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# School-based outdoor education and teacher subjective well-being: An exploratory study

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Can school-based outdoor education (OE) benefit teachers' well-being? Multiple studies have reported the positive impact of OE on students' well-being and the benefits of contact with nature for adults. However, a literature review revealed no research on the impact of OE on teachers' well-being. This study explores the possible relationships between OE and preschool and primary school teachers' subjective well-being (SWB) in Québec, Canada, during COVID-19. A survey measuring teacher SWB was conducted; 381 teachers responded, 164 practiced OE, and 217 did not. The questionnaire results indicated that teachers who practice OE have significantly higher SWB than their colleagues ( $d=0.21$  to  $d=0.36$ ). However, only a limited positive correlation was found between teacher SWB and the number of times teachers practice OE ( $\rho=0.184$ ). This study suggests that school-based OE is positively related to teacher SWB and therefore has the potential to benefit teachers and students alike.

## KEYWORDS

subjective well-being, teacher, outdoor learning, school-based outdoor education, preschool, primary school

## Introduction

"Teachers are the most important school-related factor impacting student learning" (OECD, 2020, p. 41). Still, their ability to take care of their students to the best of their capabilities partially depends on their well-being. Although research on the effects of teacher well-being is limited, Hascher and Waber's (2021) systematic review has found it to influence teaching quality. Indeed, studies have illustrated the relationship between teachers' well-being and teaching quality (Hargreaves, 2000; Roffey, 2012; Zee and Koomen, 2016), relationships with students (Klassen et al., 2012), students' well-being (Harding et al., 2019), socioemotional skills, and motivation (Sutton and Wheatley, 2003; Pakarinen et al., 2010; Siekkinen et al., 2013; Zinsser et al., 2013). Hence promoting teacher well-being would be beneficial for students.

However, the COVID-19 pandemic has created new hardships that affected teachers' well-being (Gadermann et al., 2021). To face the new pandemic context, some teachers in

Québec adapted their practices by taking their students outside and practicing OE. A recent survey reported an increase of 25% in the number of primary school teachers practicing OE during the pandemic compared to the two previous years in the province of Québec, Canada (Ayotte-Beaudet et al., 2022).

The connection between the outdoors – out of school settings – and well-being is a well-researched phenomenon. In the past few years, multiple reviews have reported growing evidence of the positive effect of nature on mental health, physical health, and the well-being of adults (Russell et al., 2013; Seymour, 2016; Twhig-Bennett and Jones, 2018) and children (Townsend and Weerasuriya, 2010; Chawla, 2015; Frumkin et al., 2017).

Those benefits are also present for students taking part in OE activities. Harvey et al. (2020) observed significant improvement in children's moods and well-being over a yearlong outdoor learning program for 8–11 years old. Similar conclusions were reached in two recent reviews on the effects of OE on students by Kuo et al. (2019) and Remmen and Iversen (2022). They reported its positive impact on students' physical, mental and social well-being.

Hence, the relation between the outdoors and the well-being of students and adults raises the question; does school-based OE relate to teacher well-being as well? The outdoors provides a calmer, warmer, and more cooperative learning context that facilitates interactions between students and teachers and improves students' attention, engagement, self-discipline, enjoyment, and positive behaviors (Malone, 2008; Kuo et al., 2019). Such characteristics could alleviate some of the profession's challenges that may have a negative impact on teachers' well-being. For instance, students are less distracted and more engaged in class after outdoor lessons than indoor classroom lessons (Kuo et al., 2018). Some teachers have mentioned increased job satisfaction, motivation, enjoyment, school atmosphere, and well-being after practicing OE in their class (Fägerstam, 2014; Marchant et al., 2019). Such results suggest a potential relation between OE and teacher well-being. This relation could be two-fold. On the one hand, by enhancing teacher well-being through contact with the outdoors and, on the other hand, through its positive effect on students. However, despite such potential and the promising findings presented above, no research investigating the relationship between OE and teacher well-being has been found.

## Subjective well-being

Well-being is a complex concept (Ryan and Deci, 2001), of which subjective well-being (SWB) is a self-reported measure. Hence, clarity on the nature of SWB is crucial when measuring it. Furthermore, van Horn et al. (2004) highlighted the importance of work-specific conceptualizations of SWB when measuring well-being in a work context. They argued that the relationship of work-related SWB with work-related antecedents is stronger than context-free antecedents. Therefore, a work-specific conception of SWB would offer a greater understanding of the impact of specific

work characteristics on employees' SWB. Subsequently, following van Horn et al.'s (2004) argument, this study used a teaching-related conception of SWB.

The working definition of SWB used in this research is a modified version of the OECD's (2013) definition adapted to the teaching context:

*Teachers' self-reported good mental states, including all of the various evaluations, positive and negative, teachers make of their teaching experience.*

This definition is relatively broad to include various aspects of SWB identified by research (OECD, 2013). It comprises three complementary elements addressed in this study: (1) life evaluation, (2) affect, and (3) eudaimonia.

*Life evaluation* refers to the reflective assessment of a teacher's work experience or some specific aspect of it. According to the OECD (2013), life evaluation primarily refers to "life as a whole." However, it can be used to evaluate particular aspects of life such as health, job, financial, leisure, and environmental satisfaction, to name a few (OECD, 2013).

*Affect* refers to a teacher's feelings or emotional states at work. Positive affect relates to pleasant emotions such as happiness, joy, and contentment. In contrast, negative affect relates to unpleasant emotions such as anger, fear, and anxiety (OECD, 2013).

*Eudaimonia* refers to "a sense of meaning and purpose in life, or good psychological functioning" (OECD, 2013, p. 10). Examples of eudaimonia measurement include autonomy, competence, interest in learning, goal orientation, sense of purpose, resilience, social engagement, caring, and altruism (Huppert et al., 2009).

## Outdoor education

OE is a "semantic umbrella" (Lacoste et al., 2021) encompassing numerous approaches and practices. Traditionally, OE is used to describe a variety of educational activities and goals, such as outdoor adventures to promote personal growth; outdoor sports instruction focused on the acquisition of specific skills, field study on environmental issues, and school-based activities led by teachers directly connected to their curriculum (Beames et al., 2012). Therefore, a clear definition is necessary to avoid confusion amid this multitude of conceptions.

In Québec, the interest in OE is growing. In the past years, the Québec Ministry of Education has shown interest in OE and has ordered a review on the effects of outdoor activities, and produced a series of recommendations to promote them (Lefebvre et al., 2017), University programs have been created (Gadais et al., 2021), a research chair on school-based OE has been created (Bélanger, 2022), and, as mentioned, the number of primary school teachers practicing school-based OE has increased by 25% during the pandemic (Ayotte-Beaudet et al., 2022). While Québec's national curriculum does not encourage the practice of

OE explicitly, there seems to be a grassroots movement coming from teachers using local parks, forests, and school playgrounds to promote connection to nature, contextualize their teaching and benefit from open spaces (Ayotte-Beaudet et al., 2022).

This research is interested in those teachers who have taken the initiative to practice school-based OE. In order to investigate the relationship between their SWB and their practice of OE, the school-based and teacher-led nature of their practice needs to be central to the definition of OE used in this study. Accordingly, the working definition used of school-based OE in this research is a slight modification of Ayotte-Beaudet et al.'s (2022, p. 7) definition:

Any teacher-led educational activity taking place outdoors, in any environment, and whose objective is to achieve learning according to previously defined pedagogical intentions.

## The present study

This study aims to explore the relationship between school-based OE and teacher SWB and to answer the following question and sub-questions:

Is the practice of school-based outdoor education associated with preschool and primary school teachers' subjective well-being?

- (1) How does the subjective well-being of teachers who practice school-based outdoor education compare to their peers?
- (2) Does the frequency of school-based outdoor education practice correlate with teachers' subjective well-being?

Based on the previously described established relationship between the outdoors and adults' and children's well-being, as well as OE's positive impacts on students, this study's hypothesis is the existence of a statistically significant positive relation between school-based OE and teacher SWB; that OE teachers have, on average, a higher SWB than their colleagues, and their SWB is positively correlated with the frequency of their OE practice.

## Materials and methods

### Context

This research occurred in the autumn of 2020 in Québec, Canada, amid the COVID-19 pandemic. It comprises preschool and elementary school teachers who, at the time, were coming back to in-class teaching after a first lockdown. Hence, in-person instruction was in place with new sanitary rules. For instance, all activities outside of the school ground were strictly limited,

students and teachers had to wear masks at all times inside, and classes were forbidden to be mixed with other groups.

### Sample

A total of 386 teachers completed the questionnaire, and 381 met the inclusion criteria. Five were excluded because they did not fully complete the questionnaire. The response rate was not calculated due to the variety of methods used to recruit teachers (social media, snowball, teachers' union, and school principals).

Of the total participant population, 43% ( $n = 164$ ) practiced OE at least once since the start of the 2020–2021 school year, and 57% ( $n = 217$ ) did not practice OE since the beginning of the 2020–2021 school year.

Both groups were similar in their composition in terms of teaching experience and age, which were normally distributed, school socio-economical background index score, and number of students with, on average, between 20 and 24 students. However, there were differences in gender distribution and school environment (urban, suburban, rural, remote). Male OE teachers represented 18.3% of their group, and non-OE male teachers represented 6.5% of their group. Teachers in rural areas represented 22.4% of OE teachers and 13.8% of non-OE teachers. Hence, males and teachers in rural areas represented a higher OE teacher proportion than non-OE teachers.

Among the 164 respondents who practiced OE, 37% had 1–2 months of experience, 7% had three to six, 2% had six to twelve, 12% had 1–2 years, 14% had 3–5 years of OE experience, and 28% had 5 years or more. Therefore, OE participants generally had either limited or extensive experience in OE.

There was great variety in the number of times the respondents practiced OE: 20% practiced OE once, 23% two to four times, 13% five to eight times, 19% nine to twenty-four times, 14% twenty-five to forty and 11% taught outdoors on more than forty occasions.

### Procedures

All procedures were approved by the university's institutional review process before data collection. Data was collected *via* an online questionnaire on Qualtrics and distributed through a snowball method on social media across the province of Québec. In addition, teachers' unions were contacted *via* email to share this study with their members. Some school principals were also contacted. They were approached due to the practice of OE in their school. This was done to increase the number of teachers practicing OE in the sample since we anticipated the number of OE teachers to be significantly lower than non-OE teachers. The survey was online in October 2020 for the entire month. The questionnaire was divided into demographic, teaching practices and outdoor education practices, and SWB measurement. The demographic section aimed to gather personal and professional information on the participant teaching environment. The

teaching section gathered data on the number of students they teach, their grades, their teaching subject, and their experience. In order to identify OE teachers, all participants were asked if they practiced OE based on the working definition of OE previously presented. Those who did had to complete the OE section. This section was focused on the frequency of their practice of OE for the first 3 months of the school year, their OE teaching experience, and their environment. The SWB measurement section aimed at measuring the OECD's (2013) three dimensions of SWB: affect, life satisfaction, and eudaimonia. All participants provided consent at the start of the survey. The average completion time for the questionnaire was 7 min.

## Measures

Three teacher-specific questionnaires were used to measure SWB. Each questionnaire was selected for its correspondence with one of the SWB dimensions. Among those dimensions, they measured specific aspects of teacher SWB that were each tested for their internal reliability (Collie et al., 2015; Frenzel et al., 2016; Mankin et al., 2018; Table 1).

The first questionnaire is the Teacher Well-Being Scale (TWBS; Collie et al., 2015) was chosen for its correspondence with the life evaluation dimension of SWB through practical work-related SWB aspects. It evaluates three SWB aspects: the first aspect is workload well-being, which relates to the pressures and issues associated with the perceived strains of the teachers' workload. The second is organizational well-being, which relates to teachers' perceived relationships with and support from their colleagues and school administration. The third aspect is teacher-student interactions well-being, which relates to the quality of teachers' interactions with students, alongside teachers' perceptions of students' behavior and motivation (Collie et al., 2015).

Second, the Teacher Subjective Well-Being Questionnaire (TSWQ; Mankin et al., 2018) was chosen for its correspondence with the eudaimonic dimension of SWB. The TSWQ measures two SWB aspects: the feeling of teaching efficacy, which refers to "appraising one's teaching behaviors as effectively meeting environmental demands" (Renshaw et al., 2015, p. 294); and school connectedness, which refers to "feeling supported by and relating well to others at school" (Renshaw et al., 2015, p. 294).

Third, the Teacher Emotions Scales (TES; Frenzel et al., 2016) was chosen for its focus on the affective dimension of SWB. It measures enjoyment, anger, and anxiety.

## Data analysis

The questionnaire gathered demographic information, details on respondents' teaching practices and OE practices, and different aspects of their SWB. The data collected were analyzed through the two research sub-questions. The minimal level of statistical

significance used in the analysis was  $p < 0.05$ . Additionally, since SWB measures are prone to be influenced by personal characteristics (OECD, 2013), the findings were compared with COVID-19 based motivations and multiple demographic and practice variables described below to control their influence on the SWB measures.

To assess the participants' SWB, three ways to score SWB were used. First, the three SWB measurement tests were scored separately to measure the three dimensions of SWB. Secondly, each specific aspect was measured separately to gain detailed information on the association between OE and SWB (Table 1). Third, a Total SWB score was created by normalizing each aspect's score value to make them equal and combining them to provide an overall evaluation of the teachers' SWB.

To answer the first sub-question – *How does the subjective well-being of teachers who practice outdoor education compare to their peers?* – participants were separated into two groups, the teachers who did not teach outdoors since the beginning of the school year and those who had once or more. These two groups were named (1) non-OE teachers and (2) OE teachers. The analysis compared their SWB scores using independent-sample *t*-tests and effect size analysis to find any significant differences and, if so, their sizes. One-way ANOVA tests were used to compare the SWB scores with the school environment variable. Similarly, Spearman or Pearson's correlation test was used depending on the data's nature to test the variables of age, teaching experience, school socio-economical background index score, and the number of students. These tests allowed further insight into the association between the variables and teacher SWB for both groups and the identification of other variables that could influence the results.

The second sub-question – *Does the frequency of outdoor education practice correlate with teachers' subjective well-being?* – was answered by analyzing the correlation between the number of times OE teachers practiced OE and their SWB scores. Spearman's correlation was used in this case. Other variables that can potentially impact SWB were also tested. Variables such as whether the teachers started teaching outdoors due to COVID-19 or not, and the length of their experience in OE. These variables were chosen because of the likeliness of their correlation with SWB. For instance, it is reasonable to assume that teachers who started teaching outdoors to diminish the risk of transmission of the virus could experience

TABLE 1 SWB tests, dimensions and aspects.

Tests	Dimension	Aspect	$\alpha$
TWBS	Life evaluation	Organizational well-being	0.84
		Workload Well-being	0.85
		Teacher-student interactions well-being	0.82
TSWQ	Eudaimonia	School connectedness	0.87
		Feeling of teaching efficacy	0.87
TES	Affect	Enjoyment	0.73
		Anxiety	0.80
		Anger	0.81

less anxiety due to the lower risk of contagion outdoors. Additionally, teachers who recently started teaching outdoors could face more difficulties than more experienced teachers and therefore have a potentially lower teaching efficacy feeling.

## Results

### How does the subjective well-being of outdoor education teachers compare to non-outdoor education teachers?

All SWB scores of OE and non-OE teachers were compared using dependent *t*-tests and Cohen's *d* to measure the effect size. These results are displayed in Table 2. They showed a statistically significant difference in SWB scores between OE and non-OE teachers in every aspect and dimension except for Feeling of Teaching Efficacy. Hence, the SWB mean scores were higher for Total SWB, Life Evaluation, Eudaimonia, Affect, School Connectedness, Enjoyment, Anger, Anxiety, Workload, Organizational Well-Being and Teacher-Student Interactions, with effect sizes ranging from  $d=0.21$  to  $d=0.36$ . Such results suggest that part of the hypothesis was correct.

The SWB score with the largest effect size was Total-SWB ( $d=0.361$ ), and the SWB dimension with the largest effect size was life evaluation with an effect size of  $d=0.347$ . As for the SWB aspects, the ones with the highest effect sizes were Enjoyment ( $d=0.329$ ), Teacher-Student Interactions ( $d=0.294$ ) and Workload ( $d=0.286$ ). On the other hand, the dimensions with the smallest effect sizes were Feeling of Teaching Efficacy with no statistically significant difference and Organizational Well-Being with an effect size of  $d=0.208$ .

OE and non-OE teachers' SWB scores were compared with the previously mentioned demographic and teaching practice variables: gender, school environment, age, teaching experience,

school socio-economical background index score, and number of students to further the comparison between OE and non-OE teachers and to control the influence of other variables. There were no statistically significant differences between OE and non-OE teachers and these variables except three notable ones. These were the number of students, the teacher's age, and teaching experience.

Spearman's *rho* was used to investigate the relationship between the number of students and teacher SWB for OE and non-OE teachers. Results showed statistically significant weak negative correlations between the average number of students of non-OE teachers and their Total-SWB ( $r=-0.144$ ), affect ( $r=-0.147$ ), Anger ( $r=-0.179$ ) and Teacher-Student Interactions ( $r=-0.166$ ) scores (Table 3). Meanwhile, no correlation was observed for OE teachers.

The situation was similar for the respondents' teaching experience and age when using Spearman's correlation. Teaching experience and age of non-OE teachers positively correlated with Total-SWB, eudaimonia, affect, feeling of teaching efficacy, anger, anxiety, and teacher-student interaction (Table 4). However, the OE teachers' teaching experience and age correlated with eudaimonia (age:  $rho=0.203$  | experience:  $rho=0.265$ ) and their feeling of teaching efficacy (age:  $rho=0.158$  | experience:  $rho=0.248$ ) scores (Table 4).

### Does the frequency of outdoor education practice correlate with teachers' subjective well-being?

To answer this question, the correlation between the number of times OE teachers taught outdoors and their SWB scores were tested using Spearman's correlation. Contrary to our hypothesis, the results showed no statistically significant correlation except a weak positive correlation of  $rho=0.184$  and a significance of  $t=0.018$  for the feeling of teaching efficacy.

To further the analysis, the association of teachers' OE experience, COVID-19 based motivation to practice OE, and the

TABLE 2 OE and non-OE teachers' SWB scores comparison.

	OE teacher $n=164$		Non-OE teachers $n=217$		<i>t</i> -test	Value of <i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Total-SWB	244.8	32.71	232.45	35.64	0.001***	0.001	0.361
Life evaluation	63.75	13.33	59.09	13.47	0.001***	0.001	0.347
Eudaimonia	25.57	3.55	24.66	4.15	0.001***	0.025	0.235
Affect	39.73	5.27	38.00	6.09	0.004**	0.004	0.303
School-connectedness	12.71	2.30	12.13	2.57	0.023*	0.023	0.237
Feeling of teaching-efficacy	11.77	1.32	11.80	1.72	0.843	0.843	0.021
Enjoyment	13.02	2.18	12.27	2.41	0.002**	0.002	0.329
Anger	13.64	1.94	13.17	2.26	0.034*	0.034	0.223
Anxiety	12.93	2.35	12.34	2.78	0.029*	0.029	0.228
Workload	20.22	5.24	18.66	5.65	0.006**	0.006	0.286
Organizational well-being	24.9	6.19	23.54	5.65	0.046*	0.046	0.208
Teacher-student interactions	19.32	4.63	17.90	5.03	0.005**	0.005	0.294

*t*-tests and effect sizes. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

TABLE 3 SWB scores correlations with number of students.

	OE teacher <i>n</i> = 164		Non-OE teachers <i>n</i> = 217	
	Spearman's <i>rho</i>	Value of <i>p</i>	Spearman's <i>rho</i>	Value of <i>p</i>
Total-SWB	-0.074	0.350	-0.144*	0.036
Life evaluation	-0.051	0.521	-0.111	0.106
Eudaimonia	-0.032	0.688	-0.085	0.220
Affect	-0.080	0.312	-0.147*	0.033
School-connectedness	-0.028	0.719	-0.105	0.129
Feeling of teaching-efficacy	-0.051	0.520	-0.007	0.917
Enjoyment	-0.032	0.684	-0.123	0.073
Anger	-0.096	0.225	-0.179**	0.009
Anxiety	-0.097	0.219	-0.091	0.188
Workload	-0.045	0.570	-0.129	0.060
Organizational well-being	-0.016	0.835	-0.018	0.792
Teacher-student interactions	-0.087	0.270	-0.166*	0.016

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001.

TABLE 4 SWB scores correlations with age and teaching experience.

	Age OE teachers <i>n</i> = 164		Age non-OE teachers <i>n</i> = 217		OE teachers experience <i>n</i> = 164		Non-OE teachers experience <i>n</i> = 217	
	Spearman's <i>rho</i>	Value of <i>p</i>	Spearman's <i>rho</i>	Value of <i>p</i>	Spearman's <i>rho</i>	Value of <i>p</i>	Spearman's <i>rho</i>	Value of <i>p</i>
Total-SWB	0.085	0.285	0.165*	0.016	0.117	0.136	0.191**	0.005
Life evaluation	-0.016	0.838	0.021	0.758	-0.002	0.984	0.005	0.939
Eudaimonia	0.203**	0.009	0.198**	0.004	0.265**	0.001	0.267***	0.000
Affect	0.077	0.333	0.152*	0.027	0.085	0.281	0.171**	0.012
School-connectedness	0.085	0.284	0.074	0.281	0.111	0.156	0.116	0.087
Feeling of teaching-efficacy	0.158*	0.044	0.281***	0.000	0.248***	0.001	0.336***	0.000
Enjoyment	0.059	0.458	0.048	0.482	0.104	0.184	0.097	0.154
Anger	0.064	0.418	0.193**	0.005	0.017	0.827	0.171*	0.011
Anxiety	0.073	0.353	0.165*	0.016	0.084	0.282	0.282	0.008
Workload	-0.006	0.944	-0.010	0.880	-0.007	0.925	-0.008	0.908
Organizational well-being	-0.078	0.321	-0.044	0.0527	-0.063	0.400	-0.078	0.250
Teacher-student interactions	0.094	0.234	0.151*	0.028	0.104	0.184	0.179**	0.008

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001.

school environment (urban, suburban, rural, remote area) in which they practiced OE with their SWB scores were tested with Spearman's correlation, independent *t*-test, and one-way ANOVA, respectively. The tests found no statistically significant results for COVID-19 motivated OE practice and school environment. However, there was a weak statistically significant positive correlation between experience (*rho* = 0.221; *t* = 0.005) and school connectedness (*rho* = 0.177; *t* = 0.025), which is part of eudaimonia (*rho* = 0.177; *t* = 0.025).

Hence, the results suggest the hypothesis was partially correct. Teachers who practiced OE had a higher SWB score, and there was a statistically significant relation between OE and teachers' SWB. Although, the frequency of OE practice did not correlate with their SWB except for weak correlations with the eudaimonia and feeling of teaching efficacy. Additionally, teachers' experience

in OE only weakly correlated with school connectedness and eudaimonia.

## Discussion

To our knowledge, this research is the first to explore the relationship between school-based OE and teacher SWB. The hypothesis was that school-based OE and teacher SWB are positively related. More precisely, OE teachers have, on average, higher SWB than non-OE teachers, and the frequency of OE practice correlates positively with teacher SWB. This study's findings partially confirmed its hypothesis.

As predicted, OE teachers' average SWB scores are higher than non-OE teachers' average SWB scores. This was the case for

Total-SWB and all three SWB dimensions: life evaluation, affect, and eudaimonia. Moreover, the measured effect sizes show the difference to be moderate (from  $d=0.21$  to  $d=0.36$ ). They were on par with the average positive psychology interventions impact on SWB, which ranges from  $d=0.20$  to  $d=0.34$  (Bolier et al., 2013). Such similarity is notable since no intervention took place in this study. Notably, the SWB dimension with the largest effect size was life evaluation ( $d=0.35$ ) and the three SWB aspects with the largest effect sizes were Enjoyment ( $d=0.33$ ), Teacher-Student Interactions ( $d=0.29$ ), and Workload ( $d=0.29$ ). There were no statistically significant differences in SWB scores due to COVID-19-based motivations to practice OE. Hence, it is fair to hypothesize that future research using a quasi-experimental methodology where the practice of OE is controlled could obtain larger effect sizes.

To further the analysis of this relation, many professional characteristics with the potential to influence teacher SWB have been tested. Therefore, the relation between SWB and gender, school environment, age, teaching experience, school socio-economical background index score, and number of students were tested. This process found no significant differences between OE and non-OE teachers except for the number of students, age, and teaching experience. Weak negative correlations between the SWB of non-OE teachers and their number of students were measured, but none for OE teachers. Similarly, multiple significant positive correlations were found between non-OE teachers' SWB and teaching experience and age. However, only the feeling of teaching efficacy, school connectedness, and eudaimonia were positively correlated with age and teaching experience for OE teachers. The correlations were weak: eudaimonia (age:  $\rho=0.203$  | experience:  $\rho=0.265$ ), feeling of teaching efficacy (age:  $\rho=0.158$  | experience:  $\rho=0.248$ ). Therefore, these results show that OE teachers did not experience the effects of their number of students, age, and teaching experience of their SWB similarly to their non-OE peers, which would support the hypothesis that the practice of OE is related to teacher SWB.

However, the quasi-absence of significant positive correlations between teacher SWB and the frequency of OE practice, except for a weak positive correlation with the feeling of teaching efficacy ( $\rho=0.184$ ), was unexpected. Similarly, the correlation between the OE experience of teachers and their SWB was tested, and no significant correlation was found except a weak positive correlation between experience in OE and the eudaimonia ( $\rho=0.221$ ;  $t=0.005$ ) and school connectedness ( $\rho=0.177$ ;  $t=0.025$ ). These results contradict the hypothesis that the frequency of OE practice correlates positively with teacher SWB.

Moreover, it raises some questions on the nature of the relation between OE and teacher SWB. The medium effect sizes measured could suggest that the practice of OE likely caused this higher level of SWB in OE teachers as other studies have found OE to increase SWB (e.g., Russell et al., 2013; Passmore and Howell, 2014; Frumkin et al., 2017). Although, the quasi

absence of positive correlation could suggest that OE teachers had a higher level of SWB to begin with. For instance, the three SWB aspects with the highest effect sizes are Enjoyment ( $d=0.33$ ), Teacher-Student Interactions ( $d=0.29$ ) and Workload ( $d=0.29$ ). It is fair to assume that teachers who have low levels of enjoyment at work and face difficulties coping with the workload and class management are not in a position that promotes experimentation with new teaching practices. As Fägerstam's (2014) research has shown, it is common for teachers who consider practicing OE to anticipate a negative impact on discipline and workload.

Nevertheless, practicing OE is one of many factors that can impact teachers' SWB. Similarly, having a high level of SWB is not the only reason for teachers to practice OE. The experience of teachers is far too complex and multidimensional. Hence, it is more credible that the relation between OE and teacher SWB is bidirectional, as Zelenski and Nisbet (2014) and Herzog and Strevey (2008) have suggested in their research on the relationship between contact with nature and SWB in the general population. This interpretation would mean that practicing OE could benefit teachers' SWB, and higher levels of teacher SWB could also favor the practice of OE. Therefore, this interpretation implies that promoting OE could benefit teacher SWB and that the successful implementation of OE could be impacted by high teacher SWB, especially relating to the teachers' Enjoyment, Workload, and Teacher-Student Interactions.

While the potential of school-based OE is promising, more research is needed to identify the nature of the association between OE and teacher SWB. The use of quasi-experimental methodology could help inform us about the nature of the relationship. Moreover, there are numerous ways to practice OE which could affect teacher SWB to different degrees. Therefore, detailed and controlled OE practices should be included in further research. The level at which teachers teach could also influence the results. Primary school, preschool, and secondary school teachers do not face the same work demands. Consequently, further research could explore the differences between the different school levels.

## Study limitations

Discussion on the nature of the relation between OE and teacher SWB is limited by the design of this research. Indeed, questionnaire-based research does not provide data suitable to determine the causality of a relation. Additionally, the number of OE teachers ( $n=164$ ) could be too small to observe a correlation between the frequency of OE practice and teacher SWB. Indeed, the usually recommended number of participants required for correlation tests of  $p<0.05$  used in this research is  $n=194$  (Brybaert, 2019). Hence, further research of a different design is needed to investigate the nature of the relationship between OE and teacher SWB.

Furthermore, volunteer sampling was used due to the impossibility of using probability sampling. For instance, there could have been a participation bias based on teachers' interest in OE that could limit the generalizability of the results. The context of the research is also significant. It took place during the COVID-19 pandemic. This period created an unprecedented reality for teachers, the extent of which is still unknown at the time of this research. Measures were taken to control the influence of the pandemic, and no connection was found. However, this study's results could have been influenced by unknown circumstances not considered. Therefore, due to the sampling method and the context of this research, the interpretation of the results should be limited to the sample who participated in the study.

Finally, the OE practices of the teachers were declared and not observed as well as being uncontrolled. This means that multiple varied ways to practice OE were accepted. These different practices could influence SWB in various ways. Moreover, teachers' motivations to practice OE were unknown. For instance, studies on contact with nature and feelings of connectedness with nature have shown positive correlations with SWB (Mayer and Frantz, 2004; Howell et al., 2011; Cervinka et al., 2012; Zelenski and Nisbet, 2014). Accordingly, practices more closely connected to nature could have a stronger effect. Hence, there is an opportunity to investigate how specific OE practices relate to SWB.

## Conclusion

This research aimed to explore the relation between teacher SWB and the practice of school-based OE. Based on quantitative survey analysis of primary and preschool teachers in the province of Québec, Canada, during the COVID-19 pandemic, this study found a statistically significant positive relationship between the practice of school-based OE and teacher SWB in all three SWB dimensions (life evaluation, affect and eudaimonia).

As hypothesized, teachers who practiced OE had higher average SWB scores than their non-OE peers. The SWB aspects of Enjoyment, Teacher-Student Interactions, and Workload had the largest effect sizes. However, no correlation was found between the frequency of OE practice except for a limited, weak positive correlation with teachers' feeling of teaching efficacy. Still, this correlation test is limited by the number of participants. Further research could investigate the nature of the relation between OE and teacher SWB and the impact different OE practices have on SWB.

To our knowledge, this study is the first to explore the relation between OE and teacher SWB. It provides promising results, especially in a context where the teaching profession is becoming more complex (Tardif, 2012), and teachers are leaving the profession at an alarming rate (Fontaine et al., 2012; Karsenti et al., 2013) which denotes a state of ill-being in the profession that needs to be addressed. Teachers are the backbone of education, and their well-being is an essential part of quality education. Therefore, the search for ways to support teacher well-being is

ultimately beneficial to students. By finding that school-based OE positively relates to teacher SWB, this research has highlighted another possible benefit of OE and its well-documented impacts on students' learning and well-being (Malone, 2008; Kuo et al., 2019; Remmen and Iversen, 2022). Thus, this research's findings suggest that OE is a teaching practice that could benefit students and teachers alike.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

## Ethics statement

The studies involving human participants were reviewed and approved by the Moray House School of Education Ethics Committee – University of Edinburgh. The participants provided their written informed consent to participate in this study.

## Author contributions

AD realized the research and the redaction of the article, RS supervised the research process, and J-PA-B supervised the redaction and reviewed the article.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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