Canadian Journal of Educational Administration and Policy
Revue canadienne en administration et politique de l'éducation

CJEAP Canadian Journal of Educational Administration and Policy

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Emily E. Larson, Yihan Xu, Philip Oreopoulous and Sasha Tregebov

Number 203, 2023

URI: https://id.erudit.org/iderudit/1108430ar
DOI: https://doi.org/10.7202/1108430ar

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Publisher(s)

Department of Educational Administration, University of Saskatchewan

ISSN

1207-7798 (digital)

Explore this journal

Cite this article

Larson, E., Xu, Y., Oreopoulous, P. & Tregebov, S. (2023). Is it Too Optimistic to Assume Light Touch Interventions can Improve Educational Workers' Wellbeing? Insights from a Field Randomized Control Trial in Canada. *Canadian Journal of Educational Administration and Policy / Revue canadienne en administration et politique de l'éducation*, (203), 13–37. https://doi.org/10.7202/1108430ar

Article abstract

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Is it Too Optimistic to Assume Light Touch Interventions can Improve Educational Workers' Wellbeing? Insights from a Field Randomized Control Trial in Canada

Emily E. Larson[1], Yihan Xu[2], Philip Oreopoulous[3], & Sasha Tregebov[4]
[1]Behavioral Insights Team (USA), [2]Behavioral Insights Team (UK),
[3]University of Toronto, [4]Behavioral Insights Team (Canada)

Author's Note

This project was funded by the McConnell Foundation, a private family foundation that supports Canadians in building a more inclusive, innovative, sustainable, and resilient society. McConnell Foundation faculty played a role in all phases of the project, advising on and approving both intervention and research design, as well as facilitating qualitative research with Canadian educators. Competing interests: The author(s) declare none.

Abstract

Educator wellbeing has broad implications for students and schools. Current approaches to address this problem are generally resource-intensive. This trial used novel nudges to increase wellbeing and decrease burnout among educators and other school-based faculty. We designed a light touch intervention where T1 received evidence-based wellbeing weekly text messages and T2 received weekly messages plus leadership endorsement emails. We evaluated this intervention in a large-scale three-arm RCT with participants (n=1,155) from K-12 schools in Manitoba, Alberta, and British Columbia. When compared to the control group, we saw no significant difference between the control group and T1 and T2 groups on burnout or wellbeing. The failure of these evidence-based text messages in increasing educators' wellbeing and reducing their burnout highlights both the difficulty of addressing this problem and the importance of learning lessons from trials with null results to contribute to our knowledge base of improving educators' wellbeing.

Keywords: wellbeing, burnout, education, nudges, randomized controlled trial, schools

Operational Definitions

A variety of terms are used to refer to those working in the education system. To provide clarity to our readers throughout this article, we have operationally defined the following terms:

- Principals/administrators will be referred to as Administrators. These individuals worked either at the leadership level of the school or to support the leadership staff.
- Educator, teaching, and non-teaching staff will be referred to as Faculty. This includes teachers in the classroom and their assistant teachers (or support staff for those students who require more time and attention).
- Staff: This group refers to all other workers who do not sit at the administration level, nor do they play a significant role in the classroom. For example, these individuals might be bus drivers, janitors, or cafeteria staff.

- Participants: this refers to all individuals (regardless of their sub-group above) who consented to being a part of this trial.

Positive Benefits of Faculty Wellbeing

Positive school faculty wellbeing has been strongly associated with higher student wellbeing and lower levels of student psychological distress (Harding et al., 2019). A study of 24,100 faculty in UK schools found that faculty wellbeing accounted for 8% of the variance in student standardized test scores (Briner & Dewberry, 2007). Research suggests this relationship might be mediated by teacher 'presenteeism (working while sick)' and quality of teacher-student relationships (Sisask et al., 2014).

Implications of Low Educator Wellbeing

Findings from the Wellbeing in Secondary Education (WISE) pilot study found that, among a sample of 555 secondary school teachers, scores on the Warwick Edinburgh Mental Wellbeing Scale were approximately four points below the average of the general working population. Poor wellbeing amongst teachers has a variety of implications for the school, faculty, and students such as increased absenteeism, presenteeism, and health-related workplace retirement (Bowers & Melver, 2000; Henderson et al., 2011; Melchior et al., 2007). Research highlighted how teachers with lower levels of wellbeing had worse relationships with students and a lower quality of teaching (Cann, 2019).

Further implications of low wellbeing are manifested in higher rates of burnout. It has been estimated that teacher burnout costs $2.2 billion annually, making it both a mental health concern and major policy priority (Ingersoll & May, 2011). Several studies have identified teacher burnout as a growing problem, with as many as a third of teachers internationally identified as being stressed or extremely stressed (Collie et al., 2012). A National Canadian Teacher Federation survey showed that 79% of teachers in Canada believed their stress related to work-life imbalance had increased in the last five years, with 85% of teachers reporting that work-life imbalance was negatively affecting their ability to teach (Froese-Germain, 2014).

Despite decades of research on solutions to work-related burnout and wellbeing, there remain many challenges and limited progress such as lack of clarity on what interventions work reliably, lack of evidence on programs that can be scaled beyond a single classroom or school (Iancu et al., 2018), weak conclusions generated from studies of small samples and narrow inclusion criteria (Huppert & Ruggeri, 2018; Klingbeil & Renshaw, 2018; Naghieh et al., 2015), lack of evidence for long-term benefits (Huppert & Ruggeri, 2018), programs that attempted to help being costly and time intensive (Klingbeil & Renshaw, 2018), and interventions not designed based on teacher-specific stressors, nor with a focus on school faculty (e.g., school leadership and support faculty) (Iancu et al., 2018).

The use of nudges for wellbeing and burnout has the potential to overcome some of the limitations mentioned above by developing interventions that are more scalable across schools/school systems and much less resource intensive. Some researchers have outlined the potential for these light-touch solutions to improve mental health (Woodend et al., 2015). Indeed, some initial work has shown promising results of "nudging" in workplace wellbeing. In one trial, 911 dispatchers received emails that encouraged a stronger sense of professional identity and a shared sense of community. Receiving the series of emails and accompanying stories led to a 39% reduction in burnout score on a validated scale, and reduced resignations by about 30% over a six-month period following the intervention (Linos et al., 2019). More recently, a series of studies conducted in Taiwan and the U.S. found that while people anticipated gratitude to be better received when delivered face-to-face (rather than via texts), they were equally well-received (Sheldon & Yu, 2021). This finding implies that traditional face-to-face counseling can be replaced by (or at least supplemented with) lighter touch communication, such as text messages.

Despite the promise for behavioral science to help improve wellbeing and decrease burnout, the application is still new, especially in education settings. It is critical to develop tailored solutions specific to the context and to have them rigorously evaluated.

Intervention Development

Our study set out to develop and test a contextually relevant, low-cost, scalable "nudge" (i.e., it did not require financial incentives, structural changes to school administration, or other requirements that

would limit its applicability across schools) aimed at reducing school faculty burnout and increasing wellbeing in Canada.

Outline of Intervention Development

To tailor our intervention for Canadian educators, the authors conducted a literature review on wellbeing, burnout, and school culture change as well as doing fieldwork in Vancouver, BC. We did not conduct fieldwork in other provinces due to time and budget constraints. The fieldwork included 25 qualitative interviews with principals/administrators (n=10), teaching and non-teaching faculty (n=13) and school district administrators (n=2); and consultation with five leading academics and three organizations specializing in wellbeing in Canada. Our work uncovered some consistent themes around the factors that contribute to low wellbeing and burnout.

Factors that Affect Wellbeing and Burnout

Through the literature review, we identified four broad categories of determinants of teachers' wellbeing: relationships at work, workload, sense of belonging, and internal locus of control. For each category, we identified a few key components outlined in Table 1.

Table 1

Summary of General Factors that Affect Teachers' Wellbeing

Category	Component	Description
Relationships at work	Collegial relationships	While isolation from colleagues is often cited as a source of school faculty burnout, strong collegial relationships are linked to higher levels of teacher satisfaction, enthusiasm, motivation, and commitment as well as lower levels of emotional stress (Shah, 2012).
	Teacher-student relationships	Qualitative and correlational studies have identified teacher-student relationships as a significant source of motivation and workplace enjoyment for school faculty (Shah, 2012). Meanwhile, 'conflictual' or 'alienated' relationships with students can exert a negative influence on both personal and professional faculty wellbeing (O'Connor, 2008).
	School climate	School climate refers to "the atmosphere, culture, resources, and social networks of a school" (Loukas & Murphy, 2007) and comprises four dimensions: "'physical and social– emotional safety, quality of teaching and learning, relationships and collaboration and the structural environment". Faculty perceptions of school climate have been shown to impact educator wellbeing (Skaalvik & Skaalvik, 2009), workplace satisfaction (Taylor & Tashakkori, 1995), and teaching efficacy (Pas et al., 2003).
Workload	Student behavior	Student behavior has a strong influence on teacher wellbeing. Researchers have suggested that this relationship is moderated by faculty coping strategies and self-efficacy (Hastings & Bham, 2003). Misbehavior may also contribute to poor faculty wellbeing through compromising teacher-student relationships.
	Acknowledging strengths	Teacher wellbeing can be nurtured by recognizing skill diversity amongst school faculty and individual strengths (Noble & McGrath, 2012).

Category	Component	Description
Sense of belonging	Prosocial values	Prosocial values are often a significant driver for school faculty. Emphasizing these alongside the values of respect, acceptance, and care to both faculty and students can improve wellbeing (Jennings & Greenberg, 2009).
	Sense of belonging	For faculty, feeling connected to school, or having a sense of self-efficacy and purpose, can contribute to wellbeing (Jennings & Greenberg, 2009). This can be cultivated by encouraging participation in decision making processes, fostering school pride, and ensuring teachers believe in the school's norms and values (Saalvik & Saalvik, 2011).
	Positive communication	Positive communication both horizontally, between colleagues, and vertically, between faculty and administrators, is a contributor to job satisfaction and wellbeing (De Nobile, 2008).
Internal locus of control	Autonomy	Faculty job satisfaction is higher, and stress is lower when administrators (e.g. school leaders) allow faculty more autonomy over what they do in school (Davis & Wilson, 2000).
	Social-emotional competence	Social-emotional competence (SEC) includes the ability to identify and manage emotions, cultivate and maintain positive relationships and manage interpersonal situations, make appropriate decisions, and display concern for others (Jennings & Greenberg, 2009). SEC has been identified as influencing faculty wellbeing and job satisfaction and is important for effective classroom management, healthy teacher (e.g., faculty)-student relationships, a healthy classroom environment, and implementation of socio-emotional learning activities.

Through the fieldwork, (i.e., 25 interviews with administrators, faculty, and staff) we identified four key stressors acting as barriers to educator wellbeing: changes to the curriculum, behavior management, unions/pay negotiations, and an inability to "switch off." We also identified three key enabling factors that promote wellbeing: interactions with kids, getting support from other faculty, and collaboration with colleagues. Table 2 presents a summary of the key stressors and enabling factors.

Table 2

Summary of Key Stressors & Enabling Factors According to Interviews

Category	Component	Description
Stressors	Workload	A key stressor emphasized by administrators and faculty were changes to the curriculum in BC, which faculty felt had increased their workload. Many complained of having: ”so much to do, so little time.” Faculty mentioned new methods of assessment, report cards, and changes to the frequency of provincial exams and the introduction of portfolio marking[1] as adding to their workload and contributing to stress.
	Behavioral management	Behavior management was regarded by faculty as a significant stressor: “having challenging students and not having the solutions [causes stress].” One faculty member described how, perhaps counter-intuitively, her fourth year in teaching was the hardest as she had a challenging class with behavioral issues for the second year in a row, with detrimental effects on her wellbeing. At one elementary school, faculty felt that student behavior was getting worse and that parents should be doing more to prepare their children for school. These kinds of behavioral challenges led one faculty member to ask, “Can I do this till I’m 65?”
	Unions and pay negotiations	A significant factor influencing both the relationship between administrators and faculty and the wellbeing of both groups was the role of teacher unions in BC. Administrators are not part of the teachers’ union in BC. Recent faculty strikes, and the possibility of strike action in September, were front of mind for many educators we spoke to. Many noted that, “there is a real possibility [teachers] will strike.”
	Not switching off	The all-encompassing nature of both the administrators and faculty roles meant that both groups said they sometimes struggled to switch off; “this is a hard job to not be here for”, “you are always thinking about the kids.”
Enablers	Interactions with kids	The number one enabling factor for all groups (e.g., administrators, faculty, and staff) was their interactions with children, resulting in “ridiculous, fabulous moments”. Even after discussing all the factors that negatively impacted their wellbeing, most concluded, “it is a fun job.” One administrator told us a story about a child with complex needs dancing spontaneously at the end of assembly, and the whole school joining in: “the kind of thing you just don’t get in any other job.”
	Support from other faculty	Almost all faculty reflected on the importance of support from other colleagues, for example: “I think our best support is each other”, “for me, it’s connection” when referencing other faculty. Particularly at smaller schools, teaching faculty reported “having each other’s backs.”
	Collaboration	Almost all faculty told us how much they enjoyed working with each other. Unfortunately, this was often more of a hypothetical energizer than one borne out in reality. An exception was a school where the administrator reported enabling faculty to watch each other teach by covering lessons herself. In some cases, small department sizes meant that opportunities for collaboration were naturally limited. For example, in a Physics department with only two faculty members, there is only one other faculty member you could possibly collaborate with.

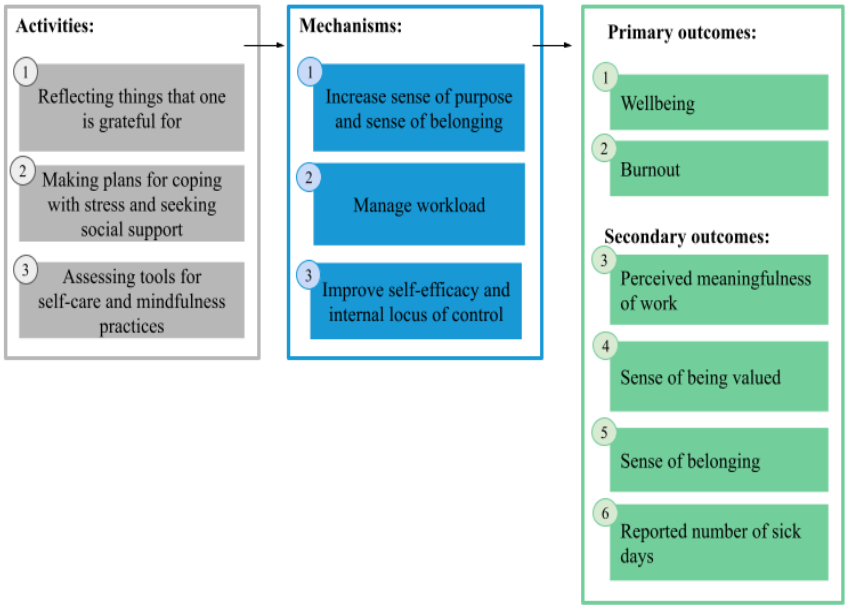
[1] This involves explaining to students what a mark of ‘80’ really means in relation to their understanding, rather than just awarding a mark.

Development of Theory of Change

Equipped with the understanding of the general factors that affect wellbeing and burnout based on the existing literature and a more contextual understanding of the factors leading to better wellbeing and lower burnout in Canada, we developed a theory of change model to increase wellbeing and lower burnout for school administrators, faculty, and staff in Canada.

Figure 1

Theory of Change to Increase Educators' Wellbeing and Lower Burnout



Development of Text Messages and Principal Emails

Based on the conceptual model of theory, we developed a nudge-style randomized control trial intervention. We randomized participants into three groups to test our theory of change, where group 1 acted as the control group (e.g., getting no messages or emails); treatment group 1 received weekly wellbeing text messages; and treatment group 2 received both weekly wellbeing text messages alongside four-additional emails from their school administration (e.g., principals). These messages aimed to bring attention to the importance of wellbeing and burnout, to communicate school leadership recognition of their importance, and, most significantly, to equip educators with evidence-based practices to support their wellbeing. While these messages would not address some of the most important "root causes" of burnout and reduced wellbeing, like workload and managing the behavior of difficult students, given the promise from light-touch interventions (e.g., Linos et al., 2019), we believed that it was worth testing this type of individually focused intervention.

We identified 12 themes that showed the most empirical evidence for increasing gratitude, helping manage workload, increasing sense of belonging, and restoring internal locus of control. They include ideas such as prompting school faculty to practice mindfulness, sending stories from past students about the impact teachers had on their lives, and simple practices for switching off at the end of the day. See full list of text message themes in the Appendix 1.

Based on these themes, we created three separate schedules of Short Message Service (SMS) messages tailored for faculty, administrators, and staff. For example, the message below was designed to get education faculty to use implementation intentions to prepare for stressful situations:

> Having a go-to technique for relieving stress can be really helpful. Complete this sentence: 'If I'm feeling overwhelmed I will _____.' e.g. I will take a quick walk outside. This website has some great tips that might help! http://bit.ly/2q6dW22 - well@work

These messages were piloted with a group of faculties, administrators, and staff to check for appropriateness and tone.

Similar to the development of the text messages, we identified four empirical concepts (wellbeing endorsement, fresh start, COVID-19 support[2], and gratitude) as the basis for the administrator (leadership) emails. While we developed these emails for administrators (e.g., principals) to send, we included guidance on how principals could tailor and personalize them to fit their own schools' culture and context. Before the start of the trial, we got input and feedback from a number of administrators on the tone and content of the template emails as well as the preferred frequency of communication.

Methods

Experimental Design

In order to robustly evaluate which intervention was most effective in increasing school's wellbeing level and reducing burnout level, we ran a 3-arm randomized controlled trial. Participants were randomly assigned to three groups.

- Control — participants received one text message with links to wellbeing resources but did not receive the intervention materials until the 2020/21 school year.
- Treatment 1 — participants received a behaviorally informed weekly wellbeing program from November 2019 until June 2020, delivered by text message. Text messages shared a common theme and were tailored to three subgroup audiences (administrators, faculty, and staff) to increase relevance.
- Treatment 2 — participants received the behaviorally informed weekly wellbeing program and additionally received emails endorsing the program from the school leadership team. Similar to Treatment 1, text messages were also tailored for three subgroups of recipients.

The randomization was conducted at school level to minimize spill-over risks and it was stratified by Canadian province (British Columbia, Alberta, and Manitoba) to achieve a similar number of schools from each province in each experimental arm.

Participants and Procedure

We calculated the minimum required sample size assuming 80% power at a 0.05 significance level using the R package "pwr" (Helios & Rosario, 2020). We expected that a baseline sample of 1,212 participants would be sufficiently powered to detect a minimum effect size of 0.2 Cohen's d for both primary outcome measures, assuming an attrition rate of no more than 50% and a modest correlation (r^2=0.5) between baseline and endline outcome measures.

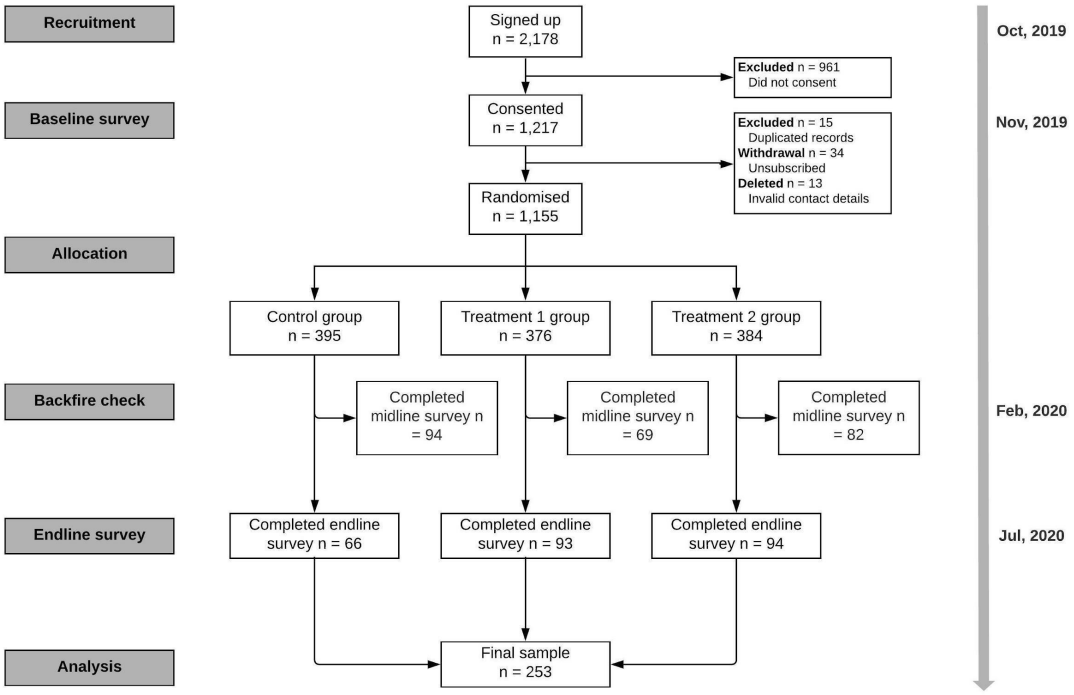
We recruited participants primarily via the WellAhead's network of contacts. We advertised the opportunity to participate in this trial on WellAhead's website and reached out to individuals on their mailing lists. Our inclusion criteria were broad; only private schools were excluded from participating. To achieve a broader geographic representation, we recruited participants from three Canadian provinces, five school districts, and 109 schools.

A total of 2,178 participants responded to our invitation, and 1,217 of them completed our baseline survey and consented to participate in this study. Among those participants, 13 of them did not provide valid contact details, and 15 of them were duplicate records. During the trial period, 34 participants unsubscribed: 15 of them were from the first treatment group, 19 from the second treatment group, and none from the control group. Among the remaining 1,155 participants, 253 completed the endline survey, which constituted our final sample for main analysis (see Figure 2 for participant flow).

[2] Our original trial did not include this theme; this theme was adapted due to the impact of COVID-19 during our trial.

Figure 2

Participant Flow from Recruitment to Analysis



To minimize spill-over effects, participants were randomized at school level, stratified by Canadian province (British Columbia, Alberta, and Manitoba), school district (5 districts + pseudo-district of individually recruited schools), and type of school (elementary, middle, secondary/high, and mixed). The randomization of the final sample was balanced except for province, which we included as a covariate in the regression analysis. Table 3 presents the characteristics of the final sample and randomization balance checks.

Table 3

Sample Characteristics and Randomization Balance Checks

	Whole sample	Treatment condition			Test statistics for difference across conditions
		Control (n=65)	Treatment 1 (n =86)	Treatment 2 (n=87)	
Age	44.9	46.2	45.1	44.1	F (2, 250) = 1.04, p = .35
(Mean (SD))	(9.2)	(8.5)	(8.9)	(10.6)	
Gender					
Female (n = 207)	81.8%	77.3%	79.6%	87.2%	$\chi^2(4) = 6.11$, p = .19
Male (n = 37)	14.6%	21.2%	16.1%	8.5%	
Prefer not to say (n = 9)	3.6%	1.5%	4.3%	4.3%	
		Faculty type			
Teacher (n = 128)	50.6%	56.1%	43.0%	54.3%	$\chi^2(8) = 5.75$, p = .67
Administrator (n = 15)	5.9%	6.1%	7.5%	4.3%	
Principal (n = 24)	9.5%	9.1%	10.8%	8.5%	
Support faculty (n = 60)	23.7%	22.7%	28.0%	20.2%	
Others (n = 26)	10.3%	6.1%	10.8%	12.8%	

	Whole sample	Treatment condition			Test statistics for difference across conditions
		Control (*n*=65)	Treatment 1 (*n* =86)	Treatment 2 (*n*=87)	
		School type			
Elementary (*n* = 103)	40.7%	39.4%	28.0%	33.0%	$\chi^2(4) = 5.56$, $p = .23$
Middle/High (*n* = 80)	31.6%	31.8%	22.6%	37.2%	
Mixed-Elementary (*n* = 70)	27.7%	28.8%	20.4%	29.8%	
		School district			
Individual (*n* = 112)	44.3%	39.4%	28.0%	46.8%	$\chi^2(8) = 12.2$, $p = .14$
Calgary Catholic (*n* = 34)	13.4%	9.1%	6.5%	18.1%	
Elk Island Catholic (*n* = 22)	8.7%	7.6%	5.4%	9.6%	
Frontier School Division (*n* = 50)	19.8%	22.7%	16.1%	20.2%	
Medicine Hat (*n* = 35)	13.8%	21.2%	15.1%	5.3%	
		Province			
Alberta (*n* = 99)	39.1%	50.0%	37.6%	33.0%	$\chi^2(4) = 14.1$, $p = .007$
British Columbia (*n* = 42)	16.6%	24.2%	10.8%	17.0%	
Manitoba (*n* = 112)	44.3%	25.8%	51.6%	50.0%	

Note. Those questions were optional for participants. ANOVA and Chi-square tests were used to test differences across conditions.

Overview of Implementation

We used an automated texting platform to send weekly messages to participants. Treatment groups received weekly wellbeing messages on Tuesdays at 9am.[3] Participants had the option to opt-out of receiving these messages at any time by texting "STOP". In total, participants in treatment groups received 37 messages from November 4, 2019 - July 20, 2020. In addition to these text messages, treatment group two received four emails written by us but personalized and sent from their administrators (i.e., principal).

During the trial period, COVID-19 drastically changed the daily routine of all participants in our treatment groups. Many schools were shut down. Given this disruption, all text messages from February 2020 until the end of the trial were reviewed and, where necessary, re-written to ensure sensitivity and appropriateness to the new context. For example, messages post-COVID-19 explicitly reference the impact of the pandemic on daily routines:

> For many of you, your day-to-day work has changed significantly. We know there are a lot of resources meant to support you on how to teach remotely. While helpful, it can be overwhelming to take in so much new information. Your students, parents and schools know you are doing the very best you can. This week, take a moment to acknowledge all the incredible work you are doing and give yourself a break - no one is perfect! -well@work

[3] Based on our qualitative interviews, school faculty expressed they were more likely to pay attention to messages that didn't come on a Monday or Friday at the beginning of their day (e.g., 9am).

Measures

We had three categories of outcomes: primary, secondary, and exploratory. All outcomes were assessed by online surveys and the primary and secondary outcomes were administered at both baseline (upon sign-up to the trial) and endline (two weeks after the end of the trial), whereas the exploratory ones solely at endline. The primary outcomes were also assessed three months into the trial to check whether our interventions backfired, which they did not. The detailed operationalization of the outcomes is presented below.

The Primary Outcomes

Wellbeing. Wellbeing was measured by the widely used and well-validated Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) (Kidger et al., 2016; Shah 2020). The SWEMWBS was designed to measure positive mental wellbeing and it comprised seven items, such as "I've been feeling optimistic about the future," "I've been feeling relaxed," and "I've been feeling close to people." Participants indicated how much they agreed or disagreed with each item from 1 (strongly disagree) to 5 (strongly agree). The scale can range from 7 (lowest wellbeing) to 35 (highest wellbeing). In UK general population sample, SWEMWBS has an average score of 23.5 (SD=3.9), and those with the top 15% mental wellbeing scored 27.5 and above, whereas those with the bottom 15% scored below 19.5 (Ng et al., 2017).

Burnout. Burnout was measured by the Copenhagen Burnout Inventory (CBI) (Kristensen et al., 2005). The CBI (work subscale) was designed to measure burnout in a work-setting and showed high validity and reliability (Kristensen et al., 2005) and was validated in two studies in New Zealand (Milfont et al., 2008) and Italy (Fiorilli et al., 2015). It comprised seven items, including "I feel burnt out because of my work," "My work is emotionally exhausting," and "I feel exhausted in the morning at the thought of another day at work." Participants answered each item using a semantic scale (never, seldom, sometimes, often, and always), which was converted into a continuous scale (never = 0, always = 100, in an interval of 25). The CBI score was calculated by averaging the score of the seven items and could range from 0 (minimum burnout) to 100 (maximum burnout). We estimated the score as 40 (SD=20) from previous studies that measured work-related burnout among healthcare professionals in various countries: Denmark (Kristensen et al., 2005), Taiwan (Chou et al., 2014), New Zealand (Chambers et al., 2016), and Australia (Parr et al., 2016).

The Secondary Outcomes

Meaningful-ness of Work. Perceived meaningfulness of work was measured by the question: "How meaningful do you find your work in general?" (0 = not at all, 10 = very much)

Feeling of being Valued. Feeling of being valued at work was measured by the question: "How valued do you feel as a faculty member?" (0 = not at all, 10 = very much).

Perceived Belongingness. Perceived belongingness at work was measured by the question: "When you walk into school do you feel a sense of belonging with your colleagues?" (0 = not at all, 10 = very much).

Absenteeism. Absenteeism (self-reported) was measured by the question: "Over the last 6 months, approximately how many sick days have you taken off work?" Participants entered a numeric value.

Presenteeism. Presenteeism (self-reported) was measured by the question: "Over the last 6 months, did you work when you were sick?". Participants answered Yes or No.

The Exploratory Outcomes

Attention to Wellbeing Resources. Attention to wellbeing resources were measured by the question "In light of COVID-19 have you found yourself paying more, less or the same amount of attention to wellbeing resources?" Participants had three options to choose from: "more", "less", and "same amount".

Action on Wellbeing Advice. In light of COVID-19 have you found yourself more, less or equally likely to take action on wellbeing advice? Participants had three options to choose from: "more", "less", and "equally".

Perceived Impact by COVID-19. Impact by COVID-19 was measured by this question: "To what

extent has COVID-19 affected your wellbeing?" (0 = not at all, 10 = very much)

Primary Analysis

Our primary outcome measures of interest were SWEMWBS and CBI for school faculty, which measured self-reported mental wellbeing and burnout, respectively. We hypothesized that the interventions would increase subjective wellbeing and decrease burnout scores compared to control. The analysis of scores used an ordinary least squares (OLS) linear model:

1. $Y_i = \beta_0 + \beta_1 \cdot Treatment_i + \alpha \cdot School_i + \eta \cdot BalanceVars_i + \theta \cdot Covars_i + \varepsilon_i$

Where:

- Y_i is the outcome of interest (SWEMWBS or CBI score at endline) for each individual i.
- $Treatment_i$ is a dummy variable indicating which group participants were assigned to (0 = Control group, 1 = Treatment one group, 2 = Treatment two group).
- $School_i$ is a fixed-effects school ID variable.
- $BalanceVars_i$ i is a set of variables used for stratification and balance checks during randomization: province, school district, school type. Only province was included in the model as all other variables were well-balanced.
- $Covars_i$ is a set of all covariates of interest: age, gender, faculty type, baseline SWEMWBS or CBI score.
- ε_i is the individual error term, clustered at the school level.

Additionally, we analyzed whether there was a difference in SWEMWBS scores when pooling both interventions together and comparing to control:

2. $Y_i = \beta_0 + \beta_1 \cdot TreatmentPooled_i + \alpha \cdot School_i + \eta \cdot BalanceVars_i + \theta \cdot Covars_i + \varepsilon_i$

Where:

- $TreatmentPooled_i$ is a dummy variable indicating whether participants were assigned to the treatment groups (0 = Control group, 1 = Treatment 1 or Treatment 2 group).
- All other variables are the same as above.

All analyses were intent-to-treat (ITT), as we could not verify whether or how much each participant engaged with the intervention, though the text messages were sent to all opted-in faculty.

Secondary Analysis

We also tested whether interventions made a difference on any of the secondary outcome measures: perceived meaningfulness of work, feeling of being valued at work, perceived belongingness at work, number of sick days (extent of absenteeism), and occurrence of working while sick (presenteeism). We did the analyses using the same linear regression models as specified in formula (1) and (2), substituting the measure of interest where relevant.

Exploratory Analysis

Since the COVID-19 pandemic swept across Canada during our trial period[4], we added a few exploratory outcome measures: attention to wellbeing resources, action on wellbeing advice, and perceived impact of COVID-19. We explored whether the effects of interventions varied with the extent to which participants were impacted by COVID-19. We hypothesized that the interventions would encourage participants to pay more attention to the wellbeing resources and to act on wellbeing advice, thus decreasing their perceived impact of COVID-19.

We also hypothesized that the effects of interventions would be moderated by the perceived impact of COVID-19. We did the analyses by adding interaction terms to between the moderators and the treatment condition to the OLS regression models as specified in formula (1):

[4] School closures in British Columbia, Alberta and Manitoba began roughly in March 2020.

$$Y_i = \beta_0 + \beta_1 \cdot Treatment_i + \beta_2 ImpactCOVID + \beta_3 Treatment_i \cdot ImpactCOVID_i + \alpha \cdot School_i + \eta \cdot BalanceVars_i + \theta \cdot Covars_i + \varepsilon_i$$

Where:

- *ImpactCOVID* is a categorical variable derived from participants' rating of perceived impact by COVID-19 (0 = minimal impact, 10 = maximum impact). Those that rated lower than 4 were categorized as "low impact", those that rated above 7 were categorized as "high impact", and the rest as "medium impact").
- $Treatment_i$ * *ImpactCOVID* is an interaction between treatment and perceived impact of COVID-19.
- All other variables are the same as above.

Results

Attrition

We observed attrition from baseline to endline in survey completion (see the Appendix 2). The profile of participants that completed both surveys differed from that completed baseline survey only, though the difference was modest in absolute terms. Those that completed both were older (44.9 vs. 42.6), had higher proportion of females (81.8% vs. 78.4%), had lower proportion of teachers (50.6% vs. 58.1%), more years working at school (15.1 vs. 12.5), and fewer number of students. Despite the difference in profile, their baseline measurements in primary and secondary outcomes were not statistically significantly different.

The attrition rate might seem high as only 253 out of the 1217 consented participants completed the endline survey. However, it was understandable given that this study ran for almost a year and most of the trial period overlapped with the pandemic, and it was comparable (and even higher) to a similar trial taking place during the COVID-19 pandemic (Brazier et al., 2022).

We also observed some differential attrition in terms of response rate (see supplemental information B). Though response rate was similar at the midline backfire check ($\chi^2(2) = 3.43$, $p = .18$), it was different at the endline — only 26.1% of participants in the control group responded to our endline survey, whereas 36.8% and 37.2% in the treatment one and two groups did so, respectively ($\chi^2(2) = 9.55$, $p = .008$). This difference was not surprising, as participants in the control group did not receive text messages and probably felt less engaged and motivated to complete the endline survey.

Despite the attrition, the control and treatment groups of the final sample had similar baseline measurements in primary and secondary outcomes, which could mitigate the impact of attrition on the estimating the treatment effects.

Engagement with Intervention Materials

We sent 37 weekly text messages and four leadership emails to participants assigned to the treatment groups during the trial period from October 2019 to June 2020, and 94% were successfully delivered. Only 34 participants unsubscribed, suggesting that participants did not find the messages too obtrusive. Overall, participants' engagement with our intervention materials were satisfactory.

Main Findings

Table 4a and 4b present the descriptive statistics of participants' primary and secondary outcome measures at baseline and endline. There was a general deterioration trend in participants' overall wellbeing from baseline to endline across all conditions. On average, for participants that completed both baseline and endline surveys, their wellbeing score decreased by 1.3 points from baseline to endline ($p < 0.001$), whereas their burnout score remained relatively stable from baseline to endline ($p = 0.24$). Meanwhile, they felt their work was less meaningful ($p < 0.001$), they were less valued ($p = 0.006$), and had less sense of belonging while working ($p < 0.001$). They took more sick leaves ($p = 0.06$) and were also less likely to have worked while sick ($p < 0.001$).

Table 4a

Descriptive Statistics of the Primary and Secondary Outcome at Baseline

Outcome measures (score range)	Baseline, *Mean (SD)*			
	Control (*n*=66)	Treatment 1 (*n*=93)	Treatment 2 (*n*=94)	Total (*n*=253)
	Primary			
Wellbeing score (7~35)	25.7 (3.8)	25.3 (4.3)	25.6 (3.5)	25.5 (3.8)
Burnout score (0~100)	51.9 (14.8)	50.2 (14.7)	50.6 (14.6)	50.8 (14.4)
	Secondary			
Feeling meaningful (0~10)	8.5 (1.4)	8.5 (1.4)	8.4 (1.6)	8.4 (1.4)
Feeling valued (0~10)	7.0 (2.5)	6.7 (2.3)	7.2 (2.0)	7.0 (2.2)
Sense of belonging (0~10)	7.1 (2.6)	6.9 (2.6)	7.5 (2.1)	7.2 (2.4)
Number of sick days (0~100)	2.6 (3.5)	3.8 (9.6)	3.5 (5.0)	3.4 (6.7)
Having worked while sick (Yes %)	86.4%	77.4%	88.3%	83.8%

Table 4b

Descriptive Statistics of the Primary and Secondary Outcome at Endline

Outcome measures (score range)	Endline, Mean (SD)			
	Control (n=66)	Treatment 1 (n=93)	Treatment 2 (n=94)	Total (n=253)
	Primary			
Wellbeing score (7~35)	25.0 (3.7)	23.9 (4.4)	24.7 (3.0)	24.5 (3.8)
Burnout score (0~100)	52.9 (14.1)	50.6 (14.6)	52.0 (12.1)	51.7 (13.6)
	Secondary			
Feeling meaningful (0~10)	8.1 (1.7)	8.0 (2.0)	7.9 (1.7)	8.0 (1.8)
Outcome measures (score range)	Endline, Mean (SD)			
	Control (n=66)	Treatment 1 (n=93)	Treatment 2 (n=94)	Total (n=253)
Sense of belonging (0~10)	6.8 (2.6)	6.4 (2.8)	6.8 (2.5)	6.7 (2.6)
Number of sick days (0~100)	4.6 (13.3)	4.7 (11.7)	5.8 (15.4)	5.1 (13.5)
Having worked while sick (Yes %)	71.2%	68.8%	73.4%	71.1%

Note. The primary outcomes wellbeing score and burnout score were measured by the Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) (Kidger et al., 2016; Shah 2020) and the Copenhagen Burnout Inventory (CBI) (Kristensen et al., 2005), respectively. Secondary outcomes were measured by survey questions where participants indicated their answers using a 11-point Likert scale (0 = not at all, 10 = very much), entering numeric value, or selecting yes versus no. See Appendix G for more details.

We hypothesized that the interventions would improve participants' wellbeing, reduce their burnout, increase positive feelings while working, and reduce sick leave taken and likelihood of working while sick. Contrary to our hypotheses, the interventions did not significantly change the outcomes. As shown in Table 5, effect estimates of interventions on primary and secondary outcomes were similar across all conditions: control, treatment one, treatment two, and pooled treatment.

Table 5

Effects of Intervention on Primary and Secondary Outcome Measures, Adjusted for Covariates and Baseline Measurement

Outcome and interventions	Effect estimate (95% CI)	P value
Primary outcome measures		
Wellbeing score (*n*=253)		
Treatment 1	-0.99 (-2.05, 0.08)	0.07
Treatment 2	-0.22 (-1.22, 0.79)	0.68
Pooled treatment	-0.61 (-1.56, 0.35)	0.21
Burnout score (*n*=253)		
Treatment 1	-1.20 (-4.68, 2.28)	0.50
Treatment 2	-0.26 (-3.69, 3.18)	0.88
Pooled treatment	-0.74 (-3.86, 2.38)	0.64
Secondary outcome measures		
Meaningful score (*n*=253)		
Treatment 1	-0.29 (-0.84, 0.26)	0.31
Treatment 2	-0.29 (-0.84, 0.26)	0.30
Pooled treatment	-0.29 (-0.78, 0.20)	0.25
Valued score (*n*=253)		
Treatment 1	-0.09 (-0.88, 0.70)	0.82
Treatment 2	-0.54 (-1.30, 0.21)	0.16
Pooled treatment	-0.32 (-1.10, 0.41)	0.40
Sense of belonging (*n*=253)		
Treatment 1	-0.25 (-0.93, 0.42)	0.47
Treatment 2	-0.37 (-0.97, 0.23)	0.24
Pooled treatment	-0.31 (-0.87, 0.25)	0.28
Number of sick days (*n*=253)		
Treatment 1	-0.73 (-4.80, 3.30)	0.73
Treatment 2	-0.26 (-5.00, 4.50)	0.92
Pooled treatment	-0.50 (-4.50, 3.50)	0.81
Having worked while sick (*n*=253)		
Treatment 1	0.11 (-0.92, 1.10)	0.84
Treatment 2	-0.02 (-0.90, 0.85)	0.96
Pooled treatment	0.04 (-0.81, 0.89)	0.93

Note. Effect estimate is an absolute mean difference for continuous outcomes, odds ratio for categorical outcomes (exp(β)=OR). Effect estimate is calculated by OLS or logistic regression models, adjusted for age, gender, faculty type, school type, school district, province, and baseline measurement. Standard errors were clustered at school level.

Exploratory Findings

Table 6 presents participants' perceived impact of COVID-19 and how they responded to wellbeing resources and advice during the COVID-19 pandemic. Overall, the impact from COVID-19 was non-negligible — 83.0% of participants perceived the impact to be medium or big, and the perceived impact by COVID-19 was similar between the pooled treatment group and the control group (β = -0.33, 95% CI [-0.99, 0.33], p = 0.32). In light of COVID-19, 39.9% of participants reported having paid less attention to wellbeing resources, although 41.1% of them reported to have acted more often on wellbeing advice. The patterns, in terms of paying attention to wellbeing advice (β = -0.78, 95% CI [-0.74, 0.56], p = 0.78) and acting on wellbeing advice (β = -0.08, 95% CI [-0.78, 0.62], p = 0.82), also did not vary significantly between the pooled treatment groups and the control group (see Figures 3 and 4).

Table 6

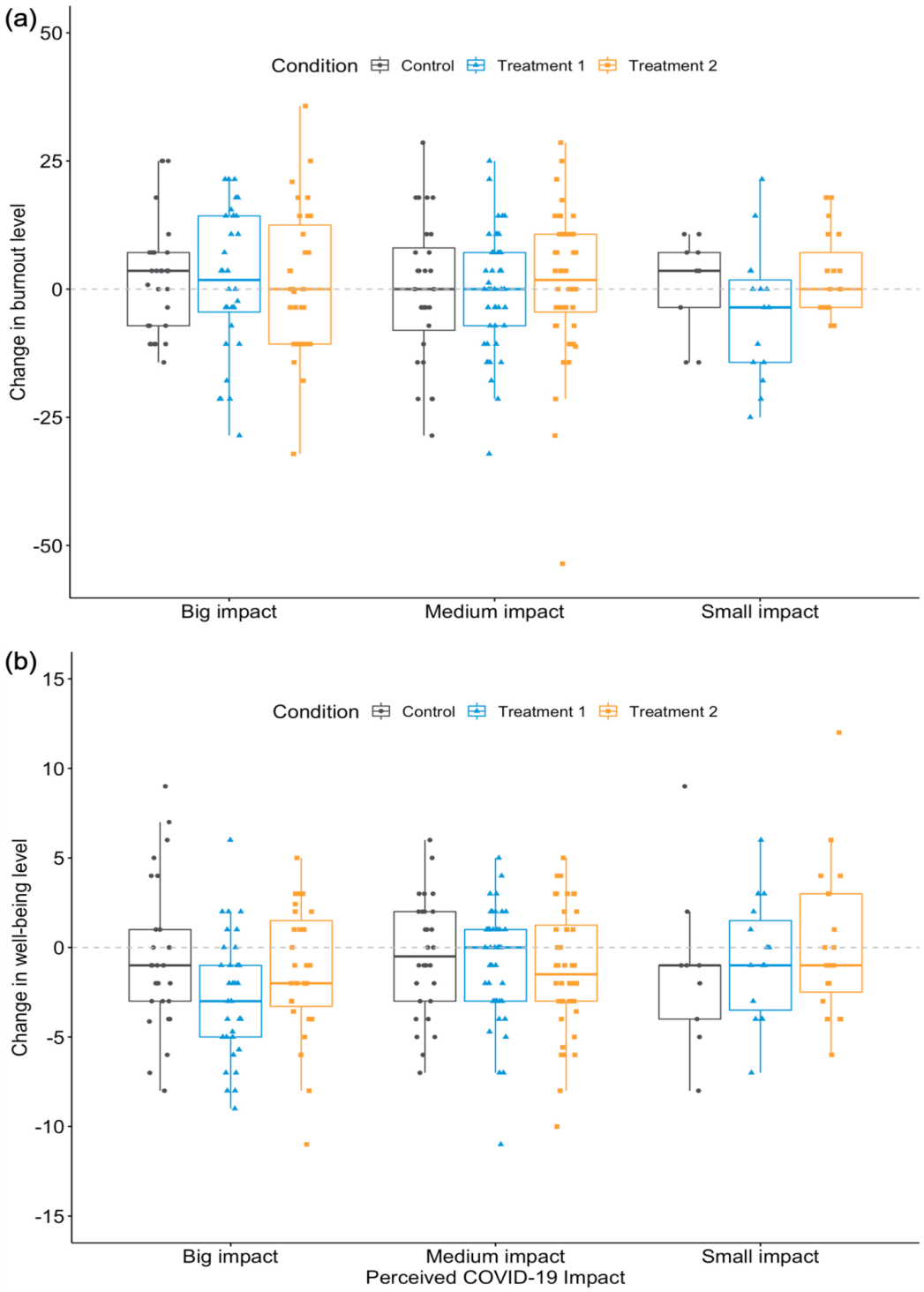
Descriptive Statistics of the Exploratory Outcome Measures related to COVID-19

Outcome measures related to COVID-19	Control (*n*=66)	Treatment 1 (*n*=93)	Treatment 2 (*n*=94)	Total (*n*=253)
Perceived COVID-19 impact (0~10)				
Mean (SD)	6.8 (2.4)	6.4 (2.2)	6.2 (2.2)	6.4 (2.3)
Small (0 ~ 4)	13.6%	16.1%	20.2%	17.0%
Medium (5 ~ 7)	42.4%	48.4%	46.8%	46.2%
Big (8 ~ 10)	43.9%	35.5%	33.0%	36.8%
Paying attention to wellbeing resources				
More	19.7%	18.3%	14.9%	17.4%
Less	45.5%	39.8%	36.2%	39.9%
Same	34.8%	41.9%	48.9%	42.7%
Acting on wellbeing advice				
More	42.4%	37.6%	43.6%	41.1%
Less	13.6%	19.4%	14.9%	16.2%
Same	43.9%	43.0%	41.5%	42.7%

Note. Outcomes were measured by survey questions. Participants were asked how their attention to wellbeing resources and intention to act on wellbeing advice had changed in light of COVID-19. They were also asked to what extent their wellbeing had been impacted by COVID-19 (0 = not at all, 10 = very much).

Figure 3

Effects of Intervention on a) Wellbeing Level and b) Burnout Level by Participants' Perceived COVID-19 Impact (0 = minimal impact, 10 = maximum impact).



Note. Those that rated lower than 4 were categorized as "low impact", those that rated above 7 were categorized as "high impact", and the rest as "medium impact"). Positive changes in scores indicate increased burnout level and improved wellbeing level.

Discussion

Given the high rates and negative implications of educator burnout, this trial set out to evaluate a novel application of nudges for K-12 educators in Canada. Overall, from baseline to endline we saw a marginal decrease in participants' wellbeing, while burnout scores remained relatively stable. The trend was almost parallel between the treatment group and the control group. This descriptive finding is somewhat unsurprising when looking at academic literature on the stability of wellbeing and burnout. Of the two constructs, wellbeing has been found to be slightly more malleable and susceptible to life events, although individuals often return to their original baseline wellbeing after a period of time (Luhmann & Intelisano, 2018). Burnout remains relatively stable over time, especially for employees who have been at their job for more than two years (Dunford et al., 2012).

Participants in treatment group two (text messages + principal emails) outperformed both control and treatment group one when it came to: a) marginal increases in wellbeing, b) feeling less impacted by COVID-19, c) paying more attention to wellbeing advice, and d) acting more often on wellbeing advice. It should be re-emphasized that these results are still not statistically significant and should be interpreted with caution.

While two recent studies using similar methodologies also found null results for light-touch prompts on well-being (Braizer et al., 2021), other research (Carolan et al., 2017; Lino et al., 2019), including a systematic review and meta-analysis of digital mental health interventions in occupational settings, reported such interventions improved psychological well-being. It is worth noting that the studies included in the systematic review had different digital interventions and mostly other types of workplaces (e.g., manufacturing, education, and insurance). Finally, electronic light-touch messages aimed at 911 dispatchers, in which participants received emails containing stories from other dispatchers, a significant reduction in burnout was reported. However, this intervention differed from the current study both in the target population and in content of intervention as participants were engaged in the intervention through writing about their own experiences. Thus, the literature has demonstrated mixed results.

Our results indicate that "light-touch" SMS interventions appear insufficient to significantly move teacher and school faculty burnout and wellbeing as measured by the Copenhagen Burnout Inventory (CBI) and Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWS) over an approximately 7-month period. We discuss the impact of our measurement tools further in the next section.

Compared to other fields, there are fewer studies examining whole school focused interventions on burnout, making it more difficult to place our findings in context with academic literature. The only meta-analysis we found does suggest there are interventions which have produced small but significant changes on teacher burnout (Iancu et al., 2018). However, in comparison to our intervention, these were much more resource and time intensive, again making direct comparisons to academic literature difficult.

Impact of COVID-19

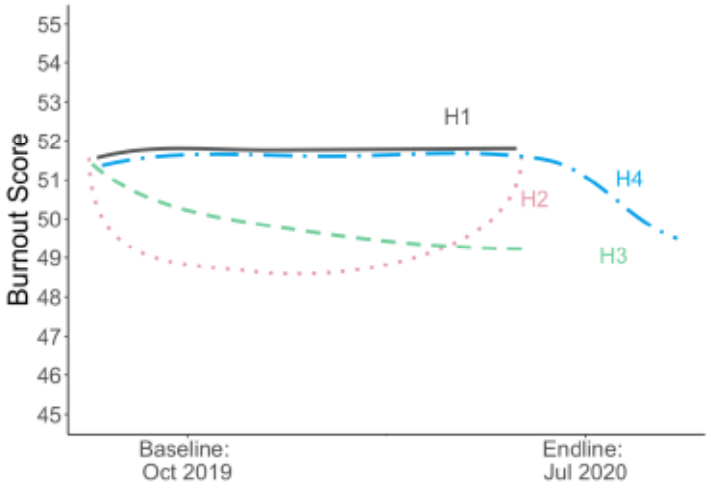
During the time of our trial, COVID-19 significantly changed the working lives of education workers across Canada. While it was not contemplated in the design of our study, we were able to generate correlational data on the impact of COVID-19 on faculty wellbeing and burnout. Our endline survey in July 2020 found that 83.0% of participants perceived COVID-19 to have a medium to big impact on their wellbeing. Additionally, participants reported feeling their work was less meaningful and felt less sense of belonging. This finding is likely due to teachers and school faculty working remotely due to COVID-19, or due to substantial increase in administrative work because of the pandemic. Therefore, it was possible that those text messages might not have been as well-received as in non-pandemic times.

However, as noted, across all participants, we see surprisingly small changes on wellbeing from baseline (and midline) to endline and virtually no change on burnout, despite the emergence of a pandemic. Although the change might be underestimated due to high attrition rate, it poses a number of other interesting questions (see Figure 4):

- H1: there is truly little to no change to burnout/wellbeing over the trial period.
- H2: people are more resilient than we think and recover from the drop by the time we measure outcomes.
- H3: there's a substantial change, but our outcomes aren't sensitive enough to detect it.
- H4: there's substantial change, but the effects will only be revealed in the long-term.

Figure 4

Illustrative Alternative Hypotheses that could Explain Changes in Outcomes.



Four hypotheses could have explained the relatively little change in primary and secondary outcomes from baseline to endline: 1) there is truly little to no change to burnout/wellbeing over the trial period; 2) people are more resilient than we think and recover from the drop by the time we measure outcomes; 3) there's a substantial change, but our outcomes aren't sensitive enough to detect it; 4) there's substantial change, but the effects will only be revealed in the long-term.

The perceived impact of COVID-19 appeared to affect our results in a few different ways. First, in-light of COVID-19, participants reported paying less attention to wellbeing resources (39.9%). There are several reasons for this. We asked participants to report if they paid 'more', 'less', or 'the same' amount of attention to wellbeing resources more generally so it is hard for us to conclude if participants' responses refer to our SMS prompts or other wellbeing resources. Participants were likely to have received other wellbeing resources during that period, and therefore, might pay less attention to messages we sent. This would reflect research indicating that attention to once novel information diminishes over time (Berlyne, 1951; Betsch et al., 1998). Alternatively, they might become less attentive due to the stress caused by COVID-19. Research has shown that during times of acute stress, such as COVID-19, people are less likely to pay attention to information being directed towards them (Sänger et al., 2014). In fact, despite participants reporting paying less attention to wellbeing resources overall, 41.1% of participants reported acting more often on wellbeing advice. Overall, the findings suggested that participants might have internalized some wellbeing advice they have received during the pandemic (thus, paying less attention to it) and translated it into action.

Limitations & Future Directions

Limitations

Attrition. While the number of participants who opted out from receiving our messages was very low (*N*=56), we experienced high attrition from baseline survey (*N*=1,217) to endline survey (*N*=253). This presents a limitation for the power of our analysis but also could represent potential selection bias. The 253 participants who took the endline survey may be different from those who did not, though the known characteristics of those that completed both surveys were mostly similar to those that completed the baseline survey only.

COVID-19. The emergence of COVID-19 during this trial makes our results more complicated to interpret and harder to generalize from.

Limited Mixed-method Approach. While we pre-specified a quantitative analysis plan for this research, we did not scope adequate qualitative interviews to understand how participants perceived the

interventions. We will take qualitative methods into account for future research.

Future Directions

Despite the null results we found in this trial, there remains an important need to investigate cost-effective efforts to foster well-being among educators and reduce burnout. Academics acknowledge that there is a gap in our knowledge around the potential for combined individual-level and organizational approaches to burnout and wellbeing (Huppert and Ruggeri, 2018). We recommend future research in this area to test the combination of these light-touch, low-cost interventions along with larger systemic changes (e.g., reduced workload, smaller class sizes, etc.) to understand the potential impact.

Given the stability of wellbeing and burnout over time, more sensitive measurement tools (e.g., measures capturing state-based wellbeing/burnout; positive and negative affect, etc.) should be used and employed with greater frequency. Along with this, some research suggests that the impact of wellbeing interventions on teachers may not show up immediately post-trial, so longitudinal measurement should be considered as well to detect any longer-term effects (Iancu et al., 2018). Including student outcomes in future trials would help us better understand the potential impact of faculty interventions on students.
As outlined above, this intervention was designed as a "shot-gun" approach combining multiple evidence-based prompts targeting wellbeing. Due to this design, it is impossible to parse out the impact of each prompt. We recommend future research focus on one evidence-based prompt (e.g., gratitude) at a time to better understand potential impact. Adding to our point above, researchers should consider construct-specific measurement (e.g., validated gratitude scale) as their primary outcome measure as opposed to global wellbeing measures.

Finally, future research should further explore the impact of leadership messenger effects. Although we did not find significant leadership messenger effects, it does not necessarily rule out the effects entirely due to the limitation of this trial. Given what we know about the impact of who the message comes from (Dolan et al., 2010) and that leadership behavior has been found to influence faculty wellbeing (Van Dierendonck et al., 2004), future trials should continue to investigate the leadership messenger effects from a different angle, e.g., considering sending more relatable messages from well-known figures.

This trial was designed to overcome some of the current limitations to wellbeing and burnout interventions through the application of light-touch, behaviorally informed solutions. While the interventions tested in this trial were not successful in increasing faculty wellbeing and decreasing burnout, we believe there are valuable findings about the role of light-touch interventions and how they may be adapted to have a greater impact. Unintentionally, the study also developed valuable insight on the impact of COVID-19 on the wellbeing and burnout of Canadian educators. This trial represents a novel application of behavioral science to complex topics like burnout and wellbeing. That being said, topics such as burnout and wellbeing in education are multifaceted and require a holistic approach - starting by understanding and addressing the need for school-based improvements in workers' conditions. With such understanding, we will be better equipped to test the role of light-touch interventions alongside these larger systematic changes.

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Appendix 1

Summary of Text Message Themes and Rationale

Theme	Explanation
Fresh start effect	The fresh start effect is "the energy and determination we feel when we're able to wipe the slate clean." [5] Research has found this approach can help us refocus and distance ourselves from past failures. For example, encourage faculty at the start of the semester to take a few moments to reflect and write down what they are looking forward to this term.
Gratitude from beneficiaries	Receiving gratitude refers to thanks from those whom you have helped (e.g., parents, students, other teachers). Receiving gratitude has been proven to increase individual motivation and engagement in positive behavior. [6] For example, reminding educators of the impact they are having on their students may help them feel more engaged at work.
Implementation intentions	Implementation intentions are exercises that specify when, where, and how a person intends to complete a goal. Different types of implementation intentions include barrier management, planning where/when/how, if-then plans, and action and coping plans.[7] For example, asking educators to make a plan for coping with stress may help them follow through with their goal.
Expressing gratitude	Expressing gratitude refers to showing thanks or appreciation. Gratitude expressions can increase prosocial behavior towards a third party. By signaling to individuals that their efforts are valued, gratitude expressions may make them more inclined to help others.[8] Taking the time to be grateful for the positives in one's own life can also boost wellbeing and improve the ability to cope with stressful situations. [9] For example, prompting faculty to reflect on one good thing at the end of their day may boost their mood and lead to prosocial behaviors.
Mindfulness	Mindfulness aims to bring greater attention and awareness to the present moment. Regular practice is associated with lower emotional exhaustion at work[10], as well as higher wellbeing. [11] For example, offering ideas for short breathing exercises to faculty may help reduce stress.
Social support	Social support refers to the social resources that people can access.[12] Research has repeatedly found that having good friends at work can buffer against negative life events and increase workplace satisfaction. For example, providing opportunities for employees to socially connect can foster a sense of belonging.

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Theme	Explanation
Connection to purpose	Feeling connected to the purpose of your work can help people behave differently. Research has shown that a sense of purpose is correlated with increased job satisfaction and organizational commitment.[13] [14] For example, reminding teachers why they chose their career can help reconnect them to the meaning they find in teaching.
Positive reappraisal	It is possible to re-construe stressful events as benign, beneficial and/or meaningful.[15] Research has shown that such positive reappraisals can yield improved moods in response to stressful daily events. For example, asking yourself "what difference will this [stressful thing] make next week, month, or year?" may be a helpful technique to come back to when you are feeling overwhelmed.
Sharing meaningful stories	Narratives can help people make sense of our experiences and events and can encourage new ways of thinking about or seeing the world. Research has shown that sharing meaningful stories can motivate positive behavioral changes and reduce burnout.[16] For example, starting your weekly faculty meetings by having faculty share a meaningful story may help others reflect on their own impact and increase motivation.
Self-care	Self-care can be interpreted in a variety of ways, from self-compassion to psychical activity. Research highlights the importance of teaching educators the importance of self-care as a way to reduce burnout and teacher attrition.[17] For example, providing educators with concrete tools for self-care during stressful periods may lead to behavior change.
Switching-off	Separating work and home life is essential for wellbeing and stress prevention.[18] [19] Research has shown that being able to 'switch off' after work has a positive impact on peoples' lives.[20] For example, changing email defaults to avoid weekend delivery and asking principals to model 'switching off' behaviors can be beneficial for school faculty.
Self-efficacy	Self-efficacy refers to the feeling of ownership over our lives and our ability to navigate day-to-day challenges. Research has shown that self-efficacy can moderate the relationship between work and stress. For example, establishing small routines can help us feel more in control.

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Appendix 2

Attrition Checks from Baseline to Endline

	Participation stage		
	Completed baseline survey only (*n*=902) % / Mean (SD)	Completed baseline survey & signed up (*n*=253) % / Mean (SD)	Test statistics for difference across conditions
	School faculty profile		
Age	42.6 (10.9)	44.9 (9.2)	t = -3.45, p < 0.001
Gender			
Female	78.4%	81.8%	$\chi^2(2) = 9.01$, $p = 0.01$
Male	20.3%	14.6%	
Prefer not to say	1.3%	3.6%	
faculty type			
Teacher	58.1%	50.6%	$\chi^2(4) = 25.9$, p < 0.001
Administrator	4.8%	9.5%	
Principal	29.2%	23.7%	
Support faculty	3.4%	5.9%	
Others	4.5%	10.3%	
Years working at school*	12.5 (9.2)	15.1 (9.2)	t = -4.01, p < 0.001
Number of students*	20.1 (8.8)	18.3 (8.6)	t = 2.52, p = 0.01
	Baseline measurement		
Wellbeing score (7~35)	25.9 (4.0)	25.5 (3.9)	t = 1.36, p = 0.18
Burnout score (0~100)	49.1 (15.5)	50.8 (14.6)	t = -1.56, p = 0.12
Feeling meaningful (0~10)	8.4 (1.6)	8.4 (1.5)	t = -0.38, p = 0.71
Feeling valued (0~10)	7.1 (2.4)	7.0 (2.2)	t = 0.53, p = 0.60
Sense of belonging (0~10)	7.5 (2.3)	7.2 (2.4)	t = 1.61, p = 0.11
Number of sick days (0~100)	3.0 (6.6)	3.4 (6.8)	t = -0.74, p = 0.46
Having worked while sick (Yes %)	0.8 (0.4)	0.8 (0.4)	$\chi^2(1) = 0.10$, p = 0.76

Note. Those questions were optional for participants.