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RESEARCH ARTICLE

The role of health demands, health resources, and adaptability in psychological strain and life satisfaction

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Abstract

The present study harnessed job demands-resources theory to identify key predictors of psychological strain (feeling overwhelmed by one's problems) and life satisfaction among a sample of 1060 adults randomly selected from the Australian electoral roll. The investigation sought to ascertain: (a) the relative contribution of health demands (e.g., inadequate health treatment) and health resources (e.g., access to helpful health-related information) in predicting psychological strain and life satisfaction, (b) the extent to which a recently proposed personal resource—adaptability—explained variance in wellbeing beyond individuals' health demands and resources, and (c) the role of psychological strain in predicting life satisfaction in the context of these demands and resources. Applying structural equation modelling we found that contextual health demands predicted greater psychological strain, individual health resources and adaptability both predicted lower psychological strain and greater life satisfaction, and psychological strain predicted lower life satisfaction. Notably, the adverse effects of health demands reduced significantly when health resources and adaptability were entered into the modelling. Taken together, the findings offer support for a health demands-resources framework that may be applied to better support individuals to respond to the stressors in their lives and in turn boost their sense of subjective wellbeing.

KEYWORDS
adaptability, demands, health, life satisfaction, psychological strain, resources

1 | INTRODUCTION

Psychological health challenges around the world are high and rising (World Health Organisation [WHO], 2022). In Australia, for example, (the site of the present study), nearly half (44%) of those over the age of 16 years are estimated to experience a psychological illness at some point in their life, while 21% have experienced a psychological illness in the previous 12 months—with stress-related problems (e.g., anxiety disorder, burnout) the most common (Australian Institute of Health and Welfare, 2023). In turn, psychological strain along these lines adversely affects broader aspects of individuals' wellbeing, including their sense of subjective wellbeing such as life satisfaction

Data are from the Australian Survey of Social Attitudes (AuSSA) conducted by Academic Surveys Australia and can be requested from the Australian Consortium for Social and Political Research Incorporated (ACSPRI).

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(Demerouti et al., 2000; Fergusson et al., 2015; WHO, 2022). Although there is increasing awareness of the importance of addressing these psychological health and wellbeing challenges, there is still much to learn and do (Diener, 2012; WHO, 2022).

2 | BACKGROUND TO THE PRESENT STUDY

In the present study we harnessed job demands-resources (JD-R) theory (Bakker & Demerouti, 2007, 2017; Schaufeli & Bakker, 2004) to conduct an integrative investigation into the health-related barriers (demands) and opportunities (resources) associated with individuals' strain and subjective wellbeing. Strain in our study was operationalised by psychological strain—feeling overwhelmed by one's problems (Bliese et al., 2017; also see Demerouti, 2015; Maslach et al., 1996, 2001; WHO, 2019 regarding the cognate 'inefficacy' component of burnout). Subjective wellbeing was operationalised by life satisfaction, an individual's subjective evaluation of their life (Diener, 2012). With a focus on these two psychological health and wellbeing indicators, we investigated: (a) the role of health-related demands (e.g., inadequate health treatment) and resources (e.g., access to helpful health-related information) in psychological strain and life satisfaction, (b) the role of a recently proposed personal resource—adaptability—in predicting psychological strain and life satisfaction beyond the effects of health demands and resources, and (c) the role of psychological strain in predicting life satisfaction in the context of these demands and resources. Figure 1 shows the process model to be investigated. The data we used to explore these issues are from the Australian Survey of Social Attitudes (AuSSA; McNeil et al., 2022) that each year seeks to ascertain views on various topics of national and international importance among a representative random sample of Australian adults. This dataset was considered ideal as it comprises indicators of various health-related demands and resources, a measure of adaptability, and also strain and subjective wellbeing indicators in the forms of psychological strain and life satisfaction.

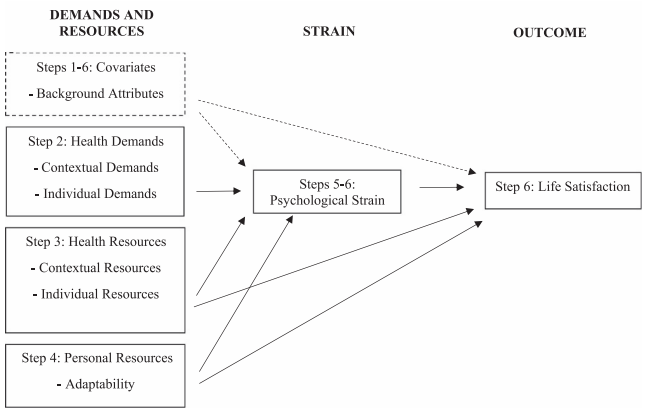

FIGURE 1 Hypothesised health demands-resources (HD-R) Framework. Bold lines represent substantive parameters and dashed lines indicate covariates.

3 | DEMANDS AND RESOURCES

As noted, the process we propose draws on JD-R theory (Bakker & Demerouti, 2017; Schaufeli & Bakker, 2004). This theory has mostly been applied to better understand employees' performance and wellbeing in the workplace, but more recently has been adapted to other domains of human functioning (e.g., students' educational experiences and outcomes; Martin, Ginns, & Collie, 2023).

3.1 | JD-R theory

JD-R theory has been pivotal to directing research aimed at improving workplace experiences of employees. According to the theory, there are various job demands that involve psychological and/or physical exertion (e.g., a heavy workload) and linked to strain (Schaufeli & Bakker, 2004). There are also job resources (e.g., support from colleagues) that assist employees to attain work-related goals and growth and lead to positive outcomes, such as motivation or wellbeing (Schaufeli & Bakker, 2004). JD-R theory also specifies personal demands and personal resources that affect employees' work-related experiences and outcomes. Personal resources, for example, are modifiable personal attributes facilitating workplace functioning (e.g., adaptability) (Bakker & Demerouti, 2017; Granziera et al., 2022; Schaufeli & Bakker, 2004).

Taking these ideas into account and as shown in Figure 1, we investigated a process where demands and resources predicted psychological strain (feeling overwhelmed by one's problems) and subjective wellbeing (life satisfaction). As also shown in Figure 1, we examined the role of psychological strain in life satisfaction, given evidence suggesting that psychological strain precedes life satisfaction. That is, when individuals feel overwhelmed in life, they then go on to be less satisfied with their lives (e.g., Hakanen & Schaufeli, 2012). Indeed, through this process, we can also formally explore (by way of indirect effects) the role of psychological strain in linking demands and resources to life satisfaction (i.e., demands and resources → psychological strain → life satisfaction).

In addition to the 'main' effects of demands and resources, JD-R suggests there are potential ''buffering' and 'boosting' effects (Bakker & Demerouti, 2017). Specifically, there are factors that may buffer the adverse effects of job demands; alternatively, when demands are high, there are resources that may play a more impactful role. In terms of buffering effects, for instance, Granziera et al. (2022) found that teachers' adaptability (a personal resource) reduced the adverse impact of role conflict (a job demand) on their emotional exhaustion (also see Martin, Collie, & Malmberg, 2023). Regarding boosting effects, Collie (2023) found that helpful feedback in the workplace was more strongly linked to teachers' work commitment

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when they faced disruptive student behaviour (also see Martin, Ginns, & Collie, 2023).

3.2 | Applying JD-R theory to the health and wellbeing process

JD-R theory is a generic framework that allows for broad categories of physical, psychological, social, and/or organisational attributes to be investigated (Bakker & Demerouti, 2017). Indeed, JD-R theory has been expanded beyond the workplace. For example, many of the same factors and processes in the workplace are evident in the academic context (Martin et al., 2021; Martin, Ginns, & Collie, 2023). Accordingly, the academic demands-resources framework was developed (Martin & Collie, 2022) and subsequently validated among school and university students (Martin, Collie, & Malmberg, 2023; Martin et al., 2021; Martin, Ginns, & Collie, 2023).

JD-R theory has also been applied to studies of health and wellbeing (Brauchli et al., 2015). Indeed, JD-R theory broadly posits that demands elicit a health impairment process while resources prompt something of a positive motivational process (Bakker & Demerouti, 2017). Most JD-R theory studies focus on strain (Bakker & Demerouti, 2007, 2017), but there is an increasing number also investigating wellbeing factors such as life satisfaction (Brauchli et al., 2015; Schaufeli & Taris, 2014).

In applying JD-R theory to the health domain, Brauchli et al. (2015) linked JD-R theory to a generic health development framework investigating positive and negative health outcomes. Although they found support for this expansion, their study was still focused on job demands and resources (not health demands and resources) and how these affected employees' health. Likewise, Langseth-Eide and Vittersø (2021) investigated health (general health and sick leave) among employees and confirmed the JD-R process, but once more, the demands and resources were work-related, not health-related. There are also applications of JD-R theory to health settings (e.g., Kaiser et al., 2020; Meirun et al., 2020; Udushirinwa et al., 2023; Viotti et al., 2015), but these are focused on health care workers and how job (not health) demands and resources affect their workplace functioning.

3.2.1 | Contextual and individual health demands and resources

The present study conducts a focused investigation of health demands and resources and their role in a general sample of adults' psychological health and subjective wellbeing. In line with biopsychosocial perspectives that emphasise the importance of considering the joint operation of biological/health, environmental, and personal factors in human development (e.g., Bennett et al., 2018; Blascovich, 2008), we demarcate demands and resources into contextual dimensions and individual dimensions. *Contextual health demands* reflect health-related factors in a person's environment that impair their wellbeing. As relevant to variables in the AuSSA dataset, we suggest that contextual barriers to wellbeing include difficulties accessing or receiving health-related treatment (e.g., due to long waiting lists, unaffordability, or inability to take time off work; McNeil et al., 2022). *Individual health demands* reflect health-related personal attributes that impair one's wellbeing. As relevant to the AuSSA dataset, we suggest factors such as one's personal state of poor health (e.g., chronic illness or disability; McNeil et al., 2022). Research has demonstrated these types of contextual and individual health demands increase stress in individuals' lives and impair their general wellbeing (e.g., Dong et al., 2020; Hierink et al., 2021; Lee et al., 2022; Owen et al., 2020; Puvill et al., 2019; Stålnacke, 2011). We thus hypothesise that health demands will be associated with higher levels of psychological strain and lower levels of life satisfaction.

Contextual health resources are health-related factors in a person's environment that support or enhance their wellbeing. As relevant to variables in the AuSSA dataset, we suggest that contextual supports to wellbeing include ready access to information and resources that are helpful for their health or that help individuals understand their health better (McNeil et al., 2022). *Individual health resources* reflect health-related personal attributes that support or facilitate their wellbeing. As relevant to the AuSSA dataset, this would include an individual's personal state of good health (McNeil et al., 2022). Evidence suggests that contextual and individual health resources such as these reduce stress in individuals' lives and promote their general wellbeing (e.g., Bakkeli, 2021; Mano, 2014; Shirom, 2009). We thus hypothesise that health resources will be associated with lower levels of psychological strain and higher levels of life satisfaction.

3.2.2 | Adaptability: A potentially key personal resource

To these health demands and resources, we suggest adding a recently proposed personal resource—adaptability—that has been introduced to and found to be significant in recent demands and resources studies (see below). Adaptability is an individual's capacity to adjust their thinking, behaviour, and/or emotion to novel situations and contexts (Martin et al., 2013). Through these adjustments, the individual effectively navigates novel, uncertain, and ambiguous situations and circumstances (Lepine et al., 2000; Levin, 2015; Martin, Ginns, & Collie, 2023). As noted, prior research applying the JD-R theory in workplace and academic settings has included adaptability as a personal resource. This research has demonstrated that adaptability is associated with higher levels of academic motivation among students (Martin et al., 2013; Martin, Ginns, & Collie, 2023) and also positive workplace outcomes among teachers (Collie et al., 2018, 2020; Granziera et al., 2022). Notably, these studies have shown that this personal resource explains variance in outcomes beyond domain-specific demands and resources. That is, adaptability yielded a predictive effect for students' academic outcomes beyond

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the predictive effects of academic demands and resources (Martin, Ginns, & Collie, 2023). Likewise, adaptability yielded a predictive effect for employees' workplace outcomes beyond the predictive effects of workplace demands and resources (Collie et al., 2018, 2020; Granziera et al., 2022). Of particular interest in the present study is the extent to which adaptability predicts psychological strain and life satisfaction beyond the predictive effects of (domain-specific) health demands and resources. Another point of interest is the potential buffering or boosting role adaptability may play. Does adaptability buffer the potentially adverse effects of health demands on psychological strain in the model? Does adaptability play a more important (boosting) role in predicting life satisfaction when demands are high? As indicated earlier, prior research in the academic and workplace domains found such a role for adaptability (Granziera et al., 2022; Martin, Ginns, & Collie, 2023) and so the present study explores this in relation to the health and wellbeing process.

4 | RELEVANT BACKGROUND ATTRIBUTES (COVARIATES)

The health and wellbeing process is also affected by various socio-demographic and health-related background attributes that are important to account for when seeking to ascertain the unique roles of health demands, health resources, and adaptability. The socio-demographic background attributes identified in the AuSSA dataset as potentially implicated in the process we investigate include: gender, age, country of birth, First Nations status, income, student status, employment status, education qualification, and married/de facto status (for research linking these attributes to our study variables, see Baird et al., 2010; Purol et al., 2021; Purvanova & Muros, 2010; Salinas-Jiménez et al., 2011; Wadsworth & Pendergast, 2021). There are also health-related background attributes to account for. The attributes in the AuSSA dataset relevant to the process we investigate include: smoking, alcohol intake, physical activity, and diet (for research linking these attributes to our study variables, see Fabio et al., 2019; Gerber et al., 2015; Verhavert et al., 2020).

5 | AIMS OF THE PRESENT STUDY

Applying JD-R theory to the health and wellbeing domain, the present investigation had three main aims. The first was to ascertain the relative contribution of contextual and individual health demands and resources in predicting adults' psychological strain (feeling overwhelmed by one's problems) and sense of subjective wellbeing (life satisfaction). The second was to explore a recently proposed personal resource—adaptability—and the extent to which it explained variance in psychological strain and life satisfaction beyond contextual and individual health demands and resources. The third was to explore psychological strain as a predictor of life satisfaction in the context of the aforementioned demands and resources (including its linking role from demands and resources to life satisfaction). Figure 1 demonstrates what we propose as a health demands-resources (HD-R) framework.

We specified five hypotheses in relation to these three aims, but because these are closely linked to the stepwise nature of our modelling, we present Hypotheses 1–5 in Data Analysis below. In follow-up analyses, we also examined indirect effects (the extent to which psychological strain linked the demands and resources to participants' life satisfaction) and potential buffering and boosting effects of adaptability by way of interaction terms (e.g., adaptability × contextual health demands). As indirect and interaction effects were an auxiliary part of the investigation, we left these as open empirical questions and did not posit hypotheses.

6 | METHODS

6.1 | Participants, sampling, and procedure

The data were from the Australian Survey of Social Attitudes (AuSSA; McNeil et al., 2022) that each year seeks to ascertain the range of adult Australians' views on various topics of national and international importance. AuSSA is also the Australian component of the International Social Survey Project (ISSP) that is a cross-national collaboration in some 40 countries. The AuSSA (and also the ISSP) focuses on a specific topic each year. The topic that was the focus of the 2021 survey (and the basis of this investigation) was 'Health and Healthcare'. The AuSSA is conducted by Academic Surveys Australia, which is the survey arm of the Australian Consortium for Social and Political Research Incorporated (ACSPRI).

The aim of AuSSA is to survey a representative sample of Australian adults (18 years and older). It does this by drawing a random sample from the Australian Electoral Roll so that every Australian citizen has an equal chance of being invited to participate. The Australian Electoral Commission confidentially provides to ACSPRI the names and addresses for the project (in compliance with Item 3 of subsection 90B(4) of the Commonwealth Electoral Act 1918). Names and addresses cannot be linked to survey data and are not retained when the survey is completed. To construct the sampling frame, 5000 Australian adults are randomly selected from the Australian Electoral Roll to complete the survey, with the aim of about 1000 returning a completed survey. For the 2021 data collection, the sampling frame was contacted by mail with a pre-notification letter in Week 1 of the survey process, followed in Week 2 with the survey package (containing a hard copy survey and a reply-paid envelope), and a postcard reminder in Week 3. In Week 6, a replacement survey package was sent to potential participants who had not responded, with a final reminder card sent in Week 7. Participants were informed that participation was voluntary and that returning the completed survey indicated consent to participate. The survey took about 40–45 min to complete. Human ethics approval (#HC220642) was provided by the first author's institutional review board.

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A total of 1060 Australian adults participated. Just over half (56%) the sample was female and the average age was 58 years (*SD* = 17 years). One-quarter (26%) of participants were born overseas and just under 4% reported being of First Nations descent. Half (51%) the participants reported being in paid employment and 7% reported they were engaged in some form of study. The average (mean) weekly pre-tax income for respondents was $1312 (*SD* = $1144); which is below the national average of ~$1700 (ABS, 2021), but this national average is for full-time workers whereas our sample comprised some respondents not in full-time employment]. The average hours worked per week was 36 (*SD* = 13 h). Sixty-one percent (61%) were married/de facto. A quarter (26%) had no post-school qualification, 34% had earned a college certificate or diploma, 20% had earned an undergraduate university degree, and 20% had earned a postgraduate university degree. In terms of lifestyle, seven percent (7%) reported being a smoker, 48% reported having four (or more) alcoholic drinks in a day at least once a month, 93% reported eating fruit and vegetables at least several times a week, and 58% reported doing vigorous physical activity at least several times a week.

6.2 | Materials

The measures in the study comprised health and personal demands and resources, psychological strain, subjective wellbeing, and background attributes—all from the Australian Survey of Social Attitudes (AuSSA; McNeil et al., 2022) dataset. Descriptive, reliability, and factor analytic properties for the measures are shown in Table 1.

6.2.1 | Demands and resources

Contextual health demands comprised three items which reflected the extent to which participants could not access or receive health-related treatment because the waiting list was too long or because they could not afford it or take time off work (e.g., 'During the past 12 months did it ever happen that you did not get the medical treatment you needed because … the waiting list was too long?'; 1 = Strongly Agree to 5 = Strongly Disagree, reverse coded for analyses and modelled as a latent factor).

Individual health demands were represented by one item that indicated the extent to which participants had a long-standing illness, a chronic health condition, or a disability ('Do you have a long-standing illness, a chronic condition, or a disability?'; 1 = Yes and 2 = No, reverse coded for analyses).

Contextual health resources comprised two items that reflected the extent to which participants could access information that positively affected their health or helped them better understand their health (e.g., 'During the past 12 months, information on the internet … affected my health behaviour in a positive way'; 1 = Strongly Agree to 5 = Strongly Disagree, reverse coded for analyses and modelled as a latent factor).

Individual health resources were represented by one item that reflected the extent to which participants were in good general health ('In general, would you say your health is … 1 = Excellent to 5 = Poor', reverse coded for analyses).

Personal resources were represented by the three-item Adaptability Scale—Short (Martin et al., 2016). The items reflected individuals' capacity to adjust cognition, behaviour, and/or emotion to successfully navigate uncertain, changing, or novel situations and circumstances (e.g., 'To assist me in a new situation, I am able to change the way I do things'; 1 = Disagree Strongly to 7 = Agree Strongly, modelled as a latent factor).

6.2.2 | Psychological strain and subjective wellbeing

Psychological strain was represented by an indicator reflecting the extent to which participants believed they could not overcome their problems (e.g., Bliese et al., 2017, 1 item; 'During the past 4 weeks how often have you felt you could not overcome your problems?'; 1 = Never to 5 = Very Often). The study's subjective wellbeing factor was represented by *life satisfaction*, reflecting the extent to which participants were happy with their life in general (one item; 'If you were to consider your life in general these days, how happy or unhappy would you say you are, on the whole?'; 1 = Completely Happy to 7 = Completely Unhappy, reverse coded for analyses).

6.2.3 | Background attributes

We also controlled for several background attribute covariates potentially implicated in participants' health and wellbeing, including *gender* (1 = Male, 2 = Female), *age* (continuous variable), *country of birth* (1 = Australian born, 2 = Overseas born), *First Nations* status (1 = Yes, 2 = No, reverse coded for analyses), pre-tax weekly *income* (continuous variable), *student* status (1 = In school/college/university, 2 = Not in school/college/university, reverse coded for analyses), *employment* status (1 = In paid work, 2 = Not in paid work, reverse coded for analyses), highest *education qualification* (1 = Postgraduate university degree, 2 = Undergraduate university degree, 3 = College certificate or diploma, 4 = No post-school qualification, reverse coded for analyses), *married*/de facto status (1 = Married/de facto, 2 = Not married/de facto, reverse coded for analyses), *smoking* (1 = Do not smoke and never did to 7 = Smoke >40 cigarettes per day), *drinking* (1 = Never drink 4 or more alcoholic drinks on the same day to 5 = Daily drink 4 or more alcoholic drinks), *physical activity* (1 = Never do vigorous physical activity for at least 20 min to 5 = Daily do vigorous physical activity for at least 20 min), and *diet* (1 = Never eat fresh fruit or vegetables to 5 = Daily eat fresh fruit or vegetables). By including these covariates, we were able to determine the unique role of health demands, health resources, and adaptability in psychological strain and life satisfaction beyond the role of participants' background attributes.

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TABLE 1 Descriptive and psychometric statistics.

	Mean	Standard deviation	Skewness	Kurtosis	Reliability	Factor loadings range (mean)
Demands and resources						
Contextual health demands	1.85	0.27	−1.85	2.48	0.62	0.53–0.71 (0.59)
Individual health demands	1.43	0.5	0.29	−1.92	-	-
Contextual health resources	3.06	0.84	−0.52	0.15	0.63	0.60–0.75 (0.67)
Individual health resources	3.17	0.93	−0.26	−0.28	-	-
Personal resources (adaptability)	5.36	1.11	−1.26	2.11	0.87	0.81–0.88 (0.83)
Strain						
Psychological strain	1.94	1.11	1.09	0.43	-	-
Outcome						
Life satisfaction	5.19	1.13	−0.91	1.37	-	-
Background attributes						
Gender	1.56	0.5	−0.23	−1.95	-	-
Year born	1963	16.87	0.41	−0.60	-	-
Overseas born	1.26	0.44	1.10	−0.79	-	-
First nations	1.03	0.18	5.10	24.07	-	-
Income	1312	1144.89	2.09	5.04	-	-
Student	1.07	0.25	3.53	1.51	-	-
Highest educational qualification	2.35	1.08	0.26	−1.19	-	-
Working	1.51	0.50	−0.04	−2.00	-	-
Married	1.61	0.49	−0.44	−1.81	-	-
Smoker	1.58	0.90	2.28	6.34	-	-
Drinker	1.84	1.10	1.26	0.76	-	-
Physical activity	3.40	1.22	−0.57	−0.66	-	-
Fruit and vegetable	4.61	0.70	−2.16	5.56	-	-

Note: Numerous variables are single-item indicators and thus reliability and factor loadings were not able to be estimated.

6.3 | Data analysis

Confirmatory factor analysis (CFA) and structural equation modelling (SEM) were the central analyses, conducted with M*plus* version 8.80 (Muthén & Muthén, 1998-2022). These analyses employed the MLR (maximum likelihood robust) estimator that generates a chi-square test statistic and parameter estimates with standard errors that are robust to non-normality (Muthén & Muthén, 1998-2022). A Comparative Fit Index (CFI) greater than 0.90 (or 0.95) and a Root Mean Square Error of Approximation (RMSEA) less than 0.08 (or 0.05) indicated acceptable (or excellent) fit (Hu & Bentler, 1999; Kline, 2016). Notwithstanding income and hours worked (numerous participants were not in work and thus did not respond to these variables), the mean missing data rate per variable was 5% and managed using the M*plus* default, Full Information Maximum Likelihood (FIML; Arbuckle, 1996). A post-stratification weighting variable ('AU_WEIGHT') was included in modelling to adjust to match the Australian census by age, sex, and highest education level. When reporting CFA and SEM findings in Tables 2 and 3, we also indicate which parameters were significant after Bonferroni correction.

For the CFA, all demand, resource, strain, subjective wellbeing, and background variables were included—thus, a 20-factor CFA. Multi-item measures were estimated as latent factors and single item indicators (e.g., gender, age) had loadings set at 1 and residuals at 0. This CFA was also the basis of the inter-factor correlations and the measurement component underlying the hypothesised SEM (Figure 1). In this SEM, we tested the model in six steps. Step 1 entered all covariates as predictors of psychological strain. Step 2 entered health demands as predictors of psychological strain alongside Step 1 predictors. Step 3 added health resources as predictors of psychological strain alongside the Step 2 predictors. Step 4 added adaptability as a predictor of psychological strain alongside the Step 3 predictors. Step 5 then modelled all Step 4 predictors as predictors of both psychological strain and life satisfaction. Finally, Step 6 added

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TABLE 2 Bivariate correlations.

	Contextual health demands	Contextual health resources	Individual health demands	Individual health resources	Personal resources (adapt)	Burnout	Life satisfaction
Demands, resources, strain							
Contextual health demands	-	0.33***	0.08	−0.29***	−0.14	0.32***	−0.19**
Contextual health resources		-	0.01	0.01	0.06	0.13**	−0.01
Individual health demands			-	−0.32***	−0.05	0.13**	−0.07
Individual health resources				-	0.26***	−0.35***	0.30***
Personal resources (adapt)					-	−0.43***	0.34***
Psychological strain						-	−0.48***
Background attributes							
Gender	0.03	0.09	0.03	0.02	−0.07	0.03	0.01
Year born	0.36***	0.34***	−0.24***	0.06	−0.13**	0.14**	−0.15**
Overseas born	0.02	0.07	−0.02	−0.02	0.09*	−0.08*	0.09*
First nations	0.14	0.12*	0.01	−0.01	0.08*	−0.03	0.01
Income	−0.18***	−0.01	−0.06	0.18***	0.21***	−0.22***	0.10*
Student	0.20*	0.14*	−0.13**	−0.03	−0.04	0.09	−0.13*
Working	0.14*	0.07	−0.18***	0.19***	0.08	−0.06	−0.03
Highest educational qual	0.09	0.10	−0.02	0.15***	0.20***	−0.09*	0.02
Married	−0.27***	−0.11	0.01	0.10*	0.15**	−0.20***	0.24***
Smoker	0.14	0.02	0.08	−0.13**	−0.03	0.08	−0.04
Drinker	−0.02	−0.08	−0.09*	0.03	0.11*	−0.07	0.09*
Physical activity	0.03	0.13*	−0.03	0.24***	0.05	−0.07	0.06
Fruit and vegetable	−0.14*	−0.03	0.05	0.20***	0.13	−0.07	0.06

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; p-values <0.001 among demands, resources, and strain are significant after Bonferroni correction.

psychological strain as a predictor of life satisfaction. This series of steps enabled us to identify the unique contribution of each demand, each resource, and psychological strain in our application of the JD-R framework. We were especially interested in the explained variance (R^2) at each step, the statistical significance of R^2 at each step change, the significant beta paths at each step, and the change in beta paths at each step (applying Peterson & Brown, 2005 criteria for comparing standardized betas). All covariate, demand, and resource predictors were correlated in the SEM.

With respect to Steps 1–6, we hypothesised that the inclusion of each step would explain significantly more variance in psychological strain and life satisfaction (Hypothesis 1). With regard to the final model (Step 6), we also hypothesised that one or more of contextual and individual health demands would predict higher psychological strain and lower life satisfaction (Hypothesis 2); one or more of contextual and individual health resources would predict lower psychological strain and higher life satisfaction (Hypothesis 3); adaptability would predict lower psychological strain and higher life satisfaction (Hypothesis 4); and psychological strain would predict lower life satisfaction (Hypothesis 5).

In addition to these central analyses, we conducted two sets of auxiliary analyses. The first examined indirect effects—namely, the extent to which psychological strain linked demands and resources to participants' life satisfaction. This was conducted using non-parametric bootstrapping (1000 draws; Shrout & Bolger, 2002). Following JD-R theory, the second set of auxiliary analyses

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TABLE 3 Standardized path coefficients.

	Step 1 (covariates to strain)	Step 2 (step 1 + demands to strain)	Step 3 (step 2 + resources to strain)	Step 4 (step 3 + adaptability to strain)	Step 5 (step 4 to strain & life satisfaction)		Step 6 (step 5 + strain to life satisfaction)	
	Strain	Strain	Strain	Strain	Strain	Life satisfaction	Strain	Life satisfaction
Demands, resources, strain								
Contextual health demands	-	0.27***	0.17*	0.16*	0.16*	−0.02	0.16*	0.04
Individual health demands	-	0.10*	0.04	0.04	0.04	0.01	0.04	0.01
Contextual health resources	-	-	0.06	0.10	0.09	0.02	0.09	0.05
Individual health resources	-	-	−0.25***	−0.18**	−0.19**	0.23***	−0.19**	0.17**
Personal resources (adapt)	-	-		−0.33***	−0.33***	0.26***	−0.33***	0.14*
Psychological strain	-	-	-	-	-	-	-	−0.36***
Covariates								
Gender	0.01	0.01	0.01	−0.02	−0.02	0.03	−0.02	0.02
Year born	0.16*	0.11	0.10	0.02	0.02	−0.02	0.02	−0.01
Overseas born	−0.07	−0.08*	−0.08*	−0.07	−0.07	0.05	−0.07	0.02
First nations	−0.07	−0.09*	−0.09	−0.05	−0.05	−0.01	−0.05	−0.03
Income	−0.18***	−0.13**	−0.13**	−0.09*	−0.08*	0.01	−0.08*	−0.03
Student	−0.06	−0.05	−0.05	−0.01	−0.01	−0.06	−0.01	−0.06
Working	−0.05	−0.06	−0.01	0.01	0.01	−0.08	0.01	−0.08
Highest educational qual	−0.01	−0.05	−0.03	0.02	0.02	−0.06	0.02	−0.05
Married	−0.11*	−0.07	−0.07	−0.06	−0.05	0.15***	−0.05	0.13**
Smoker	0.07	0.02	0.02	0.02	0.02	−0.03	0.02	−0.02
Drinker	−0.10*	−0.07	−0.07	−0.03	−0.03	0.09*	−0.03	0.08
Physical activity	−0.04	−0.05	0.01	−0.02	−0.02	0.01	−0.02	−0.01
Fruit and vegetable	−0.06	−0.03	0.01	0.03	0.04	−0.03	0.04	−0.01
R^2	0.11***	0.18***	0.23***	0.31***	0.31***	0.22***	0.31***	0.31***
$\triangle R^2$	0.11***	0.07***	0.05**	0.08***	-	0.22***	-	0.09***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; p-values <0.001 for demands, resources, and psychological strain predictors are significant after Bonferroni correction.

Indirect paths: Contextual Health Demands → Strain → Life Satisfaction ($B = -0.06$, $SE = 0.03$, $p < 0.10$); Individual Health Demands → Strain → Life Satisfaction ($B = -0.01$, $SE = 0.02$, $p = 0.35$); Contextual Health Resources → Strain → Life Satisfaction ($B = -0.03$, $SE = 0.02$, $p = 0.12$); Individual Health Resources → Strain → Life Satisfaction ($B = 0.07$, $SE = 0.02$, $p < 0.01$); Adaptability → Strain → Life Satisfaction ($B = 0.12$, $SE = 0.03$, $p < 0.001$).

Interaction effects: Adaptability × Contextual Health Demands → Strain, $\beta = 0.01$, $p = 0.94$; Adaptability × Individual Health Demands → Strain, $\beta = -0.03$, $p = 0.56$; Adaptability × Contextual Health Resources → Strain, $\beta = -0.06$, $p = 0.26$; Adaptability × Individual Health Resources → Strain, $\beta = -0.02$, $p = 0.74$; Adaptability × Contextual Health Demands → Life Satisfaction, $\beta = -0.05$, $p = 0.37$; Adaptability × Individual Health Demands → Life Satisfaction, $\beta = -0.01$, $p = 0.89$; Adaptability × Contextual Health Resources → Life Satisfaction, $\beta = -0.06$, $p = 0.24$; Adaptability × Individual Health Resources→ Life Satisfaction, $\beta = 0.08$, $p = 0.11$.

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investigated the role of adaptability in buffering the effects of health demands and boosting the effects of health resources. We tested this by way of interaction terms (e.g., adaptability × contextual health demands, to examine the extent to which adaptability moderated the effect of contextual health demands on psychological strain and/or life satisfaction) added as centred product terms to the model as predictors of psychological strain and life satisfaction.

7 | RESULTS

7.1 | Preliminary analyses: Descriptive, correlational, and psychometric properties

Descriptive statistics for the central substantive factors and covariates are shown in Table 1. These indicate acceptable reliability and approximately normal distributions (however, some covariates are an exception—e.g., smoking, First Nations status—as expected and consistent with the distribution of these attributes in the general population). The CFA of all substantive factors (health demands, health resources, personal resources [adaptability], psychological strain, life satisfaction) and covariates yielded an excellent fit to the data, $\chi^2 = 146.30$, $df = 102$, CFI = 0.98, RMSEA = 0.02. Loadings for the multi-item factors, shown in Table 1, are sound. Correlations drawn from the CFA are shown in Table 2. Here we report significant correlations most relevant to the hypothesised substantive links in Figure 1. Contextual health demands (including after Bonferroni correction) and individual health demands were positively correlated with psychological strain and contextual health demands were negatively correlated with life satisfaction. Individual health resources and the personal resource of adaptability were negatively correlated with psychological strain and positively correlated with life satisfaction, including after Bonferroni correction. Psychological strain was negatively correlated with life satisfaction, including after Bonferroni correction. Unexpectedly, contextual health resources were positively correlated with psychological strain—but, importantly, not after Bonferroni correction and not in the multivariate modelling (below). Taken together, these bivariate associations, in the main, provide preliminary support for the hypothesised links among health demands and resources, personal resources (adaptability), psychological strain, and life satisfaction—and so analyses proceeded to multivariate SEM.

7.2 | Central modelling: Structural equation modelling

As described in Data Analysis, we tested the hypothesised model in six steps (also see Figure 1). In Table 3, explained variance (R^2) is shown. Each step explained a sizeable proportion of variance in the outcome measures ($p < 0.001$). Notably, the inclusion of health demands at Step 2 explained significantly more variance ($\triangle R^2$) in psychological strain than did the covariates at Step 1. The inclusion of health resources at Step 3 explained significantly greater variance in psychological strain than did the health demands at Step 2. The inclusion of adaptability at Step 4 explained significantly more variance in psychological strain than health demands and resources at Steps 2 and 3. Finally, including psychological strain at Step 6 explained significantly more variance in life satisfaction than the Step 5 health demands, health resources, and adaptability. The final model yielded an excellent fit to the data, $\chi^2 = 146.30$, $df = 102$, CFI = 0.98, RMSEA = 0.02 (in fact, the same fit as the CFA as the SEM was a 'fully forward' model).

Statistically significant (at least $p < 0.05$) substantive paths are shown in Figure 2 (all substantive paths and covariate paths are presented in Table 3). As Figure 2 demonstrates, contextual health demands predicted higher psychological strain. Individual health resources and adaptability (the latter also after Bonferroni correction) predicted lower psychological strain and greater life satisfaction. Psychological strain predicted lower life satisfaction, including after Bonferroni correction. Applying Peterson and Brown's (2005) criteria for comparing standardized betas, the adverse predictive paths of contextual health demands to psychological strain and individual health demands to psychological strain significantly reduced when health resources were entered into the model at Step 3 ($p < 0.001$ and $p < 0.05$ respectively); the predictive path of health resources to

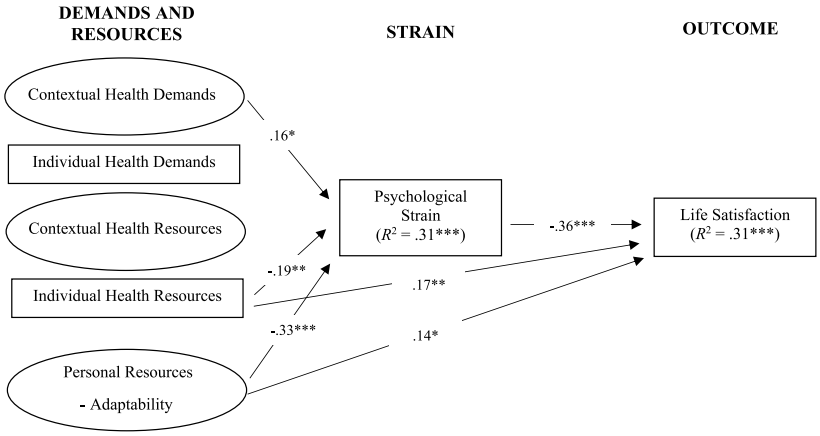

FIGURE 2 Significant substantive paths in final model (step 6). Covariates and non-significant paths are shown in Table 3.

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psychological strain ($p < 0.01$) and to life satisfaction ($p < 0.05$) significantly reduced when adaptability was entered at Step 4; and, the predictive path of adaptability to life satisfaction ($p < 0.001$) significantly reduced when psychological strain was entered at Step 6. Importantly, however, although these paths declined when others were subsequently entered into the model, all but individual health demands remained statistically significant in the final model.

7.3 | Auxiliary modelling: Indirect and interaction effects

Indirect effects using non-parametric bootstrapping were then examined to determine the extent to which psychological strain linked demands and resources to participants' life satisfaction. Indirect effects are shown in Table 3 notes, with two effects attaining statistical significance. There was a significant indirect association from individual health resources to life satisfaction via psychological strain ($p < 0.01$). Indirect effects also showed that psychological strain significantly linked adaptability to life satisfaction ($p < 0.001$).

We also tested the extent to which adaptability buffered the effects of health demands and boosted the effects of health resources. This was pursued via interaction terms alongside the four substantive main effects—thus, four interaction terms (e.g., adaptability × contextual health demands). Interaction effects are detailed in Table 3 notes. None of the interaction terms significantly predicted psychological strain or life satisfaction beyond the main and covariate effects.

8 | DISCUSSION

This study applied JD-R theory to the health and wellbeing domain. In broad terms, the findings showed that health demands were implicated in higher levels of psychological strain (feeling overwhelmed by one's problems) and this in turn was inversely associated with subjective wellbeing (life satisfaction). Importantly, however, alongside these demands were health resources and personal resources that were significantly associated with lower levels of psychological strain and greater life satisfaction. We now discuss each of the major findings and the ways in which they supported our central hypotheses.

8.1 | Findings of particular note

Beyond the role of covariates at Step 1, the inclusion of each variable set in subsequent steps (to Step 6) explained iteratively (and significantly) more variance in psychological strain and life satisfaction—thus supporting Hypothesis 1 (that the inclusion of each step would explain significantly more variance in psychological strain and life satisfaction). Support for this hypothesis offers overall support for the application of JD-R theory to the health domain—thus, confirming our proposed HD-R framework. Moreover, whereas health factors in previous research have been modelled as outcome measures (e.g., Brauchli et al., 2015; Langseth-Eide & Vittersø, 2021), our study proposed and found that health factors can function as demands and resources as well. Taken together, our investigation adds to prior work-related research by expanding key JD-R concepts and processes to domains outside of work (e.g., Lesener et al., 2020; Martin & Collie, 2022; Martin, Collie, & Malmberg, 2023; Martin et al., 2021; Martin, Ginns, & Collie, 2023; Salmela-Aro et al., 2022).

Turning to specific paths in the final model, contextual health demands predicted higher psychological strain (supporting Hypothesis 2 that one or more of contextual and individual health demands would predict higher psychological strain and lower life satisfaction) and individual health resources predicted lower psychological strain and greater life satisfaction (supporting Hypothesis 3 that one or more of contextual and individual health resources would predict lower psychological strain and higher life satisfaction). It was noted earlier that JD-R theory posits that demands elicit a health impairment process and resources elicit something of a motivational process (Bakker & Demerouti, 2017). Support for Hypotheses 2 and 3 suggests that these contended impairment and enhancement effects are indeed evident when it comes to health-related predictors of psychological strain and life satisfaction. These findings also provide support for the biopsychosocial lens (e.g., Bennett et al., 2018; Blascovich, 2008) we adopted to demarcate the contextual and individual health demands and resources in the health and wellbeing process. The yield here was to show that contextual and individual factors uniquely and distinctly contributed to psychological strain and life satisfaction. Contextual, but not individual, health demands were associated with higher psychological strain. Individual, but not contextual, health resources were associated with lower psychological strain and greater life satisfaction. It is also important to note that the adverse paths of health demands to psychological strain (Step 2) reduced when health resources (Step 3) were added to the model. We consider the findings regarding individual health resources especially encouraging as these resources connected to both psychological strain and life satisfaction—and, relative to contextual factors that rely on system-level change, individual resources are more modifiable and potentially amenable to agentic action (Xanthopoulou et al., 2007).

In support of Hypothesis 4 (that adaptability would predict lower psychological strain and higher life satisfaction), we did indeed find that adaptability predicted lower psychological strain and greater life satisfaction. Thus, beyond domain-specific health-related demands and resources, this domain-general personal attribute explained unique variance. This is consistent with previous research showing that (domain-general) adaptability predicted work- and education-related outcomes beyond the effects of (respectively) work- and education-related demands and resources (e.g., Collie et al., 2018; Granziera et al., 2022; Martin, Ginns, & Collie, 2023). Thus, adaptability is proving to be a personal resource that is important in human functioning across diverse domains. It is interesting to note that adaptability items were a special inclusion in the AuSSA dataset for

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2021 and our findings suggest the viability of its inclusion in future national datasets where important health and other outcomes are of interest.

Findings also demonstrated that our measure of strain (by way of psychological strain) predicted lower subjective wellbeing (by way of life satisfaction), supporting Hypothesis 5 (that psychological strain would predict lower life satisfaction). This is a well-demonstrated path in other research and is largely a function of feeling overwhelmed and inefficacious that in turn adversely impacts individuals' subjective appraisal of their life (e.g., Demerouti et al., 2000; Fergusson et al., 2015; Wang et al., 2019; WHO, 2022). Our study was particularly noteworthy because it also showed that psychological strain significantly linked individual health resources and adaptability to life satisfaction. Given its direct role in predicting life satisfaction and its role in linking health and personal resources to life satisfaction, psychological strain is clearly a factor to target in intervention efforts (discussed further below).

Although socio-demographic and health-related background factors were not a substantive focus of this study (they were modelled as covariates to better ascertain the unique roles of demands and resources), we draw attention to some relevant findings. The first is the generally non-significant role they played in predicting psychological strain and life satisfaction once the demands and resources were included in the model. These findings speak to the predictive power of the health and personal demands and resources we modelled. Second, notwithstanding the salient role of the demands and resources, income emerged as a significant predictor of lower psychological strain and marital status (being married) was associated with higher life satisfaction. The link between income and psychological strain is possibly due to the fact income is associated with greater job satisfaction and sense of agency that are known to contribute to life satisfaction (Tarcan et al., 2017). With regard to marital status, this has previously been linked to greater subjective wellbeing (Purol et al., 2021) and attributed to the positive effects of companionship—but researchers suggest caution here as it may not be marriage per se, but the positive effects of a close interpersonal relationship that are available to single people as well (DePaulo & Morris, 2005; Greitemeyer, 2009).

8.2 | Implications for practice

By drawing on the well-established JD-R theory, the study offers an integrative perspective on the impeding and facilitating factors implicated in the health and wellbeing process—and in so doing, offers concrete direction on the factors to target in efforts to redress existing and growing psychological health concerns. In terms of the contextual health demands that we modelled, findings suggest there would be yield in policy and practice efforts towards enabling greater access to health-related treatment, including by way of reduced wait lists, greater affordability, and time off work to visit a health practitioner or attend a clinic (Australian Institute of Health and Welfare, 2020). In terms of the individual health resource that we modelled, policy and practice could be aimed at supporting individuals to maintain their general health, including through personal routines such as good diet and exercise (Firth et al., 2020; Sharma et al., 2006).

We also draw attention to adaptability. Martin et al. (2013; see also Burns & Martin, 2014; Martin & Burns, 2014; Martin et al., 2021) have suggested a tripartite approach to boosting adaptability through: (a) cognitive adjustment—thinking about a new situation in a different way, such as seeing the opportunities a new situation might provide; (b) behavioural adjustment—such as seeking out new or more information or resources in a new or uncertain situation; and (c) emotional adjustment—such as by minimising negative feelings (e.g., frustration) in a new or uncertain situation. These may be helpful ways to navigate uncertain situations or task demands that would otherwise be a source of psychological strain (e.g., feeling overwhelmed) and poor subjective wellbeing (e.g., life satisfaction).

Finally, psychological strain merits applied attention as it directly predicted life satisfaction and also significantly linked health and personal resources to life satisfaction via indirect effects. According to Demerouti (2015; see also Lee et al., 2016), a first practical response is to determine if the source of psychological strain can be removed or if some aspects of its characteristics can be adjusted. If these options are not possible, a second response is to identify if the source of psychological strain can be re-appraised in some way to mitigate its impact. A third response is to see if the individual can create boundaries between the source of stress and other aspects of their life—such as not bringing work home to reduce the link between a stressful workplace and one's home life (Demerouti, 2015).

8.3 | Limitations and future directions

There are some study limitations to note and which provide direction for future research. First, although the AuSSA data were very useful for conducting a study among a large and representative sample of adults, the AuSSA survey was not purpose built for our investigation. Thus, we applied some flexibility in item and factor selection to best explore the HD-R framework. For example, the measure for psychological strain that we adopted reflected the extent to which participants believed they could not overcome their problems. In part this mapped onto the 'inefficacy' (Maslach et al., 1996, 2001) aspect of burnout—but there are other parts to burnout, including self-doubt, exhaustion, and cynicism (e.g., Dicke et al., 2022; Marsh et al., 2022; Maslach et al., 2001), and future research can include these in the HD-R process to ascertain their roles. In addition, the dataset contained a personal resource—adaptability—but not a personal demand. Although adaptability was very informative in the present study, future research might look to include a personal demand that may impede health and wellbeing. Second, there are many health demands and resources in individuals' lives that could plausibly impact psychological strain (feeling overwhelmed) and life

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satisfaction and future research could look to administer additional measures of health demands and resources to assess them. Third, the study was located in the Australian context. Future research might look to expand this study to other national contexts to ascertain the generality of the findings. Fourth, the AuSSA data were cross-sectional. Longitudinal data are necessary to identify the extent to which health-related demands and resources predict, for example, gains/declines in psychological strain and life satisfaction. Also to note is that we followed the classic demands-resources process where strain predicted wellbeing as an outcome. Longitudinal data can empirically verify if this is the most appropriate ordering. Fifth, the AuSSA data were collected in 2021, a year that many Australians were experiencing COVID-19 isolation and lockdowns. Findings therefore must be interpreted with this in mind. Finally, the present study focused only on psychological strain and life satisfaction as the factors predicted by demands and resources. Future research could look to expand the health outcomes to further explore the HD-R framework.

9 | CONCLUSION

Given the prevalence of stress-related psychological health issues around the world and the impacts of these on wellbeing, it is important to identify factors that impede or support individuals to navigate these challenges. The present investigation harnessed JD-R theory to conduct an integrative investigation into the health and personal demands and resources associated with strain (psychological strain) and subjective wellbeing (life satisfaction). Applying a HD-R approach, we found that the hypothesised health and personal demands and resources did indeed link to psychological strain and life satisfaction. Targeting these predictors in policy and practice efforts may enable individuals to better respond to the stressors in their lives and in turn experience a greater sense of subjective wellbeing.

DATA AVAILABILITY STATEMENT

Data are from the Australian Survey of Social Attitudes (AuSSA) conducted by Academic Surveys Australia (https://dataverse.ada.edu.au/dataverse/aussa) and can be requested from the Australian Consortium for Social and Political Research Incorporated (ACSPRI).

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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