

Ambulance personnel's intention to quit and its associations: a multi-group comparison using structural equation modelling

Tiet-Hanh Dao-Tran

*Centre for Health Services Research, The University of Queensland,
Brisbane, Australia*

Keith Townsend, Rebecca Loundoun and Adrian Wilkinson

*Centre for Work, Organisation, and Well-being, Griffith University,
Brisbane, Australia, and*

Charllotte Seib

*Faculty of Health, School of Nursing and Midwifery, Griffith University,
Meadowbrook, Australia*

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Abstract

Purpose – This study aims to explore the intention to quit and its associations among ambulance personnel and to compare the intention to quit and its associations between paramedic and non-paramedic staff.

Design/methodology/approach – A cross-sectional study was conducted on 492 Australian ambulance personnel. Participants were selected by stratified random sampling. Data were collected using phone interview-administered questionnaires. Descriptive analyses, bivariate associations and structural equation modelling were performed for data analysis.

Findings – The study found that 70% of ambulance personnel intended to quit their jobs. Intention to quit was similar between paramedics and non-paramedic staff. In both staff groups, supervisors' and colleagues' support was associated with mental health symptoms; job satisfaction was associated with the intention to quit. Supervisors' and colleagues' support was indirectly associated with the intention to quit via increasing job satisfaction and reducing the experience of mental health symptoms among paramedics only. Mental health symptoms were directly associated with the intention to quit and indirectly associated with the intention to quit via reducing job satisfaction among paramedics only.

Practical implications – The study findings provide evidence for resource allocation in human resource management. The findings suggest that interventions to increase job satisfaction may reduce the intention to quit for all ambulance personnel. Interventions to improve supervisors' and colleagues' support and to manage depression, anxiety and stress symptoms may help to reduce the intention to quit for paramedics only.

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Ethical approval: The study protocol was reviewed by the Griffith University Human Research Ethics Committee and granted ethical approval (Approval number: 2016/702).



Originality/value – This is the first study to model and compare the direct and indirect associations of intention to quit between paramedics and non-paramedic staff in ambulance personnel.

Keywords Intention to quit, Ambulance personnel, Paramedics, Support, Job satisfaction, Mental health

Paper type Research paper

Introduction

Ambulance personnel are one group of first responders to emergencies (Jones, 2017). In 2010, ambulance personnel in the United States had an annual turnover rate of 10% (Patterson *et al.*, 2010). Research published in the United States in 2020 has shown that 16.4% of paramedics and 32.4% of emergency medical technicians intend to quit their jobs (Rivard *et al.*, 2020). Employee turnover can be costly and significantly impacts staffing, work performance, and patient outcomes (Bae, 2022). Therefore, management of turnover among ambulance personnel is important.

Although the intention to quit, an employee's idea of voluntarily leaving their jobs (Yan *et al.*, 2021), is not actual turnover, those with a stronger intention to quit will be more likely to leave the organisation (Ki and Choi-Kwon, 2022). This is why the intention to quit is a proxy for turnover (Mathieu *et al.*, 2016; Sun and Wang, 2017; Tabur *et al.*, 2022) and management of employees' intention to quit is considered a proactive approach to managing turnover.

Understanding factors associated with intention to quit is important for developing turnover management strategies. Two common theories that attempt to explain employees' intention to quit are Mobley's conceptual model (1979) and the Conservation of Resource Theory (Hobfoll, 1988). Mobley's conceptual model describes the intention to quit using personal characteristics, work-related characteristics, and job satisfaction. In the model, personal characteristics include age, education, and family responsibility, while work-related characteristics include supervision and working conditions (Mobley *et al.*, 1979). Personal characteristics determine individual values, while work-related characteristics impact the employees' perceptions of their jobs (Mobley *et al.*, 1979). Individual values and job perception ultimately influence employees' job satisfaction (Mobley *et al.*, 1979). Those with more job satisfaction will have less intention to quit (Mobley *et al.*, 1979).

On the other hand, the Conservation of Resource Theory (Hobfoll, 1988) explains the intention to quit via a balance between resources and job demands. According to this theory, resources include supervisors' and colleagues' support, while demands include night shifts and working hours (Hobfoll, 1988). When resources do not meet demands, employees experience mental health symptoms such as psychosocial stress, which can then reduce their job satisfaction and increase their intention to quit (Hobfoll, 1988). Combining these two theories with the following literature allows a more comprehensive understanding of factors associated with employees' intention to quit.

Personal characteristics and intention to quit: Personal characteristics include age, gender, education, marital status, and the number of dependants. The association of these characteristics with an intention to quit appears mixed in the current literature. In some cohorts of health personnel, evidence suggests that older employees (Ma *et al.*, 2022; Yan *et al.*, 2021), males (Yan *et al.*, 2021), married or partnered employees (Ma *et al.*, 2022), employees with higher levels of education (Saijo *et al.*, 2016), or those with dependants (Yamaguchi *et al.*, 2016) have less intention to quit. Others, however, indicate that younger employees (El-Jardali *et al.*, 2013), females (Ali Jadoo *et al.*, 2015; Jiang *et al.*, 2019), those with lower levels of education (Yan *et al.*, 2021), and single employees (El-Jardali *et al.*, 2013) have less intention to quit.

Work-related characteristics and intention to quit: Work-related characteristics include night shift, working hours, work roles, job tenure, supervisors' support, and colleagues' support. Supervisors' support is the extent to which employees have support from their supervisors. Colleagues' support is the extent to which employees have support from their colleagues. Research has shown that ambulance personnel usually have night shifts and work long hours (Dopelt *et al.*, 2019; Granter *et al.*, 2019; Jiang *et al.*, 2019; Lawn *et al.*, 2020),

which increases their intention to quit (Dopelt *et al.*, 2019). Negative relationships with colleagues are also one of the important reasons for ambulance personnel to leave the profession (Rivard *et al.*, 2020).

Mental health symptoms and intention to quit: Mental health symptoms include stress, depression, and anxiety. Ambulance personnel are frequently exposed to strenuous physical (Dopelt *et al.*, 2019) and mental demands (Osmančević *et al.*, 2023; Pyper and Paterson, 2016; Wongtongkam, 2017), which negatively impacts their health and well-being after long-term work in the profession (Osmančević *et al.*, 2023). Ambulance personnel are at risk of stress, anxiety, and depression (Petrie *et al.*, 2022; Reid *et al.*, 2022; Roberts *et al.*, 2021; Wagner *et al.*, 2020). Evidence among health workers shows that anxiety directly influences the intention to quit (Poon *et al.*, 2022), and mediates the associations between work-related characteristics and the intention to quit (Raza *et al.*, 2021). Emergency service staff involved in call-taking and dispatching with inadequate support from their supervisor will experience stress (Smith *et al.*, 2019), which can increase their intention to quit (Dechawatanapaisal, 2022). Stress is the main reason they leave their jobs (Al-Mansour, 2021; Rivard *et al.*, 2020). These suggest that mental health symptoms can directly influence the intention to quit or mediate the associations between work characteristics and the intention to quit.

Job satisfaction and intention to quit: Job satisfaction is the extent to which the employee is happy with their job. It was found that 22% of paramedics had high job satisfaction (Thielmann *et al.*, 2022). Literature on health personnel found that individuals with higher job satisfaction have less intention to quit (Al Zamel *et al.*, 2020; Jiang *et al.*, 2019; Lee, 2022; Pressley and Garside, 2023; Wen *et al.*, 2018). Job satisfaction is higher among those with more supervisor support (Mathieu *et al.*, 2016; Modaresnezhad *et al.*, 2021) and lower among those experiencing higher anxiety levels (Modaresnezhad *et al.*, 2021). This suggests that job satisfaction can directly influence the intention to quit and may mediate the associations between work-related characteristics, mental health problems, and the intention to quit.

Australian ambulance personnel include paramedics (community, advanced care, and flight rescue paramedics) (Wilkinson-Stokes, 2021) and non-paramedics (dispatchers, patient transport officers, emergency support officers, local assessment response unit officers, and call takers). Paramedics mainly provide emergency medical care to patients outside hospital settings, while non-paramedics mainly support patients while waiting for paramedic arrivals. This study aims to explore the intention to quit and its associations among ambulance personnel and compare the intention to quit and its associations between paramedic and non-paramedic staff. This study is warranted for several reasons. First, knowledge about the intention to quit among Australian ambulance personnel is still limited (Reynolds *et al.*, 2021). A recent study among Australian rural paramedics, police, community nurses, and child protection workers reports that 27.4% of the participants intend to quit their jobs (Roberts *et al.*, 2021). The study pools participants from different professions but does not present the results for each profession separately, thereby failing to provide an accurate prevalence of employees who intend to quit in a specific profession. In addition, this existing evidence was generated among rural paramedics only; it cannot provide a broader picture of Australian ambulance personnel's intention to quit. Moreover, the study uses a convenience sampling method to recruit the participants, limiting the study's power to be representative. Second, literature exploring the mediating role of mental health and job satisfaction in the association between work characteristics and intention to quit was still limited. Finally, while research has shown that intention to quit and its associations may vary across working roles (Saijo *et al.*, 2016; Yan *et al.*, 2021), to date, only one study has explored the intention to quit and its associations among paramedics and non-paramedic staff (Rivard *et al.*, 2020). In addition, associations of factors with intention to quit can vary across national cultures (Yildiz *et al.*, 2021). This study was conducted in the US and did not compare the model of associations between personal characteristics, work-related factors, mental health, and intention to quit among paramedics and non-paramedic staff.

Based on the current literature, the current study hypothesised the following among Australian ambulance personnel:

- H1. Personal characteristics (age, gender, education level, marital status, and the number of dependants), work-related characteristics (night shift, working hours, work roles, job tenure, supervisors' support, and colleagues' support), job satisfaction, and mental health problems (stress, depression, and anxiety) were directly associated with the intention to quit.
- H2. Mental health problems (stress, depression, and anxiety) mediated the associations between work-related characteristics and intention to quit.
- H3. Job satisfaction mediated the associations between work-related characteristics and intention to quit.
- H4. The associations of intention to quit differed between paramedics and non-paramedics.

Findings from this study would provide evidence for prioritising resource allocation and justifying different strategies for paramedic and non-paramedic staff to manage their intention to quit.

Research methods

Design, setting, sample, and sampling

This cross-sectional study is part of a bigger project conducted in 2017 in partnership with multiple employee unions representing Australian ambulance staff in three Australian states. Total ambulance personnel in these states were 4,959, and 90% were union members. The organisations and unions informed staff of the study. The unions randomly selected prospective participants using their membership lists. Current working ambulance union members were invited to participate. Administrative staff, staff currently on leave, and non-union members were excluded. Stratified random sampling was used to select the participants. The proportion of participants from each state and for different working roles (paramedics and non-paramedics) reflected the number of ambulance personnel working in each state and in different working roles. Recruitment continued until at least 10% of the ambulance personnel from each state were attained. Finally, 1,216 ambulance personnel were randomly invited ($n = 1,216$), and 492 were accepted to participate (response rate was 40.5%), including 415 paramedics and 77 non-paramedic staff.

Measures and data collection

In the co-design process, the unions advised that a phone-administered online questionnaire would help increase participants' response rate and reduce missing data. Therefore, the research team developed a Qualtrics online survey and trained call centre staff with existing telephone communication skills to administer the data collection over the telephone. The call centre is a sub-department owned by the employees' unions. The call centre staff were call takers; one of their roles in the organisation was to engage in telephone-based research.

The survey consisted of standard items to collect data on personal characteristics (the participants' year of birth, gender, the highest completed education level (high school, diploma, bachelor, post-graduate), marital status (married or partnered, others)), and work-related characteristics (the total number of dependants, work tenure (year), work location (metropolitan, regional, rural), working roles (paramedics, non-paramedics), average working hours per week, average working night shifts per month). Valid and reliable scales were also used to measure supervisors' support, colleagues' support, depression, anxiety, stress, job satisfaction, and intention to quit.

Supervisors' and colleagues' support was measured using the Supervisors' Support Subscale and Colleagues' Support Subscale of the Social Support Scale (Caplan, 1975). Each subscale has four self-reported items, asking participants to rate the extent to which they had support from their supervisors (Caplan, 1975). The responses range from (0) do not have any

such person, (1) not at all, (2) a little bit, (3) somewhat, or (4) very much (Caplan, 1975). A sum of their answers provides a total score, potentially ranging from 0–16 (Caplan, 1975). Higher total scores indicate stronger support. The Supervisors' Support Subscale has been validated among workers, and Cronbach's alpha was 0.86 (Caplan, 1975). The Colleagues' Support Subscale has been validated among workers, and Cronbach's alpha was 0.91 (Caplan, 1975). In this study, Cronbach's alpha of the Supervisors' Support Subscale was 0.89, and that of the Colleagues' Support Subscale was 0.83.

The Depression, Anxiety, and Stress Scale (DASS-21) (Antony *et al.*, 1998) assessed the participants' symptoms of depression, anxiety, and stress. This scale has 21 self-reported items, asking the participants to indicate their frequency of experiencing the symptoms of depression, anxiety, and stress on a 4-point Likert scale (never to almost always) (Antony *et al.*, 1998). Responses are summed, and higher total scores suggested that the participant experienced the symptoms of depression, anxiety, and stress more frequently (Antony *et al.*, 1998). The cut-off point for depression, anxiety, and stress was 4, 3, and 7, respectively (Antony *et al.*, 1998). The scale has been validated and had Cronbach's alphas of 0.94, 0.87, and 0.91 for depression, anxiety, and stress subscale (Antony *et al.*, 1998). In this study, the Cronbach's alpha of depression, anxiety, and stress subscale was 0.87, 0.73, and 0.83, respectively.

Job satisfaction was assessed using the Job Satisfaction Scale (Macdonald and MacIntyre, 1997). This scale contains ten self-reported items, asking participants to rate their satisfaction with the current job on a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree (Macdonald and MacIntyre, 1997). Possible total scores ranged from 10 to 50, with higher scores indicating higher levels of job satisfaction (Macdonald and MacIntyre, 1997). The scale was validated on a wide range of working adults with a Cronbach's alpha of 0.77 (Macdonald and MacIntyre, 1997). In this study, the Cronbach's alpha of job satisfaction was 0.76.

The intention to quit was measured using four items adapted from the self-reported Turnover Scale (Walsh *et al.*, 1985). Participants were asked to rate their response on a 5-point Likert scale as either strongly disagree (1), somewhat disagree (2), neither agree nor disagree (3), somewhat agree (4), or strongly agree (5) for each statement about their intention to quit (Walsh *et al.*, 1985). Responses are summed, and the total scores vary from 4–20, with a total score greater than 4 indicating an intention to quit (Walsh *et al.*, 1985). The scale has been validated and had Cronbach's alpha of 0.80 (Walsh *et al.*, 1985). In this study, the Cronbach's alpha of intention to quit scale was 0.84.

The average time for completing the survey was 45 min. If the survey was not completed in a single call, mutually agreeable call-back times were arranged until the study was complete. All participants completed the survey.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) (George and Mallery, 2024) and Analysis of Moment Structures (AMOS) 29.0 were used for data analysis. Continuous data were checked for normality using the Kolmogorov-Smirnov test (Pallant, 2020) and found not normally distributed. Therefore, non-parametric tests were performed, and descriptive statistics (frequency, percentage, median, and interquartile (IQR)) were used to describe the participant's characteristics (Pallant, 2020). Chi-square and Mann-Whitney U tests were used to test the differences between paramedics and non-paramedics regarding their intention to quit and their characteristics (Pallant, 2020).

For all participants ($n = 492$), Chi-square, Mann-Whitney U tests, Kruskal-Wallis, and Spearman's rho tests were used to explore the bivariate associations among the study variables where appropriate (Pallant, 2020). Findings from the bivariate association analyses were integrated with the literature to finalise the study's hypothesised model. Then, a two-step structural equation modelling (SEM) approach was used to test the goodness of fit between the

hypotheses and the study data for all participants ($n = 492$) (Anderson and Gerbing, 1988). Step 1 was performing confirmatory factors analysis of all pre-validated scales used to collect data for the variables in the hypothesised model to confirm the measures have structural validity. Step 2 tested both direct and indirect influences of personal, work-related characteristics, mental health symptoms, and job satisfaction on the intention to quit. In the SEM modelling, latent variables were support and mental health symptoms. Support included support from supervisors and colleagues. Mental health symptoms included stress, anxiety, and depression symptoms. Multi-group structural equation modelling was also performed to test the parameter invariance for paramedics ($n = 415$) compared with non-paramedics ($n = 77$) in the model of factors associated with their intention to quit (Kline, 2023).

Assumptions of outliers were checked before performing SEM (Kline, 2023). Because the assumptions of normal distribution were violated, SEM with asymptotically distribution-free estimation and Bollen-Stine bootstrap function was used (Kline, 2023). Criteria to determine model fit included: (1) The chi-square (χ^2) test was not significant ($p > 0.05$); (2) the ratio of chi-square to degrees of freedom (χ^2/df) was between 1 and 2; (3) the root mean square error of approximation (RMSEA) was less than 0.05, and p -value of close fit (PCLOSE) was greater than 0.05; the goodness-of-fit index (GFI) was greater than 0.90; (4) adjusted goodness-of-fit index (adjusted GFI) was greater than 0.90; (5) standardised root mean square residual (SRMR) was less than 0.06 (Kline, 2023). If the hypothesised model was not fit, the modification was conducted based on its significant regression weights. To be more specific, the non-significant association was removed from the testing model. Modification indices were also used to modify the testing model if the suggested modification was theoretically sound. The significance level was set at 0.05 (Kline, 2023).

Results

Participants' characteristics

Of 492 participants, the median of the participants' age was 45 years (IQR = [35.0–52.0]). Most participants were paramedics (84.3%). Approximately two-thirds were male (68.1%). Slightly more (77.6%) were married or had a partner, and slightly less (61.2%) worked in Metropolitan cities. Less than half of participants completed a bachelor's degree (44.1%) or had no dependants (44.3%). On average, participants have worked in the profession for 14 years (IQR = [8.0–24.0]) and were currently working 48 h per week (IQR = [42.0–51.5]), including 6 nights per month (IQR = [0.0–8.0]). Their median supervisor and colleague support scores were 13.0 (IQR = [3.0–16.0]) and 14.0 (IQR = [0–16.0]), respectively. The median job satisfaction score was 36.0 (IQR = [10.0–50.0]). Prevalence of depression (DASS-21 score >4), anxiety (DASS-21 score >3), and stress (DASS-21 score >7) score was 17.7%, 15.7% and 16.7% respectively.

Paramedics and non-paramedic staff were not significantly different regarding age, marital status, the number of dependants, nightshift work status, supervisors' support, colleagues' support, job satisfaction, the experience of stress, anxiety, and depression symptoms ($p > 0.05$). Paramedics had more males, those with bachelor's degrees, longer job tenure and more weekly working hours than non-paramedic staff ($p < 0.05$) (See Table 1).

Finalisation of the hypothesised model

Bivariate association analyses were conducted on all participants despite their working roles ($n = 492$). The analyses found no significant association between intention to quit and age, gender, education, marital status, number of dependants, job tenure, working hours, work location, working role, or night shift work status. Bivariate association analyses also found that there were significant correlations between intention to quit and supervisors' support, colleagues' support, job satisfaction, depression, anxiety, and stress and among supervisors' support, colleagues' support, job satisfaction, depression, anxiety, and stress (See

Table 1. Participants' characteristics

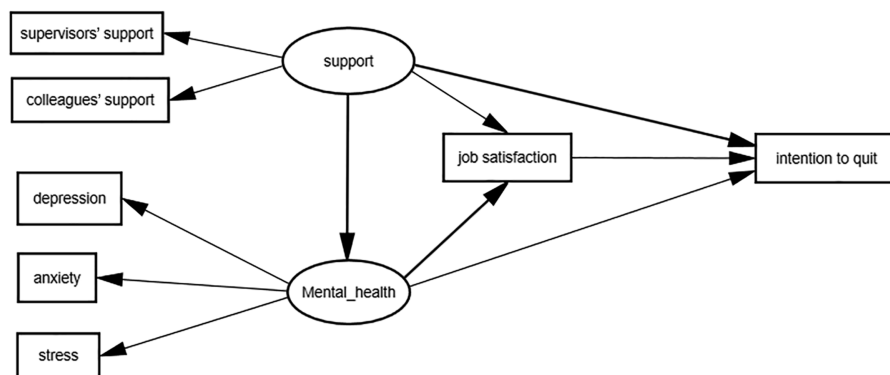
		All (<i>n</i> = 492) <i>n</i> (%)	Non-paramedics (<i>n</i> = 77) <i>n</i> (%)	Paramedics (<i>n</i> = 415) <i>n</i> (%)	Differences
<i>Personal characteristics</i>					
Age (Median [IQR range]) in year		45 [35.0–52.0]	46.5 [35.0–52.5]	45.0 [35.0–52.0]	<i>Z</i> = -1.016, <i>p</i> = 0.310
Gender	Male	335 (68.1)	42 (54.5)	293 (70.6)	$\chi^2(1) = 7.707$, <i>p</i> = 0.006
	Female	157 (31.9)	35 (45.5)	122 (29.4)	
Education	High school	36 (7.3)	18 (23.4)	18 (4.3)	$\chi^2(4) = 44.839$, <i>p</i> < 0.001
	Diploma	165 (33.5)	33 (42.9)	132 (31.8)	
	Bachelor	217 (44.1)	21 (27.3)	196 (47.2)	
	Post-graduate	74 (15.0)	5 (6.5)	69 (16.6)	
Marital status	Married/ Partner	382 (77.6)	56 (72.7)	326 (78.6)	$\chi^2(1) = 1.270$, <i>p</i> = 0.297
	Others	110 (22.4)	21 (27.3)	89 (21.4)	
	Number of dependants (median [IQR range])	1 [0–2]	0 [0–2]	1 [0–2]	
<i>Work-related characteristics</i>					
Job tenure (Median [IQR range]) in year		14.0 [8.0–24.0]	9.5 [6.75–17.5]	15.0 [9.0–25.0]	<i>Z</i> = -2.985, <i>p</i> = 0.003
Working hours per week (Median [IQR range])		48.0 [42.0–51.5]	44.0 [40.0–48.0]	48.0 [43.0–52.0]	<i>Z</i> = -2.985, <i>p</i> = 0.003
Working location	Metropolitan	301 (61.2)	61.0 (79.2)	240 (57.8)	$\chi^2(2) = 17.672$, <i>p</i> < 0.001
	Regional	112 (22.8)	15 (19.5)	97 (23.4)	
	Rural	79 (16.1)	1 (1.3)	78 (18.8)	
Night shift work	No	155 (31.5)	29 (37.7)	126 (30.4)	$\chi^2(1) = 1.604$, <i>p</i> = 0.230
	Yes	337 (68.5)	48 (62.3)	289 (69.6)	
Supervisor support (Median [IQR range])		13.0 [10.0–15.0]	13.0 [9.5–16.0]	13.0 [10.0–15.0]	<i>Z</i> = -0.903, <i>p</i> = 0.366
Colleagues' support (Median [IQR range])		14.0 [12.0–15.0]	13.0 [12.0–15.0]	14.0 [12.0–15.0]	<i>Z</i> = -0.542, <i>p</i> = 0.588
Job satisfaction (Median [IQR range])		36.0 [32.0–41.0]	38.0 [32.5–41.0]	36.0 [32.0–40.25]	<i>Z</i> = -0.966, <i>p</i> = 0.334
<i>Health-related characteristics</i>					
Depression (Median [IQR range])		2.0 [0–6.0]	2.0 [0–8.0]	2.0 [0–6.0]	<i>Z</i> = -0.614, <i>p</i> = 0.539
Anxiety (Median [IQR range])		2.0 [2.0–4.0]	2.0 [0–4.0]	2.0 [0–4.0]	<i>Z</i> = -1.902, <i>p</i> = 0.057
Stress (Median [IQR range])		8.0 [4.0–12.0]	8.0 [4.0–12.0]	8.0 [4.0–12.0]	<i>Z</i> = -0.013, <i>p</i> = 0.990
Intention to quit (Median [IQR range])		6.0 [4.0–10.0]	6.0 [4.0–8.5]	7.0 [4.0–10.0]	<i>Z</i> = -1.449, <i>p</i> = 0.147

Source(s): Table created by authors

supplementary Table 1). These findings were combined with the literature to develop the study's hypothesised model of direct and indirect factors associated with intention to quit among Australian ambulance personnel (see Figure 1).

Intention to quit and its associations among Australian ambulance personnel

The prevalence of ambulance personnel who intended to quit (total intention to quit score greater than 4) was 69.9% (*n* = 343). Structural equation modelling (SEM) was performed for all participants (*n* = 492) to test the hypothesis's goodness of fit. The model fit indexes (*p* = 0.023, χ^2/df = 2.069, RMSEA = 0.047, PCLOSE = 0.531, GFI = 0.974; adjusted GFI = 0.927, SRMR = 0.039) indicated the hypothesised model did not fit with the data.



Source(s): Figure created by authors

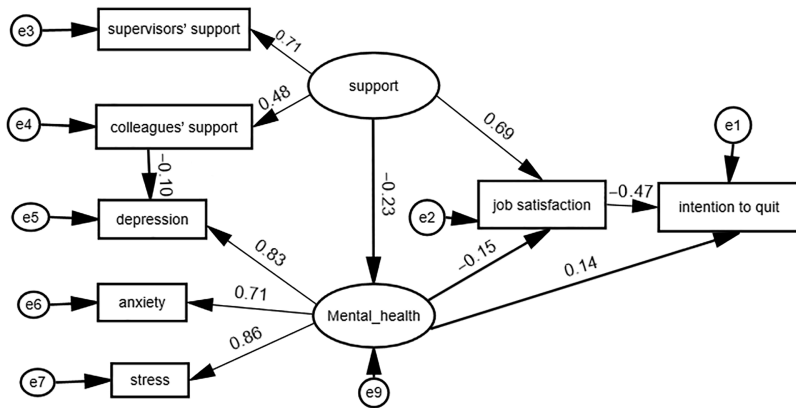
Figure 1. Hypothesised model

The regression weight further revealed that the direct association between support and intention to quit was insignificant. Mobley's conceptual model (1979) explains that work-related characteristics, including supervisors' support and colleagues' support, influence employees' intention to quit by changing their level of job satisfaction. This means support from supervisors and colleagues does not directly influence the employees' intention to quit. Instead, it mediates the associations between supervisors' and colleagues' support and employees' intention to quit. Therefore, the direct association between supervisors' and colleagues' support and intention to quit was removed from the testing model. The model modification indices further suggested the direct influence of colleagues' support on ambulance personnel's experience of depression, which is also in line with the Conservation of Resource Theory (Hobfoll, 1988). The Conservation of Resource Theory (Hobfoll, 1988) suggests that employees with more resources, including colleagues' support, are less likely to experience psychosocial stress. As such, the association between colleagues' support and depression was added to the testing model.

After these modifications, model indexes showed a good fit as $p = 0.228$, $\chi^2/df = 1.180$, RMSEA = 0.014, PCLOSE = 1.000, GFI = 0.981; adjusted GFI = 0.947, SRMR = 0.025. All the associations in the final model were significant at $p < 0.05$. Figure 2 indicated that support from supervisors and colleagues was not directly associated with ambulance personnel's intention to quit. Mental health symptoms mediated the influence of supervisors' and colleagues' support on the intention to quit. Job satisfaction mediated the associations between supervisors' and colleagues' support, mental health and the intention to quit. This meant among ambulance personnel, supervisors' and colleagues' support was indirectly associated with the intention to quit via increasing job satisfaction and reducing the experience of mental health symptoms such as stress, depression and anxiety. Experience of mental health problems was directly associated with intention to quit and indirectly associated with intention to quit via reducing job satisfaction.

Comparison of intention to quit and the associations of intention to quit between paramedics (n = 415) and non-paramedic staff (n = 77)

Of 415 paramedics, the prevalence of staff with the intention to quit was 70.9%. Of 77 non-paramedic staff, the prevalence of staff with the intention to quit was 64.1%. Paramedics and non-paramedic staff were not significantly different regarding the intention to quit ($p > 0.05$). Multiple group comparison SEM found the associations of intention to quit were different among paramedics and among non-paramedic staff (see Figure 3). The Table 2 further shows



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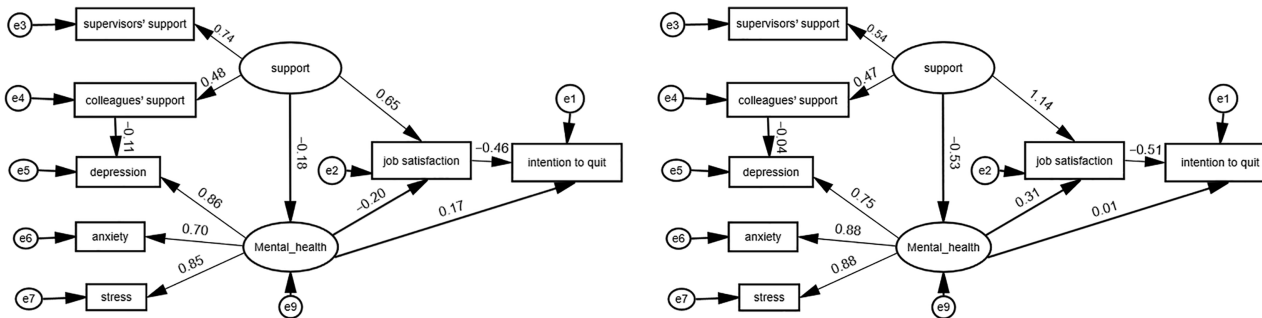
Figure 2. Direct and indirect influences on intention to quit among ambulance personnel (including a paramedic and non-paramedic staff)

that the associations between supervisors’ and colleagues’ support and mental health, job satisfaction and intention to quit were significant among both paramedics and non-paramedic staff. However, the associations between supervisors’ and colleagues’ support, mental health and job satisfaction, and between mental health and intention to quit were only significant among paramedics but not among non-paramedic staff.

Discussion

This study explored the intention to quit and its associations among ambulance personnel and compared the intention to quit and its associations between paramedic and non-paramedic staff. The study found that 70% of ambulance personnel (70.9% of paramedics, and 64.1% of non-paramedic staff) intended to quit their jobs. This prevalence is higher than reported in the study among Australian rural paramedics, police, community nurses, and child protection workers (27.4%) (Roberts *et al.*, 2021). A potential explanation is that the previous study only collected data from pooled professions in rural areas. The current study collected data from ambulance personnel working in metropolitan cities and regional and rural areas of three Australian states. More alternative career opportunities exist for ambulance personnel working in metropolitan cities than in rural areas. Resource allocation, call type and call volume are also different across workplaces. Another potential explanation is that the previous study measures intention to quit on a single item “Seriously considering quitting my current employer”, which may increase measurement error risk due to reduced measurement reliability. It is also important to keep in mind that the intention to quit is not equivalent to a turnover rate. However, this study focused on the intention to quit as a proactive approach to the management of turnover. The high prevalence of ambulance personnel with the intention to quit found in this study reflects a concern about turnover in ambulance personnel. Thus, this finding highlights the need for relevant strategies to address the turnover rate in the ambulance profession.

While previous studies suggested that age, gender, marital status, and the number of dependants may influence ‘employees’ intention to quit (Ma *et al.*, 2022; Poon *et al.*, 2022; Yan *et al.*, 2021), the intention to quit was stronger among those working nightshift (Zhang *et al.*, 2014) and among emergency staff with less work experience. The current study did not find any significant association between age, gender, marital status, the number of dependants, nightshift work status, job tenure, and intention to quit among ambulance personnel.



Note(s): Left: Direct and indirect influences on intention to quit among paramedic staff; Right: Direct and indirect influences on intention to quit among non-paramedic staff

Source(s): Figure created by authors

Figure 3. Multi-group modelling of factors influencing intention to quit among ambulance personnel

Table 2. Standardised regression weights of the associations of intention to quit among paramedics and non-paramedic staff

	Paramedics (<i>n</i> = 415)		Non-paramedics (<i>n</i> = 77)	
	Standardised regression weight	<i>p</i> -value	Standardised regression weight	<i>p</i> -value
Colleagues support ← Supervisors, colleagues support	0.476	na	0.467	na
Supervisors support ← Supervisors, colleagues support	0.738	<0.01	0.542	<0.01
Depression ← Colleagues support	-0.115	<0.01	-0.041	0.500
Stress ← Mental health	0.849	na	0.878	na
Anxiety ← Mental health	0.699	<0.01	0.875	<0.01
Depression ← Mental health	0.861	<0.01	0.746	<0.01
Mental health ← Supervisors, colleagues, support	-0.177	0.35	-0.530	0.033
Job satisfaction ← Supervisors and colleagues support	0.647	<0.01	1.136	0.055
Job satisfaction ← Mental health	-0.197	<0.01	0.305	0.354
Intention to quit ← job satisfaction	-0.458	<0.01	-0.507	<0.01
Intention to quit ← Mental health	0.166	<0.01	0.006	0.946

Source(s): Table created by authors

A possible explanation is that the study participants had strong support from their supervisors and colleagues, which may reduce their work-life conflict (Yamaguchi *et al.*, 2016). Also, previous studies suggested an association between education and intention to quit (Saijo *et al.*, 2016; Yan *et al.*, 2021); the current study did not find any significant association between education and their intention to quit among ambulance personnel. A possible explanation is that while previous studies focused on only one work role, the current study had participants from different roles. Their intention to stay or not should not be related to their education qualifications (Eltaybani *et al.*, 2018).

Being consistent with the current literature, the present study found job satisfaction was directly associated with intention to quit among ambulance personnel, including paramedics and non-paramedic staff (Al Zamel *et al.*, 2020; Jiang *et al.*, 2019; Lee, 2022; Pressley and Garside, 2023; Wen *et al.*, 2018). This finding was consistent among both paramedic and non-paramedic staff, suggesting that interventions to improve job satisfaction may reduce the intention to quit among ambulance personnel, including paramedics and non-paramedic staff.

Also, in line with the literature, data from ambulance personnel as a whole or paramedic staff only supported that employees with more mental health symptoms would also have less job satisfaction (Modaresnezhad *et al.*, 2021) and a stronger intention to quit (Al-Mansour, 2021; Modaresnezhad *et al.*, 2021; Raza *et al.*, 2021; Srikanth *et al.*, 2022; Tabur *et al.*, 2022). Support from supervisors and colleagues could also indirectly reduce their intention to quit by reducing their mental health symptoms, including depression, anxiety, and stress (Modaresnezhad *et al.*, 2021; Raza *et al.*, 2021) and increasing job satisfaction (Mathieu *et al.*, 2016; Modaresnezhad *et al.*, 2021). This suggests that interventions to improve support from supervisors and colleagues and to manage mental health symptoms may reduce the intention to quit among ambulance personnel as a whole or paramedic staff.

Among non-paramedic staff, the current study found that supervisors' and colleagues' support and mental health were not significantly associated with job satisfaction. Mental health was not associated with the intention to quit. These findings suggest that improving supervisors' and colleagues' support or promoting mental health may not help in reducing the intention to quit among non-paramedic staff. However, in line with the literature, the current study data support that those with more supervisor support will experience fewer mental health

symptoms such as stress (Smith *et al.*, 2019). Therefore, strategies to further improve supervisors' and colleagues' support are recommended as ambulance professionals' work will continue to intensify in various aspects (Granter *et al.*, 2019).

Limitations and strengths

The study findings should be interpreted with caution due to the following limitations. First, the current study was cross-sectional; findings on the associations of intention to quit could not be concluded as causal. Second, the study collected data from three Australian states with a response rate of 40.5%. Findings may only be generalisable to some Australian ambulance personnel. Third, the study used a self-report questionnaire, which could have introduced reporting bias.

Regarding strengths, both paramedics and non-paramedic employees were included in the sample; the findings could be generalised better for a wider ambulance professional population. The study compared the associations of intention to quit between paramedics and non-paramedic staff, findings of the differences in factors associated with intention to quit between paramedics and non-paramedic staff suggest different potential strategies to manage turnover for these different staff groups in the ambulance profession. In addition, the study used a stratified random sampling method, which can help improve the population's representation. Moreover, using validated scales for data collection helps increase the reliability of the study's findings. Finally, the study performed multi-group structural equation modelling, which allowed the researchers to investigate the direct and indirect influence of the study variables on the intention to quit among paramedic and non-paramedic staff in Australian ambulance personnel.

Implications

The study provided evidence of a high prevalence of ambulance personnel having the intention to quit. This evidence supports more resource allocation in human resource management. The study showed that while job satisfaction was associated with intention to quit in both staff groups in the ambulance profession (paramedics and non-paramedic staff), factors associated with intention to quit among paramedic and non-paramedic staff were different. To be more specific, support from supervisors and colleagues, as well as experience of mental health symptoms, were associated with the intention to quit among paramedics but not among non-paramedic staff. These findings suggested that strategies to manage the intention to quit the ambulance profession differ between paramedics and non-paramedic staff. Increased job satisfaction may reduce the intention to quit for paramedics and non-paramedic staff. However, for paramedics, additional interventions to promote support from supervisors and colleagues and to manage depression, anxiety, and stress symptoms may further reduce their intention to quit. To promote mental health for paramedics, better management support and service delivery for a healthy diet and frequent exercise are recommended (Phung *et al.*, 2022). Training to improve their trauma-related knowledge and emotion regulation, psychological consultations and cognitive therapy for those in need should also be provided (Qian *et al.*, 2022; Roberts *et al.*, 2019). However, paramedics may be reluctant to seek support for their mental health due to concerns about confidentiality and the potential negative impact on their careers (Ntatamala and Adams, 2022). Therefore, organisations must ensure that support services are confidential to facilitate usage.

Conclusion: Many Australian ambulance personnel have expressed the intention to quit. Increased job satisfaction may be useful in reducing their intention to quit. Increasing support from supervisors and colleagues and management of depression, anxiety, and stress may further help reduce the intention to quit for paramedic staff.

References

- Ali Jadoo, S.A., Aljunid, S.M., Dastan, I., Tawfeeq, R.S., Ali Mustafa, M., Ganasegeran, K. and AlDubai, S.A.R. (2015), "Job satisfaction and turnover intention among Iraqi doctors - a

- descriptive cross-sectional multicentre study”, *Human Resources for Health*, Vol. 13 No. 1, p. 21, doi: [10.1186/s12960-015-0014-6](https://doi.org/10.1186/s12960-015-0014-6).
- Al-Mansour, K. (2021), “Stress and turnover intention among healthcare workers in Saudi Arabia during the time of COVID-19: can social support play a role?”, *PLoS One*, Vol. 16 No. 10, e0258101, doi: [10.1371/journal.pone.0258101](https://doi.org/10.1371/journal.pone.0258101).
- Al Zamel, L.G., Lim Abdullah, K., Chan, C.M. and Piaw, C.Y. (2020), “Factors influencing nurses’ intention to leave and intention to stay: an integrative review”, *Home Health Care Management & Practice*, Vol. 32 No. 4, pp. 218-228, doi: [10.1177/1084822320931363](https://doi.org/10.1177/1084822320931363).
- Anderson, J.C. and Gerbing, D.W. (1988), “Structural equation modeling in practice: a review and recommended two-step approach”, *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-423, doi: [10.1037/0033-2909.103.3.411](https://doi.org/10.1037/0033-2909.103.3.411).
- Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W. and Swinson, R.P. (1998), “Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample”, *Psychological Assessment*, Vol. 10 No. 2, pp. 176-181, doi: [10.1037/1040-3590.10.2.176](https://doi.org/10.1037/1040-3590.10.2.176).
- Bae, S.H. (2022), “Noneconomic and economic impacts of nurse turnover in hospitals: a systematic review”, *International Nursing Review*, Vol. 69 No. 3, pp. 392-404, doi: [10.1111/inr.12769](https://doi.org/10.1111/inr.12769).
- Caplan, R.D. (1975), *Job Demands and Worker Health: Main Effects and Occupational Differences*, US Department of Health, Education, and Welfare, Public Health Service, Washington D.C.
- Dechawatanapaisal, D. (2022), “Linking workplace social support to turnover intention through job embeddedness and work meaningfulness”, *Journal of Management & Organization*, pp. 1-23, doi: [10.1017/jmo.2022.4](https://doi.org/10.1017/jmo.2022.4).
- Dopelt, K., Wacht, O., Strugo, R., Miller, R. and Kushnir, T. (2019), “Factors that affect Israeli paramedics’ decision to quit the profession: a mixed methods study”, *Israel Journal of Health Policy Research*, Vol. 8 No. 1, p. 78, doi: [10.1186/s13584-019-0346-0](https://doi.org/10.1186/s13584-019-0346-0).
- El-Jardali, F., Alameddine, M., Jamal, D., Dimassi, H., Dumit, N.Y., McEwen, M.K., Jaafar, M. and Murray, S.F. (2013), “A national study on nurses’ retention in healthcare facilities in underserved areas in Lebanon”, *Human Resources for Health*, Vol. 11 No. 1, p. 49, doi: [10.1186/1478-4491-11-49](https://doi.org/10.1186/1478-4491-11-49).
- Eltaybani, S., Noguchi-Watanabe, M., Igarashi, A., Saito, Y. and Yamamoto-Mitani, N. (2018), “Factors related to intention to stay in the current workplace among long-term care nurses: a nationwide survey”, *International Journal of Nursing Studies*, Vol. 80, pp. 118-127, doi: [10.1016/j.ijnurstu.2018.01.008](https://doi.org/10.1016/j.ijnurstu.2018.01.008).
- George, D. and Mallery, P. (2024), *IBM SPSS Statistics 29 Step by Step: A Simple Guide and Reference*, Routledge, New York.
- Granter, E., Wankhade, P., McCann, L., Hassard, J. and Hyde, P. (2019), “Multiple dimensions of work intensity: ambulance work as edgework”, *Work, Employment and Society*, Vol. 33 No. 2, pp. 280-297, doi: [10.1177/0950017018759207](https://doi.org/10.1177/0950017018759207).
- Hobfoll, S.E. (1988), *The Ecology of Stress*, Taylor & Francis, New York.
- Jiang, F., Zhou, H., Rakofsky, J., Hu, L., Liu, T., Wu, S., Liu, H., Liu, Y. and Tang, Y. (2019), “Intention to leave and associated factors among psychiatric nurses in China: a nationwide cross-sectional study”, *International Journal of Nursing Studies*, Vol. 94, pp. 159-165, doi: [10.1016/j.ijnurstu.2019.03.013](https://doi.org/10.1016/j.ijnurstu.2019.03.013).
- Jones, S. (2017), “Describing the mental health profile of first responders: a systematic review”, *Journal of the American Psychiatric Nurses Association*, Vol. 23 No. 3, pp. 200-214, doi: [10.1177/1078390317695266](https://doi.org/10.1177/1078390317695266).
- Ki, J. and Choi-Kwon, S. (2022), “Health problems, turnover intention, and actual turnover among shift work female nurses: analyzing data from a prospective longitudinal study”, *PLoS One*, Vol. 17 No. 7, e0270958, doi: [10.1371/journal.pone.0270958](https://doi.org/10.1371/journal.pone.0270958).
- Kline, R.B. (2023), *Principles and Practice of Structural Equation Modeling*, Guilford Publications, New York.

- Lawn, S., Roberts, L., Willis, E., Couzner, L., Mohammadi, L. and Goble, E. (2020), "The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research", *BMC Psychiatry*, Vol. 20 No. 1, pp. 1-16, doi: [10.1186/s12888-020-02752-4](https://doi.org/10.1186/s12888-020-02752-4).
- Lee, J. (2022), "Nursing home nurses' turnover intention: a systematic review", *Nursing Open*, Vol. 9 No. 1, pp. 22-29, doi: [10.1002/nop2.1051](https://doi.org/10.1002/nop2.1051).
- Ma, Y., Chen, F., Xing, D., Meng, Q. and Zhang, Y. (2022), "Study on the associated factors of turnover intention among emergency nurses in China and the relationship between major factors", *International Emergency Nursing*, Vol. 60, 101106, doi: [10.1016/j.ienj.2021.101106](https://doi.org/10.1016/j.ienj.2021.101106).
- Macdonald, S. and MacIntyre, P. (1997), "The generic job satisfaction scale", *Employee Assistance Quarterly*, Vol. 13 No. 2, pp. 1-16, doi: [10.1300/J022v13n02_01](https://doi.org/10.1300/J022v13n02_01).
- Mathieu, C., Fabi, B., Lacoursière, R. and Raymond, L. (2016), "The role of supervisory behavior, job satisfaction and organizational commitment on employee turnover", *Journal of Management & Organization*, Vol. 22 No. 1, pp. 113-129, doi: [10.1017/jmo.2015.25](https://doi.org/10.1017/jmo.2015.25).
- Mobley, W.H., Griffeth, R.W., Hand, H.H. and Meglino, B.M. (1979), "Review and conceptual analysis of the employee turnover process", *Psychological Bulletin*, Vol. 86 No. 3, pp. 493-522, doi: [10.1037/0033-2909.86.3.493](https://doi.org/10.1037/0033-2909.86.3.493).
- Modaresnezhad, M., Andrews, M.C., Mesmer-Magnus, J., Viswesvaran, C. and Deshpande, S. (2021), "Anxiety, job satisfaction, supervisor support and turnover intentions of mid-career nurses: a structural equation model analysis", *Journal of Nursing Management*, Vol. 29 No. 5, pp. 931-942, doi: [10.1111/jonm.13229](https://doi.org/10.1111/jonm.13229).
- Ntatamala, I. and Adams, S. (2022), "The correlates of post-traumatic stress disorder in ambulance personnel and barriers faced in accessing care for work-related stress", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 4, p. 2046, doi: [10.3390/ijerph19042046](https://doi.org/10.3390/ijerph19042046).
- Osmančević, B., Karnjuš, I. and Prosen, M. (2023), "Ambulance personnel's perceptions on their workplace well-being: a descriptive interpretative study", *Work*, Vol. 76 No. 4, pp. 1615-1627, doi: [10.3233/WOR-230056](https://doi.org/10.3233/WOR-230056).
- Pallant, J. (2020), *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS*, 7th ed., Routledge, New York.
- Patterson, P.D., Jones, C.B., Hubble, M.W., Carr, M., Weaver, M.D., Engberg, J. and Castle, N. (2010), "The longitudinal study of turnover and the cost of turnover in emergency medical services", *Prehospital Emergency Care*, Vol. 14 No. 2, pp. 209-221, doi: [10.3109/10903120903564514](https://doi.org/10.3109/10903120903564514).
- Petrie, K., Smallwood, N., Pascoe, A. and Willis, K. (2022), "Mental health symptoms and workplace challenges among Australian paramedics during the COVID-19 pandemic", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 2, pp. 1-15, doi: [10.3390/ijerph19021004](https://doi.org/10.3390/ijerph19021004).
- Phung, V.-H., Sanderson, K., Pritchard, G., Bell, F., Hird, K., Wankhade, P., Asghar, Z. and Siriwardena, N. (2022), "The experiences and perceptions of well-being provision among English ambulance services staff: a multi-method qualitative study", *BMC Health Services Research*, Vol. 22 No. 1, p. 1352, doi: [10.1186/s12913-022-08729-1](https://doi.org/10.1186/s12913-022-08729-1).
- Poon, Y.-S.R., Lin, Y.P., Griffiths, P., Yong, K.K., Seah, B. and Liaw, S.Y. (2022), "A global overview of healthcare workers' turnover intention amid COVID-19 pandemic: a systematic review with future directions", *Human Resources for Health*, Vol. 20 No. 1, p. 70, doi: [10.1186/s12960-022-00764-7](https://doi.org/10.1186/s12960-022-00764-7).
- Pressley, C. and Garside, J. (2023), "Safeguarding the retention of nurses: a Systematic review on determinants of nurse's intentions to stay", *Nursing Open*, Vol. 10 No. 5, pp. 1-17, doi: [10.1002/nop2.1588](https://doi.org/10.1002/nop2.1588).
- Pyper, Z. and Paterson, J.L. (2016), "Fatigue and mental health in Australian rural and regional ambulance personnel", *Emergency Medicine Australasia*, Vol. 28 No. 1, pp. 62-66, doi: [10.1111/1742-6723.12520](https://doi.org/10.1111/1742-6723.12520).

- Qian, J., Wang, W., Sun, S., Liu, L., Sun, Y. and Yu, X. (2022), "Interventions to reduce post-traumatic stress disorder symptoms in health care professionals from 2011 to 2021: a scoping review", *BMJ Open*, Vol. 12 No. 1, e058214, doi: [10.1136/bmjopen-2021-058214](https://doi.org/10.1136/bmjopen-2021-058214).
- Raza, B., St-Onge, S. and Ali, M. (2021), "Consumer aggression and frontline employees' turnover intention: the role of job anxiety, organizational support, and obligation feeling", *International Journal of Hospitality Management*, Vol. 97, 103015, doi: [10.1016/j.ijhm.2021.103015](https://doi.org/10.1016/j.ijhm.2021.103015).
- Reid, B.O., Næss-Pleym, L.E., Bakkelund, K.E., Dale, J., Uleberg, O. and Nordstrand, A.E. (2022), "A cross-sectional study of mental health-posttraumatic stress symptoms and post exposure changes in Norwegian ambulance personnel", *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, Vol. 30 No. 1, p. 3, doi: [10.1186/s13049-021-00991-2](https://doi.org/10.1186/s13049-021-00991-2).
- Reynolds, A.C., Crowther, M.E., Ferguson, S.A., Paterson, J.L., Howie, C. and Adams, R.J. (2021), "Protecting the health and safety of the paramedic workforce in Australia: the role of cohort studies with new recruits", *Emergency Medicine Australasia*, Vol. 33 No. 5, pp. 935-937, doi: [10.1111/1742-6723.13808](https://doi.org/10.1111/1742-6723.13808).
- Rivard, M.K., Cash, R.E., Woodyard, K.C., Crowe, R.P. and Panchal, A.R. (2020), "Intentions and motivations for exiting the emergency medical services profession differ between emergency medical technicians and paramedics", *Journal Of Allied Health*, Vol. 49 No. 1, pp. 53-59.
- Roberts, N.P., Kitchiner, N.J., Kenardy, J., Lewis, C.E. and Bisson, J.I. (2019), "Early psychological intervention following recent trauma: a systematic review and meta-analysis", *European Journal of Psychotraumatology*, Vol. 10 No. 1, 1695486, doi: [10.1080/20008198.2019.1695486](https://doi.org/10.1080/20008198.2019.1695486).
- Roberts, R., Wong, A., Jenkins, S., Neher, A., Sutton, C., O'Meara, P., Frost, M., Bamberry, L. and Dwivedi, A. (2021), "Mental health and well-being impacts of COVID-19 on rural paramedics, police, community nurses and child protection workers", *Australian Journal of Rural Health*, Vol. 29 No. 5, pp. 753-767, doi: [10.1111/ajr.12804](https://doi.org/10.1111/ajr.12804).
- Saijo, Y., Yoshioka, E., Kawanishi, Y., Nakagi, Y., Itoh, T. and Yoshida, T. (2016), "Relationships of job demand, job control, and social support on intention to leave and depressive symptoms in Japanese nurses", *Industrial Health*, Vol. 54 No. 1, pp. 32-41, doi: [10.2486/indhealth.2015-0083](https://doi.org/10.2486/indhealth.2015-0083).
- Smith, E.C., Holmes, L. and Burkle, F.M. (2019), "Exploring the physical and mental health challenges associated with emergency service call-taking and dispatching: a review of the literature", *Prehospital and Disaster Medicine*, Vol. 34 No. 6, pp. 619-624, doi: [10.1017/S1049023X19004990](https://doi.org/10.1017/S1049023X19004990).
- Srikanth, P., Monsey, L.M., Meischke, H.W. and Baker, M.G. (2022), "Determinants of stress, depression, quality of life, and intent to leave in Washington state emergency medical technicians during COVID-19", *Journal of Occupational and Environmental Medicine*, Vol. 64 No. 8, pp. 642-648, doi: [10.1097/JOM.0000000000002587](https://doi.org/10.1097/JOM.0000000000002587).
- Sun, R. and Wang, W. (2017), "Transformational leadership, employee turnover intention, and actual voluntary turnover in public organizations", *Public Management Review*, Vol. 19 No. 8, pp. 1124-1141, doi: [10.1080/14719037.2016.1257063](https://doi.org/10.1080/14719037.2016.1257063).
- Tabur, A., Elkefi, S., Emhan, A., Mengenci, C., Bez, Y. and Asan, O. (2022), "Anxiety, burnout and depression, psychological well-being as predictor of healthcare professionals' turnover during the covid-19 pandemic: study in a pandemic hospital", *Healthcare*, Vol. 10 No. 3, pp. 1-11, doi: [10.3390/healthcare10030525](https://doi.org/10.3390/healthcare10030525).
- Thielmann, B., Schnell, J., Böckelmann, I. and Schumann, H. (2022), "Analysis of work related factors, behavior, well-being outcome, and job satisfaction of workers of emergency medical service: a systematic review", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 11, pp. 1-15, doi: [10.3390/ijerph19116660](https://doi.org/10.3390/ijerph19116660).
- Wagner, S.L., White, N., Regehr, C., White, M., Alden, L.E., Buys, N., Carey, M.G., Corneil, W., Fyfe, T., Matthews, L.R., Randall, C., Krutop, E. and Fraess-Phillips, A. (2020), "Toyokuni", *Traumatology*, Vol. 26 No. 4, pp. 370-387, doi: [10.1037/trm0000251](https://doi.org/10.1037/trm0000251).
- Walsh, J.P., Ashford, S.J. and Hill, T.E. (1985), "Feedback obstruction: the influence of the information environment on employee turnover intentions", *Human Relations*, Vol. 38 No. 1, pp. 23-46, doi: [10.1177/001872678503800102](https://doi.org/10.1177/001872678503800102).

-
- Wen, T., Zhang, Y., Wang, X. and Tang, G. (2018), "Factors influencing turnover intention among primary care doctors: a cross-sectional study in chongqing, China", *Human Resources for Health*, Vol. 16 No. 1, p. 10, doi: [10.1186/s12960-018-0274-z](https://doi.org/10.1186/s12960-018-0274-z).
- Wilkinson-Stokes, M. (2021), "A taxonomy of Australian and New Zealand paramedic clinical roles", *Australasian Journal of Paramedicine*, Vol. 18, pp. 1-20, doi: [10.33151/ajp.18.880](https://doi.org/10.33151/ajp.18.880).
- Wongtongkam, N. (2017), "An exploration of violence against paramedics, burnout and post-traumatic symptoms in two Australian ambulance services", *International Journal of Emergency Services*, Vol. 6 No. 2, pp. 134-146, doi: [10.1108/IJES-03-2017-0014](https://doi.org/10.1108/IJES-03-2017-0014).
- Yamaguchi, Y., Inoue, T., Harada, H. and Oike, M. (2016), "Job control, work-family balance, and nurses' intention to leave their profession and organization: a comparative cross-sectional survey", *International Journal of Nursing Studies*, Vol. 64, pp. 52-62, doi: [10.1016/j.ijnurstu.2016.09.003](https://doi.org/10.1016/j.ijnurstu.2016.09.003).
- Yan, S., Shen, X., Wang, R., Luo, Z., Han, X., Gan, Y. and Lv, C. (2021), "The prevalence of turnover intention and influencing factors among emergency physicians: a national observation", *Human Resources for Health*, Vol. 19 No. 1, p. 149, doi: [10.1186/s12960-021-00688-8](https://doi.org/10.1186/s12960-021-00688-8).
- Yildiz, B., Yildiz, H. and Arda, O.A. (2021), "Relationship between work-family conflict and turnover intention in nurses: a meta-analytic review", *Journal of Advanced Nursing*, Vol. 77 No. 8, pp. 3317-3330, doi: [10.1111/jan.14846](https://doi.org/10.1111/jan.14846).
- Zhang, Y., Punnett, L. and Gore, R. (2014), "Relationships among employees' working conditions, mental health, and intention to leave in nursing homes", *Journal of Applied Gerontology*, Vol. 33 No. 1, pp. 6-23, doi: [10.1177/0733464812443085](https://doi.org/10.1177/0733464812443085).

Corresponding author

Tiet-Hanh Dao-Tran can be contacted at: h.daotran@uq.edu.au

Table A1. Bivariate associations

	Age	Gender	Education	Marital status	Number of dependants	Job tenure	Working hours	Paramedic	Number of nightshifts worked	Supervisors' support	Colleagues' support	Job satisfaction	Depression	Anxiety	Stress	Intention to quit
Age	1															
Gender	-4.195**	1														
Education	87.389**	6.933	1													
Marital status	-4.612**	4.267*	7.445	1												
Number of dependants	0.005	-1.147	1.272	-7.084**	1											
Job tenure	0.755**	-5.979**	77.260**	-5.570**	0.122**	1										
Working hours	0.006	-2.633*	0.821	-0.301	0.006	0.044	1									
Paramedic	-1.016	7.167*	43.495**	1.113	-0.986	-2.985*	-2.985*	1								
Number of nightshifts worked	-5.677**	0.863	7.973*	6.159*	-0.667	-5.584**	-1.633	1.604	1							
Supervisors' support	0.075	-0.017	6.148	-0.725	-0.088	-0.012	0.002	-0.903	-1.634	1						
Colleagues' support	-0.074	-0.254	6.609	-0.941	-0.094*	-0.112*	-0.027	-0.542	-0.886	0.370**	1					
Job satisfaction	0.083	-1.510	5.712	-0.235	-0.123**	-0.002	-0.084	-0.966	-1.487	0.472**	0.311**	1				
Depression	0.066	-0.234	2.617	-1.736	0.047	0.131**	0.043	-0.614	-0.060	-0.169**	-0.156**	-0.295**	1			
Anxiety	0.022	-1.906	2.812	-1.126	0.000	-0.004	0.073	-1.902	-0.831	-0.030	-0.026	-0.119**	0.515**	1		
Stress	-0.019	-0.894	8.533*	-0.945	0.124**	0.025	0.058	-0.013	-0.936	-0.149**	-0.107*	-0.217**	0.720**	0.601**	1	
Intention to quit	-0.001	-1.132	3.651	-1.564	-0.014	0.048	-0.047	-1.449	-1.565	-0.245**	-0.184**	-0.488**	0.190**	0.094*	0.174**	1

Note(s): Gender, education, married status, paramedics status, nightshift work status are categorical variables, and others are continuous variables. Chi-square tests, Mann Whitney z test, Kruskal Wallis test, and Spearman rho were performed as appropriate because the continuous variables were not normally distributed. *Significant at $p < 0.05$, **significant at $p < 0.001$

Source(s): Table created by authors