

RESEARCH ARTICLE

A longitudinal investigation of job demands-resources theory in volunteer firefighters working for the nonprofit sector

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Abstract

Many nonprofit emergency service organizations rely heavily on volunteers. With the recent decline in volunteer numbers and the associated economic cost, it is important for nonprofit organizations to develop strategies aimed at improving volunteer retention. To this end, we applied job demands-resources theory to examine how volunteer demands and resources explain volunteers' well-being (i.e., exhaustion and engagement) and consequently, retention and mental health (i.e., depressive symptoms). Specifically, we hypothesized that: (1) exhaustion mediates the positive relationship between demands and depressive symptoms, and the negative relationship between demands and retention; (2) engagement mediates the positive relationship between resources and retention; (3) resources buffer the positive relationship between demands and exhaustion; and (4) demands boost the positive relationship between resources and engagement. Volunteer firefighters ($N = 126$) were asked to complete a self-report questionnaire twice over a 1-year period. Results showed that increases in engagement mediated the positive relationship between resources and retention

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over time. Contrary to expectations, volunteer resources boosted the positive relationship between volunteer demands and increases in exhaustion. Namely, demands related positively with exhaustion particularly when resources were high (instead of low). Collectively, the study results have important theoretical implications since they suggest that demands do not always have long-term, unfavorable consequences for volunteer firefighters. In contrast, resources enhance volunteer engagement and consequently, promote retention in the long run. Therefore, it is important for volunteer organizations to provide relevant resources to their members to keep them engaged and enhance their willingness to remain in the force.

KEYWORDS

depressive symptoms, job demands-resources theory, longitudinal design, nonprofit management, retention, volunteer firefighters

1 | INTRODUCTION

Countries like the United States and Australia are heavily dependent on volunteer firefighters particularly in remote rural and semi-metropolitan areas (Fahy et al., 2021; McLennan, 2005). Volunteer firefighters in nonprofit organizations (NPOs) make a significant contribution to society and the economy with an estimated \$2 billion in savings per year resulting from their work (McLennan & Birch, 2005). Volunteer firefighting is a special kind of social service that is characterized by challenging and exciting work, meaningful inputs to the community, and tight family-like bonds within the group (Haski-Leventhal & McLeigh, 2009; Thompson & Bono, 1993; Tuckey et al., 2012). However, despite the vital role of volunteer firefighters, their number in Australia has fallen appreciably (Knight, 2020; Yoon et al., 2014). Recent reports indicate that the total number of Australian volunteer firefighters in NPOs dropped by 10% over the last 10 years (Karp, 2020). This is concerning because many NPOs are totally reliant on the volunteer workforce for protection against wildfires and other disasters (McLennan & Birch, 2009). One reason for the decline in volunteer numbers is that fire service volunteering can be highly demanding and has physical and psychological costs for those involved (McLennan & Birch, 2009; Milligan-Saville et al., 2018). Like professional firefighters, volunteer firefighters perform similar high-risk duties that expose them to emotionally demanding situations (e.g., loss of life) and physically demanding activities. Thus, both professional and volunteer firefighters require resources (e.g., training) to help cope with the demands associated with their firefighting duties.

Given the central role that volunteer firefighters play in preserving life and property, it is important to understand the psychological processes that explain their well-being, mental health, and retention in the force. To this end, in this two-wave study, we use the well-established Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2017; Demerouti et al., 2001) as our framework with the aim to understand how volunteer demands and resources explain volunteer exhaustion and engagement, respectively, and how in turn, volunteer well-being explains important outcomes such as retention and depressive symptoms over time. Volunteer retention (i.e., the degree to which volunteer firefighters intend to continue volunteering for the same organization; Macdonald et al., 2009) is important to study, as losses in volunteer numbers has serious consequences for NPOs that rely heavily on volunteers to fulfill their mission statement (Skoglund, 2006). In addition to retention, we consider depressive symptoms as another key outcome, as the nature of fire service work (e.g., repeated exposure to traumatic events) makes volunteer firefighters highly susceptible to mental health problems (Jahnke et al., 2016; Milligan-Saville et al., 2018; Stanley et al., 2017). The risk is much greater during the summer or bushfire season when there is a higher demand for volunteer firefighters (McLennan & Birch, 2009). By considering depressive symptoms, we also address a gap that has been identified in many volunteer management studies that primarily focus on organizational-level outcomes (Allen & Mueller, 2013; Garner & Garner, 2011) and place less emphasis on individual-level outcomes. JD-R theory provides a promising framework to understand volunteer well-being, depressive symptoms, and retention because it considers both the demands associated with the volunteer experience and the resources required to meet those demands, and describes the psychological processes through which these characteristics of volunteer work determine relevant outcomes.

Although several scholars (e.g., Cox et al., 2010; Huynh et al., 2014; McMorro, 2014) have studied volunteer well-being and retention in the context of JD-R theory (Bakker & Demerouti, 2017), there are still some gaps in the literature. Many volunteer studies used a cross-sectional design which prevents conclusions about causal relationships. In addition, previous studies mainly focused on main effects (i.e., how the demanding aspects of volunteer work relate to health impairment, and how resources relate to motivation), whilst JD-R theory also proposes that demands and resources interact in explaining volunteer well-being. So far, Huynh et al. (2013) is the only longitudinal study on volunteer firefighters that has looked at the buffering hypotheses of the JD-R theory showing that non-work resources (e.g., family and friend support) mitigate the positive relationship between volunteer firefighter's demands and exhaustion. Nevertheless, they did not test the boosting hypothesis which proposes that the positive link between resources and motivation is stronger in conditions of high demands (Bakker & Demerouti, 2017). Thus, in the current study, we aim to investigate whether all assumptions of JD-R theory are valid in explaining volunteer firefighters' well-being, depressive symptoms, and retention not only cross-sectionally but also over time. In addition, we add to Huynh et al.'s (Huynh et al., 2013) study by testing whether resources, such as supervisor support and volunteer organizational support (VOS), may also buffer the effect of volunteer firefighter's demands on exhaustion.

By studying these aims, we contribute to the nonprofit management literature in the following ways. First, we add to the small but growing body of research (e.g., Lee et al., 2023; Mayr, 2017; Schreiner et al., 2018) that has adapted work-related well-being theories to (1) extend knowledge on volunteers' well-being and retention, and (2) advance theory in the management of volunteers in the nonprofit sector. This is important because it allows exploring the validity of these theories and in particular, JD-R theory (Bakker & Demerouti, 2017), in

apprehending employee well-being and outcomes in nonprofit contexts. Second, the study provides one of the first longitudinal investigations of the main assumptions of JD-R theory in a volunteer firefighter sample (i.e., a group which are under-represented in the literature). In this way, the present study may provide more compelling evidence regarding possible causal effects of volunteer demands/resources on volunteer outcomes by taking into consideration that motivation or intention to volunteer (a form of pro-social behavior) is not always constant but can change over time (Anderson & Cairncross, 2005; Clary et al., 1992). Thus, our longitudinal research design addresses the methodological limitations raised by several scholars in the field (e.g., Einolf, 2018) regarding the over-reliance of cross-sectional data in nonprofit management research. Lastly, from a practical perspective, testing the validity of the JD-R framework in the NPOs context will provide researchers and practitioners greater insights into the different pathways through which demands, and resources determine volunteer firefighter's mental health and wellbeing. This comprehensive understanding may further assist fire service organizations to better achieve their missions while supporting volunteer retention.

2 | THEORETICAL FRAMEWORK AND HYPOTHESES

2.1 | Dual processes of JD-R theory

A core assumption of JD-R theory (Bakker & Demerouti, 2017) is that a work environment can be categorized into two components namely, job demands and job resources. Job demands refer to “those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive or emotional) effort or skill and are therefore associated with certain physiological and/or psychological costs” (Demerouti & Bakker, 2011, p. 975). In the present study, we look at two demanding aspects relevant to volunteer firefighters, that is, time pressure and physical demands. Volunteer firefighters frequently find themselves responding to emergencies characterized by hazardous conditions (Prati & Pietrantonio, 2012), and acute pressures related to the need for rapid responses. Time pressure refers to the extent to which volunteers are required to work very hard and fast (Karasek et al., 1998). For example, a volunteer firefighter working quickly to extinguish a grass fire before it moves into a more densely wooded area and becomes much more difficult to control. Physical demands refer to the extent to which volunteers perform physically strenuous tasks, such as lifting heavy objects, driving long hours, or dealing with physically fatiguing tasks during fires (Young et al., 2014).

Job resources are aspects of the job that help to achieve work goals, facilitate learning and development, but also mitigate the negative consequences of job demands (Demerouti & Bakker, 2011). In the present study, we look at two types of resources that are relevant for volunteer firefighters, that is, supervisor support and VOS. Given that volunteers do not receive any payment for their service, other incentives like the support from their supervisor and their organization become paramount. Supervisor support refers to volunteer's beliefs that their supervisor cares about them and values their contributions (Eisenberger et al., 1990). High levels of supervisor support relate positively with retention in volunteer firefighters (Fallon & Rice, 2015; McLennan et al., 2009; Rice & Fallon, 2011). Similarly, Walk et al. (Walk et al., 2019) found that resources (i.e., training and recognition) relate negatively with actual volunteer turnover. VOS pertains to the degree to which a volunteer organization demonstrates concern for and addresses the requirements of its volunteers. This encompasses aspects such as

reimbursing out-of-pocket expenses, offering assistance when volunteers require support (e.g., by providing personal protective equipment), valuing volunteers' feedback seriously, and keeping them informed about any organizational changes or updates (Huynh et al., 2014; McLennan & Birch, 2005).

According to JD-R theory (Bakker & Demerouti, 2017), volunteer demands and resources evoke two relatively independent psychological pathways that explain well-being: (1) the health impairment (or energetic) process and (2) the motivational process. The health impairment process is described as an energy draining process whereby high demands deplete an individual's mental and physical resources leading to exhaustion (i.e., mental, emotional, and physical tiredness; Maslach et al., 2001) and consequently to (physical and mental) health problems and negative organizational outcomes. When volunteer firefighters are exhausted, they are at greater risk of developing symptoms of depression (i.e., sadness, loss of interest), because of the negative thoughts and feelings they have toward their work and themselves (Milligan-Saville et al., 2018). Indeed, Huynh et al. (2014) showed that job demands (i.e., emotional demands and work-home-conflict) related positively to exhaustion, which in turn associated positively with depressive symptoms in volunteer firefighters. They also showed that exhausted firefighters were less likely to continue volunteering because they lack energy to face the challenges of their volunteer work. However, as the study of Huynh et al. (2014) relied on cross-sectional data, the causal direction of associations remains unclear. Thus, we address this gap in knowledge by using longitudinal data of volunteer firefighters to test the following hypotheses:

Hypothesis 1a. *Exhaustion will mediate the positive relationship between time pressure and depressive symptoms over time.*

Hypothesis 1b. *Exhaustion will mediate the negative relationship between time pressure and retention over time.*

Hypothesis 1c. *Exhaustion will mediate the positive relationship between physical demands and depressive symptoms over time.*

Hypothesis 1d. *Exhaustion will mediate the negative relationship between physical demands and retention over time.*

The motivational process of JD-R theory (Bakker & Demerouti, 2017) proposes that the presence of high job resources provides employees with the means to achieve work-related goals and, therefore, stimulates personal growth and development. This, in turn, create feelings of engagement (i.e., a motivational state characterized by high levels of vigor [i.e., energy, resilience, and a commitment to hard work], dedication [i.e., enthusiasm, pride and challenge], and absorption [i.e., concentration and full immersion in one's and well-being during work]; Schaufeli et al., 2009) and consequently, motivation to continue volunteering with the same organization (Aboramadan et al., 2019; Mayr, 2017). For example, VOS (e.g., reimbursement for out-of-pocket expenses around travel and equipment costs) can enhance volunteers' feelings of vigor, dedication and absorption, and allow them to persist in the face of challenges (Hakanen et al., 2005). In line with social exchange theory (Hormans, 1961), when NPOs provide these resources, volunteers are more willing to give back or reciprocate by becoming more energized, dedicated, and involved in their work (Bakker, 2011). Thus, engaged volunteer firefighters will

tend to continue with the organization that supports them (Huynh et al., 2014; Mayr, 2017). Whilst some paid work studies have examined the link between work engagement and depressive symptoms (e.g., Innstrand et al., 2012), this association is not predicted in the motivational process of JD-R theory (Bakker & Demerouti, 2017; Hakanen et al., 2008), since depression is a result of individuals' health impairment and not of their lack of motivation. In addition, previous studies on volunteers have found no link between the two variables (e.g., Cox et al., 2010). Thus, as depicted in Figure 1, we focus only on retention as a positive outcome in the motivational process.

Cross-sectional research has provided preliminary empirical support for the motivational process of JD-R theory operating for volunteer firefighters. For example, Huynh et al. (2014) found that engagement mediated the link between volunteer resources (i.e., training and VOS) and reduced turnover intention. These findings are consistent with those of Rice and Fallon (2011), Vecina et al. (2013), Mayr (2017), and Senses-Ozyurt and Villicana-Reyna (2016), who reported that resources such as support or transformational leadership and engagement related positively to retention in volunteers. Also, a more recent study by Aboramadan et al. (2022) showed that engagement mediated the positive relationship between servant leadership and extra-role behaviors among employees in NPOs. Overall, these findings indicate that when volunteer firefighters receive adequate levels of resources, they feel more vigorous at, dedicated to, and absorbed in their fire service work and this, in turn, makes them more likely to stay with the organization. Whilst these studies provide promising evidence for the model's assumptions, they are all based solely on cross-sectional research. A longitudinal approach provides the advantage of capturing changes in different dimensions of volunteer motivation and retention over time (Senses-Ozyurt & Villicana-Reyna, 2016). We make use of longitudinal data from volunteer firefighters and hypothesize that:

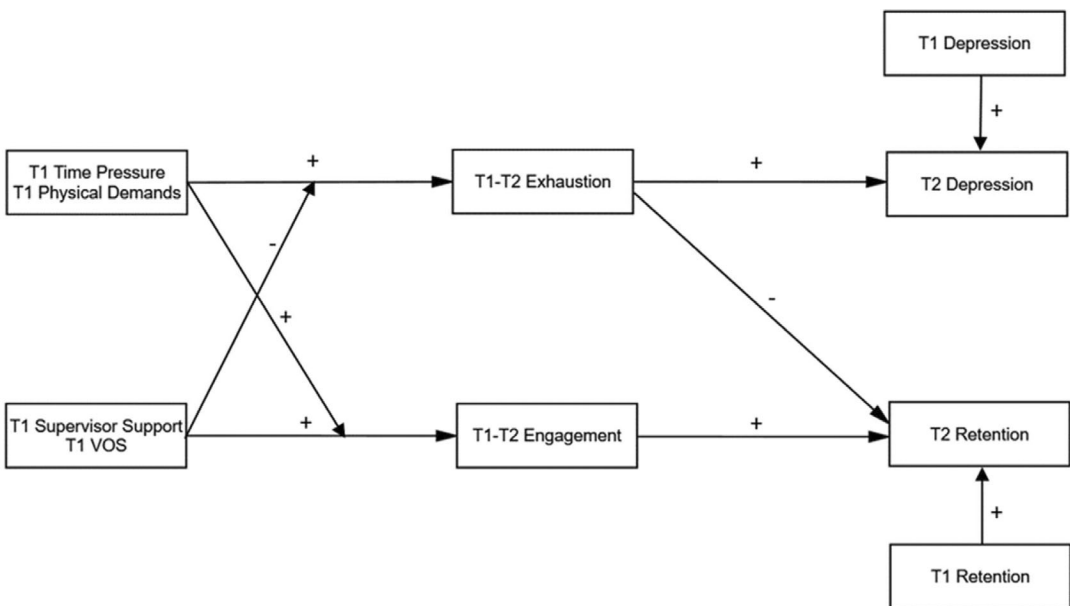


FIGURE 1 The Hypothesized model. T1-T2 refers to changes in exhaustion and engagement over time.

Hypothesis 2a. *Volunteer engagement will mediate the positive association between supervisor support and retention over time.*

Hypothesis 2b. *Volunteer engagement will mediate the positive association between VOS and retention over time.*

2.2 | The buffering hypothesis

According to JD-R theory (Bakker & Demerouti, 2017), job resources do not only stimulate employees' motivation and work engagement, but they also play a critical role in buffering the unfavorable outcomes of exposure to high levels of demands. The so-called buffering hypothesis of JD-R theory proposes that job demands are not necessarily harmful if there are enough resources for employees to cope with stressful work situations or to complete demanding tasks. This is because adequate resources enable employees or volunteers to deal with demands successfully and protect themselves from exhaustion (Xanthopoulou et al., 2007).

The above assumption is in line with conservation of resources (COR) theory (Hobfoll, 2002). This theory suggests that individuals strive to obtain, build, and protect their resources, and psychological stress occurs when these valuable resources are lacking or threatened, or when they fail to acquire additional resources after significant investment. To minimize the impact of stress, individuals will use the available resources such as the support provided by their supervisor or their organization to deal more effectively with the environmental demands. Supervisors and organizations can provide valuable resources which can serve to restore the energy lost to excessive job demands (Yavas & Babakus, 2011), thereby, minimizing the negative effects of demands on exhaustion.

There are very few studies looking at the buffering role of resources on the impact of volunteer demands. Tuckey and Hayward (2011), in their cross-sectional study, showed that resources related to volunteer fire service work, such as camaraderie, moderated the positive relationship between emotional demands and burnout. Similarly, in a longitudinal study, Huynh et al. (2013) reported that non-work resources (i.e., family and friend support) buffered the effect of volunteer firefighter's demands on exhaustion. To extend the above findings, we test the buffering hypothesis by focusing on different types of demands and resources in a longitudinal sample of volunteers. In the present study, we expect that supervisor support and VOS would mitigate the impact of physical demands and time pressure. Namely, supervisors who approve volunteer requests for reimbursement of out-of-pocket expenses (e.g., provision of full personal protective equipment) would enable their volunteers to be better equipped in dealing with the time pressure and physical demands of fire service work, particularly during the summer or bushfire seasons when resources are needed the most (McLennan et al., 2009). Based on the above, it is hypothesized that:

Hypothesis 3a. *Supervisor support moderates the positive relationship between time pressure and exhaustion over time in a way that the relationship is weaker for volunteers who have higher (vs. lower) levels of supervisor support.*

Hypothesis 3b. *Supervisor support moderates the positive relationship between physical demands and exhaustion over time in a way that the relationship is weaker for volunteers who have higher (vs. lower) levels of supervisor support.*

Hypothesis 3c. *VOS moderates the positive relationship between time pressure and exhaustion over time in a way that the relationship is weaker for volunteers who have higher (vs. lower) levels of VOS.*

Hypothesis 3d. *VOS moderates the positive relationship between physical demands and exhaustion over time in a way that the relationship is weaker for volunteers who have higher (vs. lower) levels of VOS.*

2.3 | The boosting hypothesis

According to JD-R theory (Bakker & Demerouti, 2017), job demands do not only exhaust individuals' energy but may also play a critical role in boosting the positive relationship between job resources and work engagement. Namely, the boosting hypothesis proposes that when job demands are high, job resources have a stronger positive relationship with motivation. This hypothesis builds on COR theory (Hobfoll, 2002) which proposes that in situations of high demands, resources become more crucial for motivation, because it is when they are mostly needed. There is strong evidence supporting this proposition in various samples of employees in for-profit organizations (see Bakker et al., 2007; Hakanen et al., 2005). There is also emerging evidence supporting this proposition in a sample of volunteer firefighters in NPOs. Namely, Tuckey et al. (2012) found that volunteers' engagement was higher when high cognitive resources and high empowering leadership co-existed with high cognitive demands. These results suggest that when abundant resources co-exist with high levels of demands, demands are more likely to be perceived as challenges that motivate individuals to make the best use of their resources and become more engaged. We expect that job demands would be higher for volunteer firefighters during the summer or bushfire season (McLennan & Birch, 2009) and this is when job resources are needed the most. Based on the above, it is predicted that:

Hypothesis 4a. *Time pressure moderates the positive relationship between supervisor support and engagement over time, such that the relationship is stronger for volunteers who report higher (vs. lower) levels of time pressure.*

Hypothesis 4b. *Time pressure moderates the positive relationship between VOS and engagement over time, such that the relationship is stronger for volunteers who report higher (vs. lower) levels of time pressure.*

Hypothesis 4c. *Physical demands moderate the positive relationship between supervisor support and engagement over time, such that the relationship is stronger for volunteers who report higher (vs. lower) levels of physical demands.*

Hypothesis 4d. *Physical demands moderate the positive relationship between VOS and engagement over time, such that the relationship is stronger for volunteers who report higher (vs. lower) levels of physical demands.*

The hypothesized research model is graphically displayed in Figure 1.

3 | METHOD

3.1 | Procedure and participants

The CEO of a South Australian volunteer fire service agency was contacted about the study. After obtaining consent, individual volunteers were randomly selected by management staff from 406 brigades and six regions across the state using the central database maintained by the organization. Selected volunteers within each brigade were then sent an information sheet and questionnaire. Potential participants were active volunteer firefighters as opposed to those performing operational support roles. Volunteers were informed about the anonymous and confidential nature of the study. The self-administered questionnaire was sent out twice, approximately 12 months apart during the summer season. Initially (T1), an email containing a link to an online survey was sent to 1429 volunteer firefighters, yielding 447 responses (a response rate of 31%). Among these, 151 individuals returned their questionnaire at T2 (resulting in a response rate of 36%). At both time points, a unique matching code was generated by volunteers based on the first three letters of their mother's first name and the day and month of their birthday. This was done to ensure the questionnaires could be matched while remaining anonymous. To encourage participation, a follow-up email was sent twice at each time point (T1 & T2)—first reminder at 2 weeks and then final reminder at 4 weeks after the survey was sent.

The final sample comprised of 126 volunteers, whose responses were successfully linked from T1 to T2 (response rate: 28% of the original sample). Participants were predominantly male ($n = 108$, 86%), with an average age of 45.47 (SD = 13.02) years, who held the following ranks: firefighter, $n = 56$ (44.4%); senior firefighter $n = 20$ (15.9%); lieutenant, $n = 31$ (24.6%); and captain, $n = 16$ (12.7%). On average, participants had dedicated 15.20 years (SD = 10.66) to volunteer work in the fire service. Their average tenure within the volunteer workforce was 19.71 years (SD = 15.58). Finally, the majority of participants were in a marital relationship (77.8%), held full-time employment (69%) and were either high school (30%) or higher education (41%) graduates. Attrition analyses were conducted using independent samples t-tests to assess whether dropouts ($N = 321$) differed significantly on key variables (i.e., demographics and the main study variables) from the panel group ($N = 126$) at baseline. Results revealed that participants of the panel group were slightly older ($M = 45$ versus $M = 42$; $t(445) = -2.22$, $p = 0.027$) than the dropouts. No other significant differences were found.

3.2 | Measures

Volunteer demands (T1). *Physical demands* were measured using five items adapted from the Demand-Induced Strain Questionnaire (de Jonge et al., 2007). A sample item was: “In my volunteer work, I have to perform physical activity in a quick and continuous fashion” ($\alpha = 0.91$). *Time pressure* was measured using two items adapted from the job demands sub-scale of the Job Content Questionnaire (JCQ; Karasek et al., 1998). An example item was: “My volunteer work requires working very hard”. The inter-item correlation of the two items was 0.60. The items of the volunteer demands scales were rated on a 5-point scale ranging from (1) = very rarely/never to (5) = very often/always.

Volunteer resources (T1). *Supervisor support* was measured using four items adapted from the social support sub-scale of the JCQ (Karasek et al., 1998). An example item is “My

supervisor is concerned about my welfare" ($\alpha = 0.91$). *Volunteer organizational support* was measured using five items such as "The organization keeps me well informed" (Eisenberger et al., 1986; $\alpha = 0.90$). Resource items were rated on a 5-point scale (1 = very rarely/never; 5 = very often/always).

Exhaustion (T1 and T2) was measured using five items adapted from the exhaustion subscale of the Maslach Burnout Inventory-General Survey (Maslach et al., 1996). Participants rated items such as "I feel emotionally drained from my volunteer work" on a 7-point scale from 0 = never to 6 = everyday ($\alpha_{T1} = 0.86$; $\alpha_{T2} = 0.89$).

Volunteer Engagement (T1 and T2) was measured using the 9-item Utrecht Work Engagement Scale (Schaufeli et al., 2006) adapted to the volunteer context (van Schie et al., 2014; Vecina et al., 2013). Items included "At my volunteer work, I feel strong and vigorous" (vigor, 3 items), "I am enthusiastic about my volunteer work" (dedication, 3 items) and "Time flies when I am doing volunteer work" (absorption, 3 items). All items were rated on a 7-point scale ranging from (0) = never to (6) = always ($\alpha_{T1} = 0.90$; $\alpha_{T2} = 0.89$).

Depressive symptoms (T1 and T2) were measured with seven items adapted from the Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995). Participants were asked how much each item applied to them over the past week. An example item is: "I felt I wasn't worth much as a person" ($\alpha_{T1} = 0.91$; $\alpha_{T2} = 0.89$). All items were rated on a 4-point scale ranging from (0) = does not applied to me at all to (3) = applied to me very much or most of the time.

Retention (T1 and T2) was measured with the following question: "I intend to continue volunteering for the organization" (Macdonald et al., 2009) which was rated on a scale ranging from (1) = strongly disagree to (5) = strongly agree.

3.3 | Analysis strategy

We examined the hypotheses using the PROCESS macro for SPSS, which was developed by Hayes (2018). First, we adopted Model 4 of PROCESS, which allows testing for mediation effects formulated in Hypotheses 1a-d and 2a,b. Accordingly, we ran the simple mediation models six separate times to generate the indirect effects for each of the volunteer demand (time pressure and physical demands), volunteer resource (supervisor support and VOS), and outcome (depressive symptoms and retention) variables. Mediation effects were tested using 10,000 bootstrap samples and 95% bias-corrected confidence intervals (CIs) around the indirect effects. Mediation is supported when confidence intervals (CIs) associated with the indirect effect do not contain zero.

Second, we adopted Model 1 of PROCESS which allows testing for moderation effects predicted in Hypotheses 3a-3d and 4a-4d. Accordingly, we conducted the moderation models independently on eight occasions to derive the interaction effects for every possible combination of each demand (time pressure and physical demands) and each resource (supervisor support and VOS) with exhaustion (Hypothesis 3a-3d) or engagement (Hypothesis 4a-4d) as outcomes. Before conducting the analyses, we centered all measures included in the interaction terms around their means (Cohen et al., 2003).

Ideally, mediation should be tested with at least three waves of data. To address the limitation of having only two waves of data, we used change scores from T1 to T2 for the mediating variables, namely, exhaustion and volunteer engagement (see Schaufeli et al., 2009). These scores were calculated as residual scores that were then added to the mediation (Model 4) and moderation (Model 1) analyses. Following the suggestions by Smith and Beaton (2008), we

obtained these residual scores by conducting a regression analysis where T2 mediator score was treated as the dependent variable and T1 mediator score as the independent variable. Two separate regression analyses were conducted for exhaustion and engagement. The standardized residual scores for both exhaustion and engagement were then used as change scores in the hypothesized models. Residual scores that are positive suggest an increase, whereas residual scores that are negative indicate a decrease in exhaustion or volunteer engagement. Raw scores were used for the dependent variables (depressive symptoms and retention) at T2, while controlling for these outcomes at T1 in Model 4. For consistency, we also used residual scores for exhaustion and volunteer engagement as dependent variables in the moderation analyses. However, results of the moderation analyses were similar when T1 exhaustion and T1 engagement were used as covariates, and T2 exhaustion and T2 engagement were used as dependent variables.

4 | RESULTS

4.1 | Descriptive statistics

Means, standard deviations, average variance extracted (AVE) and correlations among the study variables are presented in Table 1. Values of AVE for all scales met the criterion of 0.50 (Fornell & Larcker, 1981) indicating that common method bias was not an issue in the present study.

4.2 | Hypotheses testing

Hypothesis 1 predicted that an increase in exhaustion from T1-T2 would mediate the positive association between T1 time pressure (Hypothesis 1a) and physical demands (Hypothesis 1c) and T2 depressive symptoms, and the negative association between T1 time pressure (Hypothesis 1b) and physical demands (Hypothesis 1d) and T2 retention over time, while controlling for depressive symptoms and retention at T1, respectively. Results showed that the indirect effect of T1 time pressure on T2 depressive symptoms via T1-T2 increase in exhaustion (indirect effect = 0.006, 95% CIs = -0.010 to 0.029), and the indirect effect of T1 physical demands on T2 depressive symptoms via T1-T2 increase in exhaustion (indirect effect = 0.008, 95% CIs = -0.008 to 0.031) were not significant. Similarly, the indirect effect of T1 time pressure on T2 retention via T1-T2 increase in exhaustion (indirect effect = -0.015, 95% CIs = -0.066 to 0.029), and the indirect effect of T1 physical demands on T2 retention via T1-T2 increase in exhaustion (indirect effect = -0.020, 95% CIs = -0.068 to 0.019) were also not significant. Thus, Hypothesis 1a,1d were not supported. However, it is worth noting that while T1 time pressure ($b = 0.07$, $p < 0.05$) and T1 physical demands ($b = 0.10$, $p > 0.05$) were not associated with an increase in exhaustion, increase in exhaustion related positively to T2 depressive symptoms ($b = 0.08$, $p < 0.05$) and negatively to T2 retention ($b = -0.18$, $p < 0.01$), after controlling for T1 depressive symptoms and T1 retention, respectively.

Hypothesis 2 predicted that T1-T2 increases in volunteer engagement will mediate the positive association between T1 supervisor support and T2 retention (Hypothesis 2a), and between T1 VOS and T2 retention (Hypothesis 2b). Results showed that the relationship between T1 supervisor support and T2 retention (indirect effect = 0.045, 95% CIs = -0.005 to 0.108) was

TABLE 1 Descriptive statistics of study variables ($N = 126$).

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Time pressure T1	3.62	0.80	0.58												
2. Physical demands T1	3.56	0.85	0.57***	0.70											
3. Supervisor support T1	3.95	0.76	0.00	0.08	0.77										
4. VOS T1	3.37	0.70	-0.19*	-0.22**	0.13	0.55									
5. Δ Exhaustion	0.00	0.99	0.06	0.11	0.06	-0.02	-								
6. Exhaustion T1	1.88	0.97	0.13	0.24**	-0.11	-0.40***	0.02	0.57							
7. Exhaustion T2	1.76	1.04	0.14	0.25**	-0.03	-0.31***	0.69***	0.74***	0.60						
8. Δ Engagement	0.00	1.00	-0.11	-0.06	0.14	0.27**	-0.34***	-0.17*	-0.36***	-					
9. Engagement T1	4.02	0.85	0.12	-0.06	0.33***	0.22**	-0.03	-0.41***	-0.32***	0.00	0.57				
10. Engagement T2	3.90	0.81	0.01	-0.09	0.34***	0.34***	-0.25**	-0.43***	-0.48***	0.66***	0.75***	0.55			
11. DEP T1	0.21	0.44	-0.01	0.18*	-0.16*	-0.20*	0.13	0.31***	0.31***	-0.17*	-0.18*	-0.25**	0.65		
12. DEP T2	0.30	0.43	-0.09	0.09	-0.13	-0.19*	0.24**	0.39***	0.44***	-0.21**	-0.25**	-0.33***	0.56***	0.50	
13. Retention T1	4.03	0.88	0.04	-0.10	0.19*	0.23**	-0.14	-0.35**	-0.35**	0.05	0.56**	0.45**	-0.23**	-0.26**	-
14. Retention T2	4.01	0.89	0.04	-0.13	0.23**	0.35***	-0.27**	-0.35***	-0.44***	0.32***	0.53***	0.61***	-0.29***	-0.40***	0.51***

Note: Δ EX and Δ WE refer to changes in exhaustion and engagement over time, respectively. Average variance extracted (AVE) is presented at the diagonal.

Abbreviations: DEP, depressive symptoms; T1, time 1; T2, time 2; VOS, volunteer organizational support.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

not mediated by volunteer engagement. However, it was found that T1 VOS was positively associated with increases in volunteer engagement ($b = 0.39, p < 0.01$), which in turn was positively related to T2 retention ($b = 0.22, p < 0.01$). The indirect effect was found to be significant ($ab = 0.087, CIs = 0.029$ to 0.167). Given that the direct effect remained significant ($b = 0.23, p < 0.05$) after the inclusion of the mediator, increase in volunteer engagement partially mediated the relationship between T1 VOS and T2 retention. This model accounted for 37% of the variance in T2 retention. Thus, Hypothesis 2b was supported but Hypothesis 2a was rejected.

Hypothesis 3 predicted that the positive relationship between T1 time pressure (Hypothesis 3a,c) and physical demands (Hypothesis 3b,d) and T1-T2 increases in exhaustion will be moderated by T1 volunteer resources (supervisor support and VOS), such that the positive relationships will be weaker for volunteers who have higher (vs. lower) levels of volunteer resources available. Table 2 presents the results regarding Hypothesis 3. As can be seen, only VOS interacted with time pressure ($b = 0.51, p < 0.01$) and physical demands ($b = 0.30, p < 0.05$) at T1 in explaining T1-T2 increases in exhaustion. However, contrary to expectations, the simple slopes tests showed that T1 time pressure was positively related to increases in exhaustion at higher levels (+1SD) of VOS (estimate = $0.362, t = 2.31, p < 0.05$), while the

TABLE 2 Results of moderated regression analyses using process: Interactions of job demands and job resources on T1-T2 increases in exhaustion using 2 waves of data ($N = 126$).

Predictor	β	SE	95% CI
Constant	0.009	0.088	-0.166 to 0.184
Time pressure T1	0.071	0.111	-0.149 to 0.290
Supervisor support T1	0.066	0.123	-0.178 to 0.309
Time pressure T1 \times supervisor support T1	0.067	0.147	-0.223 to 0.358
ΔR^2 - interaction term	0.002		
Constant	0.064	0.089	-0.112 to 0.240
Time pressure T1	0.007	0.113	-0.216 to 0.230
VOS T1	-0.019	0.127	-0.270 to 0.232
Time pressure T1 \times VOS T1	0.512**	0.194	0.127 to 0.894
ΔR^2 - interaction term	0.054		
Constant	0.015	0.088	-0.159 to 0.190
Physical demands T1	0.136	0.106	-0.075 to 0.346
Supervisor support T1	0.078	0.117	-0.154 to 0.310
Physical demands T1 \times supervisor support T1	-0.121	0.141	-0.401 to 0.159
ΔR^2 - interaction term	0.006		
Constant	0.047	0.088	-0.127 to 0.222
Physical demands T1	0.123	0.105	-0.086 to 0.332
VOS T1	0.019	0.128	-0.235 to 0.273
Physical demands T1 \times VOS T1	0.295*	0.134	0.031 to 0.560
ΔR^2 - interaction term	0.038		

Abbreviations: 95% CI, confidence interval with lower and upper limits; SE, standard error; T1, time 1; T2, time 2; VOS, volunteer organizational support.

* $p < 0.05$; ** $p < 0.01$.

relationship was not significant at lower levels (-1 SD) of VOS (estimate = -0.349 , $t = -1.81$, ns; Figure 2). Similarly, simple slopes analyses showed that T1 physical demands were positively related to increases in exhaustion at higher levels ($+1$ SD) of VOS (estimate = 0.329 , $t = 2.35$, $p < 0.05$), while the relationship was not significant at lower levels (-1 SD) of VOS (estimate = -0.083 , $t = -0.583$, ns; Figure 3). Overall, these results do not provide support for Hypothesis 3.

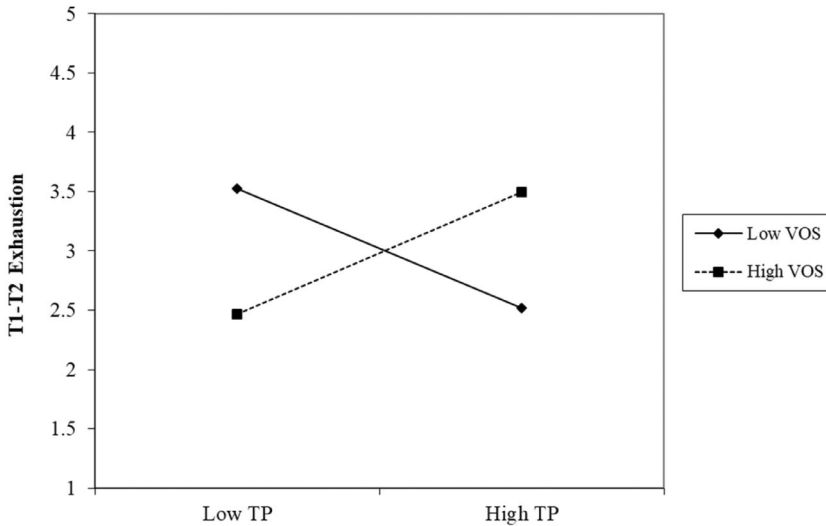


FIGURE 2 Relationship between time pressure at T1 and T1-T2 exhaustion at low and high levels of volunteer organizational support.

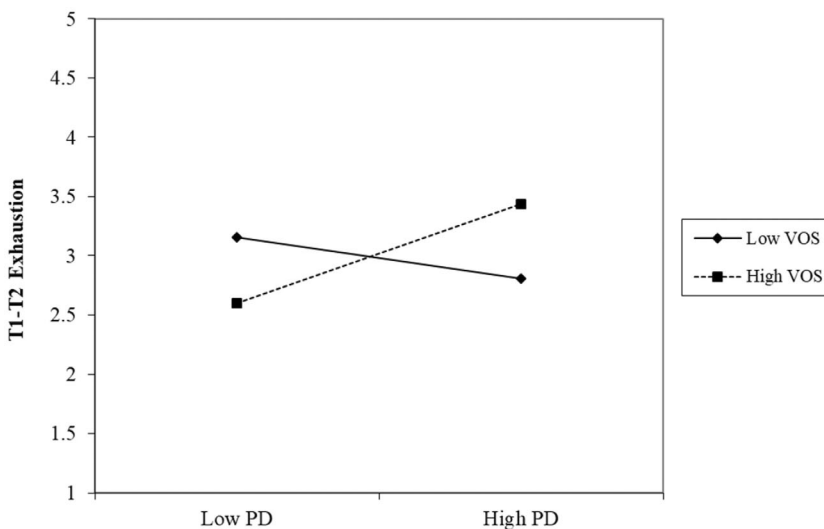


FIGURE 3 Relationship between T1 physical demands and T1-T2 exhaustion at low and high levels of T1 volunteer organizational support.

TABLE 3 Results of moderated regression analyses using process: Interactions of job resources and job demands on T1-T2 increases in engagement using 2 waves of data ($N = 126$).

Predictor	β	SE	95% CI
Constant	0.000	0.088	-0.174 to 0.174
Supervisor support T1	0.225	0.122	-0.017 to 0.467
Time pressure T1	-0.140	0.110	-0.358 to 0.079
Supervisor support T1 \times time pressure T1	-0.153	0.146	-0.442 to 0.136
ΔR^2 - interaction term	0.009		
Constant	-0.011	0.089	-0.186 to 0.165
VOS T1	0.370**	0.127	0.119 to 0.621
Time pressure T1	-0.067	0.113	-0.290 to 0.157
VOS T1 \times time pressure T1	-0.102	0.194	-0.485 to 0.282
ΔR^2 - interaction term	0.002		
Constant	0.006	0.089	-0.170 to 0.181
Supervisor support T1	0.120	0.118	-0.034 to 0.433
Physical demands T1	-0.071	0.107	-0.282 to 0.141
Supervisor support T1 \times physical demands T1	-0.110	0.142	-0.391 to 0.172
ΔR^2 - interaction term	0.005		
Constant	-0.024	0.088	-0.198 to 0.149
VOS T1	0.377**	0.127	0.125 to 0.628
Physical demands T1	0.003	0.104	-0.203 to 0.210
VOS T1 \times physical demands T1	-0.188	0.133	-0.450 to 0.075
ΔR^2 - interaction term	0.015		

Abbreviations: 95% CI, confidence interval with lower and upper limits; SE, standard error; T1, time 1; T2, time 2; VOS, volunteer organizational support.

* $p < 0.05$; ** $p < 0.01$.

Hypothesis 4 predicted that the positive relationships between T1 supervisor support (Hypothesis 4a,c) and VOS (Hypothesis 4b,d) and increases in volunteer engagement is moderated by T1 volunteer demands (time pressure and physical demands, such that the positive relationships will be *stronger* for volunteers who have higher (vs. lower) levels of volunteer demands. As indicated in Table 3, results showed that T1 volunteer demands did not interact with any of the T1 volunteer resources in predicting T1-T2 increases in engagement. Thus, **Hypothesis 4** was not supported. The only significant main effect found was between T1 VOS and T1-T2 increases in volunteer engagement ($b = 0.37$, $p < 0.01$ and $b = 0.38$, $p < 0.01$).

5 | DISCUSSION

The primary aim of this longitudinal study was to apply JD-R theory (Bakker & Demerouti, 2017; Demerouti et al., 2001) in order to understand how volunteer firefighters' work characteristics may determine their depressive symptoms and retention over time. To this end, we examined the health impairment and the motivational pathways proposed by JD-R

theory, as well as the buffering and boosting hypotheses. Results were mixed with one out of the four hypotheses supported. Specifically, there was no support for the mediating role of volunteers' increases in exhaustion in the positive relationship between job demands and depressive symptoms or the negative relationship between job demands and retention, over time. However, we did find some support for the motivational process whereby increases in volunteer engagement mediated the positive relationship between VOS and retention over time. In contrast to predictions, results showed that volunteer resources boosted rather than buffered the positive relationship between demands and increases in exhaustion over time. In what follows, we discuss the theoretical and practical implications of the study findings.

5.1 | Theoretical implications

The study findings have certain important implications for theory development. Contrary to the health impairment process of JD-R theory (Bakker & Demerouti, 2017), our results showed that increases in exhaustion over time did not explain the positive relationship between T1 demands and T2 depressive symptoms, or the negative relationship between T1 demands and T2 retention. These results are not only inconsistent with JD-R theory, but also with the findings of previous studies on volunteer firefighters (e.g., Huynh et al., 2014). These inconsistent findings could be explained by the sample characteristics and type of demands under study. In this study, participants had long tenure, which may indicate that experienced and highly trained volunteers are more capable of dealing with time pressure and physically demanding aspects of fire service work, preventing long-term negative effects on exhaustion. Also, as previous studies suggest, it is possible that other demands (e.g., emotional demands, work-home conflict, critical incident demands; Bryant & Harvey, 1996; Huynh et al., 2014; Tuckey & Hayward, 2011) may play a more important role in explaining exhaustion among volunteer firefighters than the job demands assessed here.

In addition, the discretionary nature of volunteering compared to paid work in nonprofit organizations could mean that volunteers have greater flexibility to take time off to rest and physically recharge after a critical incident or when they feel overloaded. This also means that they can discontinue their volunteering commitment whenever they wish (with the option to return) thereby regulating their levels of exhaustion (Ross et al., 1999). As a result, the effects of demands on exhaustion may be only short-lived. Collectively, previous and current findings seem to indicate that the health impairment process of JD-R theory may hold only for specific demands (e.g., critical incident demands, emotional demands, work-home conflict), specific volunteer characteristics (e.g., less experienced volunteers), or only short-term. Thus, future research should consider the unique aspects and nature of volunteer firefighting when applying theories of employee behavior such as the JD-R theory to the nonpaid work context, as well as the role of time.

It is worth noting that we found that increase in exhaustion over time was positively related to T2 depressive symptoms and negatively related to T2 retention. These findings corroborate those of Huynh et al. (2014) which showed that exhaustion associated positively to depressive symptoms and negatively related to retention in volunteer firefighters cross-sectionally. Our results suggest that volunteer firefighting can still be stressful and may lead to negative outcomes for both the organization and the individual in the long-term. When volunteer firefighters are exhausted, they are at greater risk of developing symptoms of depression (i.e., sadness, loss of interest), because of the negative thoughts and feelings they have toward

their work and themselves (Milligan-Saville et al., 2018). Indeed, Huynh et al. (2014) showed that job demands (i.e., emotional demands and work-home-conflict) related positively to exhaustion, which in turn associated positively to depressive symptoms in volunteer firefighters. They also showed that exhausted firefighters are less likely to stay with the organization because they lack energy to face the challenges of their volunteer work.

Regarding the motivational process of JD-R theory (Bakker & Demerouti, 2017), it was found that increases in volunteer engagement did not mediate the positive relationship between T1 supervisor support and T2 retention (Hypothesis 2a). However, increases in volunteer engagement from T1 to T2 (partially) mediated the positive relationship between T1 VOS and T2 retention (Hypothesis 2b). This finding is in line with those of Huynh et al. (2014) who showed that engagement mediated the negative relationship between VOS and turnover intention in volunteer firefighters in a cross-sectional analysis. These findings also support and expand the findings of Vecina et al. (2013) and Mayr (2017) who reported that engagement was positively related to retention among volunteers. Although the findings of Aboramadan et al. (2022) supported the mediating role of engagement in the relationship between servant leadership and extra-role behaviors, our results indicate that for volunteer firefighters, receiving support from their supervisor may not be as important as the long-term support they receive from the organization. This may be because “on call” firefighters have minimal direct contact with their supervisor, who usually remain at the bases and is unlikely to be present at the scene. The tight family-like bonds within the group (Haski-Leventhal & McLeigh, 2009; Thompson & Bono, 1993) could suggest that other types or sources of social support such as camaraderie (Tuckey & Hayward, 2011) or co-volunteer support (Ângelo & Chambel, 2013) may be more important resources for volunteer firefighters. Hence, future research should take a finer-grained approach in examining multiple potential sources of work-based social support.

Interestingly, the motivational pathway received stronger support than the health impairment pathway. One possible explanation for this finding is that motivational factors (e.g., career development and fostering social interactions; Clary et al., 1992) are more central for volunteer firefighters than health-related concerns. This possibility may be reflected in the unique characteristics of volunteer firefighters as a group. The work they do is characterized by challenging and exciting tasks linked with strong and meaningful contributions to the community (Haski-Leventhal & McLeigh, 2009; Thompson & Bono, 1993; Tuckey et al., 2012). A second possibility is that alternative specific demands (e.g., critical incident demands; Bryant & Harvey, 1996) may play a more important role in predicting or explaining the levels of exhaustion experienced by volunteer firefighters than time pressure or physical demands.

Volunteer resources did not have a buffering effect on the relationship between volunteer demands and increases in exhaustion. Contrary to expectations, VOS was found to boost (instead of buffer) the positive relationship between T1 demands and increases in exhaustion. These results are not in line with those of Huynh et al. (2013) and Tuckey and Hayward (2011) who found that other types of support such as family support (personal) and camaraderie (team) mitigate the impact of demands on volunteer firefighter's exhaustion. This unexpected finding may be explained by social exchange theory (Hormans, 1961). When volunteer firefighters receive support from the agency (at the organizational level), they feel more obliged to return the favor by completing volunteer tasks thereby putting overwhelming effort and energy to deal with their demands. This in turn result in higher levels of exhaustion.

Contrary to the boosting hypothesis of JD-R theory (Bakker & Demerouti, 2017), the relationship between volunteer resources and volunteer engagement was not boosted under conditions of higher volunteer demands. This result is inconsistent with the volunteer firefighter

study of Tuckey et al. (2012), who found that the combination of high volunteer demands, and high volunteer resources was positively related to work engagement particularly when leaders used an empowering leadership style. Perhaps, as Tuckey et al. (2012) suggested, the boosting effect may only be evident when the type of demands (e.g., cognitive demands) is matched with of the type of resources (cognitive resources) to manage these demands.

All in all, our empirical findings highlight the complex nature of volunteer work and point to the importance of recognizing several differences between volunteer and paid employment. For example, volunteering is associated with different demands (i.e., less time commitment) and different motivational factors (i.e., people are volunteering because they want to give back to the community rather than to earn an income) compared with paid work. Hence, it may be necessary to adapt aspects of JD-R theory (Bakker & Demerouti, 2017) when applying it to the volunteering context. As Kragt and Holtrop (2019, p. 356) noted in a recent review: “future research should not apply theories about employee behaviour to a volunteering context without considering the unique aspects and nature of volunteering work.” Following this recommendation will help strengthen the validity or application of JD-R theory as a useful framework for designing interventions aimed at improving the recruitment and retention of volunteer firefighters in NPOs.

JD-R theory (Bakker & Demerouti, 2017) provides a unique advantage because it suggests that the focus should be on demands and resources that are most relevant for the context under study. Hence, one suggestion based on our findings would be to focus on demands (e.g., critical incident demands) and resources (e.g., VOS, camaraderie) that seem more applicable to the volunteer firefighting context. The lack of a significant interaction between demands and resources in explaining volunteer exhaustion in the present study indicates the importance of focusing on job characteristics that are most relevant to volunteering, instead of assuming that all volunteer resources will mitigate the negative effects of all volunteer demands.

5.2 | Strengths, limitations, and future directions

One important strength of the current study is that it applies a longitudinal design to investigate the central assumptions of JD-R theory (Bakker & Demerouti, 2017) among volunteer firefighters. This is a strength because it allowed determining whether demands and resources of volunteering work have short-term or long-term effects on well-being, depression, and retention. Our results revealed that although volunteer demands were not associated with exhaustion, volunteer resources and particularly VOS could potentially increase volunteer engagement over time and in turn, promote retention. Thus, our study addresses the methodological concerns raised by several scholars (e.g., Einolf, 2018; Kragt & Holtrop, 2019) regarding the use of cross-sectional data in volunteer management research. Another important strength is that the current study adds to the limited empirical research on volunteer management and practices.

Despite these strengths, the present study also has some limitations. First, data collected with self-report measures may result in biases due to common method variance. We tried to reduce common method biases by using time intervals between measurements. However, future studies may use multiple sources of data or other ratings (e.g., volunteer manager or co-volunteers) of, for example, demands and resources. Future researchers are also encouraged to use measures of actual volunteer retention (as opposed to self-reported intent to continue) such as those used by previous scholars (see Beirne & Lambin, 2013; Davis et al., 2003; Tang et al., 2010). Another study limitation was that a relatively small proportion of the original

sample was retained at follow-up. Although attrition analyses revealed differences only with regards to age between those retained and those lost to follow-up, it is possible that participants differed on other unmeasured variables (e.g., conscientiousness) that may play a role when it comes to explaining outcomes.

Further, a study limitation is that we focused only on two demands and two resources. It would be useful to explore more relevant demands and resources for volunteers. For example, role ambiguity and co-volunteer support or camaraderie which have shown to be important job characteristics for volunteer firefighters (Cook & Mitchell, 2013; Tuckey & Hayward, 2011). Also, volunteers' "perception of voice" which refers to the extent to which volunteers perceived their voice to be heard in their organization (Dyne & LePine, 1998) may be a relevant job resource. A study by Allen and Mueller (2013) reported that perception of voice was negatively associated with volunteer burnout and intention to quit. Furthermore, the role of personal resources (i.e., the beliefs people hold regarding how much control they have over their environment) together with job resources are considered the most relevant antecedents of work engagement (Bakker & Demerouti, 2017) may also be examined in future studies.

The results of this study were based on a relatively small sample of volunteer firefighters which is not representative of the study population. The low response rate is also a potential source of non-response bias such that more active volunteer firefighters (e.g., those more committed or satisfied with the organization) were more likely to participate in the survey. Since we could not rule out non-response bias, caution should be taken when applying results to the whole volunteer fire service population in Australia. Future research should also focus on other type of volunteer work that has not been previously studied. Perhaps, an interesting idea would be to confirm the validity of JD-R theory (Bakker & Demerouti, 2017) in a sample of crisis support volunteers. A recent systematic review of the literature indicates that telephone crisis support personnel are facing vicarious trauma, stress, burnout, and psychiatric disorders (Kitchingman et al., 2018) due to the inherent demands of their role. We suspect the health impairment process (as well as buffering hypothesis) of JD-R theory would be very relevant and useful for gaining insights into how strain (e.g., exhaustion, depressive symptoms, posttraumatic stress) is developed and may be prevented or managed for volunteers working in nonprofit organizations.

Future studies could also extend JD-R theory (Bakker & Demerouti, 2017) by accounting for other mediating variables most relevant to the volunteering context. For example, the well-known functional approach to volunteer motivation outlines six primary reasons (values, understanding, career, social, esteem and protective) why people volunteer (see Clary et al., 1992). These factors could be incorporated in JD-R theory for volunteers. Finally, the model can be extended by including other relevant outcomes of chronic mental health. Comorbidity with other psychological illness is not uncommon and the psychological impact of firefighting is not limited to paid employees. Volunteer firefighters can also experience psychological trauma which may result in post-traumatic stress disorder (PTSD) overtime. For example, PTSD may result from witnessing the death of a co-volunteer while on duty. Statistics have shown that the prevalence of PTSD in volunteer firefighters after a massive Australian bushfire event was around 22% (Cook & Mitchell, 2013).

5.3 | Implications for practice

Although our results provided only modest support for our hypotheses, some of our findings have implications for NPOs' strategies aimed at increasing volunteer retention. VOS was found

to enhance retention through engagement. VOS refers to regular staff consultation, compensation for incurred costs, listening to the needs of volunteers and taking actions accordingly (Huynh et al., 2014). Below we outline several practical strategies NPOs management can adopt to facilitate this form of support.

One practical strategy is to set up a volunteer program which includes full or partial reimbursements for volunteer-related expenses (e.g., petrol, phone). Volunteer management may consider allocating more funding to support (e.g., provision of full personal protective equipment) volunteer firefighters during the summer or bushfire seasons when resources are needed the most (McLennan et al., 2009). A reward system could also be incorporated into the program where all volunteer firefighters would benefit by, for example, not being required to pay Emergency Service Levy. As noted by Hartenian (2007), the reward system is a key factor in attracting, retaining, and motivating volunteers.

Another practical strategy is to ensure that when certain resources are available, these should be clearly communicated to all volunteer members. While VOS was associated with increased engagement and in turn, increased retention, these resources will become less relevant when volunteers are unaware of their existence. For example, a large survey study conducted among volunteers indicated that some volunteers did not know whether their organization offered them any reimbursements, and this may have affected their ability to continue volunteering (Volunteering Australia, 2010). Thus, the key recommendation here is to have regular and effective consultation and communication with volunteer staff (e.g., via newsletters and/or team meetings). However, it is important that volunteer managers do not become “micro-managers” as such management practices could have the reverse effect on volunteers (i.e., make them less likely to continue volunteering; for example, see Hager & Brudney, 2004, 2015).

While the provision of VOS can be useful for increasing volunteer engagement and retention, it is important to recognize that these approaches will become ineffective when the factors leading to departure are outside the fire service agency's control. These factors might pertain to age, competing work or study commitments, health or relocating to a different state (see McLennan et al., 2008, 2009). Our findings also suggest that NPOs should take care when providing VOS since volunteers who deal with demands are more exhausted in conditions of high VOS. In such cases, it would be beneficial for nonprofit management to educate volunteer members to recognize signs of exhaustion and try to restore their energy when needed.

5.4 | Conclusion

This study adds to the existing body of knowledge on nonprofit management by presenting the first longitudinal investigation of JD-R theory (Bakker & Demerouti, 2017) in a volunteer sample. In this sense, the study also provides a step forward in addressing the limitations of many volunteering studies in terms of its theoretical and methodological developments (see Kragt & Holtrop, 2019). Specifically, the findings of this study suggest that the motivational process of JD-R theory is applicable to volunteer organizations, and this is supported by longitudinal data. The role of VOS was found to be particularly important in facilitating engagement and consequently, retention. However, the health impairment process, as well as the buffering and boosting hypotheses of the JD-R theory were not supported by the longitudinal data. Thus, longitudinal replication of the study in other volunteer population is encouraged.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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