

COVID-19 pandemic disruptions to working lives: A multilevel examination of impacts across career stages

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ARTICLE INFO

Keywords:

Career stages
 COVID-19 disruptions
 Burnout
 Stress
 Job satisfaction
 Job demands and resources

ABSTRACT

Since early 2020 the COVID-19 pandemic disrupted societies worldwide. As we moved from expecting the closure of society to be a short-term one to experiencing it as a longer-term phenomenon, we lacked understanding about how the pandemic has affected the working lives and wellbeing of employees in different life and career stages. Drawing from lifespan development approaches and Job Demands-Resources (JD-R), we considered the effect this profound disruption had on stress, burnout, and job satisfaction across career stages over time. We took a multi-level approach to the analysis of three waves of data. Disruptions were a predictor of stress and negatively affected disengagement and job satisfaction over time. We found differences in the ways in which people in different career stages reacted to these disruptions and adjusted over time. Job autonomy positively influenced wellbeing over time, however perceived organizational support contributed to growth in burnout disengagement and exhaustion and lower job satisfaction over time. We discuss the implications of our findings for workplaces managing in the aftermath of external shocks going forward.

1. Introduction

COVID-19 has dominated lives around the world since early 2020 when many millions of people experienced an abrupt lockdown of all spheres of their lives. Work and personal lives underwent wide-ranging disruption exacerbated by restricted access to health services, education, and family care (Kim et al., 2022). As large numbers of people were forced to remain at home, social isolation ensued with increases in loneliness and mental health issues reported from the early days of the crisis (Jia et al., 2020; WHO, 2021). Amidst these challenges, many people also coped with the requirement to work remotely from home while balancing numerous competing demands on their time (Meyer et al., 2021; OECD, 2021). In many countries, the restrictions fluctuated for two years including repeated openings and closings (e.g., Weible et al., 2020); in other countries restrictions continue¹. It is widely anticipated that the COVID-19 pandemic will not be the last one we experience; as the world's population expands, the prevalence of pandemics is also expected to grow (Heileman, 2020).

The COVID-19 pandemic has proved to be a longer-term political, economic, and natural shock differentiating it from other types of disasters (CDC, 2020; Mihalache & Mihalache, 2021). The IMF forecasts that the global economic cost of the pandemic through to 2024 will rise beyond \$12.5 trillion (Reuters, 2022). The WHO estimates the true number of people who died directly or indirectly from the pandemic is 14.9 million (WHO, 2022). Experts have warned that the next pandemic could be worse, being more contagious, or more

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lethal, or both (e.g., Gregory & Elgot, 2021). The implications are stark: the world needs to capture the wide-ranging lessons of this pandemic now to prepare for the next pandemic. That preparation needs to include strengthened workforce management with the focus shifting from human resources to human beings (Ferry, 2022). The COVID-19 Mental Disorders Collaborators (2021) found the pandemic was responsible for generating an additional 53 million cases of major depressive disorder and 76 million additional cases of anxiety disorders. Laterally, it is estimated that between 2011 and 2030, mental health will cost \$16 trillion in lost economic output worldwide (Broom, 2020). More immediately, indications are that some level of remote work will remain indefinitely for certain jobs (Lund et al., 2020). The spotlight remains therefore on workforce well-being (Wolpert, 2021). With our longitudinal study, we shed light on the extent to which the COVID-19 pandemic disrupted working people at various life and career stages early in the pandemic from a Job Demands-Resources (JD-R) perspective (Demerouti et al., 2012) to contribute to our understanding of well-being in a crisis. We conclude with recommendations for work practices based on lessons learned during the shock of political, economic, and social upheaval.

2. Background and research questions

2.1. Resources and demands

The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al., 2001) is firmly established as a leading theoretical framework to work and well-being. Job demands are any aspects of the job that require some physical or psychological effort and have associated costs, whereas job resources can reduce job demands and stimulate positive aspects, such as personal growth and development (Bakker & Demerouti, 2007). Increased job demands may lead to a strain or impairment in individual functioning processes, whereas work resources may give rise to motivational processes. Demerouti et al. (2011) found that demands were related to burnout, as exhibited through exhaustion, and resources to burnout, as evidenced by disengagement. Importantly, engaged individuals are motivated to stay engaged and create new resources over time (Bakker & Demerouti, 2017). Research prior to the pandemic had established that wide-ranging personal and job demands and resources vary by the individual (e.g., Bakker & Demerouti, 2017, 2007).

The demands brought about by the pandemic have been widely reported. Meyer et al. (2021) outline many of these demands: having to work from home; closure of childcare facilities; job insecurity; work-privacy conflicts; and privacy-work conflicts. Against the backdrop of the existing 24/7 work culture (Padavic et al., 2020), the popular press reported that employees worked even longer hours (Beheshti, 2021) and Zoom fatigue was widespread with women worse off (Fauville et al., 2021). Working parents with school-age children experienced the additional pressure of coping with home schooling while simultaneously working from home (Wakefield, 2021). The digital divide exacerbated the overall situation for the lower socio-economic classes (Holpuch, 2020).

Against this backdrop of pervasive pandemic-induced demands, the major story affecting personal and job resources was that of loneliness. Loneliness arises from social and emotional isolation (Shaver & Mikulincer, 2014) whereas social support in its various forms (e.g., from peers, supervisor, and the organization) is a well-documented job resource (e.g., Den Dulk et al., 2016; Rhoades & Eisenberger, 2002). Brooks et al. (2020) found that remote working exacerbated the pervasive feelings of loneliness already experienced by many workers prior to the pandemic. Marzban et al. (2021) reported that what employees missed most was face-to-face interaction with colleagues. Governmental organizations, universities, charities, and the popular press also reported widely on these experiences (GOV.UK, 2022; Mental Health Foundation, 2021; WHO, 2020). Younger people were widely reported to be hit hard (Walsh, 2021). Without personal support, single people also appeared to struggle more than others (ONS, 2021). Employees who were furloughed (Bernal, 2021) or whose hours were significantly reduced may have experienced an even greater sense of social isolation which was exacerbated by higher job insecurity (Ouwkerk & Bartels, 2022).

Despite the pandemic disruption, researchers have reported personal and job resource bright spots. Becker et al. (2022) found that high job control resulted in lower emotional exhaustion and better work-life balance. Mihalache and Mihalache (2021) showed that positive organizational support and supervisor accessibility resulted in more positive changes in work-related well-being. While Meyer et al. (2021) uncovered that the well-being of women with children suffered more than that of men, their analysis identified job autonomy and partner support as partially mitigating the effect. Nevertheless, overall resources were depleted and demands increased on individuals.

Given that these early limited findings from the pandemic suggest job resources have had a positive impact on well-being, despite wide-ranging new and increased demands over an extended period, we ask:

Research Question 1: To what extent are individuals' job resources able to counteract the perceived disruption of the COVID-19 pandemic over time?

2.2. Life and career stages

The adult lifespan is theorized to unfold in several dynamic and variable stages or bands organized around career development (Baltes & Baltes, 1990; Demerouti et al., 2012; Huffman et al., 2013; Super, 1980, 1957). The early career or exploration stage is characterised by finding oneself vocationally through the trialling of careers. In the mid-career or establishment phase, individuals have settled on a career and are building on those foundations. The late or maintenance stage signals a period of reassessment of life goals resulting in a reduced emphasis on career advancement. Recent evidence suggests that stages may be shifting later as traditional gender roles become increasingly blurred (Greenhaus & Powell, 2017; Powell, 2019), childbearing is delayed (Neal & Hammer, 2007), more young adults are returning to live with parents after higher education (Ullrich & Pantuosco, 2020), and people are working until an older age before retiring (Boeri et al., 2016).

Considering early negative research findings of the pandemic disruption on the mental health of whole populations (GOV.UK, 2022) and, particularly, younger people (Jia et al., 2020), our first aim is to examine how individuals at different life and career stages were affected by the COVID-19 pandemic disruption. We ask:

Research Question 2: How does the perception of the COVID-19 pandemic disruption vary by life and career stage?

2.3. Work outcomes over life and career stages: stress, burnout and job satisfaction

Stress, burnout, and job satisfaction are three widely studied work and well-being outcomes (Mäkikangas et al., 2016). Stress occurs when external forces place the cognitive-emotional-environmental system into a state of disequilibrium (Lazarus & Folkman, 1984). To confront stress, people try to minimize their resource losses or accumulate a surplus of resources to offset possible losses in the future. Salmela-Aro and Upadhyaya (2018) found that younger employees are more prone to experience stress and burnout than older employees, a finding of much earlier research as well (e.g., Antoniou et al., 2006; Maslach et al., 2001).

Where the stress arising from short-term disequilibrium is not managed and continues for an extended period, burnout (and ill-health) can be the longer-term outcome (Hockey, 1997; Leiter et al., 2013). Burnout is defined as a syndrome of exhaustion (or strain) and cynicism (or disengagement) (Maslach et al., 2001; Schaufeli et al., 2009). In contrast, work engagement is a positive work-related state comprised of high energy (vigor) and high identification (dedication) (Bakker & Schaufeli, 2008; Schaufeli et al., 2009). Work engagement is argued to be higher when people have higher levels of work-related resources (Halbesleben et al., 2009). While individuals with depleted resources are at risk of burnout, the relationship among the components of burnout have been shown to have a complex and dynamic relationship (Leiter et al., 2013; Toppinen-Tanner et al., 2002).

Job satisfaction is often defined as the degree to which people generally like their jobs (Spector, 1997). Subjective well-being has been shown to be positively related to job satisfaction (Judge & Klinger, 2008). Given our focus on the wide-ranging pandemic disruption, we highlight that work-family conflict has a negative impact on job satisfaction (Grandey et al., 2005; Kossek & Ozeki, 1998).

As all four outcomes have been shown to be dynamic, varying over time as dynamic circumstances change, we ask:

Research Question 3: Under the perceived disruption of the COVID-19 pandemic, how do stress, exhaustion, disengagement, and job satisfaction vary over time across life and career stages?

3. Method

3.1. Participants

This study was longitudinal and focused on work-related and resilience factors during the initial period of the COVID-19 pandemic. The WHO Director General declared a pandemic on March 11, 2020 (WHO, 2020). A sample of 421 respondents was recruited via personal and professional networks shortly thereafter, in April and May 2020. We retained 327 usable questionnaires after accounting for missing data. The gender composition of the sample was 61 % female and 39 % male, the median age was 46 years, and 88.4 % of respondents had a formal university education. Most respondents (76 %) work full-time, and 88.3 % were still in employment during the COVID pandemic. Only 16.6 % reported that they live alone. Of those living in households with others, 69 % reported having carer responsibilities, with a median number of children in their care of 1. Respondents resided in 30 countries, the majority (73.3 %) in Anglo countries. Nationalities were more varied, representing 41 home countries and 65.4 % Anglo. Prior to the COVID-19 pandemic, only 10.7 % of respondents indicated that they worked the full week at home; during the initial months of the pandemic 85 % of respondents did.

We asked respondents to complete two follow-up questionnaires at two-week intervals after the first study. Over half (53.8 %) of respondents ($N = 176$) agreed to participate in follow-up studies. Of these, we received 98 responses in Time 2 (response rate 55.7 %) and 81 in Time 3 (response rate 82.6 %). At each wave of the study, reminders were sent four days after the first invitation. We tested selective dropout between studies by comparing all the demographic variables of participants at T2 ($N = 98$) with those who only participated in T1 ($N = 229$). There were no significant differences between the groups on any of the demographic variables. A comparison of relationships across individuals completing the survey in T1 and additional waves was conducted. We compared differences in bivariate correlations between carer status and the dependent variables using the UNIANOVA/GLM procedure. No significant differences across these relationships were found. We also conducted t -tests to compare mean scores on the dependent variables across the completion groups (first wave only and all three waves). We found significant differences in mean scores on three of the four variables (disengagement, exhaustion, and stress). Individuals completing only the first wave were significantly more disengaged ($T(296) = -5.23, p < .001$) and more stressed ($T(296) = -8.51, p < .001$) and scored lower on exhaustion ($T(296) = 22.758, p < .001$), suggesting that dropout may have been a result of higher stress for these individuals.

3.2. Measures and procedure

The questionnaire consisted of items repeated at each timewave, as well as questions that were timewave specific. English was the language of the questionnaire, as respondents mainly resided in English-speaking countries.

Five work-related measures were included to capture the change in respondents' perceptions under COVID working conditions over all time periods (T1-T3). Burnout *Disengagement* ($\alpha_{T1} = 0.82, \alpha_{T2} = 0.82, \alpha_{T3} = 0.82$) and *Exhaustion* ($\alpha_{T1} = 0.84, \alpha_{T2} = 0.88, \alpha_{T3} = 0.82$) were measured using the 8-item subdimensions of the Oldenburg Burnout Inventory (Demerouti et al., 2010). A sample item is

Table 1
Means, standard deviations, and correlations among the study variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1. Disengagement _{T1}	3.25	1.04																	
2. Exhaustion _{T1}	3.70	1.04	0.53**																
3. Stress _{T1}	2.70	0.84	0.45**	0.43**															
4. Job satisfaction _T	5.55	1.27	-0.78**	-0.50**	-0.38**														
5. POS _{T1}	4.59	1.40	-0.57**	-0.49**	-0.29**	0.54**													
6. Job autonomy _{T1}	5.42	0.97	-0.48**	-0.46**	-0.26**	0.44**	0.39**												
7. Disengagement _{T2}	3.35	0.98	0.80**	0.60**	0.47**	-0.67**	-0.58**	-0.58**											
8. Exhaustion _{T2}	3.68	1.14	0.45**	0.82**	0.47**	-0.38**	-0.40**	-0.43**	0.58**										
9. Stress _{T2}	2.74	0.97	0.41**	0.54**	0.66**	-0.25*	-0.35**	-0.26*	0.50**	0.60**									
10. Job satisfaction _{T2}	5.28	1.25	-0.75**	-0.57**	-0.33*	0.87**	0.42**	0.34*	-0.76**	-0.48**	-0.37**								
11. POS _{T2}	4.57	1.49	-0.60**	-0.46**	-0.20	0.47**	0.87**	0.47**	-0.60**	-0.39**	-0.23*	0.38**							
12. Job autonomy _{T2}	5.41	1.00	-0.44**	-0.40**	-0.24*	0.69**	0.48**	0.69**	-0.66**	-0.46**	-0.28*	0.37*	0.51**						
13. Disengagement _{T3}	3.43	1.02	0.78**	0.54**	0.37*	-0.70**	-0.52**	-0.48**	0.86**	0.46**	0.38*	-0.75**	-0.56**	-0.54**					
14. Exhaustion _{T3}	3.70	1.00	0.30*	0.67**	0.36*	-0.28*	-0.31*	-0.33*	0.48**	0.81**	0.36*	0.49**	-0.44**	-0.36*	-0.38*	0.43**			
15. Stress _{T3}	2.88	0.84	0.33*	0.42**	0.46**	-0.29*	-0.19	-0.21	0.46**	0.54**	0.63**	-0.36*	-0.29*	-0.29*	0.42**	0.54**			
16. Job satisfaction _{T3}	5.19	1.27	-0.64**	-0.50**	-0.11	0.84**	0.48**	0.45**	-0.67**	-0.34*	-0.18	0.85**	0.48**	0.41*	-0.76**	-0.38*	-0.30*		
17. Disruptions _{T1}	4.34	1.03	0.01	0.06	0.20**	0.00	-0.11*	-0.05	0.21*	0.26*	0.30*	-0.09	-0.16	-0.14	0.26*	0.33**	0.33*	0.03	

Notes:

- * $p < .05$.
- ** $p < .001$.

“There are days when I feel tired before I even start work.” *Stress* ($\alpha_{T1} = 0.77, \alpha_{T2} = 0.82, \alpha_{T3} = 0.82$), from the Copenhagen Psychosocial Questionnaire (COPSOQ) (Kristensen et al., 2005; Pejtersen et al., 2010), measured the extent of nervousness and negative mood with five items. To measure *Job Satisfaction* ($\alpha_{T1} = 0.88, \alpha_{T2} = 0.87, \alpha_{T3} = 0.90$), we used a 3-item scale from the Michigan Organizational Assessment Questionnaire (OAQ) by Cammann et al. (1983).

Time-invariant measures were included at T1. First, we measured the extent of disruption perceived to be due to the pandemic. Three items gauged the extent to which respondents rated disruptions by COVID to their work, family, and personal routines on a scale from 1 (*not at all*) to 6 (*to a very great degree*). We labelled this *Disruptions* ($\alpha_{T1} = 0.67$). Additionally, we included the following demographic variables: gender (0 = female, 1 = male), age in years, and carer status (0 = no family or carer responsibilities, 1 = yes). Public responses to the pandemic have been found to differ across cultures (e.g., Maaravi et al., 2021). To account for differences in culture, and individualism, in particular, we asked respondents where they resided and coded countries as 1 if they were in an Anglo culture and 0 otherwise. Respondents were recategorized into five career stages: early career stage (18–29 years of age), developing career stage (30–39 years), consolidating career stage (40–49 years), late career stage (50–59 years) and pre-retirement stage (age 60+) (e.g., Cohen, 1991; Veiga, 1983).

Three time-varying covariates were also included to capture variation in response to the pandemic over time. *Restrictions* was an external index from the Oxford COVID-19 Government Response Tracker (Hale et al., 2021) measuring daily government response to the pandemic. The index represents the average of 16 component indicators². We included the index for each respondent’s country on the date that the respondent completed the questionnaire at each period (T1-T3). *Perceived organizational support (POS)* ($\alpha_{T1} = 0.87, \alpha_{T2} = 0.91$) was a 4-item scale based on Eisenberger et al. (1986). To measure *Job autonomy* ($\alpha_{T1} = 0.76, \alpha_{T2} = 0.81$) we used a 4-item scale from Rosenthal et al. (1996).

4. Analysis and results

The means, standard deviations, and bivariate correlations among the variables in the study are depicted in Table 1.

4.1. Temporal analyses

We analyzed the data with longitudinal linear mixed models. The multilevel analyses were conducted for each outcome variable using the general linear mixed model procedure in SPSS v25. The primary Level 1 unit of analysis was time with individuals at Level 2. Time was coded as 0, 1, 2 and all variables, except for dichotomous variables, were grand mean centered prior to analysis. The temporal patterns were examined via multilevel models (Tables 2 and 3). We first calculated the intercept-only (unconditional) null models adding the linear effect of time as a fixed effect to assess the variance components and to establish how much of the variation for the dependent variables is explained at the individual and repeated measures levels (Table 2). The full models for each outcome variable are presented in Table 3.

The null models (Table 2) allowed us to calculate the intraclass correlations (ICC). For Disengagement, 82.4 % (Level 2) and 17.6 % (Level 1) of the variance were at the individual and repeated measures levels, respectively, for Exhaustion these were 74 % (Level 2) and 26 % (Level 1), for Stress – 54 % (Level 2) and 46 % (Level 1) and for Job Satisfaction – 86 % (Level 2) and 14 % (Level 1). These results suggest that multilevel analyses are justified (Aguinis et al., 2013).

We next examined the predictive ability of the time-invariant and time-varying Level 2 variables, and the cross-level interactions with time. Table 3 depicts the full models for each outcome variable. We are interested in effects on individuals during the early pandemic period; we included time, and the two pandemic-related variables, disruptions and restrictions, as fixed effects in all models. We modelled fixed and random effects for the time-varying job resources (POS and job autonomy) variables to account for variation in perceptions about job resources across individuals. The addition of the interpersonal variables significantly improved each of the models as follows: Disengagement $\chi^2(14) = 373.91, p < .001$; Exhaustion $\chi^2(13) = 268.97, p < .001$; Stress $\chi^2(9) = 272.87, p < .001$ and Job Satisfaction $\chi^2(13) = 540.38, p < .01$. The significant findings are discussed in turn.

Table 2
Unconditional (null models) for all job outcome variables.

	Disengagement			Exhaustion			Stress			Job Satisfaction		
	Est	SE	ρ	Est	SE	ρ	Est	SE	ρ	Est	SE	ρ
Intercept	3.25	0.06	<0.001	3.70	0.06	<0.001	2.69	0.05	<0.001	5.54	0.07	<0.001
<i>Repeated measures</i>												
Time	0.14	0.03	<0.001	0.02	0.04	0.578	0.05	0.04	0.23	-0.17	0.04	<0.001
<i>Residual variance</i>												
Repeated measures (σ^2)	0.19	0.02	<0.001	0.28	0.03	<0.001	0.34	0.03	<0.001	0.23	0.03	<0.001
Intercept (σ^2_{i0})	0.89	0.08	<0.001	0.80	0.08	<0.001	0.40	0.05	<0.001	1.41	0.13	<0.001
<i>Deviance</i>	1233.89			1290.67			1218.13			1401.03		

Notes: The repeated measures variable, Time, is coded 0, 1, 2. The deviance statistic (-2 Log-Likelihood) is an indication of model fit (smaller values indicate better fit).

Table 3
Multilevel analysis for predictors of job outcome variables.

	Disengagement	Exhaustion	Stress	Job satisfaction
	Est. (SE)	Est. (SE)	Est. (SE)	Est.(SE)
Intercept	3.25*** (0.11)	3.21*** (0.15)	2.43*** (0.12)	5.56*** (0.11)
<i>Repeated measures</i>				
Time	0.25** (0.08)	0.18 (0.10)	-0.08 (0.08)	-0.30*** (0.09)
<i>Time-invariant covariates</i>				
Early career ^a	0.53** (0.15)	0.58** (0.19)	0.67** (0.17)	-0.30* (0.15)
Developing career	0.33* (0.13)	0.59*** (0.17)	0.44** (0.14)	-0.22 (0.13)
Consolidating career	0.21 (0.13)	0.46** (0.16)	0.27* (0.13)	-0.19 (0.12)
Late career	0.12 (0.12)	0.30 (0.16)	0.14 (0.13)	-0.05 (0.12)
Gender ^b		0.23* (0.10)		
Culture ^c	-0.21* (0.09)			
Disruptions	-0.03 (0.04)	0.09 (0.05)	0.16*** (0.04)	0.02 (0.04)
<i>Time-varying covariates</i>				
Restrictions	0.01* (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
POS	-0.48*** (0.03)	-0.31*** (0.03)	-0.17*** (0.03)	0.70*** (0.03)
Job Autonomy	-0.06 (0.03)	0.09* (0.04)		0.10** (0.03)
<i>Cross level interactions</i>				
Disruptions × Time	0.13* (0.06)			-0.13* (0.06)
POS × Time	0.19*** (0.04)	0.14** (0.05)		-0.14** (0.05)
Job autonomy × Time	-0.29*** (0.06)	-0.21** (0.08)		0.14* (0.07)
<i>Residual variance</i>				
Repeated measures (σ_e^2)	0.11*** (0.02)	0.18*** (0.03)	0.28*** (0.05)	0.14*** (0.02)
Intercept (σ_{i0}^2)	0.15** (0.05)	0.38*** (0.07)	0.12** (0.06)	0.13** (0.04)
POS var. (σ_{i1}^2)	0.04* (0.02)	0.01 (0.02)	0.05* (0.02)	0.10*** (0.02)
Job autonomy var. (σ_{i2}^2)	0.10*** (0.03)	0.11** (0.03)	0.06* (0.02)	0.04* (0.02)
Deviance	859.98	1021.70	945.26	860.65

Notes: The repeated measures variable, Time, is coded 0, 1, 2. The deviance statistic ($-2 \text{ Log-Likelihood}$) is an indication of model fit (smaller values indicate better fit).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

^a The reference category for career stage is pre-retirement stage.

^b The reference category for Gender is male.

^c The reference category is Anglo country.

4.1.1. The linear effect of time

We were interested in changes to our outcome variables over time. In Table 3 we can see that the effect of time was significant in the model for Disengagement ($b = .25, p < .01$) indicating a linear relationship between disengagement and time. The rate of growth in disengagement increases by 0.11 over time after adjusting for the covariates (i.e., compared to the null model in Table 2). Time was also a significant predictor of Job satisfaction ($b = -.30, p < .001$); the negative coefficient indicates that job satisfaction decreases with each unit increase in time, and the rate of growth increased by 0.13 after adjusting for the covariates in the model.

4.1.2. Pandemic-related disruptions to work, family and personal routines

Disruptions to individuals' routines due to the pandemic was a significant predictor of stress ($b = .16, p < .001$). The time-varying variable restrictions was positively related to disengagement ($b = .01, p < .05$), suggesting an increase in disengagement with restrictions over time. A cross-level interaction between disruptions and time was significant in the model for disengagement ($b = .13, p$

< .05). Holding other variables in the model constant, this implies that individuals who experience higher levels of disruptions due to the COVID pandemic (e.g., +1 SD above the mean), would see a 0.13 increase in disengagement over time, compared to individuals with disengagement levels at the grand mean. Disruptions and time interact to influence job satisfaction ($b = -.13, p < .05$), suggesting a greater decrease in job satisfaction (at 0.13) during the pandemic for individuals experiencing higher levels of disruption compared to individuals who experience average or lower levels of disruptions.

4.1.3. Job resources

We see an effect of job resources in all models to varying degree. In the Disengagement model, the coefficient for POS is negative and significant ($b = -.48, p < .001$). Job autonomy did not reduce disengagement. But both job resources interacted with time. The interaction between POS and time ($b = .19, p < .001$) indicates that disengagement increased at a rate of 0.19 for individuals reporting higher levels of POS (+1 SD above the mean). Although the fixed effect of job autonomy is nonsignificant, there is a negative interaction with time ($b = -.29, p < .001$) suggesting that individuals reporting higher levels of autonomy experience greater reductions (of 0.29 at each point in time) in disengagement. We see similar results regarding exhaustion: a negative coefficient for POS ($b = -.31, p < .001$), a positive interaction of POS with time ($b = .14, p < .01$), and a negative interaction between job autonomy and time ($b = -.22, p < .01$). The coefficient for job autonomy is also positive ($b = .09, p < .05$). Regarding stress, the negative coefficient for POS ($b = -.17, p < .01$) appears to alleviate the positive effect of disruptions, but only marginally, holding all other covariates constant. The findings for job satisfaction indicate that the coefficient for POS is not only positive but high ($b = .70, p < .001$). However, there is a negative interaction of POS with time ($b = -.14, p < .01$), indicating negative growth in job satisfaction for individuals who report higher levels of POS. While these results appear contradictory, the interaction indicates change over time, compared to the fixed effect of the average value of POS across time periods. In this case, the involvement of one's organization over time might in fact become a nuisance during COVID, as opposed to the positive interaction between job autonomy and time ($b = .14, p < .05$), indicating that individuals who report higher levels of job autonomy experience higher rates of growth in job satisfaction of 0.14, compared to individuals whose job autonomy is average or lower. The fixed effect of job autonomy is also significant ($b = .10, p < .05$). Thus, over time, high levels of organizational support (POS) have negative consequences, increasing disengagement and exhaustion and lowering job satisfaction.

4.1.4. Differences across career stages

We were also interested in observed differences between career stages with respect to the job-related variables. At level 2, there were significant differences in all models, holding all other variables in the model constant. Coefficients for Exhaustion were significantly higher for the early ($b = .59, p < .01$), developing career ($b = .60, p < .001$) and consolidating career ($b = .46, p < .01$) groups than the reference group - pre-retirement. These groups also reported higher levels of stress ($b = .67, p < .001$; $b = .44, p < .01$; $b = .27,$

Table 4
Age as a predictor of job outcomes variables.*

	Disengagement	Exhaustion	Stress	Job satisfaction
Intercept	3.24*** (0.05)	3.63*** (0.05)	3.29*** (0.05)	5.49*** (0.06)
Age	-1.16*** (0.30)	-1.06*** (0.27)	-1.16*** (0.30)	0.79** (0.30)
<i>Carer Stage</i>				
Early career (18–29)				
Mean	3.563	3.898	3.096	5.262
Lower	3.550	3.896	3.087	5.261
Upper	3.577	3.899	3.109	5.263
Developing career (30–39)				
Mean	3.414	3.904	2.929	5.297
Lower	3.410	3.904	2.921	5.294
Upper	3.418	3.905	2.937	5.299
Consolidating career (40–49)				
Mean	3.359	3.835	2.766	5.379
Lower	3.356	3.829	2.760	5.374
Upper	3.361	3.840	2.772	5.383
Late-career (50–59)				
Mean	3.241	3.598	2.600	5.534
Lower	3.233	3.585	2.593	5.525
Upper	3.250	3.612	2.607	5.543
Pre-retirement (60+)				
Mean	2.899	3.184	2.416	5.801
Lower	2.863	3.148	2.402	5.777
Upper	2.935	3.220	2.430	5.826

Notes:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

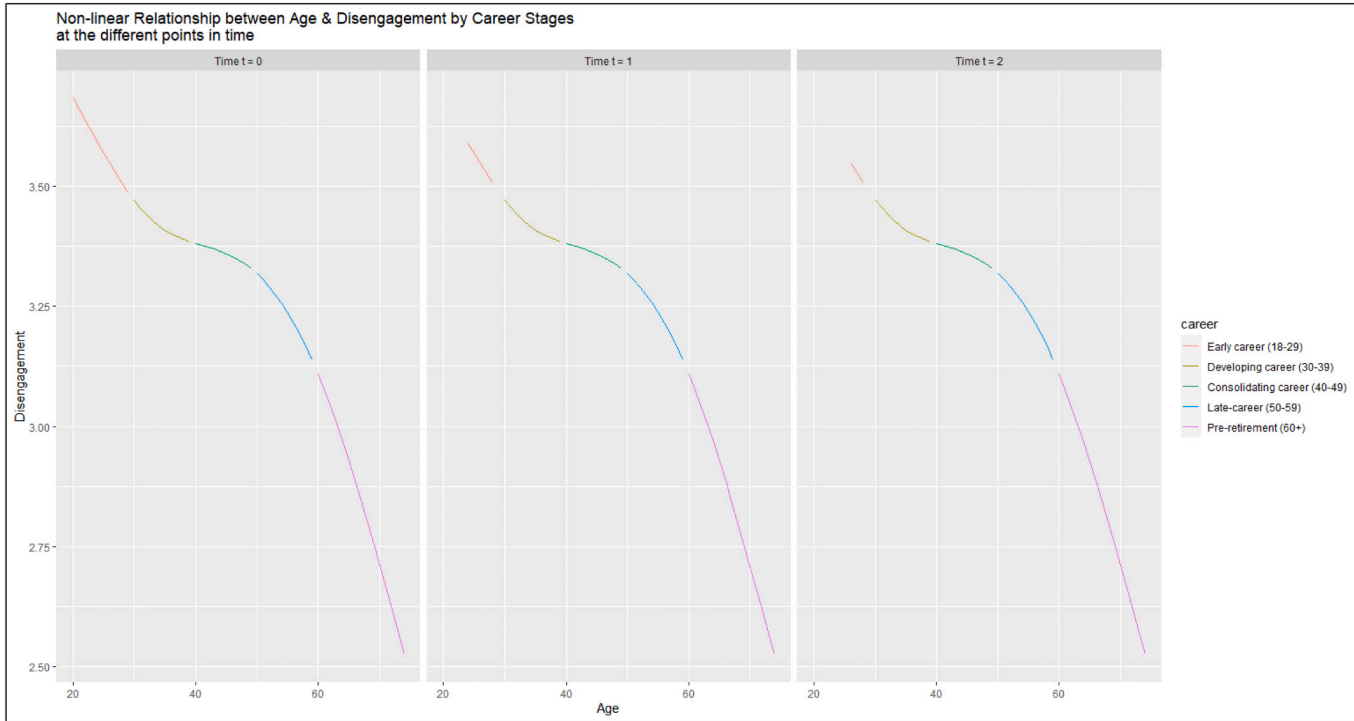


Fig. 1. Spline curves of predicted disengagement for ages at the three time points.

$p < .05$, respectively). The coefficients for disengagement were significant and higher for the early career ($b = .53, p < .01$) and developing career ($b = .33, p < .05$) groups. Individuals at early career also experienced significantly lower levels of job satisfaction ($b = -.30, p < .001$).

4.1.5. Probing career stages further – the effect of age

Given these differences across life and career stages, we further examined these differences by probing the non-linear relationship between age as a continuous variable and the four job outcomes (Table 4). The mean predicted disengagement ($b = -1.16, p < .001$) was highest for the early career stage (3.56) and decreased successively through to pre-retirement (2.90). In the case of exhaustion ($b = -1.06, p < .001$), the developing career group had the highest value (3.904) followed by early career (3.898), consolidating career (3.84), late-career (3.60) and pre-retirement (3.18). Stress ($b = -1.06, p < .001$) was highest for the early career (3.10) and decreased in successive stages. For job satisfaction ($b = 0.79, p < .01$), the mean predicted value was highest for the pre-retirement stage (5.80) and decreased at each stage to early career as lowest (5.26). Fig. 1 provides the spline visualization of the predicted values for Disengagement by age; different colors represent individual career stages. The visualisations for the remaining outcome variables are presented in supplemental materials.

We further examined how the career stages differ in trend on the outcome variables. We observe (Table 5) that the mean disengagement for the early career decreased while disengagement for the late career increased over time. However, for the developing

Table 5
Differences in trends in job outcome variables for career stages.

Disengagement				Exhaustion			
Time	Mean	LCI	UCI	Time	Mean	LCI	UCI
<i>Early Career (18–29)</i>							
0	3.566	3.548	3.583	0	3.897	3.896	3.899
1	3.548	3.016	4.081	1	3.899	3.844	3.954
2	3.527	3.271	3.782	2	3.902	3.877	3.927
<i>Developing career (30–39)</i>							
0	3.415	3.408	3.422	0	3.905	3.903	3.906
1	3.412	3.399	3.425	1	3.904	3.902	3.906
2	3.413	3.400	3.426	2	3.904	3.902	3.907
<i>Consolidating career (40–49)</i>							
0	3.359	3.356	3.362	0	3.836	3.827	3.845
1	3.357	3.351	3.363	1	3.831	3.815	3.847
2	3.358	3.351	3.366	2	3.834	3.814	3.853
<i>Late career (50–59)</i>							
0	3.236	3.223	3.248	0	3.589	3.568	3.609
1	3.246	3.223	3.269	1	3.605	3.567	3.643
2	3.261	3.237	3.286	2	3.631	3.590	3.672
<i>Pre-retirement (60+)</i>							
0	2.919	2.869	2.969	0	3.204	3.154	3.254
1	2.851	2.722	2.981	1	3.139	3.012	3.266
2	2.883	2.766	3.000	2	3.170	3.054	3.286
Stress				Job satisfaction			
Time	Mean	LCI	UCI	Time	Mean	LCI	UCI
<i>Early Career (18–29)</i>							
0	3.095	3.082	3.109	0	5.262	5.261	5.264
1	3.118	3.071	3.165	1	5.264	5.215	5.313
2	3.082	2.997	3.166	2	5.265	5.238	5.293
<i>Developing career (30–39)</i>							
0	2.928	2.904	2.952	0	5.297	5.293	5.300
1	2.926	2.902	2.950	1	5.298	5.290	5.306
2	2.767	2.758	2.777	2	5.298	5.290	5.305
<i>Consolidating career (40–49)</i>							
0	2.767	2.758	2.777	0	5.378	5.371	5.385
1	2.763	2.746	2.780	1	5.383	5.370	5.395
2	2.766	2.744	2.787	2	5.380	5.364	5.395
<i>Late career (50–59)</i>							
0	2.596	2.585	2.606	0	5.540	5.527	5.553
1	2.602	2.584	2.620	1	5.530	5.507	5.553
2	2.618	2.596	2.639	2	5.514	5.489	5.539
<i>Pre-retirement (60+)</i>							
0	2.421	2.400	2.441	0	5.788	5.754	5.822
1	2.404	2.357	2.451	1	5.833	5.746	5.919
2	2.414	2.371	2.457	2	5.812	5.733	5.890

Notes: Values are computed at 95 % CI.

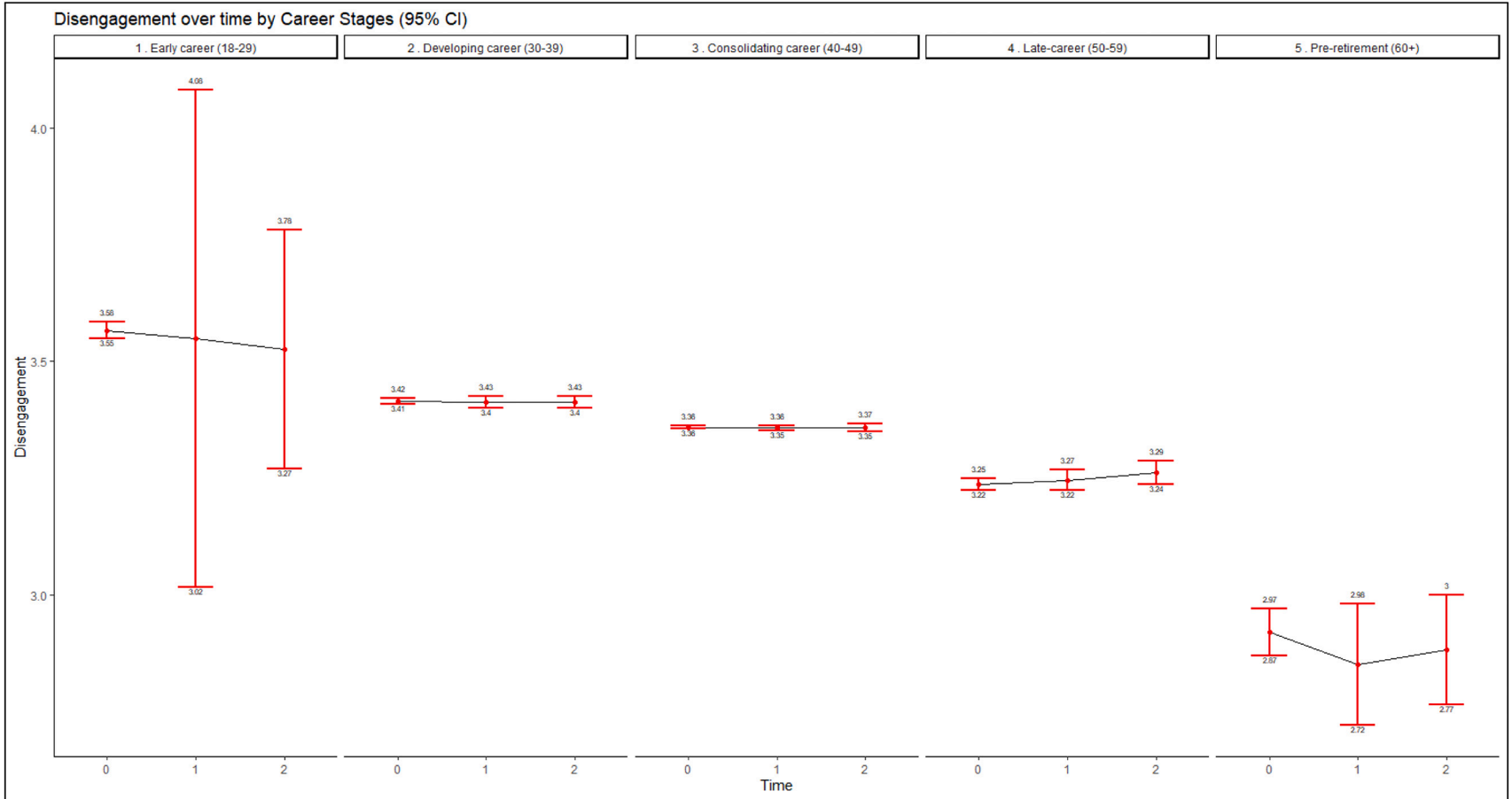


Fig. 2. Differences in trends in disengagement for the career stages.

career, consolidating career and pre-retirement stages the initial fall in disengagement in T2 was followed by more disengagement in T3. Exhaustion levels for early and late career increased over time and decreased with time for the developing career. For consolidating career and pre-retirement, the initial decrease in exhaustion at T2 was followed by an increase in T3. Regarding stress, the initial decrease at T2 for developing career, consolidating career and pre-retirement was followed by an increase in T3. An opposite trend was observed for the early career stage where an initial increase in stress at T2 was followed by a decrease at T3. For late career, stress increased with time. Job satisfaction increased with time for the early and developing career groups but decreased for the late career and pre-retirement groups. The consolidating career group exhibited an initial increase at T2 was followed by a decrease in T3. The trend analyses reveal that the late-career group was uniquely on a downward spiral for all four outcome variables. Fig. 2 provides the trend analysis for disengagement across the different career stages. The trend visualisations for the other three outcome variables are included in the supplement.

Finally, a few words about our remaining covariates. At the between person level (Table 3), remote working experience and having carer responsibilities did not contribute as significant predictors in any of the models. Importantly, of the remaining variables, females reported higher levels of stress ($b = .23, p < .01$). People in non-Anglo cultures also reported significantly lower levels of disengagement compared with respondents in Anglo cultures ($b = -.21, p < .05$).

5. Discussion

We conducted our study at a time when employees everywhere were experiencing major disruptions to work and personal lives. Although the individuals in this study each reacted differently to the external shock of the COVID-19 pandemic, we found distinct patterns in these reactions that are delineated by life and career stages. Within this context, our findings add to our understanding in several areas and have implications for theory and practice.

Our findings highlight the importance of job resources during times of crisis for job-related well-being. On average, job-related well-being decreased due to the disruptions of the pandemic. Higher levels of perceived disruptions were related to greater stress, and increased disengagement and lower job satisfaction over time, while changing restrictions contributed to disengagement. Like recent studies that have linked job autonomy to lower exhaustion during the pandemic (Becker et al., 2022), we found that job autonomy decreased exhaustion and disengagement over time in the early stages of adjustment to pandemic-induced demands. However, our findings regarding how organizations can respond to periods of disruptions for their employees are counterintuitive. POS theory states that employees value support as it provides comfort during times of stress (Eisenberger et al., 1986). Research has shown both main and buffering effects of POS on fatigue and burnout (see Rhoades & Eisenberger, 2002, for a review), yet our results show a decrease in job-related well-being over time for employees with higher levels of POS. Mihalache and Mihalache (2021) found indirect well-being outcomes of POS through employees' affective commitment to the organization during the initial months of the pandemic. Although POS was on average negatively related to disengagement and exhaustion, over time it did not mitigate the average increase in disengagement across the sample, as well as within career stages because of the pandemic shock.

A career shock is defined as "... a disruptive and extraordinary event that is, at least to some degree, caused by factors outside the focal individual's control and that triggers a deliberate thought process concerning one's career. The occurrence of a career shock can vary in terms of predictability, and can be either positively or negatively valenced (Akkermans et al., 2018: 4)." The pandemic may have disrupted employees' existing resources, producing stress (Hobfoll, 1989). Over time POS may have come to be experienced as contributing to the further intensification of work during a crisis (Chillakuri & Vanka, 2022). The resulting stress caused by job resource disruptions to individuals' work and nonwork routines may similarly have affected their ability to balance job demands, negatively affecting job satisfaction. We contend that the extent to which individuals can cope with or recover from these losses depends to some extent on the types of resources they have at their disposal at different stages of their careers.

Compared to individuals in other career stages, early and developing career stage employees have fewer surplus personal and job resources to offset these losses, and hence experience lower levels of well-being. For these employees, social and networking resources are important for developing one's career and identifying with work. Opportunities to build new knowledge resources by growing task variety are also critical. Employees are increasingly seeking meaning (Vaccaro, 2014) and purpose (Danson, 2015) from work. Yet, the isolation and restrictions of the pandemic have also placed restrictions on these resources (Kong & Belkin, 2021). Reduced visibility in the workplace for those in the earlier career stages is considered to limit opportunities for promotion and other new opportunities (McGregor et al., 2016) especially when compounded by lack of supervisor visibility (Becker et al., 2022). Face-to-face social interaction with colleagues is disrupted (Marzban et al., 2021). The personal job resources typically invested in the work domain are essentially stagnant. Adding to the growing literature underlining the complex relationships between the various components of well-being (Mäkikangas et al., 2021), we found that for these career stages burnout does not necessarily begin with exhaustion before proceeding to disengagement. But we also found that early career employees were able to slightly improve their disengagement over the period of the study, in contrast to employees in other career stages (e.g., average disengagement for late-career respondents increased over time).

The pandemic has also negatively affected individuals in their mid-career stage relative to older employees. Deepening further our understanding of the exhaustion and disengagement relationship, individuals in the consolidating career stage have reported higher levels of exhaustion and stress persisting over time, relative to employees in pre-retirement. And while outcomes between the late and pre-retirement career stages were not significantly different, individuals in the late career stage exhibited a decline over time in all the job-related well-being variables, compared to decline and recovery for employees in pre-retirement, a group that exhibited higher levels of overall resilience. That the challenges posed by the pandemic have exacerbated these symptoms has implications for organizations in managing their workforce during such difficult times.

The implication for organizations is that efforts must be taken to fill these early career voids in the earlier career stages to mitigate against on-going resource depletion (Hobfoll, 2011) and contributing to disengagement and general lack of well-being, which has negative impacts for both individual and organization (Demerouti et al., 2001). Employers might provide additional meaningful and purposeful work-related supports to address job design through organizational nostalgia techniques (Leunissen et al., 2018), emphasizing to employees the job autonomy and job control embedded in their roles (Becker et al., 2022), promoting involvement with authentic horizontal partnerships (Cornwell et al., 2018), and offering knowledge development and training/mentoring opportunities. Social interaction needs to be the second major focus for organizations which can deliberately provide opportunities for more frequent 1:1 s with attention to leadership style (Butler et al., 2020), encouraging online coffee breaks/water cooler moments, and creating online social spaces for employees to mingle.

Organizations should encourage mid-career employees to expend resources in both work and family domains to allay exhaustion and minimize the potential for resource loss (Hobfoll, 2011). For example, where mid-career employees have family or carer roles, encouraging employees to attain, maintain or increase job satisfaction by promoting the expenditure of resources that contribute to identification with work, such as the organizational nostalgia techniques noted above, while not depleting resources from other non-work roles, might fuel positive emotions in these employees. Maintaining a balance between the domains at the initiative of the employer, offering flexible working hours, supervisor and peer support, boundary management training, work-family programs or other initiatives that recognize the importance of these competing roles and do not contribute to the intensification of work are recommended avenues at this career stage. Gravador and Teng-Calleja (2018) demonstrated that employees who manage work efficiently to guard private time are more successful in balancing work-life balance.

Our findings have revealed that, for mid-career employees, the shock of the pandemic may have increased or freed up certain resources, such as time with family or flexibility in work scheduling, that has promoted active decision-making by individuals (Hirschi et al., 2019) and helped dual-role employees better manage their resources with positive job-related outcomes (see Crawford et al., 2019). We found that job autonomy in fact improved disengagement, exhaustion, and job satisfaction over time; mid-career employees reported the least change over time and have been relatively stable in their reactions to the pandemic.

For the two later career stage employees (especially pre-retirement), the results of our study have shown that they are the least affected group with respect to levels of stress and burnout. This may suggest that they have been able to accumulate additional resources to offset negative effects of pandemic-related disruptions, leading to a degree of eustress (Hobfoll, 1989). Although there were no differences between groups across the outcome variables generally there were differences in the ways these two groups responded over time. Exhaustion decreased for the pre-retirement group over time and job satisfaction increased slightly. But in the late career group stress and disengagement and exhaustion levels increased over time. For late-stage career employees, it is important that the resources are not depleted and that employers be mindful that employees do not invest their resources in one role at the expense of another (Rothbard, 2001) to prevent turnover. Shocks precede turnover in the conceptualization of career shocks as presented by Lee et al. (1996). Employers can promote increased job engagement for these individuals, encourage self-directed work or more autonomy, so that these employees can balance any competing demands for resources as needed, simultaneously nurturing identification with the workplace. The unexpected and disruptive nature of the pandemic event has the potential to “activate changes in career development” (Akkermans et al., 2018: 7) for individuals in this group.

5.1. Future research directions

We propose important avenues for future research. Prior to the pandemic, Adamovic (2018) and Mockaitis et al. (2018) suggested that there is too little focus on employee-centric models of human resource management and that it is time to shift our focus from resources to people. Carnevale and Hatak (2020) call for research that addresses the needs of different groups of workers and the toll that the pandemic may have on their mental and physical well-being. Wolpert (2021) underlines how little we still know about supporting mental health at work. Our findings support the point that two groups of employees, i.e., younger employees (with limited to no family responsibilities, and perhaps also limited support networks), and late career (with various competing roles and declining well-being over time) should be the focus of new human resource management models with an emphasis on remote work. While organizations may be reaping benefits from remote work (Mockaitis et al., 2018), our results show that there are vast differences in the extent to which employees at different life and career stages have reacted to and adjusted (or not) to the early months of the pandemic. An important starting point for this stream of research is to understand the relationship between exhaustion and disengagement for different groups of workers including those at different career stages (Demerouti et al., 2012). This work needs supplementing by research to understand the relationship among the different forms of work support: peer, supervisor and organizational (see Den Dulk et al., 2016).

We also need to explore how life and career stages are evolving as we enter the age of longevity (Gratton & Scott, 2016). We have based our cut-offs of career stages on prior studies (e.g., Huffman et al., 2013), and it is difficult to justify career stages given the variety of job types and career trajectories in different professions (for example, academics and medical professionals may start their careers at later stages in life as they devote their 20s to education). However, our findings show quite clear differences justifying these stages. Super (1984) argues that people can also “recycle” through different stages, i.e., move back and forth, especially if they change organizations. Over the past several decades the boundaryless career (Arthur, 1994) has been touted as the “new career” and the four-day work week is being trialled (Pohjanpalo, 2021). Thus, more nuanced definitions and operationalizations of career stages that consider life stages and organizational tenure, as well as job type (Sturges, 2008), are still needed.

Finally, we studied reactions to an external event (the pandemic) over several months as the pandemic was gaining momentum in the early stages, and our findings cannot be generalized to longer term consequences on wellbeing and vocational behavior of

employees at different life and career stages. Scholars have suggested that the pandemic, as an external shock, can have different short- and long-term consequences across life and career stages (Akkermans et al. (2020); for example, negative outcomes in the short term may convert to positive outcomes in the longer term. As individuals initially reacted to the COVID-19 pandemic disruptions in different ways, over time they can realign their reactions to external events or seek out new opportunities to augment or reinvent their careers (Chen et al., 2021). Research comparing life and career stages over the longer term from a career perspective would add to our understanding about these impacts.

6. Conclusion

Research has shown that working from home initiatives help employees to cope with competing demands across physical and temporal boundaries (Adamovic, 2018; Caligiuri et al., 2020). However, for early-career workers, who are not coping as well under the new pressures, more measures from organizations are necessary to help them balance job demands and resources within the context of remote work. Caligiuri et al. (2020) suggest that more frequent and consistent communication from managers is important for reducing the various stresses of working from home, including social isolation. According to Butler et al. (2020) under “normal” circumstances, the younger generations of workers need additional supports from their managers. As we shift towards a “new normal”, humane-oriented leadership will become ever more important to mitigate the long-term effects on employee health and well-being. Our findings demonstrate that it is time to shift the focus away from organizations and home in on the needs of employees.

Notes

1. At the time of writing, in parts of the EU, for example, masking is mandatory on public transport, while in parts of China, strict lockdowns are in place.
2. The indicators comprising the Government Response Index are: school closings, workplace closing, cancellation of public events, restrictions on gatherings, closure of public transport, stay at home requirements, restrictions on internal movement, international travel controls, income supports, debt/contract relief, public information campaigns, testing policy, contact tracing, facial coverings, vaccination policy, and protection of the elderly.

CRedit authorship contribution statement

Audra I Mockaitis: Conceptualization, Methodology, Formal analysis, Investigation, Visualization, Writing - Original Draft, Review & Editing, Supervision, Project Administration.

Christina L Butler: Conceptualization, Methodology, Writing - Original Draft, Review & Editing, Project Administration.

Adegboyega Ojo: Methodology, Formal analysis, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors would like to acknowledge Garima Verma for assistance with the data collection for this study.

The authors would like to acknowledge support for their study from the Maynooth University (Donnellan Fund), and Kingston University.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jvb.2022.103768>.

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