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Resilience in Ambulance Service Paramedics and Its Relationships With Well-Being and General Health

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Abstract

The purpose of this investigation is to assess if time in paramedic service is associated with increased resilience or if it is simply that the profession of paramedic attracts individuals with high levels of resilience, and second, to evaluate whether resilience exhibits a positive relationship with general health and well-being among paramedics? A total of 219 male and female participants, 146 Queensland paramedics (Australia), and 73 first- and second-year paramedical students completed a survey assessing resilience, general health, and well-being. Results indicated that experienced paramedics displayed significantly higher levels of resilience than paramedical students. Furthermore, that resilience was significantly correlated with general health and well-being. Findings strengthen calls advocating for the increase of resilience interventions for paramedics and paramedical students to protect their well-being.

Keywords

paramedics; resilience; well-being

Ambulance service paramedics are exposed to traumatic events involving human pain and suffering on a daily basis. Australian Queensland Ambulance Service (QAS) paramedics respond to more emergency calls than their fire and police services counterparts combined (Shakespeare-Finch, 2006; Shakespeare-Finch, Smith, Gow, Embleton, & Baird, 2003). While the altruistic experience of emergency work can be both rewarding and personally gratifying (McAllister & McKinnon, 2008), ambulance personnel do remain vulnerable to psychological distress in both the short and long term (see Regehr, Goldberg, & Hughes, 2002). Reacting and adapting to traumatic experiences or events can leave a lasting impairment of preevent psychological functioning (Clohessy & Ehlers, 1999). One review of emergency ambulance personnel concluded that, compared with other emergency professionals (i.e., police and firefighters), paramedic stress and burnout levels are among the highest (Paton & Violanti, 1996). Research also indicates that paramedics experience a disproportionate share of stress-related issues, including depression, anxiety, sleep disturbances, coronary disease, substance abuse, and suicide (Beaton, 2006; Smith & Roberts, 2003; Wieclaw, Agerbo, Mortensen, & Bonde, 2006). These negative symptoms, which may follow a traumatic event experienced during the course of fulfilling one's professional obligations, are reported to be akin to negative posttrauma symptoms found in direct survivors of traumatic experiences (Shakespeare-Finch et al., 2003).

Resilience in QAS Paramedics

Remarkably, considering the frequency, nature, and potential intensity of their work-related traumatic exposures, the QAS is reported as experiencing relatively low levels of stress-leave among its paramedics (Shakespeare-Finch & Scully, 2004). However, despite these apparent trends in the QAS, little research has explored possible reasons as to how paramedics are able to continuously deal with work-related traumatic experiences.

In an attempt to explain how paramedics deal positively with work-related trauma, Alexander and Klein (2001) suggest that some emergency personnel possess a "hardy personality," finding that people who responded as being "hardy" displayed significantly less burnout than those who were defined as "less hardy." It was further suggested that dealing with traumatic events may become easier with experience (Alexander & Klein, 2001). Similarly, research conducted with U.S. soldiers by Bartone, Roland, Picano, and Williams (2008) indicated that hardy individuals who see themselves as engaged in meaningful work and recognize the benefits of

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hardship are less likely to experience the negative effects of stress. A further possible explanation may be that a "natural selection" process is evident in the profession of a paramedic, where only those with naturally high resilience levels withstand the stressors of being a paramedic. Certainly, this claim aligns with a growing number of studies which have found that highly resilient individuals exhibit faster psychological and emotional recovery from stress (Gillespie, Chadboyer, Willis, & Grimbeek, 2007). However, while these claims appear logical, little endeavor has been given to empirically validating them. Moreover, previous attempts to explain this phenomenon have mistakenly either overlooked or oversimplified the reasons why or how paramedics are able to, in Luthar's (1999) words, psychologically "bounce back" (p. 264) from dealing with work-related traumatic experiences.

The concept of resilience has gained increasing attention despite a lack of conceptual clarity, methodological agreement, and generalizability of findings in the research literature (see Luthar & Cushing, 1999). For the purposes of this study, resilience was defined as the dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma, as used by Luthar and Cicchetti (2000).

In the workplace, resilience has been described in terms of mitigating the effects of stress through the use of behaviors that facilitate adaptation (Mallack, 1998). Paramedical work is undoubtedly a stressful occupation (Beaton, 2006; Shakespeare-Finch et al., 2003; Smith & Roberts, 2003; Wieclaw et al., 2006). Consequently, the need to enhance resilience in paramedics has not gone unnoticed, with authors asserting that "learning about and applying strategies of resilience are vital and should be a key component of all health curricula for health professionals" (McAllister & McKinnon, 2008, p. 2). While there seems to be little argument that, developing resilient qualities may assist paramedics to meet and overcome the challenges of their work, relatively few investigators have attempted to quantify levels of resilience in paramedics. Moreover, studies of resilience, from childhood to old age, have given limited attention to the positive benefits which people may experience from being exposed to trauma (Gillespie et al., 2007).

Therefore, to further the current body of knowledge considering how paramedics deal positively with work-related trauma, the first research question of this investigation addresses the issue of is time in service associated with increased resilience or is it simply that the profession of paramedic attracts individuals with high levels of resilience?

Resilience and Well-Being

The second research question posed by this research asked whether resilience exhibits a positive relationship with general health and well-being among paramedics. Given that resilience to traumatic experiences is generally accepted within the context of positive adjustment outcomes (Wald, Taylor, Asmundson, Jang, & Stapleton, 2006), QAS paramedics who are found to be resilient should likewise report positive levels of general health and well-being. Smith and Roberts (2003) suggest that one of the ways in which paramedics may deal with traumatic situations is by managing them on a cognitive and technical level, while maintaining an emotional distance. However, while at first this may appear to be a positive protective mechanism, Beaton (2006) warns that frequent exposure to trauma can be cumulative, and may manifest itself in lowered levels of personal health and well-being.

A study by Van der Ploeg and Kleber (2003) with 221 Netherlands paramedics, confirmed that exposure to trauma was not only correlated with lowered psychological and physical well-being but also adversely affected paramedics' social and family life. However, neither Van der Ploeg and Kleber (2003), nor Beaton (2006), or Smith and Roberts (2003), measured resilience, thus limiting our current understanding of how resilience may protect paramedics' general health and well-being. Despite the absence of empirical validation, a plausible hypothesis would be that those paramedics who have low resilience, but are still in service, have limited coping resources compared with the demands placed on them. Such QAS paramedics, who do appear to continue to cope, albeit for the short-term, may do so by investigating higher levels of personal resources, which consequently may lead to lower general health and well-being. Therefore, enhancing resilience should lead to better health and well-being in QAS paramedics. Analyzing the relationship between resilience and well-being is therefore the second research question of this study; specifically, does a significant positive relationship exist between resilience, and general health and well-being, among QAS paramedics?

Implications for Resilience Intervention for Paramedics

Given that the majority of paramedics will inevitably have to face traumatic experiences, professional preparation to equip paramedics to deal with these events is crucial for their health and well-being. If as predicted, resilience does increase with time in service, and does relate positively with general health and life satisfaction, these findings have important meaning for the training and continued professional development of paramedics. Such findings would strengthen calls advocating for the increase of resilience interventions and training for paramedics. Currently, the inclusion of resilience training or education to student QAS paramedics has is some instances been disproportionate, with examples of universities where approximately only four out of a possible 350 hrs of lecture time during their training is devoted to discussing

the psychological impacts of work-related traumatic experiences. Furthermore, McAllister and McKinnon (2008) warn that if students are not prepared for the emotional and cognitive strain involved with caring, work can become a burden, leading to stress, burnout, and neglect. To this end, if results confirm the interrelationships hypothesized between resilience and well-being, then there are direct ramifications for the training of paramedics; the key tenant of this study being that, if resilience levels between students and qualified paramedics do significantly differ, and resilience is positively associated with well-being, then clearly there is a justification to increase resiliency training for paramedics to enhance their well-being. Enhancing well-being would not only confer positives for the individual paramedic in terms of quality of life, but there would also be positive, tangible outcomes for the associated paramedical association, potentially saving taxpayer dollars currently attributed to lost work hours, burnout, and attrition of paramedics. These outcomes would have a significant financial impact on both the ambulance service and the taxpayer.

Table 1. Participant Groups' Details.

Participant group	*n*	Age *M*	Age *SD*
Group1: Students (no or very limited experience)			
Male	30	22.1	4.6
Female	43	23.0	6.7
Total	73	22.2	5.9
Group 2: Diploma-qualified (1-3 years experiences)			
Male	56	32.1	7.9
Female	30	30.8	8.0
Total	86	31.7	7.9
Group 3: Qualified paramedic (3-5 years experience)			
Male	5	40.2	6.6
Female	9	35.6	5.0
Total	14	37.2	5.8
Group 4: Qualified and ICPs (5+ years experience)			
Male	36	44.4	7.7
Female	10	38.9	5.5
Total	46	43.2	7.6

Method

Procedure

Following ethical approval by the University of the Sunshine Coast Ethics Committee and the Queensland Government Department of Emergency Services, 219 participants aged between 18 and 61 volunteered to complete a 7-page questionnaire pack. The questionnaire pack included a coversheet that provided information about the purpose of the research, an informed consent form, a demographics questionnaire, the 10-item Connor–Davidson Resilience Scale (CD-RISC, Connor & Davidson, 2003), the Satisfaction With Life Scale (SFWL, Diener, Emmons, Larsen, & Griffin, 1985), and the General Health Questionnaire (GHQ-28, Goldberg & Hillier, 1979). The sample comprised 146 Queensland paramedics (Australia), from stations located from Brisbane to Pomona in the north of the Sunshine Coast Queensland as well as 73 first- and second-year paramedical students from the University of the Sunshine Coast Bachelor of Paramedical Science program. This sample represented more than 50% of the qualified paramedics in the North Coast Queensland region. This response rate was relatively high and uncharacteristic of previously reported response rates (approximately 20%) in this field of paramedical research (Newman, 2003).

Participants allocated themselves to one of four groups which best represented their years of experience as a QAS paramedic. The four groups were: Group 1: first and second year USC undergraduate paramedical students who had little or no work-related traumatic experience; Group 2: diploma-qualified paramedics with 1-3 years of experience; Group 3: qualified paramedics with between 3-5 years experience; and Group 4: qualified paramedics and Intensive Care (IC) paramedics with over 5 years experience (see Table 1).

Participants' involvement in this study was voluntary; this was repeatedly stressed by the investigators throughout participant recruitment. While supervisors endorsed this investigation, no pressure was placed on individuals to participate by the management, and supervisors received no feedback as to who took part in the survey.

Measures

The demographic questionnaire was designed to elicit demographic information from participants, including age, gender, professional qualification (i.e., student, Diploma-qualified, fully qualified, or ICP), and corresponding years of service as a paramedic.

The 10-item CD-RISC is a self-report scale comprising 10 items intended to measure resilience. The CD-RISC asks respondents to identify their perceived adaptive strategies in stressful situations, with the aim of identifying resilient characteristics. Questions such as, "Are you able to adapt to change?" and "Do you tend to bounce back after illness or hardship?" were scored using a 5-point response scale (0 = *not at all true* to 4 = *true nearly all of the time*), where higher scores indicate greater resilience. Preliminary analysis of the 10-item CD-RISC in general populations, primary care, and clinical samples, support its internal consistency, test-retest reliability, and convergent and divergent validity (Campbell-Sills & Stein, 2007). The CD-RISC has been suggested as one of the most reliable and efficient measures of resilience in general populations, and has consistently reported internal consistency of between .67 from .93

(Campbell-Sills & Stein, 2007). Cronbach's alpha internal consistency score for this sample was .80.

In an attempt to capture a more complete picture of the general health and well-being of the participants, two instruments were chosen, the SFWL and the GHQ-28. The SWLS (Diener et al., 1985) was designed to assess a person's global judgment of life satisfaction and measures change in subjective well-being (Pavot & Diener, 1993). The internal consistency of the SWLS has been reported to be .87, with a test-retest correlation of .82 (Diener et al., 1985). For this sample, the interval consistency Cronbach's alpha score was .83. The SWLS has been recommended as a complement to scales that focus on psychopathology or emotional well-being, because it consists of only five items and assesses an individual's conscious evaluative judgment of his or her life by using the person's own criteria (Diener et al., 1985). Responses to questions such as "In most ways my life is close to ideal" are indicated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating higher levels of subjective well-being. The GHQ-28 (Goldberg & Hillier, 1979) was used to assess the general physical and mental health of paramedics. Reported reliability coefficients for the GHQ-28 have ranged from 0.78 to 0.95 (Goldberg & Hillier, 1979). Examples of the items used include "Have you found everything getting on top of you?" or "Have you been getting scared or panicky for no good reason?" Each item is accompanied by four possible responses, "not at all," "no more than usual," "rather more than usual," and "much more than usual," and uses a 4-point Likert-type scale from 0 to 3, respectively (Goldberg & Hillier, 1979). The 28-item version used in this study does contain four subscales for identifying specific psychopathology; however, for the purposes of this study, a more general indication of health was required and thus a global score was used. Lower total scores were indicative of higher levels of general health and well-being. For this sample, internal consistency Cronbach's alpha was .82.

Results

Resiliency Differences Between Paramedic Groups

One-way Analysis of Variance (ANOVA) with Bonferroni multiple post hoc comparisons conducted on the resilience scores of the four QAS participant groups revealed a significant group (years of experience) main effect, $F(3, 217) = 3.53$, $p = .016$, partial $\eta^2 = .052$. Descriptive statistics showed that resilience increased from paramedical students ($M = 27.43$, $SD = 5.52$), to 1 to 3 years qualified paramedics ($M = 30.09$, $SD = 5.82$), and again to 3 to 5 years qualified paramedics ($M = 31.16$, $SD = 5.07$), but then slightly dropping for the QAS paramedics with over 5 years of experience ($M = 30.08$, $SD = 5.52$). Pairwise multiple comparisons indicated that the paramedical students had significantly lower resilience scores than all the more experienced participant groups.

It also became evident that along with resilience increasing with years of service and levels, age also generally increased. To assess the extent of possible confounding affects due to an unequal distribution of ages along the continuum of resilience scores (where lower participant ages appeared to be associated with lower resilience scores), further analysis was undertaken. To assess the relationship between resilience and years experience, and resilience and age, two correlations were conducted. The Bonferroni method was used to correct critical p values ($p < .025$ for the resilience scale) while maintaining an alpha of 5%, thus controlling against an inflated alphas. Results indicated that both age ($r = .176$, $p < .009$) and experience ($r = .158$, $p < .019$) were significantly related to resilience. Age and experience significantly and strongly positively correlated with each other ($r = .724$, $p < .001$)

Resiliency Relationships with Well-Being and General Health

Correlations calculated only using qualified paramedics (i.e., not including student paramedics) between resilience scores and the two indicators of well being and general health (SFWL scale and GHQ), with Bonferroni corrections ($p < .025$) to maintain an alpha of 5%, were both significant ($r = .369$, $p < .001$, $r = -.259$, $p < .002$, respectively). These results showed that higher resilience was significantly associated with better general health and well-being.

Discussion

Limitations of the Study

Methodological drawbacks that were encountered in this study included the use of correlation analysis, cross-sectional design, and reliance on self-reports. First, the use of correlation analysis in this research, although useful for determining relationships is not able to definitively determine the cause and effects of variables used. Second, the limitations of cross-sectional surveys must also be accepted. Longitudinal case studies or field research incorporating both qualitative and quantitative methods may enhance our understanding of this topic. Although there are limitations to cross-sectional design, it was an ideal method for describing a broad picture—a picture that is desirable when conducting this type of exploratory investigation relative to the population of interest (Shakespeare-Finch et al., 2003). A final limitation concerns the use of self-report measures for all variables, which has been recognized as problematic for obvious reasons (Spector, 1994).

Significance of the Findings

With reference to the first research question of this investigation, is time in service associated with increased resilience or is it simply that the profession of paramedic attracts individuals with high levels of resilience? Results indicated that paramedical students were significantly less resilient than qualified QAS paramedics. Moreover, the paramedical students' levels of resilience were significantly lower than qualified paramedics regardless of the number of years of experience they had as a qualified paramedic. These results are important for two reasons. First, these findings are the first in this field of research to identify and quantify resilience levels in ambulance personnel, let alone between qualified paramedics and undergraduate paramedical students. Second, this result suggests that increased resilience is associated with the number of years experience as a qualified QAS paramedic.

This result coincides with emerging literature in this field of research. For example, the identification of resilience in ambulance personnel adds empirical evidence to Duckworth's (1996), Alexander and Klein's (2001), and Smith and Roberts' (2003) claims that protective processes do operate among ambulance personnel. Similarly, results further confirm Gillespie et al.'s (2007) findings that individual resilience is a key factor in protecting emergency medical personnel from psychopathology resulting from traumatic exposure.

The differences found in mean resilience scores between students and qualified paramedics were not subtle. In relation to mean population norms, mean differences of 2 to 3 points in resilience levels found in other research have been suggested as representing meaningful differences in levels of environmental adversity (Connor & Davidson, 2003; Lukey & Tepe, 2008). Understandably, differences in the levels of trauma experienced in, for instance, a lecture room, compared with a fatal multiple car accident, may certainly have contributed to a difference in mean resilience levels of up to 4 points—as found in the current investigation. Thus, it is conceivable that because paramedical students are not exposed to work-related trauma, they may not be developing resilience at the same level as qualified paramedics. In other words, traumatic experiences encountered by qualified paramedics while "on the job" may play a substantial role in developing resilience in QAS paramedics. However, this suggestion must be considered with caution as further research is required to validate such statements. Nevertheless, it does not appear that the profession of paramedic simply attracts individuals with high levels of resilience. This result may be potentially the first step toward understanding how experiencing trauma may have a positive affect in the role of a qualified paramedic. However, these findings do need to be interpreted with caution as participant ages were not evenly distributed throughout the four categories used in this investigation. Consequently, age differences (i.e., where students were generally younger than experienced paramedics) may also have contributed toward the development of significant differences in resilience between groups. Indeed, supplementary analysis did further confirm strong correlations between age and experience. Nevertheless, while at first this relationship appears to be a logical one, the relationship between age, experience, and years of service must be considered within the current context of paramedical duties and traumatic exposure.

Resilience levels declined past the point of 5 years of service as a qualified QAS paramedic. This was unexpected considering that many qualified paramedics commonly have well over 5 years of experience and may continue to be consistently exposed to work-related trauma. However, there may be several possible explanations why this occurred. First, perhaps there is a point in time (possibly around 5 years of service) whereby experiencing trauma may have a "plateau" or "saturation" effect on the development of resilience. This theory shares similarities with Rutter's (1993) concept of "stress inoculation," which may have caused ceiling effects of resilience. Similarly, Smith and Roberts (2003) have suggested that there may be a point where "the psychological impact of trauma may loose its sting" (p. 44). Perhaps this "point" in a paramedic's career coincides with around 5 years of service—where resilience levels appeared to decline, a trend which may also share similarities with Beaton's (2006) theory of accumulated fatigue among paramedics.

Although anecdotal, from discussions with several senior paramedics, a general consensus held (and a possible explanation of declining resilience levels) was that paramedics with over 5 years of experience generally fulfilled more management or supervisory positions such as clerical, administration, or training roles. Thus, very plausibly, if exposure to work-related trauma does in fact enhance resilience, perhaps resilience diminishes in response to a decrease in exposure to work-related traumatic exposures by senior QAS paramedics. However, without quantifying trauma and analyzing its relationship with experience and years of service, conclusions remain speculative and highlight the need for further inquiry.

There are, nevertheless, substantial practical implications of this finding. First, results suggest that resilience is an important factor operating in QAS paramedics which may assist them to buffer against the negative effects of work-related trauma. Second, given the context of limited resilience training for paramedics, differing levels of resilience found between qualified paramedics and students potentially provides a rationale for Beaton's (2006) and McAllister and McKinnon's (2008) calls for the increase of resilience education and training for undergraduate paramedical students and qualified paramedics.

With regard to the second research question, whether resilience exhibits a positive relationship with general health and well-being among qualified paramedics? An association was demonstrated between the two indicators of general

health and well-being, and resilience. The finding that resilience was positively correlated to both general health and satisfaction with life suggests that enhanced resilience in paramedics may increase their general health and well-being. Likewise, enhancing a paramedic's general health and well-being may result in higher resilience levels which potentially serve to better protect against the potential negative effects of work-related trauma. Either way, enhancing resilience in paramedics appears a worthy ideal.

Along with significant correlations found between resilience and general health, the actual mean scores of general health were relatively high in this population. These findings do however contrast general trends of psychopathology common in international emergency medical service personnel literature (Beaton, 2006; Gillespie et al., 2007). For instance, Van der Ploeg and Kleber (2003) and Regehr et al. (2002) both found that levels of general health and psychological well-being were typically low in paramedics. Newman (2003) also suggested that, despite their professionalism and job satisfaction, paramedics may commonly report lower levels of general health. The disparity between the present findings and such trends may be attributed to the use of differing tools or factors to assess general health in these studies, or that they were conducted overseas where it is difficult to determine the environmental and working conditions in which foreign paramedics may work in. However, although over half of the QAS paramedics in the north coast region did comprise this sample, the health status of the proportion of paramedics who did not participate in this research is unclear. Therefore, any evidence of the health impact of work-related trauma on a paramedic's may be underreported in this sample.

Out of the two indicators of health and well-being, a stronger relationship was found between a paramedic's satisfaction with life ($r = .369$) and resilience, than with general health ($r = -.259$, where negative correlations related to better health). Given that satisfaction with life includes satisfaction in one's work (Diener et al., 1985), and that people working in health care gain a large amount of personal satisfaction and meaning from their work (Skovholt, 2001), this finding raises two important issues. First, while the self can certainly grow and flourish in this altruistic experience, we know, as evidenced by the literature, that trauma can also allow paramedics to suffer with stress-related problems (Beaton, 2006). Thus, it appears that life satisfaction may be a fragile state among paramedics. Second, because one's satisfaction with their life does incorporate job satisfaction (Diener et al., 1985), efforts to enhance resilience in the workplace may lead to better overall life satisfaction and increased well-being.

Summary

These findings appear well positioned to add to the emerging body of trauma and emergency literature. In particular, the current findings suggest that resilience may be a key factor associated with being a qualified paramedic, which may assist to protect against repeated work-related traumatic exposure. However, how resilience is developed, maintained, and exerts this benefit, still warrants further research. Given the limited attention, currently devoted to resilience training and discussion of these issues with students or paramedics, interventions designed to enhance resilience in this population may result in substantial benefits. These benefits may be associated with reduced spending in taxpayer dollars attributed to burnout and attrition of paramedics. More importantly, resilience intervention may assist to better prepare and protect the well-being of these ordinary people who have volunteered for the extraordinary vocation of saving human lives.

Author's Note

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