Canada (Bergeron et al., 2019; Sando et al., 2017). For example, Sando et al. (2017) found that injuries were rare in Norwegian ECE centres, with most of the injuries being minor and not requiring professional medical attention. Similar findings have been shown in nature preschools in the United States, where injury rates for both conventional and nature preschools were shown to be relatively low, leading to the conclusion that nature preschools are a healthy and safe child-care model (Frenkel et al., 2019). Collectively, the results in the present study and the ECE and outdoor play literature are encouraging for ECE providers interested in incorporating more outdoor activities into their programmes.

Unique to our study was that the documented injury rate per child*hour was higher in conventional programmes. There are several possible explanations for why this may have been the case. One possible hypothesis is that outdoor-focused ECE programmes may provide more opportunities to engage in risky outdoor play, develop related skills to prevent injury, and facilitate healthy growth and development (Beaulieu & Beno, 2024). A Canadian study conducted by Harper and Obee (2021), where their team interviewed 10 forest and nature school practitioners, revealed that practitioners learn by observing children's risky behaviour, and this constant risk assessment, which involves the children in the process, helps educators develop skills to navigate risky play. The respondents also highlighted the importance of risk in the development of children's ability to navigate risks (Harper & Obee, 2021). The increased exposure to risk that children in these outdoor environments may experience could partially explain the lower

injury rates in outdoor-focused programmes. Another explanation could be that minor injuries may be underreported in outdoor environments compared to traditional settings, as they are more likely to be dismissed/accepted as part of normal outdoor play. This reporting difference was raised by ECE stakeholders on this project and could explain the lower injury rates observed in outdoor-focused programmes, though this remains speculative and should be investigated further.

In the present study, some data were excluded from analysis because survey respondents used phrases such as 'a few' or 'not many' when asked about the number of injuries their programmes experienced in the last year. This method of reporting may reflect attitudes towards minor injuries like scrapes and bruises being considered a normal part of outdoor play and therefore not reported as incidents. The conceptual frameworks that determine the classification of an injury as noteworthy may exhibit variance between outdoor and conventional programmes. This discrepancy could be attributed to the potentially more permissive attitudes toward risk-associated activities prevalent in outdoor programmes (Garden, 2023).

The lower rates of injuries observed in outdoor-focused ECE programmes compared to conventional programmes may also be attributed, in part, to the softer surfaces found in outdoor-focused programme play areas. Our study examined the distribution of minor, moderate, and severe injuries in relation to the type of surface where the injuries occurred. The findings indicate that minor injuries in conventional programmes predominantly occurred on manufactured surfaces such as asphalt, pavement, indoor floors, carpets, and soft playground floors. On the other hand, minor injuries in outdoor-focused programmes were more likely to occur on natural surfaces such as forest floors, dirt, mud, grass, or snow. The observed patterns for conventional programmes' injury surfaces were similar for moderate and severe injuries, with a higher incidence on the manufactured surfaces previously mentioned. The fact that running was the most common injury-related activity in both programme types, yet conventional programmes still had more injuries, supports the hypothesis that natural outdoor spaces are safe for young children, and in some instances, safer than conventional school environments.

4.1. Limitations and future directions

Major strengths of this study include the diverse sample of programmes, distributed relatively evenly across urban, suburban, and rural locations across most provinces in Canada. The study collected data on at least 1,750 children, providing a preliminary understanding of injury rates in both conventional and outdoor childcare settings in Canada. The study provided a detailed analysis of injury occurrences in relation to different factors, such as gender, daily programme duration, and activity type, which enhanced understanding of the specific factors that could contribute to injuries in Canadian childcare settings. Additionally, the study examined injury rates in low-severity, medium-severity, and high-severity injury categories, providing a more nuanced understanding of the injury rates in both conventional and outdoor childcare settings in Canada.

In addition to the strengths of this study, there are some limitations that should be considered when interpreting the results. First, this study relied on self-reported data, which inherently carries the potential for selection bias, social desirability bias, and

sampling bias. The study also relied on programme-reported injury data, which may not capture all injuries or accurately reflect their severity. Despite attempts to minimize reporting biases using standardized definitions and injury categories, there is still potential for underreporting or misreporting.

Second, in our survey we asked about the number of injuries among boys, consistent with previous studies assessing gender differences in injuries (Brussoni et al., 2015; Frenkel et al., 2019). However, without specific data on the total number of boys and girls in each programme, our interpretation of injury rates related to gender is limited. Third, to capture data on overall time spent outdoors within each programme, we asked respondents to report on the average outdoor time per programme day. While this question was designed to ensure the most accurate depiction of programme behaviour, its generality has limitations. Lastly, this study captured a relatively small number of ECE centres in Canada and therefore the generalizability of these findings is limited, though of the childcare programmes included, our sampling was distributed relatively evenly across urban, suburban, and rural locations across most provinces in Canada. Despite these identified limitations, this study serves as a valuable foundation for future outdoor and risky play research.

Future research is needed to confirm and extend the current project findings to better understand other potential mediating factors, such as the relationship between socioeconomic status, programme quality, and ECE provider experience and training on injury rates in outdoor-focused ECE programmes (Audrey & Batista-Ferrer, 2015; Bhamkar et al., 2016). Gathering larger datasets and more injury-specific information on variables such as age and gender would be a general improvement to attain more robust results, as these two variables may impact injury prevalence (Brussoni et al., 2015). One way to mitigate the biases associated with reported design studies like this one would be to acquire official injury records from the ECE programmes. This approach could provide a more objective measure of injury rates and help minimize the impact of the biases. Future research should consider this approach to improve the accuracy and reliability of injury data in ECE programmes.

5. Conclusion

This study found that outdoor-focused ECE programmes had lower minor injury rates than conventional programmes. This finding provides preliminary evidence to help mitigate the concerns of parents, guardians, and other decision-makers regarding the safety of outdoor-focused programmes. Future research directions include exploring the impact of surfaces and activities on injury rates and investigating the relationship between gender and injury rates. This study adds to the growing body of literature supporting the safety of outdoor-focused ECE programmes and the benefit of such programmes for young children.

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Notes on contributors

Yousif Al-Baldawi is a Master's student in Epidemiology at the University of Ottawa with a background in health science. His research focuses on paediatric health outcomes, with his current thesis examining outcome reporting for children with intellectual disabilities in clinical trials. He previously worked with the Healthy Active Living and Obesity Research Group (HALO) during his undergraduate studies.

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