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ABSTRACT

Background

The Canadian Federal Public Service Workplace Mental Health Strategy (the Strategy) seeks to measure, report, and improve employee psychological health, recognizing the National Standard of Canada for Psychological Health and Safety in the Workplace (the Standard) as a starting point. The present research introduced a new survey battery for the assessment of employee psychological health as profiles of burnout and work engagement. It also considered a wide range of predictors aligned with the Standard and several outcomes in accordance with the Job Demands-Resources (JD-R) Model to support the Strategy.

Data and methods

A total of 4,781 Statistics Canada employees completed an Employee Wellness Survey in late 2021, during the COVID-19 pandemic, for a response rate of 58%. Additional sociodemographic variables were linked from human resource databases. Survey weights were applied to adjust for non-response.

Results

Latent profile analysis uncovered four employee psychological health profiles, ranging from employees who were thriving (15%) to those who were doing well (34%), moving along (38%), or struggling (13%). Job autonomy, role clarity, person-job fit, work-life interference, and workplace incivility—all workplace psychosocial factors aligned with the Standard—were consistently associated with profile membership, as expected, and outcome levels were systematically less favourable from the thriving profile to the struggling profile.

Interpretation

The results support the validity of the employee psychological health profiles and predictors of profile membership, meeting expectations based on the JD-R literature. Key predictors can serve as metrics to monitor and as targets for workplace interventions designed to improve employee psychological health in support of the Strategy.

Keywords

COVID-19 pandemic, psychological health, burnout, engagement, public service employees, job demands, job resources, performance, sickness absence

AUTHORS

Ann-Renée Blais was formerly with the Human Resources Business Intelligence, Wellness and Transformation Division at Statistics Canada and is now with the Treasury Board of Canada Secretariat. Glen T. Howell, István Tóth-Király and Simon A. Houle are with the Human Resources Business Intelligence, Wellness and Transformation Division at Statistics Canada. Simon A. Houle is also with Concordia University.

Longstanding research in organizational psychology, occupational health, and other disciplines in the social sciences has established the importance of employee psychological health for organizations, irrespective of their sector or size.[1,2] With two-thirds of Canadians spending 60% or more of their time at work,[3] it is no surprise that research has also demonstrated the significance of employee psychological health to their mental health and functioning.[4,5] Employee psychological health has become even more crucial, in light of the wide-ranging consequences of the COVID-19 pandemic on individuals, organizations, and governments around the world.[6-8] For example, the prevalence of self-reported anxiety and depression has more than doubled in the Canadian population since the beginning of the pandemic,[9] while the prevalence of self-reported positive mental health outcomes has declined.[10]

Within organizations, the pandemic upended normal work routines and accelerated a move to virtual work environments, as many employees were required to work from home to slow the spread of the virus.[6] This unprecedented situation has had fundamental impacts on workers (e.g., blurring of work and personal boundaries) and work practices (e.g., virtual team management),[6,8] possibly leading to decreased work engagement,[11] and exacerbated burnout[12] and related forms of workplace distress among employees across many industries. An increasing legal imperative for organizations to provide a psychologically healthy workplace for their employees further strengthens the case for employee psychological health.[13] For instance, the Government of Canada adopted the Federal Public Service Workplace Mental Health Strategy (hereafter referred to as the Strategy) in 2016,[3] establishing its commitment to building a healthy, respectful, and supportive federal workplace. One of the Strategy's three goals is to measure, report, and continuously improve employee psychological health, recognizing the National Standard of Canada for Psychological Health and Safety in the Workplace (hereafter referred to as the Standard[13]) as a starting point. The Standard suggests that at least 13 workplace psychosocial factors influence employee psychological health, and that organizations should measure and monitor them with an aim to address areas that need improvement.

Currently, the authors are aware of three instruments used in the Canadian federal public service to measure the 13 workplace psychosocial factors, but each has shortcomings.

First is the Guarding Minds at Work questionnaire,[14] which is unable to isolate these factors according to a recent evaluation of its psychometric properties.[15] Furthermore, it does not allow for an assessment of whether the factors are indeed associated with employee psychological health (and to what degree), thus lacking evidence of predictive validity.

Second is the Public Service Employee Survey, whose items were conceptually mapped to the definitions of the 13 workplace psychosocial factors[16] and psychometrically analyzed.[17] The resulting mapping offered a suitable assessment of 10 of the 13 factors, was replicable across two measurement occasions, and had some level of predictive validity through associations with job satisfaction. However, the authors cautioned that further research is needed to validate this mapping, and that the content validity of the measures remains limited, given the atypical methodology (i.e., existing items created for different purposes were mapped onto the factors).[18]

Third is the Unit Morale Profile (UMP) v2.0 survey battery assembled at the Department of National Defence from previously validated measures of constructs closely aligned to the 13 factors and employee psychological health.[19] A limitation of the UMP v2.0 concerns its definition of employee psychological health, which may be too broad—it includes both intent to turnover, typically considered an outcome of employee psychological health, and psychological distress, which captures general symptoms of anxiety and depression not necessarily related to work.[20]

Building on this research, the main objective of the current study was to assess employee psychological health, a wide range of workplace psychosocial factors as predictors of employee psychological health, and several individual and organizational outcomes of employee psychological health in a Canadian public service organization during the COVID-19 pandemic. The work relied on a theoretically motivated and psychometrically sound survey battery encompassing most of the factors highlighted in the Standard, as well as emerging concepts relevant to remote work. In addition, the research sought to outline a popular analytical strategy to properly investigate simultaneous components of employee psychological health to identify areas of improvement.

Employee psychological health: A focus on burnout and work engagement

An extensive theoretical, empirical, and applied body of knowledge highlights burnout and work engagement[20-23] as central components of employee psychological health.[24] Burnout is typically described as a psychological state caused by repeated exposure to work-related strain leading to emotional exhaustion (i.e., chronic fatigue), cynicism (i.e., diminished feelings of meaningfulness at work and increased feelings of detachment from work), and professional inadequacy (i.e., diminished feelings of efficacy at work).[25] Defined in this way, burnout is now acknowledged in the International Classification of Diseases as an occupational phenomenon driven by unmanaged work-related stress.[26] Work engagement, on the other hand, represents a positive work-related psychological state that encompasses vigour (i.e., showing high levels of energy during work), dedication (i.e., perceiving work as significant and meaningful), and absorption (i.e., being fully immersed in one's work).[27]

Table 1
Characteristics of the sample by socioeconomic and employment variable, Statistics Canada, 2021

Characteristics	Unweighted count	Percentage	95% confidence interval from	95% confidence interval to	Standard error
Sex					
Male	2,067	45.54	44.63	46.45	0.46
Female	2,714	54.46	53.55	55.37	0.46
Age					
18 to 29	761	16.73	16.03	17.46	0.37
30 to 39	1,061	22.39	21.62	23.19	0.40
40 to 49	1,280	25.84	25.04	26.66	0.41
50 to 59	1,171	24.32	23.52	25.13	0.41
60 or older	490	10.72	10.15	11.32	0.30
Indigenous person status					
No	4,649	97.47	97.17	97.75	0.15
Yes	125	2.53	2.25	2.83	0.15
Racialized group status					
No	4,045	84.72	84.04	85.37	0.34
Yes	729	15.28	14.63	15.96	0.34
Person with disabilities status					
No	4,511	94.59	94.15	95.00	0.22
Yes	263	5.41	5.00	5.85	0.22
First official language					
English	3,383	71.88	71.10	72.66	0.40
French	1,398	28.12	27.34	28.90	0.40
Number of dependants in household					
0	2,467	53.53	52.58	54.47	0.48
1	812	17.09	16.39	17.82	0.36
2	971	20.01	19.27	20.76	0.38
3	306	6.45	6.00	6.92	0.24
4 or more	137	2.93	2.62	3.27	0.16
Number of people in household					
0	24	0.52	0.40	0.68	0.07
1	676	14.57	13.90	15.26	0.35
2	1,530	32.70	31.81	33.61	0.46
3	968	20.47	19.71	21.24	0.39
4	1,035	21.50	20.74	22.28	0.39
5	354	7.37	6.89	7.87	0.25
6 or more	137	2.88	2.58	3.21	0.16
Dedicated home office					
No	1,064	22.48	21.69	23.28	0.40
Yes	3,712	77.52	76.72	78.31	0.40
Place of work					
Statistics Canada	3,752	76.07	75.70	76.44	0.19
Statistical Survey Operations	1,029	23.93	23.56	24.30	0.19
Supervisory status					
No	3,006	66.92	66.11	67.73	0.41
Yes	1,775	33.08	32.27	33.89	0.41
Contract status					
Part time	1,207	27.65	27.16	28.15	0.25
Full time	3,570	72.35	71.85	72.84	0.25
Contract length					
Determinate	1,088	24.67	23.94	25.41	0.37
Indeterminate	3,689	75.33	74.59	76.06	0.37
Start of employment					
Before the pandemic	3,742	77.01	76.21	77.79	0.40
During the pandemic	1,030	22.99	22.21	23.79	0.40
Teleworking status					
Not exclusively teleworking	223	4.76	4.39	5.16	0.20
Exclusively teleworking	4,520	95.24	94.84	95.61	0.20
Occupational group					
Administrative Services	269	5.08	0.16	4.77	5.40
Clerical and Regulatory	222	4.51	0.17	4.19	4.86
Computer Systems	562	11.44	0.07	11.30	11.58
Economics and Social Science Services	1,978	40.63	0.26	40.11	41.15
Interviewer	1,029	23.95	0.19	23.58	24.32
Information Services	101	2.12	0.10	1.93	2.33
Mathematics	224	4.06	0.08	3.91	4.21
Other	392	8.21	0.22	7.78	8.66

Source: Statistics Canada, human resources database, November 2021.

A simultaneous consideration of burnout and work engagement as negative and positive components of employee psychological health answers prior calls for the inclusion of both constructs in research studies to better understand their combined impact on employees.[28] To this end, and to bridge the researcher-practitioner divide by keeping an applied research setting in mind,[29,30] the study adopted a person-centred approach that identifies distinct, homogeneous subgroups, or profiles, of employees, based on their shared experience of these components of employee psychological health. This approach is particularly well suited to applied research settings because the resulting profiles facilitate communication of employee psychological health with managers and employees.[31] Another advantage to this approach is its ability to describe subgroups of employees who experience suboptimal burnout and work engagement levels and who may benefit most from organizational support and workplace interventions.[32]

Despite disparities in their countries of origin, populations, research designs, and operationalizations of profile indicators, results from several studies[33-40] tend to converge on three common burnout and engagement profiles:

- thriving: low burnout and high engagement
- struggling: high burnout and low engagement
- conflicted: high burnout and high engagement.

Additional profiles have also emerged in a subset of studies: low burnout and engagement,[37] low burnout and average engagement,[39] and high cynicism and inefficacy but low exhaustion or engagement.[33] The presence of these additional profiles highlights the need to replicate these findings in various work settings and contexts.

Research Question 1 (RQ1): How many distinct configurations of burnout and work engagement exist among employees in a Canadian public service organization, and what form do they take?

Predictors of employee burnout and work engagement

It is important to highlight that burnout and work engagement were selected as central indicators of employee psychological health in this study, entailing, in an applied context, that they are targeted for improvement. However, because employee

Table 2-A
Standard factors and references for the measures in the present study

Measures and number of items	Standard factor	Response scale	Reference
Predictor			
Job autonomy - 4	Involvement and influence	1 = strongly disagree, 7 = strongly agree	Chen et al. (2015)
Role clarity - 5	Clear leadership and expectations	1 = strongly disagree, 7 = strongly agree	Bowling et al. (2017)
Person-job fit - 3	Psychological job demands	1 = strongly disagree, 5 = strongly agree	Cable & DeRue (2002)
Work-life interference - 3	Work-life balance	1 = never, 5 = always	Bakker et al. (2009)
Workgroup inclusion - 6	Civility and respect	1 = strongly disagree, 5 = strongly agree	
Workplace incivility - 4	Civility and respect	1 = never, 5 = many times	Matthews & Ritter (2015)
Distributive justice	Recognition and reward	1 = to a very small extent, 5 = to a very large extent	Colquitt & Rodell (2015)
Quantitative workload - 5	Workload management	1 = less than once/month or never, 5 = several times/day	Spector & Jex (1998)
Training – Supervisory skills - 3	Growth and development	1 = strongly disagree, 7 = strongly agree	Kraimer et al. (2010)
Training – Specialized skills - 3	Growth and development	1 = strongly disagree, 7 = strongly agree	Kraimer et al. (2010)
Transformational leadership - 7	Clear leadership and expectations	1 = strongly disagree, 7 = strongly agree	Carless et al. (2000)
Segmentation supplies - 4	Work-life balance	1 = strongly disagree, 7 = strongly agree	Kreiner (2006)
Recreation of going to work - 1	…	1 = never, 7 = always	Allen et al. (2021)
Setting expectations - 1	…	1 = never, 7 = always	Allen et al. (2021)
Temporal segmentation strategies - 3	…	1 = never, 7 = always	Allen et al. (2021)
Physical segmentation strategies - 2	…	1 = never, 7 = always	Allen et al. (2021)
Boundary-crossing behaviours - 2	Work-life balance	1 = never, 5 = always	Barber & Jenkins (2014)
Psychological health profile indicator			
Emotional exhaustion - 5	…	1 = never, 7 = every day	Maslach et al. (1996-2018)
Cynicism - 5	…	1 = never, 7 = every day	Maslach et al. (1996-2018)
Professional efficacy - 6	…	1 = never, 7 = every day	Maslach et al. (1996-2018)
Work engagement - 3	Engagement	1 = never, 7 = always	Schaufeli et al. (2019)
Outcome			
Job satisfaction - 5	…	1 = strongly disagree, 7 = strongly agree	Fouquereau & Rioux (2002)
Psychological distress - 6	…	1 = never, 6 = very often	Kessler et al. (2010)
Self-reported work performance - 1	…	0 = worst performance, 10 = top performance	Kessler et al. (2003)
Sickness absence -1	…	Aggregated number of paid sick leave days taken three months prior to data collection	…

… not applicable.
Notes: The full references for the literature cited in this table (using superscript numbers) can be found in Appendix 1 of the online supplementary materials.
Source: Statistics Canada human resources database, November 2021 and Employee Wellness Survey 2021, November to December 2021.

Table 2-B
Standardized factor loadings and reliability estimates for the measures in the present study

Measures	Standardized factor loading	Scale score reliability	Model-based composite reliability
Predictor			
Job autonomy	0.639	0.727	0.747
Role clarity	0.806	0.932	0.919
Person-job fit	0.885	0.915	0.915
Work-life interference	0.820	0.856	0.863
Workgroup inclusion	0.750	0.882	0.888
Workplace incivility	0.719	0.806	0.817
Distributive justice	0.945	0.970	0.971
Quantitative workload	0.794	0.898	0.895
Training – Supervisory skills	0.912	0.935	0.937
Training – Specialized skills	0.941	0.958	0.959
Transformational leadership	0.884	0.960	0.962
Segmentation supplies	0.859	0.918	0.919
Recreation of going to work	...	...	...
Setting expectations	...	...	...
Temporal segmentation strategies	0.677	0.718	0.718
Physical segmentation strategies	0.775	0.747	0.751
Boundary-crossing behaviors	0.808	0.790	0.791
Psychological Health Profile indicator			
Emotional exhaustion	0.844	0.926	0.926
Cynicism	0.727	0.849	0.861
Profession efficacy	0.654	0.813	0.821
Work engagement	0.775	0.810	0.823
Outcome			
Job satisfaction	0.744	0.857	0.862
Psychological distress	0.785	0.903	0.907
Self-reported work performance	...	...	...
Sickness absence	...	...	...

... not applicable.

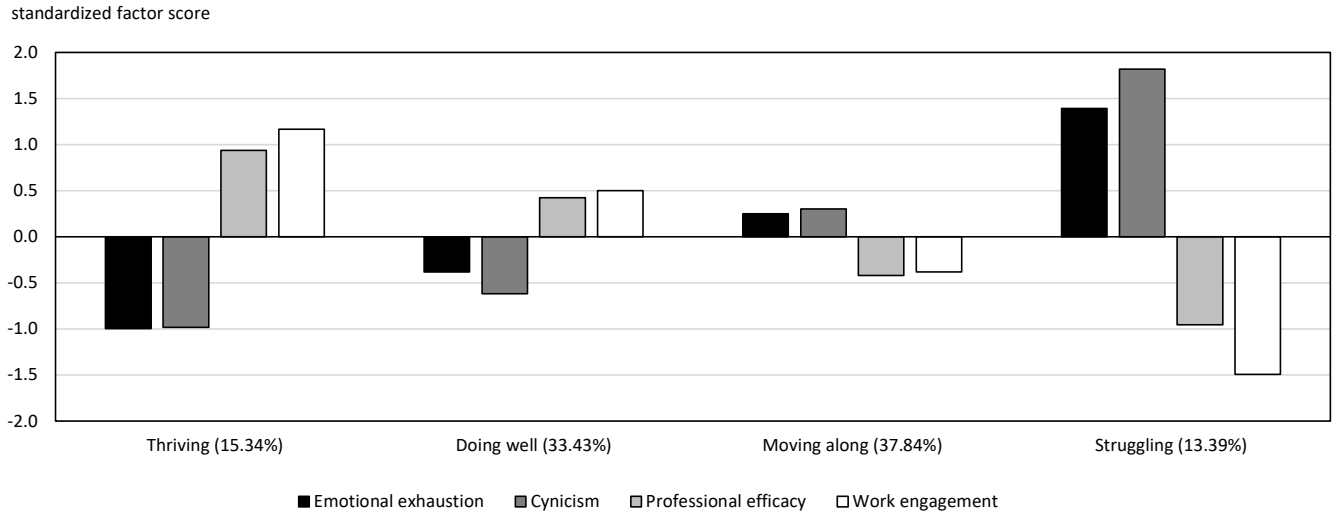
Source: Statistics Canada Human Resources database, November 2021 and Employee Wellness Survey 2021, November to December 2021

psychological health is broader than burnout and work engagement, it is important to capture other aspects of this psychological state that are thought to influence burnout and work engagement alongside workplace psychosocial factors. The premise is to capitalize on workplace interventions by discovering which aspects of employee psychological health (e.g., basic need satisfaction) will have the greatest influence on its other aspects (i.e., burnout and work engagement). As such, predictors were chosen based on their conceptual overlap with the definitions of the factors in the Standard[13] and their applied usefulness as actionable drivers of (e.g., workload) or contributors to (e.g., basic need satisfaction) employee psychological health at various levels of intervention (i.e., the group, leader, and organization levels).[41] Most were selected from the research literature that focuses on the Job Demands-Resources (JD-R) Model,[20,21] one of the leading job stress models, an approach similar to that taken to assemble the UMP v2.0.[19]

In the JD-R Model, job demands (e.g., workload) require a sustained effort that takes a physical and psychological toll on exposed employees.[42] Two complementary psychological processes are expected to underline the effects of job demands and job resources on burnout and work engagement. In the health-impairment process, excessive demands are likely to consume energy and deplete psychological resources because employees must constantly invest high effort to deal with these demands. Consequently, they may experience a more persistent state of energy depletion that may lead to negative consequences (e.g., increased health symptoms and sick leave absence). By contrast, in the motivational process, job resources (e.g., job autonomy) help employees achieve their work objectives by initiating their willingness to engage in their work and nurturing and supporting growth, motivation, and performance, while also facilitating a more efficient management of demands.[42] Previous studies generally supported the JD-R Model's propositions by demonstrating that consistent exposure to job demands tends to be related to higher burnout and greater sickness absence, among other undesirable outcomes, while the availability of job resources is likely to be associated with increased well-being and performance at work.[21,22,43] The present study contributes to this literature by investigating employee functioning and related outcomes during a global crisis, like the COVID-19 pandemic.[44]

The current study included another set of predictors based on employee feedback at earlier stages of the pandemic that highlighted the advantages and disadvantages of remote work. Consequently, in addition to work–life interference, the following predictors were examined:[45-47] segmentation supplies (i.e., organizational norms that encourage employees to segment their work and personal lives), segmentation strategies

Figure 1
Final four-profile solution



Note: Profile indicators were standardized factor scores (mean = 0, standard deviation = 1) derived from preliminary measurement models.
Source: Statistics Canada, Employee Wellness Survey, November to December 2021.

(i.e., strategies people can use to segment their work and personal lives), boundary-crossing behaviours via information and communication technologies (ICTs), the presence of other individuals in the household, and the availability of a dedicated home office. Finally, the present research included a variety of sociodemographic variables based on their established relationships with psychological health (e.g., age)[25,48-50] or for exploratory purposes (e.g., first official language).

Research Question 2 (RQ2): Are the predictors related to membership in the emergent employee psychological health profiles as expected, based on the JD-R Model and related research?

Outcomes of employee psychological health

The present study encompassed a mix of individual and organizational outcomes for which the JD-R Model has provided theoretical support in relation to burnout and work engagement.[20,22] Specifically, job satisfaction, a positive component of employee psychological health at work,[51] has received attention in the organizational literature as a broad indicator of employee functioning.[4] On the opposite end of the spectrum lies psychological distress, a state of emotional suffering that may also encompass somatic and functional problems.[52,53] Self-reported work performance was also recorded,[54] as was an objective measure of sickness absence. This mix of outcomes was suitable to help evaluate the construct validity of emergent profiles and quantify the individual and organizational consequences of profile membership to managers and employees.

Research Question 3 (RQ3): Do the nascent employee psychological health profiles differ on the outcomes as expected, based on the JD-R Model and related research?

Data and methods

Procedure and participants

All Statistics Canada employees who had a valid work email address received an email invitation to complete an electronic Employee Wellness Survey in the official language of their choice via a survey link. Employees seconded to Statistics Canada from other departments and those on long-term leave (e.g., maternity leave) who did not respond to the email were considered out of scope. Statistics Canada is a medium-to-large public service organization in the science and professional services domain, and it is headquartered in the National Capital Region with regional offices across the country. At the time of data collection, the target population included 8,277 in-scope employees. These employees were distributed across occupational groups and levels with pay and benefit structures commensurate with their work, from clerical and general administrative positions to highly specialized technical positions, and from entry-level to executive positions.

Data collection took place from November 11 to December 21, 2021. The final response rate was approximately 58%, for a total of 4,781 respondents. Survey weights were created to adjust for non-response by organizational unit and sex within organizational units, for a total of 32 weighting classes. These survey weights were then calibrated to known population totals for 18 lower-level organizational units (i.e., divisions) and to

known totals for the remaining 60 lower-level organizational units further broken down by supervisor status. Agency directives and the privacy impact assessment were followed to ensure confidentiality by (a) using a linkage file, separate from the survey responses, to match employees' sociodemographic information with their survey responses; (b) storing this linkage file in a highly restricted, password-protected location; (c) limiting access to all files on a need-to-know basis; and (d) only disclosing aggregated (i.e., not individual-level) results.

Slightly more than half of employees were female (54%; see Table 1), close to three-quarters reported English as their first official language (72%), and half were aged 40 to 59 (50%). One-third (33%) were in supervisory roles, and many were economics and social science professionals (41%). The vast majority worked full time (72%) and held indeterminate positions (75%). Almost all were exclusively teleworking at the time of the study (95%).

Measures

The Employee Wellness Survey included multi-item measures of burnout and work engagement and a mix of single- and multi-item measures of the predictors and outcomes. The scientific literature supports the validity of these measures, except for the segmentation strategies measure, which was under investigation in the present study. Five subject-matter experts independently mapped the measures to the definitions of the workplace psychosocial factors in the Standard. Mappings that were consistent across four or more of the experts were considered official. Table 2 shows the measures, associated Standard factors, response scales, standardized factor loadings, scale score and model-based composite reliabilities, and key references. Sociodemographic variables extracted from the agency's administrative databases are shown in Table 1. Supplementary materials are available on the Open Science Framework's website (https://osf.io/hz5f2/?view_only=eb221ea5cfcc4daca35f05df53a20b19).

Analytical strategy

Conducted with Mplus 8.7,[55] the statistical analyses applied the survey weights and accounted for the clustering of employees in 78 divisions via the Mplus design-based correction of standard errors.[56] The robust maximum likelihood estimator was used alongside the full information maximum likelihood algorithm to handle the limited number of missing responses at the item level (i.e., 0.06% to 1.51%; *Mean* = 0.48%, *Standard Deviation* = 0.34%). Preliminary measurement models were estimated via confirmatory factor analysis to test the psychometric properties of the multi-item measures and derive factor scores (with $M = 0$ and $SD = 1$) for the main analyses. See Appendix 2 in the online supplementary materials for more details.

One to eight latent profiles were estimated with their indicator means and variances free to vary between profiles,[57] where the profile indicators were the burnout and work engagement factor scores from the measurement model. To ensure convergence on a true maximum likelihood, all models were estimated using 10,000 random start values, 1,000 iterations, and 500 final

Table 3-1
Results from the multinomial logistic regressions of the Job Demands-Resources Model predicting profile membership

Predictor	Thriving versus doing well			Thriving versus moving along			Thriving versus struggling		
	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio
Job autonomy	1.21 ††	0.16	3.34	2.52 ††	0.17	12.48	4.14 ††	0.20	62.68
Role clarity	0.71 ††	0.14	2.04	1.24 ††	0.14	3.47	1.53 ††	0.16	4.62
Person–job fit	0.38 ††	0.12	1.47	0.87 ††	0.13	2.38	1.25 ††	0.14	3.48
Work–life interference	-0.77 ††	0.10	0.46	-1.25 ††	0.10	0.29	-2.00 ††	0.12	0.14
Workgroup inclusion	0.27 ††	0.11	1.31	0.56 ††	0.10	1.76	1.04 ††	0.12	2.82
Workplace incivility	-0.53 ††	0.20	0.59	-0.88 ††	0.18	0.42	-1.07 ††	0.19	0.34
Distributive justice	0.26 ‡	0.11	1.30	0.40 ††	0.10	1.49	0.40 ††	0.12	1.48
Quantitative workload	-0.18 ††	0.07	0.83	-0.22 ††	0.07	0.81	-0.72 ††	0.09	0.49
Training—Supervisory skills	0.07	0.14	1.08	0.13	0.16	1.14	0.28	0.22	1.32
Training—Specialized skills	-0.06	0.14	0.94	-0.21	0.16	0.81	-0.31	0.21	0.73
Transformational leadership	0.01	0.13	1.01	0.16	0.12	1.18	0.43 ††	0.14	1.53
Segmentation supplies	0.60 ††	0.10	1.82	1.03 ††	0.10	2.80	1.71 ††	0.11	5.52
Recreation of going to work	0.09 ††	0.03	1.09	0.15 ††	0.03	1.16	0.24 ††	0.04	1.27
Setting expectations	0.12 ‡	0.05	1.13	0.21 ††	0.05	1.24	0.18 ††	0.05	1.19
Temporal segmentation strategies	-0.04	0.08	0.96	0.06	0.08	1.06	0.28 ††	0.10	1.33
Physical segmentation strategies	0.33 ††	0.08	1.40	0.40 ††	0.08	1.49	0.41 ††	0.10	1.50
Overtime	0.28 ‡	0.11	1.32	0.26 ‡	0.11	1.29	0.05	0.14	1.05
Number of hours worked outside working hours	0.01	0.01	1.01	0.03 ††	0.01	1.03	0.03 ‡	0.01	1.03
Boundary-crossing behaviours	0.39 ††	0.07	1.47	0.79 ††	0.08	2.20	1.63 ††	0.12	5.11

‡ coefficient significantly different from 0 ($p < 0.05$)

†† coefficient significantly different from 0 ($p < 0.01$)

Note: The coefficients and odds ratios reflect the effects of the predictors on the likelihood of membership in the first listed profile relative to the second listed profile.

Source: Statistics Canada, Employee Wellness Survey, November to December 2021.

Table 3-2
Results from the multinomial logistic regressions of the Job Demands-Resources Model predicting profile membership

Predictor	Doing well versus moving along			Doing well versus struggling			Moving along versus struggling		
	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio
Job autonomy	1.32 ††	0.09	3.74	2.93 ††	0.14	18.77	1.61 ††	0.12	5.02
Role clarity	0.53 ††	0.06	1.70	0.82 ††	0.09	2.27	0.29 ††	0.07	1.33
Person–job fit	0.49 ††	0.08	1.62	0.87 ††	0.10	2.38	0.38 ††	0.07	1.46
Work–life interference	-0.48 ††	0.06	0.62	-1.22 ††	0.09	0.29	-0.75 ††	0.08	0.47
Workgroup inclusion	0.29 ††	0.06	1.34	0.77 ††	0.09	2.15	0.48 ††	0.08	1.61
Workplace incivility	-0.35 ††	0.07	0.70	-0.55 ††	0.08	0.58	-0.19 ††	0.07	0.83
Distributive justice	0.14 ‡	0.06	1.15	0.14	0.09	1.14	0.00	0.08	1.00
Quantitative workload	-0.04	0.05	0.97	-0.54 ††	0.08	0.58	-0.50 ††	0.07	0.60
Training—Supervisory skills	0.06	0.10	1.06	0.20	0.18	1.23	0.15	0.16	1.16
Training—Specialized skills	-0.15	0.10	0.86	-0.25	0.17	0.78	-0.10	0.15	0.90
Transformational leadership	0.15 ‡	0.08	1.16	0.41 ††	0.10	1.51	0.26 ††	0.08	1.30
Segmentation supplies	0.43 ††	0.06	1.53	1.11 ††	0.08	3.03	0.68 ††	0.08	1.97
Recreation of going to work	0.06 ‡	0.02	1.06	0.16 ††	0.03	1.17	0.09 ††	0.03	1.10
Setting expectations	0.09 ††	0.03	1.09	0.06	0.04	1.06	-0.04	0.04	0.97
Temporal segmentation strategies	0.10	0.06	1.10	0.32 ††	0.08	1.38	0.23 ††	0.08	1.25
Physical segmentation strategies	0.06	0.06	1.07	0.07	0.08	1.07	0.01	0.08	1.01
Overtime	-0.02	0.09	0.98	-0.23	0.12	0.80	-0.21	0.12	0.81
Number of hours worked outside working hours	0.02	0.01	1.02	0.02	0.01	1.02	0.01	0.01	1.01
Boundary-crossing behaviours	0.40 ††	0.07	1.49	1.24 ††	0.11	3.47	0.84 ††	0.10	2.32

‡ coefficient significantly different from 0 ($p < 0.05$)
†† coefficient significantly different from 0 ($p < 0.01$)
Note: The coefficients and odds ratios reflect the effects of the predictors on the likelihood of membership in the first listed profile relative to the second listed profile.
Source: Statistics Canada, Employee Wellness Survey, November to December 2021.

optimizations.[58] The most optimal profile solution was selected based on its theoretical and statistical adequacy—i.e., based on the Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size adjusted BIC (SSABIC), consistent AIC (CAIC), and Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.[59]

Once the final solution was identified, multinomial logistic regressions were conducted to test the associations between the predictors and the likelihood of membership in the emergent profiles using the Mplus auxiliary R3STEP function. The regression coefficients indicate the likelihood of belonging to the target profile compared with the referent profile. Finally, the profiles were compared in terms of the outcomes using the Mplus auxiliary BCH function.

Results

Table S3 in the online supplements displays the fit indexes for the profile solutions. With the inclusion of additional profiles, the AIC, BIC, CAIC, and SSABIC continued to decrease, while the elbow plot showed an improvement in model fit that became marginal around the four- or five-profile solutions (see Figure S1 in the supplementary materials). Comparing these solutions showed that the addition of a fourth profile resulted in a distinct and relatively large profile, while moving from four to five profiles only led to the arbitrary division of an existing profile into two profiles with similar shapes and levels. The four-profile solution was thus retained for interpretation (see Figure 1 and Table S4 in the supplementary materials).

The first profile (thriving) characterized 15% of employees with low emotional exhaustion and cynicism, along with high professional efficacy and work engagement. Profile 2 (doing well) encompassed one-third of employees (34%) with moderately low emotional exhaustion and cynicism combined with moderately high professional efficacy and work engagement. Profile 3 (moving along) comprised slightly more than one-third of employees (38%) with moderately high emotional exhaustion and cynicism coupled with moderately low professional efficacy and work engagement. Finally, Profile 4 (struggling) characterized 13% of employees with high emotional exhaustion and cynicism, along with low professional efficacy and work engagement.

Given the wide set of predictors, they were added to the four-profile solution in separate models organized according to theoretical and statistical principles. Tables 3 and 4 show the results from the multinomial logistic regressions for the workplace psychosocial factors (i.e., job demands and resources) and the sociodemographic variables, respectively, predicting profile membership. Greater levels of the following factors were systematically associated with a greater likelihood of membership in healthier profiles across all comparisons: job autonomy, role clarity, person–job fit, workgroup inclusion, and segmentation supplies. Similarly, mimicking the rhythm of going to work outside one's home and crossing boundaries via ICTs were positively and consistently related to a greater likelihood of membership in healthier profiles across all comparisons.

By contrast, greater levels of work–life interference and a greater prevalence of workplace incivility were systematically associated with a greater likelihood of membership in suboptimal profiles across all comparisons. Employees with French as their first official language or who had access to a dedicated home office were consistently more likely to belong to healthier profiles across all comparisons, relative to their counterparts. Multiple other meaningful pairwise comparisons were statistically significant, further supporting the construct validity of the emergent profiles. Finally, Table 5 displays the results from the analyses of associations between profile membership and the outcomes. The most optimal outcome levels (i.e., greater job satisfaction and work performance, lower psychological distress, and fewer days of sickness absence) were all associated with the thriving profile, followed by the doing well, moving along, and struggling profiles, though the first two profiles did not differ significantly in terms of sickness absence.

Discussion

Using a theoretically motivated and psychometrically sound survey battery, the present study uncovered four distinct profiles of burnout and work engagement experienced by employees of a Canadian public service organization during the pandemic (RQ1). These emergent profiles were mostly quantitatively different, falling on a continuum from least optimal (struggling) to most optimal (thriving). The struggling and thriving profiles were similar to those that emerged in previous research.[33-40]

Several predictors (e.g., job autonomy and work–life interference) showed consistent associations with membership in healthier profiles (RQ2). Considering that the most desirable outcomes were also systematically associated with membership in healthier profiles (RQ3) and that organizational resources are limited, knowing which levers to pull for blanket workplace intervention is beneficial. That said, qualitative differences in the effects of the predictors on profile membership were also observed. For instance, some predictors (e.g., transformational leadership) had stronger associations with suboptimal profile membership. By contrast, other predictors (e.g., managing expectations in advance of a work-from-home boundary violation) had stronger relationships with membership in the more desirable profiles. These findings point to the potential for tailored initiatives in addition to or instead of blanket ones. Overall, the results align with the JD-R Model,[19,21] as well as with emerging research on boundary management.[45,47] They also support the construct validity of the nascent employee psychological health profiles.[60]

Table 4-1
Results from the multinomial logistic regressions of the sociodemographic characteristics predicting profile membership

Predictor	Thriving versus doing well			Thriving versus moving along			Thriving verus struggling		
	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio
Sex	0.21	0.11	1.23	0.32 ‡	0.11	1.38	0.32 ‡	0.13	1.37
Age	0.23 ††	0.05	1.25	0.56 ††	0.05	1.75	0.63 ††	0.06	1.87
Indigenous person status	0.38	0.31	1.46	0.36	0.30	1.43	0.60	0.39	1.82
Racialized group status	0.02	0.15	1.02	0.40 ††	0.15	1.49	0.62 ††	0.19	1.85
Person with disabilities status	-0.37	0.26	0.69	-0.10	0.26	0.90	-0.79 ††	0.28	0.45
First official language	0.47 ††	0.12	1.60	0.67 ††	0.12	1.95	1.00 ††	0.16	2.73
Number of dependants in household	0.02	0.08	1.02	-0.01	0.08	0.99	-0.04	0.10	0.96
Number of people in household	-0.07	0.07	0.94	0.08	0.07	1.08	0.16 ‡	0.08	1.18
Dedicated home office	0.70 ††	0.17	2.02	1.17 ††	0.16	3.23	1.52 ††	0.18	4.55
Place of work	0.34	0.30	1.41	0.03	0.29	1.03	-2.00 ††	0.57	0.14
Supervisory status	-0.43 ††	0.13	0.65	-0.58 ††	0.13	0.56	-0.72 ††	0.16	0.49
Contract status	0.49	0.30	1.63	0.64 ‡	0.29	1.90	-0.20	0.58	0.82
Contract length	-0.54 ††	0.18	0.58	-1.06 ††	0.18	0.35	-1.39 ††	0.23	0.25
Start of employment	0.07	0.16	1.07	0.50 ††	0.16	1.65	0.98 ††	0.22	2.65
Teleworking status	-0.33	0.24	0.72	-0.51 ‡	0.23	0.60	-0.88 ††	0.32	0.41
Occupational group: Administrative services	0.10	0.21	1.10	0.32	0.20	1.37	0.99 ††	0.28	2.68
Occupational group: Clerical and regulatory	0.45	0.24	1.56	0.24	0.21	1.27	0.72 ††	0.27	2.05
Occupational group: Computer sciences	-0.45 ‡	0.18	0.64	-0.34 ‡	0.17	0.71	0.28	0.21	1.33
Occupational group: Economics and social science services	-0.47 ††	0.12	0.62	-0.46 ††	0.12	0.63	0.20	0.14	1.22
Occupational group: Mathematics	-1.21 ††	0.37	0.30	-1.38 ††	0.34	0.25	-0.82 ‡	0.38	0.44
Occupational group: Executive	-1.41 ††	0.50	0.25	-0.40	0.53	0.67	0.11	0.64	1.11

‡ coefficient significantly different from 0 ($p < 0.05$)

†† coefficient significantly different from 0 ($p < 0.01$)

Notes: The coefficients and odd ratios reflect the effects of the predictors on the likelihood of membership in the first listed profile relative to the second listed profile. Sex (0 = male, 1 = female), age (0 = 18 to 29, 1 = 30 to 39, 2 = 40 to 49, 3 = 50 to 59, 4 = 60 or older), Indigenous person status (0 = no, 1 = yes), racialized group status (0 = no, 1 = yes), person with disabilities status (0 = no, 1 = yes), first official language (0 = English, 1 = French), number of dependants in household (0 = 0, 1 = 1, 2 = 2, 3 = 3, 4 = 4 or more), number of people in household (0 = 0, 1 = 1, 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6 or more), dedicated home office (0 = no, 1 = yes), place of work (0 = Statistics Canada, 1 = Statistical Survey Operations), supervisory status (0 = no, 1 = yes), contract status (0 = part time, 1 = full time), contract length (0 = determinate, 1 = indeterminate), start of employment (0 = before the pandemic, 1 = during the pandemic), teleworking status (0 = not exclusively, 1 = exclusively), occupational groups (0 = not a member of the specific group, 1 = a member of the specific group).

Sources: Statistics Canada, human resources database, November 2021; and Employee Wellness Survey, November to December 2021.

Table 4-2
Results from the multinomial logistic regressions of the sociodemographic characteristics predicting profile membership

Predictor	Doing well verus moving along			Doing well versus struggling			Moving along versus struggling		
	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio	coefficient	standard error	odds ratio
Sex	0.12	0.09	1.13	0.11	0.11	1.12	-0.01	0.12	0.99
Age	0.34 ††	0.04	1.40	0.40 ††	0.05	1.49	0.06	0.05	1.07
Indigenous person status	-0.02	0.27	0.98	0.22	0.36	1.25	0.24	0.37	1.27
Racialized group status	0.38 ††	0.12	1.47	0.60 ††	0.17	1.81	0.21	0.17	1.24
Person with disabilities status	0.26	0.19	1.30	-0.43 ‡	0.21	0.65	-0.69 ††	0.23	0.50
First official language	0.20 ‡	0.10	1.22	0.54 ††	0.14	1.71	0.34 ‡	0.14	1.40
Number of dependants in household	-0.03	0.06	0.97	-0.06	0.08	0.94	-0.03	0.08	0.97
Number of people in household	0.14 ††	0.05	1.15	0.23 ††	0.07	1.26	0.09	0.07	1.09
Dedicated home office	0.47 ††	0.11	1.60	0.81 ††	0.13	2.26	0.34 ††	0.12	1.41
Place of work	-0.32	0.23	0.73	-2.34 ††	0.53	0.10	-2.02 ††	0.55	0.13
Supervisory status	-0.15	0.10	0.86	-0.29 ‡	0.14	0.75	-0.14	0.14	0.87
Contract status	0.15	0.22	1.17	-0.69	0.54	0.50	-0.84	0.55	0.43
Contract length	-0.52 ††	0.16	0.59	-0.85 ††	0.21	0.43	-0.32	0.22	0.72
Start of employment	0.43 ††	0.14	1.53	0.90 ††	0.20	2.47	0.48 ‡	0.21	1.61
Teleworking status	-0.18	0.21	0.83	-0.55	0.30	0.57	-0.37	0.29	0.69
Occupational group: Administrative services	0.22	0.20	1.25	0.89 ††	0.27	2.43	0.67 ‡	0.28	1.95
Occupational group: Clerical and regulatory	-0.20	0.22	0.82	0.28	0.27	1.32	0.48	0.27	1.61
Occupational group: Computer sciences	0.11	0.14	1.11	0.73 ††	0.18	2.08	0.63 ††	0.19	1.87
Occupational group: Economics and social science services	0.01	0.10	1.01	0.68 ††	0.12	1.95	0.66 ††	0.13	1.93
Occupational group: Mathematics	-0.17	0.20	0.84	0.40	0.25	1.49	0.57 ‡	0.25	1.76
Occupational group: Executive	1.01 ††	0.34	2.74	1.51 ††	0.48	4.53	0.50	0.55	1.65

‡ coefficient significantly different from 0 ($p < 0.05$)

†† coefficient significantly different from 0 ($p < 0.01$)

Notes: The coefficients and odd ratios reflect the effects of the predictors on the likelihood of membership in the first listed profile relative to the second listed profile. Sex (0 = male, 1 = female), age (0 = 18 to 29, 1 = 30 to 39, 2 = 40 to 49, 3 = 50 to 59, 4 = 60 or older), Indigenous person status (0 = no, 1 = yes), racialized group status (0 = no, 1 = yes), person with disabilities status (0 = no, 1 = yes), first official language (0 = English, 1 = French), number of dependants in household (0 = 0, 1 = 1, 2 = 2, 3 = 3, 4 = 4 or more), number of people in household (0 = 0, 1 = 1, 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6 or more), dedicated home office (0 = no, 1 = yes), place of work (0 = Statistics Canada, 1 = Statistical Survey Operations), supervisory status (0 = no, 1 = yes), contract status (0 = part time, 1 = full time), contract length (0 = determinate, 1 = indeterminate), start of employment (0 = before the pandemic, 1 = during the pandemic), teleworking status (0 = not exclusively, 1 = exclusively), occupational groups (0 = not a member of the specific group, 1 = a member of the specific group).

Sources: Statistics Canada, human resources database, November 2021; and Employee Wellness Survey, November to December 2021.

While boundary crossing via ICTs was unexpectedly associated with a greater likelihood of membership in healthier profiles, research on ICT use and the work–life interface is in its infancy. It is possible that ICT use outside work hours affords employees a certain level of flexibility and control over their hours, place, and conditions of work,[61-63] leading to better psychological health and functioning at work. Given the mixed results in this area,[64] future studies and theoretical developments are needed to disentangle the association between boundary crossing via ICTs and employee psychological health.

Limitations and future directions

The use of an objective measure of sickness absence constitutes an important strength of this study, mitigating the potential impact of various forms of method bias common in self-reports.[65] Nonetheless, future research would benefit from the integration of additional objective measures (e.g., turnover) or measures obtained from multiple informants (e.g., supervisor, coworkers, spouses).[65] The current study relied on a cross-sectional research design, making it impossible to demonstrate causal connections between membership in the employee psychological health profiles and their predictors and outcomes. Longitudinal research would strengthen the alleged directionality of these relationships and allow for the study of transitions (i.e., changes in profile membership) over time.[59] In addition, given that data collection took place during the pandemic, when the majority of employees were working remotely, a post-pandemic replication of the profiles is important as hybrid work becomes the norm. Similarly, the significance of the predictors included in the present study could change in a hybrid-work context.[44] Finally, the results of the current research apply only to the employees of a single Canadian public service organization. Future research could explore whether the findings generalize to other work settings and contexts.

Practical implications

One of the goals of the Strategy is to measure, report, and continuously improve employee psychological health. The present study identified several predictors that were consistently associated with membership in healthier profiles. These results can inform workplace interventions to maintain or improve employee psychological health, such as interventions designed to elicit autonomy-supportive leadership behaviours, promote role clarity by introducing job-crafting strategies, or support employees' efforts to minimize work–life interference by segmenting their professional and personal lives. These findings can also guide the design of interventions targeting a specific lever at the levels of the individual, group, leader, and organization simultaneously, to increase the potential for sustained improvements to employee psychological health.[41]

Table 5
Outcome means with 95% confidence intervals and pairwise comparisons between the psychological health profiles

	Thriving			Doing Well			Moving Along			Struggling		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Outcome	Mean	from	to	Mean	from	to	Mean	from	to	Mean	from	to
Job satisfaction	1.04	1.00	1.08	0.52	0.50	0.55	-0.34	-0.37	-0.30	-1.55	-1.61	-1.48
Psychological distress	-0.84	-0.87	-0.81	-0.43	-0.46	-0.39	0.21	0.17	0.25	1.43	1.35	1.52
Self-reported work performance	1.13	1.06	2.21	0.56	0.49	0.62	-0.42	-0.49	-0.34	-1.37	-1.56	-1.18
Sickness absence	-1.18	-2.34	-0.02	-0.99	-1.78	-0.20	0.37	-0.52	1.27	2.35	0.92	3.78

Notes: Outcomes were estimated from factor scores with a mean of 0 and a standard deviation of 1 where 0 signifies that an outcome is on an average level. Scores substantially higher than 0 are considered above average, while scores substantially lower than 0 are considered below average. For job satisfaction, psychological distress and self-reported work performance, there is a significant ascending difference between the mean of each psychological health profiles, with Struggling < Moving Along < Doing Well < Thriving. For sickness absence, there is a significant ascending difference between the mean of 3 out of 4 psychological health profiles, with Struggling < Moving Along < Doing Well = Thriving.
Source: Employee Wellness Survey 2021, November to December 2021

Conclusion

The pandemic and a growing legal imperative for organizations to provide a psychologically healthy workplace for their employees have punctuated the need for a valid and reliable measurement of employee psychological health, its predictors, and its outcomes. To meet this need, the present research focused on burnout and work engagement as core indicators of employee psychological health and appealed to the JD-R Model and its associated literature to identify predictors and outcomes of membership in employee psychological health profiles. The current study also aligned with the Standard and emergent considerations around remote work.

The research uncovered four psychological health profiles among employees of a Canadian public service organization during the pandemic, ranging from optimal to suboptimal configurations of burnout and work engagement. Membership in healthier profiles was consistently related to several predictors, and the profiles differed from one another in terms of job satisfaction, psychological distress, self-reported work performance, and sickness absence. The results of the current study can serve as useful evidence-based inputs in support of the Strategy, with consistent predictors of burnout and work engagement being selected as targets for interventions aimed at maintaining or improving employee psychological health.

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