

# The psychosocial work environment among educators during the COVID-19 pandemic

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<b>Background</b>	The education sector has been heavily impacted by COVID-19. While the impact on school-aged children has received much attention, less attention has focused on the experiences of educators.
<b>Aims</b>	To compare various dimensions of the psychosocial work environment and health outcomes between educators engaged in online learning to those engaged in in-person learning in the Canadian province of Ontario.
<b>Methods</b>	Responses from 5438 educators engaged in either online or in-person learning were collected between 23 November and 21 December 2020; three months after the start of the 2020/21 academic year in September 2020. Psychosocial outcomes included quantitative demands, work pace, predictability, role conflicts, and social support from supervisors and co-workers; assessed using an abbreviated version of the Copenhagen Psychosocial Questionnaire. Secondary outcomes included burnout and sleep troubles. Ordinary Least-Squares regression models examined adjusted mean differences in the levels of outcomes for respondents in in-person versus online learning, after adjustment for a variety of covariates.
<b>Results</b>	Compared to respondents engaged in in-person learning, respondents engaged in online learning reported less predictability, higher role conflicts and less support from supervisors and co-workers. Statistically significant differences in work pace, burnout and sleep troubles were also observed across learning modes, although these differences did not exceed previously suggested thresholds for minimum important differences.
<b>Conclusions</b>	Important differences in the psychosocial work environment were observed between respondents engaged in in-person learning versus online learning. Addressing these differences is required, given the potential continued importance of online learning within the context of the COVID-19 pandemic and beyond.
<b>Key words</b>	Psychosocial; burnout; stress; COVID-19; working population; Canada; education; virtual instruction.

## Introduction

The education sector has been heavily impacted by the COVID-19 pandemic. In many jurisdictions, part of a public health response to slow the spread of COVID-19

included closing schools for in-person learning. In Ontario, Canada, schools were closed in March 2020 and then re-opened for in-person learning, at the start of the 2020/21 school year, in September 2020. At the same time, the option of online learning was offered to students and

## Key learning points

### What is already known about this subject

- In many jurisdictions, part of a public health response to slow the community spread of COVID-19 included closing schools for in-person learning.
- While much of the debate around school closures (and re-openings) and modes of education delivery has focused on outcomes among school-aged children, less research has focused on the experiences of educators.

### What this study adds

- Among a sample of more than 5000 educators in Ontario, we observed important differences in predictability, role conflicts and support from supervisors and co-workers between respondents engaged in online versus in-person education. In each case, psychosocial exposures were worse among those engaged in online education.
- Although no meaningful differences in burnout were observed across learning modes, levels of burnout were high in our sample.

### What impact this may have on practice or policy

- With the potential for online learning to continue in jurisdictions, more work needs to be undertaken to better understand the psychosocial exposures associated with this learning mode.
- In addition, given the high rates of burnout and sleep troubles observed in general, the ongoing assessment of the psychosocial work environment and physical and mental health of educators is warranted.

their families, who did not want to return to face-to-face instruction [1]. Students engaged in online learning were still subject to attendance requirements, and educators engaged in online learning were required to provide ‘a daily schedule of subjects/courses according to a 5-hour instructional day with opportunities for frequent, live contact’, with the expectation of mostly synchronous learning [1].

Much of the debate around school closures (and re-openings) and modes of education delivery has focused on outcomes among school-aged children [2, 3], with less research focusing on the experiences of educators [4]. A study from China, conducted early in the pandemic, observed increased anxiety among educators, although limited aspects of the work environment were assessed, and there was no distinction between educators engaged in online and in-person teaching [5]. Understanding the experiences of educators is not only important from the perspectives of the teachers themselves, but educator health and subsequent support at work can also impact student academic and health outcomes [6]. The allocation of educators to remote and online learning at the same time provides an opportunity to compare the psychosocial work environment and health outcomes of educators in these different delivery models. As such, the objective of this paper is to compare dimensions of the psychosocial work environment among educators engaged in online learning and those engaged in in-person learning in the Canadian province of Ontario. In addition, we also examine two health outcomes related to the psychosocial work environment, burnout and sleep troubles.

## Methods

In early November 2020, an online survey was developed by the Occupational Health Clinics for Ontario Workers

(OHCOW) in collaboration with the Elementary Teachers Federation of Ontario (ETFO). ETFO represents over 83 000 educators employed in the public elementary schools of Ontario.

The Survey was open from 23 November to 21 December 2020. To encourage participation multiple emails to ETFO members were sent out, along with social media posts, with 5774 responses to the survey were recorded. The current paper focuses on respondents who were engaged in teaching activities either in-person or remotely on a regular basis ( $N = 5438$ ). Of the 336 respondents excluded, 152 respondents (45%) were not currently working, and 73 respondents (22%) were engaged in other types of instruction (e.g. simultaneous online and face-to-face instruction, or sending packages home). The study received approval from the University of Toronto Research Ethics Board.

Respondents described their current work situation and the types of instruction they had been engaged in since the start of the school year. Respondents who answered they were working at home for the full week or working at home and going into the school/worksite a couple of times per month and engaged in virtual instruction (synchronous or asynchronous) were defined as engaged in online education. Respondents who reported that they were working at the worksite but engaged in virtual instruction were also defined as engaged in online education. Respondents who reported they were working at the school/worksite for the whole week or working at home up to two full days per week and working at the school/worksite for the remainder of the week, and engaged in face-to-face teaching were defined as in-person educators.

Dimensions of the current psychosocial work environment were assessed using an abbreviated version of the

Copenhagen Psychosocial Questionnaire (COPSOQ) [7, 8]. The COPSOQ was used given the broad range of psychosocial exposures assessed with this instrument and its previous validation among Canadian workers [9]. Dimensions included: quantitative demands, work pace, predictability, role conflicts, social support from supervisor, and social support from co-workers (questions listed in Appendix). All scores were transformed to a 0 and 100 scale, with higher scores indicating greater demands, higher work pace, greater predictability, greater conflict, and higher support from supervisor or co-workers.

Minimally important differences for dimensions in the COPSOQ have been previously approximated using both a proportion of the standard deviation for each scale [10] and differences of five points on the 0–100 scale [11]. For simplicity, we used the latter definition to denote important differences across exposure groups.

Symptoms of burnout and sleep troubles in the past two weeks were assessed. Burnout using two items from the Copenhagen Burnout Inventory [12], and sleep disturbance using the Karolinska Sleep Questionnaire [13] (questions provided in Appendix). These scales were also transformed to 0–100 scores, with higher scores indicating more burnout and more sleep disturbance.

The following variables were included as covariates: age (grouped), sex (male/female), racial status (white versus those who self-identified as First Nations, Métis, Inuit and/or racialised), length of time working at the current school (less than one year, 1–4 years, 5–9 years, 10–19 years, 20+ years); their employment relationship (permanent teacher, long-term occasional teacher, short-term occasional teacher or support personal); grades taught (kindergarten, primary, junior, intermediate, junior and primary, junior and intermediate, other); if the respondent worked full-time (yes/no); if the respondent has worked their usual job since the start of the pandemic (yes/no), if the respondent had been required to self-isolate with their class (yes/no); if the respondent had done a mixture of virtual and in-person teaching since September; if the respondent's household had lost income since the pandemic started (yes/no), and the date the survey was completed.

To minimise bias in parameter estimates and standard errors, missing information on all variables was handled through multiple imputations [14, 15]. Variables with the highest level of missing information were racial status (34% missing), psychosocial work exposures (24% missing), gender (23% missing) and age, teacher type, grades taught, full-time/part-time status and whether the respondent was working their regular job (all 19% missing). Variables with the lowest level of missing data were the survey completion date, whether the respondent had done a mixture of virtual and in-person learning since September, if the respondent had been required to self-isolate (all with no missing values); and burnout and sleep troubles scores (3% missing). A total of 57% of the sample had complete information on all study variables.

In general, variables with higher proportions of missing data were located towards the end of the survey.

Imputation models included all analytical variables, as well as the following auxiliary variables: symptoms of depression as measured by the two-item Patient Health Questionnaire [16], symptoms of anxiety measured with the seven item Generalised Anxiety Disorder Questionnaire [17], exposure to bullying or harassment in the previous 12 months (yes/no), the general level of fear about the pandemic (0–10 scale), years of experience in the Ontario elementary school system, level of agreement that the union, the employer and the government were doing their best to protect/support workers (5-point scales), and a general rating of the psychological health and safety climate in their workplace (7-point scale from healthy/supportive to toxic) [9].

Initial analyses examined the distribution of all analytical variables and the relationships between variables to assess collinearity. Ordinary Least-Squares regression was used to examine the relationship between online and in-person learning, and all outcomes. For models examining burnout and sleep troubles an initial model was run including only study covariates, with a further model run with additional adjustment for psychosocial work exposures, given these exposures are mediators in the relationship between learning mode and burnout and sleep troubles. Given the collapsibility of model estimates, and assuming no interaction between exposure and mediator, the difference in coefficients between these models can be used to estimate the proportion of the effect of learning mode on burnout and sleep troubles mediated through psychosocial work exposures [18]. All models were run using PROC SURVEYREG in SAS with standard errors estimated using Taylor series approximation. PROC MI was used to generate 50 multiple imputation data sets and PROC MIANALYZE was used to pool estimates and standard errors. Given a high proportion of respondents were missing information on psychosocial measures (24% of the sample), we ran a series of sensitivity analyses among only respondents with complete information on psychosocial variables ( $N = 4126$ ) [19]. Estimates and conclusions from these models were similar. Only models with data from all respondents are presented in this paper.

## Results

Of the 5438 respondents, 724 (13%) were engaged in online instruction. Among these respondents, 492 (68%) were engaged in synchronous instruction while working from home, 20 respondents (3%) were working at home one to two days per week and at the school worksite for the rest of the week, and 212 (29%) were engaged in online instruction from the school/worksite for the whole week. Of the 4714 respondents defined as in-person educators, 4650 (99%) were working at the school/worksite for the whole work week.

**Table 1** presents the mean, standard deviations, skew and kurtosis estimates for psychosocial work exposures and burnout and sleep problems. The value in the table represents the average of each of the 50 imputed data sets, with the minimum and maximum values presented within the parentheses. Exposures with the highest values were social support from co-workers (mean 77.5) and work pace (mean 74.0). Measures with the lowest values were predictability (mean 45.9) and role conflicts (mean 53.3). Mean scores for burnout were 78.7 and sleep troubles 65.1. In general, all measures met the criterion for normal distributions, based on skew and kurtosis values [20].

**Table 2** presents the distribution of the study covariates across respondents engaged in online education and those engaged in in-person education, along with combined chi-square estimates from the pooled data sets. Compared to respondents engaged in in-person education, respondents engaged in online education were younger (24% under 35 years compared to 15%), more likely to identify as non-white (13% versus 9%), had shorter job tenure at their current school (35% less than one year of job tenure compared to 13%), were more likely to be teaching primary and junior grades (57% versus 36%), and more likely to live in a household that had lost income since the start of the pandemic (42% versus 36%). No differences were observed when remote and in-person respondents completed the survey, engagement in alternate forms of learning, and full-time/part-time status.

**Table 3** presents adjusted mean scores for each of the psychosocial work exposures for participants engaged in online learning and in-person learning. Compared to respondents engaged in in-person instruction, those in online learning reported less predictability (mean = 34.5 versus 48.5), higher role conflicts (mean = 56.5 versus 47.5) and less support from supervisors and co-workers (mean = 55.4 versus 68.2). A statistically significant difference was also observed for work pace, with those in online learning reporting higher work pace than those in

in-person learning, however, this difference was less than five points on the 0 to 100 scale. Quantitative demands were similar across groups.

**Table 4** presents the adjusted mean scores for burnout and sleep troubles for those in online learning versus in-person learning. Statistically significant differences were observed for both burnout scores and sleep troubles scores after adjustment for study covariates, with higher burnout and sleep troubles reported amongst those engaged in online learning (mean burnout = 74.7 versus 71.8; mean sleep troubles = 62.4 versus 59.6). However, in each case these differences were less than five points. Additional adjustment for psychosocial work exposures attenuated these differences.

We conducted post hoc analyses to examine differences in work exposures and burnout and sleep disturbance between the 492 respondents engaged in online instruction from home with the 232 respondents engaged in online instruction while working at the school worksite at least one to two days per week. All differences in exposures between these two groups were less than five points, with one exception. This was social support where educators engaged in online instruction at the worksite had scores approximately 10 points higher than those engaged in online instruction at home. However, those engaged in online instruction at the worksite still had average social support scores eight points lower than those engaged in in-person instruction. All these differences were statistically significant ( $P < 0.001$ ) (results not presented, but available from authors on request).

## Discussion

Our objective was to better understand differences in the psychosocial work environment between respondents engaged in online and in-person education in the Canadian province of Ontario. Compared to respondents engaged in in-person learning, respondents engaged in online learning reported less predictability, higher role conflicts and less support from supervisors and co-workers.

**Table 1:** Mean, standard deviation, skew and kurtosis values of psychosocial work exposures, burnout and sleep troubles outcomes across 50 imputed data sets. Ontario educators engaged in on-line or in-person education ( $N = 5438$ ).

	Mean <sup>1</sup>	SD	Skew	Kurtosis
Quantitative demands	66.9 (66.5, 67.3)	23.0 (22.8, 23.3)	-0.29 (-0.32, -0.26)	-0.33 (-0.38, -0.27)
Work pace	74.0 (73.7, 74.4)	20.4 (20.2, 20.7)	-0.71 (-0.74, -0.68)	0.40 (0.32, 0.48)
Predictability	45.9 (45.5, 46.1)	22.6 (22.3, 22.7)	-0.09 (-0.11, -0.06)	-0.48 (-0.53, -0.45)
Role conflicts	53.3 (52.8, 53.6)	25.9 (25.7, 26.2)	-0.16 (-0.18, -0.15)	-0.54 (-0.59, -0.50)
Social support from supervisors	65.2 (64.8, 65.6)	25.3 (25.1, 25.6)	-0.47 (-0.49, -0.44)	-0.41 (-0.46, -0.36)
Social support from co-workers	77.5 (77.3, 77.9)	22.9 (22.7, 23.2)	-0.93 (-0.96, -0.90)	0.57 (0.49, 0.66)
Burnout	78.7 (78.6, 78.8)	20.8 (20.7, 20.8)	-1.15 (-1.16, -1.13)	1.45 (1.40, 1.49)
Sleep troubles	65.1 (65.0, 65.2)	25.7 (25.6, 25.7)	-0.50 (-0.51, -0.49)	-0.38 (-0.40, -0.37)

<sup>1</sup>The values in the table represent the average value across the 50 imputed datasets. Estimates within the brackets represent the minimum and maximum values observed across the 50 imputed datasets.

**Table 2:** Distribution of study covariates. Ontario educators engaged in online or in-person learning ( $N = 5438$ ).

	Online	In-Person	Total	Combined Chi-sq <sup>1</sup>	P-value
<b>N</b>	724	4714	5438		
<b>Age</b>					
Less than 35	24%	15%	16%	10.71	< 0.001
35–44 years	35%	33%	34%		
45–54 years	30%	39%	37%		
55 + years	12%	13%	13%		
<b>Sex</b>					
Male	11%	8%	9%	3.53	0.061
Female	89%	92%	91%		
<b>Racial status</b>					
White	87%	92%	91%	10.03	0.002
Non-White	13%	8%	9%		
<b>Length of time at the school</b>					
Less than one year	35%	13%	16%	56.20	< 0.001
1–4 years	29%	24%	25%		
5–9 years	20%	26%	26%		
10–19 years	12%	27%	25%		
20 + years	4%	10%	9%		
<b>Employment relationship</b>					
Permanent teacher	80%	88%	87%	20.89	< 0.001
Long-term occasional teacher	17%	7%	8%		
Short-term occasional teacher/support personal	3%	5%	5%		
<b>Grades taught</b>					
Kindergarten	14%	14%	14%	22.60	< 0.001
Primary	30%	21%	22%		
Junior	28%	16%	17%		
Intermediate	14%	11%	11%		
Junior and primary	4%	7%	6%		
Junior and intermediate	3%	6%	5%		
Other	11%	36%	24%		
<b>Full-time</b>					
No	8%	10%	10%	2.57	0.108
Yes	92%	90%	90%		
<b>Worked in usual job</b>					
No	61%	14%	21%	585.76	< 0.001
Yes	39%	86%	79%		
<b>Required to self-isolate with class</b>					
No	99%	97%	97%	6.9	0.009
Yes	1%	3%	3%		
<b>Performed a mix of virtual and in-person teaching since September</b>					
No	86%	85%	85%	0.09	0.771
Yes	14%	15%	15%		
<b>Household lost income since start of pandemic</b>					
No	58%	64%	64%	9.36	0.002
Yes	42%	36%	36%		
<b>Median date of survey completion from index date (23 November 2020)</b>					
Median	3	1		1.7	0.090
Interquartile range	0–14	0–13			

<sup>1</sup>Combined chi-square to account for multiple datasets, given the use of multiple imputation for missing values.

Statistically significant differences in work pace, burnout and sleep troubles were also observed across learning modes, although these differences were less than previously suggested minimum important differences for the COPSOQ scales [11].

The results of this study should be interpreted given the following strengths and limitations. Although we have a large sample of educators in this study, ETFO has over 83 000 members. As such the 5438 respondents in this study represents less than 7% of the total ETFO



**Table 3:** Adjusted<sup>1</sup> mean scores for psychosocial exposures for educators involved in online versus in-person instruction (N = 5438).

	Online		In-person		P-value for diff
	Mean	95% CI	Mean	95% CI	
Quantitative demands	61.6	57.8–65.4	60.6	57.4–63.7	0.382
Work pace	71.5	68.1–74.9	67.9	65.0–70.8	<0.001
Predictability	34.5	31.3–37.7	48.6	46.1–51.2	<0.001
Role conflicts	56.5	52.4–60.6	47.5	44.2–50.8	<0.001
Social support from supervisors	55.4	51.4–59.4	68.2	65.2–71.3	<0.001
Social support from co-workers	63.8	60.5–67.1	78.8	76.4–81.2	<0.001

<sup>1</sup>Adjusted for age, gender, racial status, length of time at current school, employment relationship, grades taught, full time/part-time status, working a usual job if respondents had self-isolated, if the respondent had done a mixture of online and in-person education if the respondent’s household had lost income since the start of the pandemic, and date of survey completion.

**Table 4:** Adjusted mean burnout and sleep troubles scores for educators engaged in online versus in-person instruction (N = 5438).

	Online		In-person		P value for diff
	Mean	95% CI	Mean	95% CI	
<b>Model one<sup>1</sup></b>					
Burnout	74.7	71.3–78.0	71.8	68.9–74.7	0.003
Sleep troubles	62.4	58.6–66.2	59.6	56.6–62.6	0.022
<b>Model two<sup>2</sup></b>					
Burnout	73.4	70.3–76.5	75.1	72.4–77.8	0.047
Sleep troubles	60.7	56.7–64.4	62.2	59.3–65.2	0.186

<sup>1</sup>Adjusted for age, gender, racial status, length of time at current school, employment relationship, grades taught, full time/part-time status, working a usual job, if respondents had self-isolated if the respondent had done a mixture of online and in-person education if the respondent’s household had lost income since the start of the pandemic, and date of survey completion

<sup>2</sup>Adjusted for all variables in model one, plus an additional adjustment for psychosocial exposures listed in Table 3.

membership. It should be noted not all ETFO members will be working and may have chosen not to participate for these reasons. We examined the distribution of age, gender, full-time status and years of experience in our sample compared to information available from the ETFO membership database (which contains the information on 31 251 ETFO members). Compared to the ETFO membership database, our sample had fewer men (9% versus 16%), people 35 and younger (16% versus 21%), educators with less than 5 years of experience (11% versus 18%) and part time employees (10% versus 15%). However, in each of these underrepresented groups, we still have adequate numbers of respondents to include these groups in our analytical models, potentially limiting the extent to which these selection effects biases the relationship between online versus in-person learning and our outcomes [21]. All measures in our study were based on self-report, which can produce common-method bias.

In addition, abbreviated measures were used for some measures, including sleep troubles and burnout, which may result in a lack of information and reduce sensitivity and specificity of outcomes. We note, while reverse causality is always a concern in cross-sectional analyses, that the assessment of the learning environment (in-person versus online) by each respondent is unlikely to be impacted by the outcomes examined. Further, while both exposure and outcomes are self-reported we think it is unlikely that common method bias can fully explain the differences reported in our paper. While we had reasonably large proportions of missing observations across our psychosocial exposures, we used multiple imputation approaches to handle missing values, which increases confidence in the analytic estimates and associated standard errors for these outcomes [15]. Given the rapidly changing educational environment associated with COVID-19 in Ontario, study results should not be generalised beyond the point in time when our study was conducted.

Although no meaningful differences in burnout were observed across learning modes, levels of burnout were high in our sample. A previous study using similar measures to assess burnout in a sample of Canadian labour force participants, prior to the COVID-19 pandemic, observed that 12% of respondents had burnout scores of 75 and higher [22]. In addition, a previous study on European educators conducted in 2011 using the COPSOQ instrument observed mean burnout scores of 49 points [23]. In our sample we observed that 48% of our sample had burnout scores of 75 and higher, approximately four-times higher than the estimate from the Canadian labour force before the COVID-19 pandemic [22]; and a mean score of 78.7, almost 30 points higher than the previous study on European educators [23]. While noting that the abbreviated measures of burnout used in this study may partially explain these differences, given the relationships between high burnout and future absenteeism and job turnover [24] these elevated burnout scores in general among educators in Ontario are important to address. We also observed higher levels

of quantitative demands and work pace, and lower levels of predictability compared to a multi-country sample of workers in a study conducted prior to the COVID-19 pandemic, that assessed the work environment using the same COPSOQ III measure [8]. However, levels of role conflict and supervisor and co-worker support were similar between our sample and this previous study [8].

While we noted differences in many aspects of the psychosocial work environment between online educators and in-person educators, we did not observe important differences in burnout or sleep problems. It is possible that at the time of the survey (three to four months into the new school year), the observed differences in the psychosocial work environment between educators engaged in online and in-person instruction had not yet manifested in differences in burnout, potentially buffered by a sense of purpose and mission in maintaining educational instruction during a public health crisis. Our study highlights the need for continued assessments of the work environment and health outcomes of educators to better understand how prolonged exposure to these different education environments is related to psychosocial exposures and health outcomes.

In conclusion, in a sample of more than 5000 education workers in Ontario, surveyed three to four months into the 2020/21 school year we observed important differences in predictability, role conflicts and support from supervisors and co-workers between respondents engaged in online versus in-person education. In each case, psychosocial exposures were worse among those engaged in online education. With the potential for on-line learning to continue in jurisdictions more work needs to be undertaken to better understand the psychosocial exposures associated with this learning mode. In addition, given the high rates of burnout and sleep troubles observed in general, the ongoing assessment of the psychosocial work environment and physical and mental health of educators is warranted.

## Acknowledgements

We thank Tracie Edward from ETFO for her help in the survey design and dissemination of the survey, and for other ETFO staff who assisted with the survey distribution.

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. Authors Smith and Mustard work for the Institute for Work & Health (IWH) and authors Oudyk and Cedillo work for the Occupational Health Clinics for Ontario Workers (OHCOW). Both IWH and OHCOW are supported through funding from the Ontario Ministry of Labour, Training and Skills Development (MLTSD). The analyses, conclusions, opinions and statements expressed herein are solely those of the authors and do not

reflect those of the MLTSD; no endorsement is intended or should be inferred.

## Competing interests

None declared.

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