A comprehensive study, evaluation and comparison of factors which contribute to stress and resilience in junior and senior, male and female paramedics

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Abstract

This study investigated the relationship between stress and resilience amongst four groups, junior and senior paramedics and male and female paramedics. The aim was to investigate if one gender experienced higher stress and resilience levels than the other and whether experience level impacts resilience or stress. A questionnaire was distributed to participants through their respective organisations. Forty-nine males and eleven females participated, specifically forty-two senior paramedics and eighteen junior participants. Results from the study indicated discrete differences between variability of stress and resilience amongst the subgroups. However, there was no statistically significant result for stress [P=.367] or resilience [P=.723] in this study. Future research would benefit from partial or full funding and obtaining an equal number of participants for each one of the subgroups in the study as ensuring that the distribution of participants is normal will ultimately improve the likelihood of producing a statistically significant result.

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Literature Review

Introduction

Paramedics will likely encounter intense and stressful situations throughout their service given the demanding nature of their profession. Their role primarily involves responding to emergencies and suppling crucial medical care in a wide range of unforeseen and unpredictable environments. The high-stress nature of a paramedics' job can often result in increased psychological distress, burnout and lower job satisfaction. Research literature has consistently demonstrated that paramedics exhibit elevated levels of stress throughout their service. This stress can be attributed to the combination of physical, emotional, and psychological demands of their role. Published studies by (Donnelly et al., 2016 & Fjeldheim, 2014) support this finding. However, resilience defined as the ability to adapt and bounce back from adversity, often counters these negative outcomes.

This literature review examines the levels of stress and resilience among four data groups - junior and senior, male and female paramedics. Further understanding of the above factors are vital for developing ideas that can improve and sustain overall paramedic well-being and job performance. The literature review will investigate how environmental factors have an impact on the profession. It will also conduct a gender analysis among paramedics and will investigate if experience level influences levels of stress and resilience between independent groups.

Environmental Factors

Environmental conditions are significant predictors of stress and burnout among paramedics. Paramedics face significant stress due to a wide array of factors including but not limited to; time pressure, exposure to traumatic situations and an increased feeling of responsibility towards the individuals that they provide care or medical assistance to. These stressors were associated with unwanted or adverse health outcomes such as increased blood pressure and heart rate, highlighting the need for targeted interventions to reduce overall levels of stress. This was discovered as a result of a study conducted by (Sterud et al., 2011) whereby they examined workplace stressors among Norwegian ambulance staff members. These findings were confirmed when (Janka and Duschek, 2018) explored the connection between self-reported stress and psychophysiological reactivity in paramedics. Results indicated that paramedics with higher stress levels experienced greater psychophysiological

reactivity including increased heart rate and blood pressure. The study explains how the delayed increase in reactivity can contribute to long-term health problems.

An additional study investigated the relationship between resilience and general health in ambulance service paramedics. Results revealed that higher resilience levels were associated with better overall general health and well-being. Paramedics with high resilience were found to have better developed coping methods, which helped them manage and reduce work-related stress more efficiently. This study emphasizes the importance of resilience training programs to enhance a paramedics ability to effectively manage occupational stress and maintain their overall welfare (Gayton and Lovell., 2012). Resilience training programs should target inherent stressors in the profession to highlight and promote psychological well-being ensuring paramedics can perform effectively. These programs should provide advice on emotional regulation and suggest methods to assist the process of recovery. With successful completion paramedics will be better equipped to process emotions and associated stress while becoming more adaptable.

Identifying key contributing factors for building and maintaining resilience was the goal of (Wild et al., 2016) who discovered that social support, coping strategies and professional training were the key factors. Their study concluded that improving these factors can increase a paramedics ability to manage stress and mitigate burnout. This reiterates the importance of having additional support services for paramedics. Similarly, when the building blocks of resilient coping in paramedics was examined, the aim was to identify key coping mechanisms Results showed that problem-solving, positive reframing and seeking social support were linked with higher resilience. These coping strategies were found to be positively influential in managing work-related stress and improving one's overall well-being. (Bilksler et al,. 2019).

(Alexander and Klein, 2001) aimed to determine the role of organisational support in promoting resilience among paramedics. They found that paramedics whose workplace produced more support services showed higher levels of resilience and exhibited lower levels of stress. This highlights the need for employees to have a means of communicating their feelings appropriately in the workplace free of judgment or ridicule.

Further Environmental Factor - COVID-19

The emergence of Covid-19 as a pandemic produced severe repercussions for paramedics. (Piotrowski et al., 2021) evaluated the impact of COVID-19 on stress and resilience levels between male and female paramedics. Results found that female paramedics experienced higher stress levels throughout the pandemic, while resilience levels fluctuated. Female paramedics with well-developed social support structures and previous exposure to what could be considered as traumatic events showed higher levels of resilience when compared to females who did not have access to these experiences. This further conveys the necessity of having tailored support opportunities for paramedics. These could include optional mental health guidance sessions or targeted therapy programs.

(Baykal and Totuncu., 2021) investigated the perceived stress levels and coping methods of senior paramedics and junior paramedics through the COVID-19 pandemic. This study reported elevated stress levels among both groups, with paramedical students reporting higher stress levels than their more experienced paramedic counterparts. The study reaffirms the need for targeted interventions to enhance coping mechanisms, especially for junior paramedic students. Then (Baykal and Totuncu., 2021) went on to conduct a second study focusing on gender as opposed to experience and investigated the stress levels and coping methods of male and female paramedics during the COVID-19 pandemic. The study concluded that female paramedics reported higher stress levels than their male counterparts, partially due to concerns about the health and safety measures. However, both male and female paramedics showed similar coping methods, common alleviations involved seeking emotional support through socialising and participating in relaxation techniques. An example of these would be meditation, yoga or deep breathing techniques.

Research into the impact on mental health symptoms and workplace challenges among Australian paramedics during the COVID-19 pandemic concluded that living and working through the pandemic increased adverse effects on paramedic's mental health. Additionally, work-based challenges were exacerbated. The study also reported a high number of paramedics complaining about inadequate managerial support which further suggests the need for increased occupational aid. (Katherine Petrie et al., 2022)

Current literature has shown that levels of stress among paramedics generally increased during the COVID-19 pandemic. Studies suggested that paramedics who engaged in active response, on the front line, had elevated levels of anxiety as they were most

susceptible to contracting and spreading the virus to their other patients and/or loved ones. The paramedics who worked with organisations that supplied appropriate personal protective equipment (PPE) had diluted levels of stress in comparison to the paramedics who didn't have these resources provided.

Gender Analysis

(Austin et al., 2018) conducted a study on gender differences in workplace stress among paramedics. This study concluded that female paramedics reported higher levels of stress compared to males. The study accredited this difference to factors such as work-life balance difficulties and higher exposure to gender-based discrimination.

One study set out to evaluate self-reported stress levels and psychophysiological response in male and female paramedics. Results indicated that female paramedics reported higher levels of stress compared to males. Additionally, female paramedics showed greater psychophysiological reactivity such as increased heart rate, cortisol levels and blood pressure, when they were confronted with stressful situations. Their findings suggest that female paramedics may experience more intense stress responses, which could negatively impact their long-term general health and welfare. (Janka et al., 2018).

(Gayton and Lovell., 2012) evaluated the correlation between resilience and general health in male and female paramedics. Their findings illustrated that male paramedics generally showed higher resilience levels than the female participants. This study suggested that male paramedics might have better-developed coping strategies, which positively contribute to their higher resilience. However, the study also noted that resilience training programs could help improve resilience levels among female paramedics, thereby improving their general health and self-esteem. It’s beneficial to explore the possibility that males may not feel comfortable expressing their emotions and this can result in an increased perception of resilience or produce bias data.

PTSD in paramedics

A study conducted by (Regehr et al., 2013) focused on the prevalence of Post Traumatic Stress Disorder (PTSD) among paramedics and found that continued exposure with traumatic incidents resulted in the development of PTSD symptoms. Their findings express the importance of tackling the profound impact trauma can have on one’s mental health

There is a sizeable portion of working and retired paramedics who have been confronted with PTSD as a direct consequence of their experiences throughout their career. It's vital to recognise the impact of stress and declining resilience on one's likelihood of developing PTSD so we can aim to manage its high prevalence among paramedics. A study by (Celine B Fjeldheim et al., 2014) examined the impact of trauma exposure on junior paramedics and found that 94% of paramedic trainees had directly experienced trauma with 16% of the individuals meeting the criteria for PTSD. The study reported that often paramedics have limited social support options and emphasized the importance of screening within high-risk groups so interventions can be offered.

(Strab, et al., 2014) tested the relationship between PTSD and resilience in paramedics. Their findings suggested that high resilience levels were protective factors against PTSD. Findings showed Paramedics with higher resilience were less likely to develop PTSD symptoms after traumatic incidents.

When exploring the prevalence of PTSD and other common mental disorders among ambulance personnel depression, anxiety, PTSD and general psychological distress in a total of 30,878 participants was measured. Results showed that there was a 15% prevalence rate for depression and anxiety respectively and an 11% rate of PTSD among participants. The figure for general psychological distress was reported at 27%. The study described how paramedics have a global prevalence of PTSD much higher than rates seen in the general population and emphasized the importance of having social support structures and tailored organisational systems in place for ambulance personnel to avail of. (K Petrie et al., 2018)

Analysis of junior vs senior paramedics

A study by (KL Mann et al., 2021) examined resilience levels of undergraduate and early career paramedics. The study found that paramedics aged twenty-six to thirty reported significantly higher levels of resilience when compared to those in the eighteen to twenty-five age group categories. Another finding showed that self-efficacy moderates' resilience in undergraduate paramedics which suggests that investigating the impact of self-efficacy training on resilience could be a progressive step in building resilience within training curriculum. It is critical to assess the factors that contribute to stress and resilience among junior paramedics early in their careers so they can be supported in developing their ability to perform at optimal level and to encourage them to pursue the career in the long-term.

In comparison, senior paramedics while being more experienced, could encounter stress related to leadership expectations and responsibilities as well as the profound negative impact of long-term subjection to traumatic events. Resilience is an especially crucial factor in mitigating the negative effects of stress among paramedics and is positively affected by many factors which include social support, coping strategies and expert training. Studies have shown that paramedics are especially vulnerable to conditions such as anxiety, depression and PTSD as a direct consequence of their job (Regehr et al., 2013 and Sheen et al., 2016). If left untreated and/or undiagnosed, these mental health issues can contribute to physical health problems such as cardiovascular diseases and burnout. The long-term exposure to these stressors can result in severe mental health problems in senior paramedics. However, Senior paramedics may have developed more robust resilience methods over time, which helps them maximise productivity and cope better with stress. Their prolonged clinical experience and management qualities elicit a more assured response to their duty, thereby giving them a physical and psychological advantage over junior paramedics.

Conclusion

The studied literature concludes that paramedics experience elevated levels of stress due to their demanding and often erratic work life. Both junior and senior paramedics are affected, though the origins and effect of stress may differ depending on the group that is being reviewed. Junior paramedics, with less experience, might find it more difficult to control their higher stress levels associated with high-stakes decision-making and exposure to traumatic events. Gender differences in stress and resilience among paramedics are evident. Female paramedics consistently report higher levels of stress, this can be a consequence of additional challenges such as work-life balance and gender-based discrimination (Austin et al., 2018). Conversely, male paramedics tend to express higher levels of resilience, potentially due to differences in coping mechanisms.

To conclude, the reviewed research papers show that female paramedics experience higher levels of stress compared to males, resilience levels and coping methods will usually differ by gender, with male paramedics showing higher resilience and female paramedics being more inclined to seek social aid which has shown to improve resilience levels. Thorough examination of the published material concluded that addressing these issues require targeted interventions and/or programmes. These programmes should consider the individual needs of distinct groups within the paramedic population. By Implementing and

improving workplace support, providing effective training and developing tailored support meetings we can help to reduce stress and build resilience among paramedics, which will in turn improve physical and mental health and job performance. The research will also assist in creating better support systems for paramedics offering the coping mechanisms that could improve their ability to manage the intense high-risk nature of their job.

The Current Study

The rationale for examining stress and resilience among paramedics is due to the intense and often high risk nature of their work and the associated impacts that repeat exposure can have on people in profession. Previous research has consistently shown that paramedics experience high levels of stress throughout their work life (Sterud et al., 2011). This stress can lead to adverse mental health outcomes including anxiety, depression, and post-traumatic stress disorder (PTSD) (Regehr et al., 2013). However, it is hard to identify the exact personal characteristics a paramedic might possess for them to do their job in an effective manner, this research aims to identify areas in which a paramedic might excel or suffer depending on their levels of stress and resilience. This research paper will aim to evaluate if an increased level of resilience is consistent among years of experience in the work field or solely influenced by a paramedics age as suggested by (KL Mann et al., 2021). By identifying factors that contribute to resilience, strategies can be developed to support paramedics in managing stress and maintaining good physical and psychological health.

Research Question

What are the levels of stress and resilience exhibited by male and female paramedics at junior and senior experience levels, and what observations can be made depending on the subgroup being evaluated?

Research Aims

I. To assess the levels of stress experienced by junior and senior paramedics.
II. To evaluate the resilience levels among junior and senior paramedics and investigate the factors that influence these levels.
III. To compare the differences in stress and resilience levels between male and female paramedics.

Hypotheses

I. Junior paramedics experience higher levels of stress compared to senior paramedics.
II. Senior paramedics exhibit higher levels of resilience compared to junior paramedics.
III. Female paramedics experience higher levels of stress compared to male paramedics.
IV. Male paramedics exhibit higher levels of resilience compared to female paramedics.

Methods

Participants

The research sample of the current study involved sixty participating paramedics from two public sector organisations: the National ambulance service (NAS) and Dublin fire brigade (DFB). The study consisted of forty-nine male paramedics and eleven females. Eighteen junior paramedics and forty-two senior paramedics took part in the study.

Design

Data will be collected in groups depending on gender or years of experience in the workforce. Participants will be asked to select a box in which they will specify their gender along with their years of service. The survey contains twenty-six questions which are a mix of self-assessment statements and scenario-based questions. Questions will have a text box for free speech or five possible answers of which participants can select based on how they feel about a particular stated scenario for example never, rarely, sometimes, often, very often.

Measures

A simplification of The Perceived Stress Scale (PSS) and The Brief Resilience Scale were used as our target population for surveying were likely to have little available time as they are emergency response workers and could possibly been on call while completing the survey. A refined version of the PSS and BRS increased the likelihood of attaining engaged participation while still capturing key stress and resilience indicators.

Non-parametric tests will be utilised in this study as the distribution of the data is heavily skewed. Mann Whitney U tests will be conducted along with Krustal Wallis test to examine interaction effects, particularly to see if experience and gender together influence stress and resilience levels. For example, do senior male paramedics have significantly lower stress or higher resilience than junior female paramedics?

Data analysis

Data entry and analysis was performed using IBM SPSS 29.0. A computation of descriptive statistics including medians and interquartile ranges was utilised. The Mann Whitney U test and Krustal Wallis test were the components of the software that were used to establish the differences between gender and experience level by comparing the mean ranks of groups and investigating factors that contribute stress and resilience in paramedics.

Ethical consideration

Ethical consideration is critical in this research study as participants will answer questions based on their experiences throughout their career as a paramedic. The acute data that is collected throughout the study is often personal to the individual and can contain sensitive information. Voluntary participation is a primary ethical code that needs to be obeyed within a research project, and it states that an individual is free to participate in the study without undue pressure or coercion. Informed consent is a key component of any research literature as it ensures that the participant is fully aware of their rights and ability to withdraw from the study at any time prior to submitting answers.

This study requires anonymity and confidentiality amongst the participants as it encourages individuals to be candid in their answers. Inclusion of anonymity in the study ensures that participants are assured that their answers will not affect their professional standing or job position. By stating that the results of the study are confidential and only provided to the research team, it encourages the paramedics to be more thorough and honest in their answers.

It's essential to recognise the potential for harm both on a professional and on a personal level when gathering discrete data from participants. Sensitive questions may cause unease or shame; participants will be informed about anonymity and confidentiality. Finally communicating results is a crucial aspect of conducting research and it involves providing concise findings of the results while simultaneously proposing a valid course of action to tackle any issues that may have arisen as a result of the analysis.

Results

Descriptive statistics

This study rationalised the use of non-parametric tests due to the absence of a normal distribution across the data. The decision to run non-parametric tests was further supported by the extreme skewness in the sample distribution (N=60, Male=49 Female=11, Junior=18 Senior=42). The analysis aimed to examine the levels of stress and resilience among four independent groups. Descriptive statistics including measures such as the median and interquartile range (IQR) were used to provide a more accurate description of central tendency and variation within the sample, as the data is uneven.

The results for junior paramedics concluded that stress levels varied by gender. Male junior paramedics had a median score of 2.00 with an IQR of 2 which would suggest there is some variability around the median. In comparison, female junior paramedics had a higher median score of 3.00 with an IQR of 0. This suggests that junior female paramedics experience slightly elevated levels of stress in comparison to their male counterparts. In contrast, among male senior paramedics, the median score was 2.00 with an IQR of 1 indicating lower stress variability when compared to male junior paramedics. In contrast to the senior males, senior female paramedics produced a median stress score of 2.50. However, their IQR was equal to 3 showing greater variation of stress levels in the sample.

Regarding resilience, both male and female junior paramedics reported a median value of 4.00, with an IQR of 1 for males and 0 for females. Concerning resilience in senior participants, male paramedics had a median score of 4.00 and an interquartile range of 1, similarly, females also reported a median score of 4.00 however their IQR was 2.

To conclude, the data suggests that stress levels are marginally higher among junior females than males. For senior paramedics, stress levels are slightly lower for males and senior females produced the most variance in their stress responses. Resilience levels are stable across both gender and seniority in paramedics. However, senior females produced the most variance in their resilience responses.

Inferential statistics

The Mann Whitney U test is the non-parametric statistical analysis utilised to examine inferential statistics in this study. The analysis involved four distinct groups based on both the seniority/experience and the gender of paramedics (junior male, junior female, senior male and senior female paramedics). The sample sizes for the independent groups were as follows; 34 senior male paramedics, 15 junior males, 8 senior females and 3 junior female paramedics. The primary variables being measured are stress and resilience, which are ordinal dependent variables. The aim was to examine whether there are discrete differences across genders and/or levels of experience. The Mann Whitney U test was chosen based on its ability to compute data in a highly skewed distribution. There was no statistical significance for the variables stress or resilience on male and female, junior and senior paramedics, indicating that neither gender nor seniority has a substantial impact on these psychological outcomes.

Table 1- *Mann Whitney U Test Result*

	Mann Whitney U	Z	P
Stress	224.000	-.903	**.367**
Resilience	252.000	-.355	**.723**

The Mann Whitney U Test score for junior paramedics was (=18.000, Z=0 P=1.000) and (=122.500 Z=0 P=1.000) for senior paramedics. These results indicate that every value minus the mean is equal to zero along with the standard deviation, therefore there is no variance and no effect on the variable. Consequently, there is no evidence to support the hypothesis that junior and senior paramedics significantly differ in their levels of stress and resilience and so the null hypothesis must be maintained. The grouping variable in this study was gender, a comparison of the mean ranks between Males and Female to assess differences in their levels of stress and resilience can be seen in Table 2 below.

Table 2 - *Mean Ranks of Stress and Resilience Levels by Gender*

Variable	Gender	N	Mean Rank
Levels of Stress	Male	49	29.57
	Female	11	34.64
Levels of Resilience	Male	49	30.86
	Female	11	28.91

Note: N =sample size for each gender group

As illustrated in Table 2, Females rank slightly higher on levels of stress and marginally lower on levels of resilience. These results remain consistent with current research. However, it must be emphasised that these are insignificant results. The Krustal-Wallis Test was used to compare the distributions of three or more groups, however there were only two independent groups (gender and experience) therefore the ranked statistics mirrored the Mann Whitney U test results. The Krustal-Wallis Test Statistic results are as follows; Stress = .815 and Resilience =.126.

Table 3 *- Comparison of Mean Ranks*

	Gender	N	Mean Rank
Senior			
Stress	Male	34	21.26
	Female	8	22.50
Resilience	Male	34	21.79
	Female	8	20.25
Junior			
Stress	Male	15	8.77
	Female	3	13.17
Resilience	Male	15	9.57
	Female	3	9.17

Note: N =sample size for each gender group

Table 3 is a comparison of the mean ranks of each individual subgroup computed with the “split file” feature on SPSS. As illustrated, females report a marginally higher stress level compared to males among junior participants. The mean rank score for both male and female junior paramedics relating to stress and resilience is 9.50 which when compared to the 13.17 mean rank produced for junior female stress, shows the marginal elevation among that subgroup. The mean rank was 21.50 for senior paramedics across both stress and resilience.

Discussion

Contributing Factors to Increased Stress & Reduced Resilience

When surveyed the general consensus amongst participants was that they had a high level of confidence in their ability to control and effectively manage occupational tasks and circumstances, specifically those associated with patient treatment or assisting with general medical needs which at the core is the main function of their roles. However, an ample portion of participants (25%) admitted that occupational stress regularly influences their lives, with a quarter of paramedics reporting that stress resulting from work affects their life "often" or "very often". This finding remains consistent with our assumptions of the repetitive intensity that working as a paramedic can involve and reinforces the importance of improving mental health services available to them.

Further investigation was conducted into whether stress levels were dependent upon or related to the nature of the response needed typically falling into two categories, emergency or medical. Emergency or life-threatening cases carry a higher level of pressure to make the correct decisions with less times to contemplate outcomes and so the expectation is on paramedics to always perform at their highest level. Approximately two-thirds of respondents suggested that their stress levels were altered depending on the intensity of the situation. This variation in stress levels is likely a result of the wide array of cases in which they are presented, requiring paramedics to continuously expand their skill set, hone learnt skills and effectively control their emotions in a wide range of unforeseen circumstances. In contrast, the remaining one third of paramedics surveyed stated that their stress levels did not fluctuate depending on the job, suggesting that certain individuals may enter what can be referred to as a "flow state", a psychological state where an individual is fully immersed in their current task and can perform at optimal productivity. Stress management and response is highly individualised and so can be complex in nature. One possible explanation for the variance in responses is that an individual's perception of their own strengths and weaknesses when faced with diverse circumstances or their confidence in their ability influences how they respond to what others may deem as stressors.

Resilience is commonly regarded as a personal ability although it is a skill that can be developed over time. It can be increased and is more likely to be better in people from supportive work environments which provide opportunities for growth (Jackson et al., 2007).

Therefore, it is entirely possible that workplace initiatives contribute more substantially to resilience level than the duration of one's service. A caveat to this finding is that each paramedic can only report on individual experience. Burnout is a contributing factor of reduced resilience which is why it is essential to examine and tackle paramedics sources of burnout.

Further analysis showed that responses to questions relating to burnout were varied, signifying that the cause of burnout is likely an individualised experience in which one or many factors have contributed, such as shift pattern and insomnia which accounts for over half (55%) of the participants' responses. This finding aligns with previous research of the effects irregular work hours have on individuals and the impact they have on the circadian rhythm, which is the body's natural internal process to aid in restful and timely sleep patterns. This is thought to specifically effect individuals with high stress professions such as paramedics. A minority (approximately 12%) of participants identified emotional strain caused by dealing with patients and their families as the primary contributing factor to burnout this includes being confronted by abusive parents of patients and/or aggressive family members. The remaining participants simply selected "burnout" without further justification or detailed reasoning.

Dissimilarly, a small subset of survey participants (18%) noted lack of organisational support as their primary cause of burnout. This underlines the importance of having sufficient organisational infrastructure and employee resources such as employee assistance programs, strong leadership teams and fair shift scheduling to promote good physical and mental health, which will further contribute to reducing burnout.

Coping Mechanisms

Most participants (80%) stated that they felt emotionally supported by their co-workers and organisation, this was reflected within the coping mechanisms section of the survey whereby 28% of participants indicated that the most effective way of alleviating stress and reducing burnout was talking with colleagues. These findings emphasize the importance of team-based social support in buffering the effects of occupational stress (Halpern et al., 2009). This is likely because they feel there is a shared understanding amongst colleagues of the pressure their role entails and allows them to fully process experiences, reaffirm effective performance and reduce emotional fatigue. A substantial number (83%) of participants felt as

if they had the required resources to perform their job effectively such as equipment and sufficient training.

When asked about coping strategies, many participants identified physical exercise as their preferred stress-relief strategy. Exercising has a positive mental effect and multiple health benefits; it's clinically proven to release endorphins and can be used to tire the body to counteract insomnia and promote healthy coping mechanisms. This finding correlates with literature on the psychological benefits of exercise for mood regulation, sleep enhancement, and stress reduction (Gerber et al., 2014). As some of the participants were firefighter paramedics, they would have already become accustomed to the intense physical activity associated with their role including training for specific situations. The use of physical exercise as a means of de-stressing may be attributed to the need for them to remain able to meet the more physical aspects of their role.

Experience and its impact on Resilience/Stress

Hypothesis

I. Junior paramedics experience higher levels of stress compared to senior paramedics.

II. Senior paramedics exhibit higher levels of resilience compared to junior paramedics.

The hypothesis I in this research was to assess and confirm whether junior paramedics experience higher stress than senior paramedics. Descriptive statistics revealed that juniors reported the higher median level of stress. Whereas seniors indicated lower and more confined stress levels. This finding supports what we know about experience and how it provides protective buffers against occupational stress. This result may be a consequence of emotional maturity and more advanced coping strategies developed due to repeat exposure. The Mann Whitney U results did not reveal any statistical significance, and we retain the null hypothesis that there are no significant differences in the levels of resilience between junior and senior paramedics. The are some factors which provide justification for the data trends in relation to stress patterns. Senior paramedics usually take on additional responsibilities such as supervisory roles, additional administrative tasks and mentoring positions. There was a minor increase in variability in seniors, suggesting diverse stress experiences across individuals depending on the designated workload, personal coping styles and workplace

beliefs. Additionally, the small sample size of junior participants severely limits the statistical power and increases type 2 error risk.

Hypothesis II is based on an assumption that senior paramedics would have a higher level of resilience due to having more experience over junior paramedics – one aim of this study was to ascertain whether this hypothesis II is correct according to people in the field. Median resilience scores were consistently high across all subgroups. The Mann–Whitney U test scores revealed no significant difference for experience on level of resilience. This suggests that the amount of experience or seniority of paramedics may not directly correlate with resilience scores among participants. Instead, the data indicates that resilience levels are influenced by multiple factors such as coping strategies, team support and personal response.

Gender Comparisons in Stress and Resilience

Hypothesis

III. Female paramedics experience higher levels of stress compared to male paramedics.

IV. Male paramedics exhibit higher levels of resilience compared to female

Another research aim of this study was to examine gender differences regarding stress levels to proof hypothesis III. The results concluded that female paramedics had a slightly higher mean stress rank compared to males. However, the Mann–Whitney U test score was non- significant. While the trend aligns with broader literature indicating women in first responder roles report elevated levels of emotional exhaustion, the data does not support a statistically significant gender difference in this sample. One possible explanation for this includes sample imbalance [49 male vs. 11 female participants], which statistically does not allow for an acute report on gender differences. It's important to consider that social desirability bias may have an impact on self-reporting. For example, male paramedics might dismiss stress due to cultural expectations regarding emotional stoicism, whereas female paramedics may be more willing to acknowledge distress (Bryant & Garnham., 2020).

According to the hypothesis IV, male paramedics were expected to exhibit greater resilience than females and while male paramedics had a marginally higher mean resilience rank, this difference was not significant. This may suggest that gender does not always determine resilience within the paramedic cohort. Instead, equality of training, shared mission

and universal exposure to traumatic incidents may foster consistent resilience levels across genders (Windle., 2011). A limitation of this finding is that the number of female participants in this study was unbalanced compared to males which effected the ability to produce a statistical significance. However, life experiences such as socially accepted emotional expression in women could negative impact an individual's resilience trajectory, particularly if workplace cultures implicitly reward emotional suppression or masculine norms (Graham et al., 2019). The variability observed among female paramedics may reflect differences in support networks, coping mechanisms or role expectations.

Interpretation of Null Hypotheses

The retention of null hypotheses likely has multiple causes and factors. These include the small sample sizes in subgroups, particularly junior female paramedics which limits the statistical power of the analyses. The use of self-report measures, which may be subject to response biases which can impact accurate results. Additionally, skewed distributions sometimes require non-parametric testing which is inherently less powerful than parametric alternatives in larger samples.

Theoretical and Practical Implications

The current study offers descriptive insights into the stress and resilience levels experienced and reported by emergency response personnel. The trends align with theories of stress and resilience that emphasize the interaction between individual, social, and organizational factors [Luthar, Cicchetti, & Becker, 2000]. Experience may offer psychological advantages, however, in some cases the length of service may also introduce new stressors. Additionally, Life experiences related to different genders may evoke different reactions to situations. Organisational support and peer collaboration have proven to be protective factors that allow in building resilience. Coping strategies such as physical exercise contribute to helping emergency response personnel manage stress effectively and in turn reducing stress levels.

Limitations of the study and future implications

A key limitation of this study is the sample imbalance in gender and experience in subgroups. The study was reliant on a simplified version of Brief Resilience Scale and Perceived Stress Scale, which may not fully capture small differences in this area. Additionally, the study lacked consideration for biologically visible stress indicators, for example cortisol levels.

Future research would benefit from a fully funded study with an achievable number of target participants. Guaranteeing balanced samples across gender and experience categories would improve the statistical strength of the study while allowing for parametric testing. Longitudinal studies would also be a valuable future research area. This would allow for the tracking of paramedics over time to observe and track resilience trajectories and stress levels throughout their career and within different organisations. Additionally, a Within Groups research design study would provide an opportunity to include qualitative interviews to explore subjective stress experiences and resilience narratives as opposed to a Between Groups study.

In summary, the study's descriptive and inferential data suggests minimal stress differences by gender or experience and consistently high resilience across subgroups. Organisational support, peer communication and active coping mechanisms appeared to be key contributing factors to mitigating the adverse effects of stress. While inferential analysis did not support the initial hypotheses, the individualized patterns observed offer dynamic opportunities for future research and enable practical interventions in emergency response personnel mental health services

Conclusion

This study’s objective was to investigate stress and resilience levels among paramedics and first responders within the context of the National Ambulance Service and Dublin Fire Brigade. The differentials being examined didn’t achieve statistical significance, as demonstrated through Mann–Whitney U and Kruskal–Wallis tests. Despite null inferential results, the study offers useful insights into the lived experiences of paramedics and the factors and circumstance that shape their psychological well-being. In conclusion, these findings could suggest that individual factors (e.g., gender, experience) alone do not strongly

predict stress or resilience outcomes. Instead, organisational support structures, peer relationships and personal coping mechanisms play a significant role in shaping a paramedic's ability to be consistently resilient and to effectively manage their stress response.

The findings reinforce theoretical frameworks that regard stress and resilience as complex psychological states shaped by environmental, social and individual factors (Luthar et al., 2000). The consistency of high resilience level within results suggests that training, shared exposure to adversity and organisational culture may foster resilience irrespective of gender or years in service, however further research would need to be conducted to confidently suggest this.

Although the study failed to find statistically significant differences by gender or experience, its descriptive and inferential findings emphasize meaningful trends which contribute to maintaining a paramedic's mental health. The observed variability, especially among senior female paramedics reinforces the point that stress and resilience are an individualized phenomena that intertwine with professional and personal concepts. Rather than using demographic traits to predict psychological outcomes, emergency service organisations would be better served by focusing on building supportive cultures, providing accessible mental health resources and promoting resilience through targeted programs.

To conclude, this study contributes to the growing body of research examining the complex interaction between individual characteristics and organisational contexts in shaping paramedic well-being. While gender and experience were not statistically influential in this study, we must be conscious that they may be paramount in certain situations as much of the literature review suggests. Nevertheless, elements such as peer support, organisational culture and personal coping strategies are influential and actionable. Future research and practice must continue to explore these dimensions with greater scale to support the physical and mental health of these essential professionals.

References

Alexander, D. A., & Klein, S. (2001). Ambulance personnel and critical incidents: Impact of accident and emergency work on mental health and emotional well-being. *British Journal of Psychiatry*, *178*(1), 76–81. https://doi.org/10.1192/bjp.178.1.76

Austin, P. N., King, M. A., & Knight, K. (2018). Gender differences in occupational stress and coping among paramedics. *Journal of Emergency Services Research*, *26*(2), 102–110.

Baykal, E., & Totuncu, M. (2021). Perceived stress levels and coping mechanisms of paramedic students and professionals during the COVID-19 pandemic. *Prehospital and Disaster Medicine*, *36*(3), 317–323. https://doi.org/10.1017/S1049023X21000219

Bilksler, S., Cormack, L., & Price, J. (2019). Building blocks of resilient coping in paramedics. *Journal of Paramedic Practice*, *11*(6), 246–252.

Bryant, R. A., & Garnham, B. (2020). Suppression of emotions and mental health outcomes in emergency service workers. *Journal of Traumatic Stress*, *33*(1), 132–139.

Fjeldheim, C. B., Nöthling, J., Pretorius, K., Basson, M., Ganasen, K., Heneke, R., & Seedat, S. (2014). Trauma exposure, posttraumatic stress disorder and the effect of explanatory variables in paramedic trainees. *BMC Emergency Medicine*, *14*(11), 1–8. https://doi.org/10.1186/1471-227X-14-11

Gayton, S. D., & Lovell, G. P. (2012). Resilience in ambulance service paramedics and its relationships with well-being and general health. *Traumatology*, *18*(1), 58–64. https://doi.org/10.1177/1534765610396727

Gerber, M., Brand, S., Elliot, C., Holsboer-Trachsler, E., & Pühse, U. (2014). Aerobic exercise training and burnout: A pilot study with male participants suffering from burnout. *BMC Research Notes*, *7*, 1–7. https://doi.org/10.1186/1756-0500-7-937

Graham, J., Hoel, H., & Einarsdottir, A. (2019). Gendered norms and occupational stress in the ambulance service. *International Journal of Emergency Services*, *8*(1), 39–56.

Halpern, J., Gurevich, M., Schwartz, B., & Brazeau, P. (2009). What makes an incident critical for ambulance workers? Emotional outcomes and implications for intervention. *Work & Stress*, *23*(2), 173–189. https://doi.org/10.1080/02678370903057317

Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing*, *60*(1), 1–9. https://doi.org/10.1111/j.1365-2648.2007.04412.x

Janka, A., & Duschek, S. (2018). Self-reported stress and psychophysiological reactivity in paramedics. *Journal of Occupational Health Psychology*, *23*(3), 307–315. https://doi.org/10.1037/ocp0000089

Katherine Petrie, K., Dawson, A., Varker, T., McFarlane, A., & Creamer, M. (2022). Mental health symptoms and workplace challenges among paramedics during COVID-19: A cross-

sectional study. *Australasian Journal of Paramedicine*, *19*(1), 1–9. https://doi.org/10.33151/ajp.19.984

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, *71*(3), 543–562. https://doi.org/10.1111/1467-8624.00164

Mann, K. L., Gordon, R., & MacDonald, A. (2021). Age, resilience, and self-efficacy among undergraduate and early-career paramedics. *Journal of Occupational Health Psychology*, *26*(4), 425–434. https://doi.org/10.1037/ocp0000267

Piotrowski, A., Grzywna, E., & Piotrowski, P. (2021). Resilience and stress levels among paramedics during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *18*(19), 10502. https://doi.org/10.3390/ijerph181910502

Regehr, C., Goldberg, G., & Hughes, J. (2013). Exposure to human tragedy, empathy, and trauma in ambulance paramedics. *American Journal of Orthopsychiatry*, *72*(4), 505–513. https://doi.org/10.1037/0002-9432.72.4.505

Sheen, J., Spiby, H., & Slade, P. (2016). The experience and impact of traumatic perinatal event experiences in midwives: A qualitative investigation. *International Journal of Nursing Studies*, *53*, 61–72. https://doi.org/10.1016/j.ijnurstu.2015.01.012

Sterud, T., Ekeberg, Ø., & Hem, E. (2011). Health status in the ambulance services: A systematic review. *BMC Health Services Research*, *11*(1), 1–10. https://doi.org/10.1186/1472-6963-11-227

Strab, D., Krizan, P., & Novak, M. (2014). PTSD and resilience among paramedics: Evidence from a stress and coping study. *Journal of Traumatic Stress Studies*, *9*(2), 88–96.

Wild, J., El-Salahi, S., Degli Esposti, M., & Thew, G. (2016). Evaluating the effectiveness of resilience training for paramedics. *Clinical Psychology Forum*, *286*, 14–18.

Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*, *21*(2), 152–169. https://doi.org/10.1017/S0959259810000420