

Resilience, posttraumatic growth and psychological wellbeing of paramedicine clinicians: An integrative review

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Abstract

Clinicians in paramedicine are exposed to stressful events at work that have potential to cause negative psychological outcomes. Posttraumatic growth (PTG), resilience and psychological wellbeing, however, are adaptive psychological states that can also occur following trauma and adversity. Synthesis of knowledge on these positive outcomes can provide insight into resources needed to support paramedicine clinicians. To examine and synthesise what is known of PTG, resilience and psychological wellbeing of paramedicine clinicians, including the experience of these phenomena and relationship between them. An integrative review of peer-reviewed empirical literature published in English from 2013 to 2022 was conducted, following Whittemore and Knaff's method. CINAHL Complete, MEDLINE Complete, PsycINFO, Scopus and Embase databases were searched. Included articles were quality appraised, with data analysed using the constant comparison method. Thirteen articles were included, with results synthesised into four categories. Mean PTG scores were reportedly moderate, and resilience ranged from average to above average. PTG and resilience had positive and negative relationships with specific coping strategies including dysfunctional coping, active coping, planning, venting emotions, social and emotional support and mental and behavioural disengagement. PTG scores were significantly lower for clinicians with longer shift duration and paramedics compared to emergency medical technicians. Resilience scores were higher for clinicians working part-time. Wellbeing was reportedly moderate and associated with the psychosocial climate established by managers. Qualitative findings indicated that workplace culture was perceived as stoic and masculine, which served to undermine staff resilience and willingness to disclose emotions. To support PTG and resilience, organisations should work to reduce stressors in workplace culture, including management and clinical supervision style, and offer employment flexibility. Organisations can upskill clinicians' capacity for positive adaptation to adversity with professional development targeting identified coping strategies. Future research could examine clinicians' experiences of PTG, resilience and wellbeing, and the relationship between them.

Keywords

resilience, posttraumatic growth, wellbeing, mental health, integrative review, paramedic, emergency medical technician

Introduction

In the course of providing emergency care to the community, clinicians in paramedicine such as paramedics and emergency medical technicians (EMTs) are exposed to a unique combination of workplace stressors. These include the mental, physical and emotional demands of the work itself,¹ as well as structural and organisational stressors including high case volumes² and shift work.³ Clinicians can also experience specific events that may result in psychological trauma.^{4,5} The negative psychological outcomes

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of this extend to poorer mental health including symptoms of posttraumatic stress, which can be particularly prevalent if paramedicine clinicians' psychological wellbeing is not supported.⁶ Posttraumatic growth (PTG) and resilience, however, are positive psychological responses in the face of trauma and adversity, and provide insight into adaptive processes that can support psychological wellbeing.^{7,8} Psychological wellbeing involves positive psychological functioning, having a sense of autonomy, purpose, growth, self-acceptance, mastery of one's life and positive relationships with others.⁹ As a similar, but conceptually distinct positive outcome following stress and adversity, resilience can be understood as the dynamic process of regaining or maintaining psychological wellbeing through interactions between a person's adaptive resources and those from their social and physical environment.⁸ Posttraumatic growth, however, involves a severe psychological struggle where core beliefs can be challenged after a traumatic event, ultimately leading to positive cognitive transformation and growth.¹⁰ This can include recognising new possibilities in life, as well as changes in perceptions of personal strength, relating to others, spiritual or existential change and overall appreciation of life.¹⁰ It is relevant to note that as these are constructs, there has been some variance in conceptualisations of resilience and posttraumatic growth over time; however, they are distinctly defined and measured in contemporary health literature.^{7,11} To strengthen paramedicine clinicians' potential for positive psychological outcomes through trauma and adversity, and guide associated policies, a collective examination of PTG, resilience and psychological wellbeing, and the relationship between them is needed. To date, no reviews have examined the combined evidence for these positive outcomes for this health-care group.

The nature of paramedicine clinicians' work and the stress related to organisational policies and structures have well-established repercussions for mental health.¹² In addition to the cognitive demands of the role, clinicians can experience occupational violence,^{13,14} stress from extended hospital delays,¹⁵ high case volumes, time pressure,² and fatigue and social desynchronisation from shift work.^{2,3,16,17} Fatigue and disordered sleep for paramedicine clinicians exceed that of the general population,³ and can strain sources of social support, contributing to social disconnection, reduced intimacy with partners and family conflict.¹ Paramedicine clinicians' elevated prevalence of depression and generalised anxiety disorder have also been established, with a recent systematic review revealing their mean rates to be 20.6% and 20.0%, respectively.¹²

Paramedicine clinicians can also be exposed to extreme events that have the potential for psychological trauma. This is known to be an emotional response that may present with intense fear, horror, or hopelessness, which occurs after experiencing or witnessing a highly distressing event, such as an assault, severe injury, threat to life, suicide,

death, or a sudden catastrophic medical incident.^{18,19} The most debilitating of repercussions is posttraumatic stress disorder (PTSD), which is a psychiatric condition characterised by intense distress and impairment following vicarious or direct exposure to one or more traumatic events.¹⁹ With workplace experiences including attending suicides, deaths, family violence, death of a child, grotesque mutilation and threatened or actual assault,² more than half of paramedics (54.8%) report being deeply affected by traumatic workplace events.²⁰ Accordingly, the prevalence of PTSD for paramedicine clinicians is markedly elevated (11–14.6%)^{4,5} compared to the general population (1.5%).²¹

With these known negative psychological outcomes, there has been an understandable focus on measuring paramedicine clinicians' psychological distress and stress symptoms. However, investigations focused solely on deficits do not necessarily support positive psychological wellbeing. In addition, this narrow focus on deficits is misaligned with principles of trauma-informed care, which recommend a strength-based approach, instead of understanding trauma survivors based on pathology alone.²² Indeed, research suggests that for survivors of trauma, focussing only on psychopathology may impede recovery and conceal positive changes that have occurred.²³ Resilience and PTG are strength-based approaches to understanding how at-risk groups can have positive outcomes in these settings;²⁴ however, there are currently gaps in the knowledge regarding these outcomes in paramedicine. Although contemporary understandings of resilience identify the importance of interactions between an individual and their available social and environmental resources,⁸ to date, researchers in paramedicine have largely defined resilience as a personal ability or trait rather than an interactive process.²⁵ In addition, although PTG indicates a positive psychological outcome, it is widely understood that PTG can co-occur with psychological distress and posttraumatic symptoms.²³ The combined examination of PTG, resilience and psychological wellbeing has the potential to provide a more comprehensive insight, to advance understandings of the strengths and positive adaptations that could be supported for paramedicine clinicians within their work environments.

While there have been reviews on risk factors for posttraumatic stress symptoms^{26–28} and coping strategies in paramedicine,^{17,29} there are no current reviews on PTG, resilience and psychological wellbeing, and their relationship. With resilience and PTG research providing an insight into unique dimensions of wellbeing and positive adaptation, understanding the evidence on these states will provide important information to direct future policies, practice and research. To address this gap in knowledge, this integrative review aims to examine and synthesise what is known regarding the PTG, resilience and psychological wellbeing of paramedicine clinicians, including the experience of these phenomena and the relationship between them.

Methods

Design

An integrative review was performed to enable a systematic search process and comprehensive synthesis of evidence from qualitative and quantitative literature. To uphold methodological rigour, the 5-stage framework outlined by Whitemore and Knaff³⁰ was employed, ensuring the resulting synthesis of evidence on PTG, resilience and psychological wellbeing was reliable. The protocol was registered with Open Science (registration DOI: <https://doi.org/10.17605/OSF.IO/8WH9Q>), and reporting of the systematic search and screening of relevant studies followed the Preferred Reporting Items of Systematic Review and Meta-Analyses (PRISMA).³¹

Search strategy and inclusion/exclusion criteria

The phenomena of interest and sampling frame were established in accordance with the problem identification stage of integrative review methodology. Search terms were developed in collaboration with an experienced research librarian (see Table 1), and then titles and abstracts were searched with Boolean operators in CINAHL Complete, MEDLINE Complete, PsycInfo, Scopus and Embase databases on 6/01/23. To capture evidence on contemporary roles and work environments of paramedicine clinicians, empirical peer-reviewed articles that focused on the phenomena mentioned in the aim and were published in English between January 2013 and December 2022 were included. To address the international variation in models of care and terminology, studies were included if they focused on civilian, specialist out-of-hospital roles whether paid or volunteer, including paramedics and EMTs. Research with a focus on university students, military medics, or ambulances that were nurse, firefighter, or physician-led were excluded. Studies that focused on

emergency retrieval or response to a natural disaster or terrorist event were also excluded, due to the exceptional nature of these situations. Literature reviews, editorials and grey literature were excluded.

Quality appraisal

During the data evaluation stage, the screened articles were appraised for methodological quality. Qualitative studies were evaluated using the Checklist for Qualitative Research³² and quantitative studies were evaluated using the Critical Appraisal Checklist for Cross-Sectional Study.³³ Two authors independently appraised the articles, with a consensus discussion with a third author to resolve discrepancies. Consistent with Soikkeli-Jalonen et al.,³⁴ appraisal criteria were scored as either yes (1), or no or unclear (0), with a total score calculated for each article as an indication of relative quality. Although a range in quality was identified, due to the limited existing research in the field, no papers were excluded based on this appraisal. However, the quality ratings and limitations are reported for each study.

Data extraction and analysis

Data analysis was performed by sequentially progressing through the stages of data reduction, display, comparison, conclusion drawing and verification. Data from each of the included studies relevant to PTG, resilience, or psychological wellbeing of paramedicine clinicians were extracted by one author independently. Extracted data were confirmed with the other authors and compiled into a data matrix. To guide the analysis, the constant comparison method was applied,³⁵ with data continually compared across studies and against previously analysed information. This enabled categories to be systematically developed and iteratively refined until final categories and sub-categories were determined. The four main category findings are reported using narrative synthesis.

Table 1. Search terms.

Content area	Subject headings [†]	Search terms
Paramedics	Emergency medical technicians Paramedics Rescue personnel	paramedic* ambulance emergency medical technician EMT
AND		
Posttraumatic growth	Posttraumatic growth, psychological	posttraumatic growth post-traumatic growth
OR		
Resilience	Resilience, psychological Psychological resilience	resilien*
OR		
Psychological wellbeing	Psychological well-being Subjective well-being	psychological wellbeing psychological well-being

[†]Subject headings were adjusted for each database as applicable.

Results

Search outcomes

The initial search returned 405 articles, which were managed using Covidence software.³⁶ Titles and abstracts were scrutinised against the inclusion and exclusion criteria by two authors independently, to yield 61 studies for full-text extraction. Full-text articles were then screened

against the criteria, with consensus discussion with a third author. Thirteen relevant studies were included in the review (see Figure 1).

Description of studies

Of the 13 included studies (11 quantitative, 2 qualitative), two examined PTG and resilience,^{37,38} one resilience and

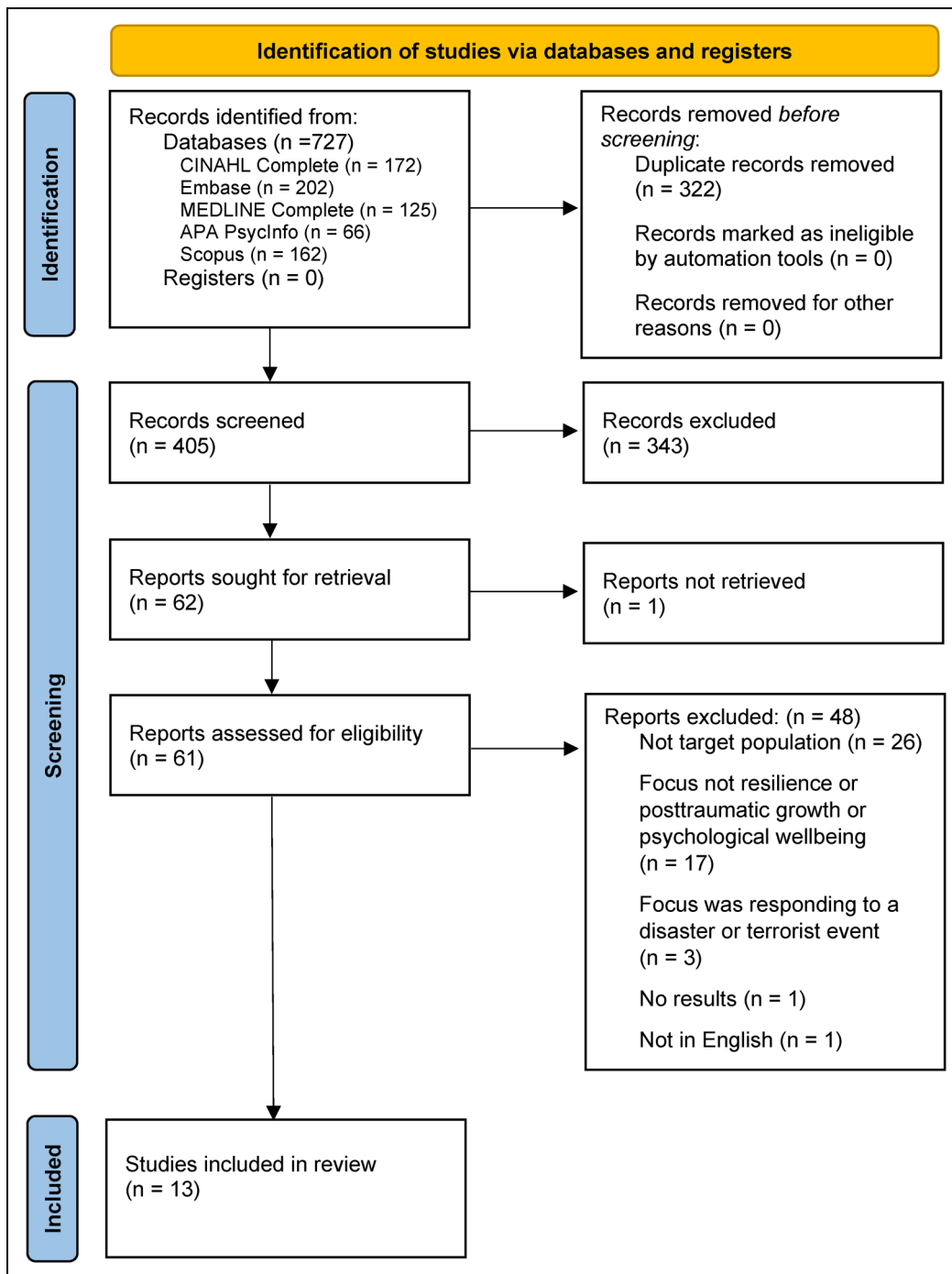


Figure 1. PRISMA flow diagram of the included studies.

psychological wellbeing,³⁹ and the remaining studies examined one outcome: PTG ($n=2$),^{40,41} resilience ($n=6$),⁴²⁻⁴⁷ or psychological wellbeing ($n=2$).^{48,49} Studies were from Australia ($n=2$), the United Kingdom ($n=2$), Germany/Austria ($n=2$), and one from Saudi Arabia, USA, Portugal, Slovakia, New Zealand, Poland and Switzerland/Liechtenstein. Participants fulfilled paramedicine clinician roles at a range of clinical levels, with most studies including paramedics ($n=9$) or EMTs ($n=5$). Three studies included volunteers and paid staff and three reported participants to be operational ambulance personnel, without further specification (see Table 2 for a summary of included papers). Findings are reported under four main categories, wherein three focused on PTG, resilience and psychological wellbeing, each with their respective sub-categories, outcomes, associated factors and experiences. As per the aim, the fourth main category addresses the relationship between the three phenomena of interest.

Posttraumatic growth

Posttraumatic growth outcomes. All four studies investigating the PTG of paramedicine clinicians were cross-sectional and used the Posttraumatic Growth Inventory (Table 2).¹⁰ Mean overall PTG ranged from 43.38, SD = 15.03⁴¹ to $M=68.52$, SD = 17.99,³⁸ with scores typically reported as moderate.^{37,40,41} The PTG domains where clinicians showed the most growth were *Appreciation of life*,^{37,38,40} *Personal strength*^{37,40} and *Changes in self-perception*.³⁸ Most studies did not identify the types of traumatic events that elicited growth; however, Ogińska-Bulik and Kobylarczyk³⁸ indicated that the most common categories were injury, dying, death of a child (30.63%) and threatening or aggressive patients (11.29%).

Factors associated with posttraumatic growth. Studies examined PTG in relation to demographics ($n=3$),^{38,40,41} as well as variables related to the role, trauma exposure and coping or dispositional style ($n=3$).^{37,40,41} The demographic variables reported did not have a significant relationship with PTG, including gender^{40,41} and age.³⁸ Role-related factors were significant, with EMTs demonstrating higher levels of PTG than paramedics ($M=55.6$, SD = 24.4 and $M=42.6$, SD = 22.8, respectively, $p=0.03$).³⁷ A shorter shift duration was also associated with higher levels of PTG ($r=-0.16$, $p<0.01$).⁴¹ Conversely, the length of service was consistently not found to be significantly related.^{37,40,41}

In the wake of a traumatic event, the amount of time that had passed was not found to have a significant relationship with PTG,⁴⁰ although a positive correlation was found between PTG and a positive change in outlook ($r=0.62$, $p<0.001$).³⁷ Regarding posttraumatic stress, when examining a low-scoring PTG subset, those with higher posttraumatic stress symptom scores showed significantly higher PTG

than those with fewer posttraumatic stress symptoms ($M=42.29$, SD = 13.36 and $M=24.71$, SD = 9.52, respectively, $p<0.05$).⁴¹ However, PTG was typically found to be independent of posttraumatic stress symptoms.^{41,50}

Coping-related variables included participants' expression of interest in coping training,³⁷ coping strategies,⁴⁰ and sense of coherence.⁴¹ Paramedicine clinicians who expressed interest in coping training were found to have significantly higher PTG than those who did not ($M=57.62$, SD = 22.36; $M=36.24$, SD = 20.30, $p=0.001$).³⁷ When examining coping strategies, Jurišová⁴⁰ reported significant positive correlations with PTG and *Active coping* ($r=0.400$), *Planning* ($r=0.355$), *Focus on and venting emotions* ($r=0.371$, $p<0.01$), as well as *Suppression of competing activities* ($r=0.307$), *Seeking social support* ($r=0.290$), *Use of emotional support* ($r=0.303$) and *Behavioural disengagement* ($r=0.256$, $p<0.05$). Positive correlations were found with *Restraint* (waiting for an appropriate time to act), and the PTG domain *New possibilities* (identifying new possibilities in life) ($r=0.272$, $p<0.05$), and also between the PTG domain *Spiritual change* (understanding spirituality, strength of faith) and both *Religious coping* and *Substance abuse (smoking)* ($r=0.524$; $r=0.354$, $p<0.01$).⁷ In addition, *Self-efficacy* and *Positive affectivity* (feeling enthusiastic, active) moderated the relationship between situational coping strategies and PTG.^{40,51} Positive correlations were found between the dispositional orientation *Sense of coherence* (capacity to manage stressful events and find meaning) and PTG ($r=0.27$, $p<0.01$).⁴¹ The only significant negative correlation with PTG and a coping strategy was between *Mental disengagement* (distraction) and the PTG domain *Personal strength* (confidence responding to challenges) ($r=-0.0263$, $p<0.05$).^{7,40}

Experience of posttraumatic growth. No qualitative studies explored paramedicine clinicians' experiences of PTG.

Resilience

Resilience outcomes. Seven quantitative studies examined resilience using a variety of measures, including versions of the Resilience Scale ($n=4$) (RS-11, RS-14, RS-25),⁵² Brief Resilience Scale ($n=2$),⁵³ and Resiliency Assessment Scale⁵⁴ (Table 2). Studies that reported scores against control groups or population means indicated that paramedicine clinicians' resilience ranged from average^{38,45} to above average.^{37,42,46} In describing the distribution of clinicians' resilience scores, Fonseca et al.⁴³ reported that 47.4% were high, 46.2% moderate and 6.4% low.

Factors associated with resilience. Of the seven quantitative studies reporting factors associated with resilience, two examined demographics,^{42,46} five coping and disposition-related variables,^{37,38,43,46,47} two role-related factors,^{37,45} and five

Table 2. Summary of the included papers ($n = 13$).

Author (Year), Country	Design	Aims	Participants ($n = x$)	Data collection methods	Results/conclusions	Limitations	Quality rating
Alqahtani et al. (2021), Saudi Arabia ⁴⁸	Quantitative, CSD	Determine the psychological and social wellbeing among healthcare workers during the COVID-19 pandemic. Assess the psychological and social support offered to paramedics	$N = 106$. EMT ($n = 64$), Para ($n = 42$), F ($n = 5$)	Online survey. Adapted a World Health Organization survey assessing psychological and social wellbeing of healthcare workers after H1N1 outbreak ($\alpha = 0.79$)	Paramedics commonly reported experiencing stress during the COVID-19 pandemic. Mean psychological wellbeing of paramedics was 6.41 on a 10-point scale ($SD = 2.42$). Mean score for support from friends and family was 9.2 ($SD = 2.6$); however, it was also perceived that friends and family were keeping their distance from them	Low number of female participants, SR, CSD	5/11*
Austin et al. (2018), United States ³⁷	Quantitative, CSD	Investigate the positive and negative psychological adaptations that are a result of secondary traumatic stress (STS), and the role of resilience among paramedics and EMTs	$N = 54$. Para ($n = 33$), EMT ($n = 21$)	Anonymous survey distributed by supervisors: Brief Resilience Scale (BRS) ($\alpha = 0.80-0.91$), Posttraumatic Growth Inventory (PTGI) ($\alpha = 0.90$), Secondary Traumatic Stress Scale (STSS) and Changes in Outlook Questionnaire-Short (CIOQ-S)	Paramedics and EMTs showed a moderate level of resilience ($M = 22.85$, $SD = 3.96$), PTG ($M = 47.87$, $SD = 24.12$) and STS ($M = 33.94$, $SD = 14.24$). Resilience was inversely related to negative change in outlook ($r = -0.65$, $p < 0.001$) and STS ($r = -0.66$, $p < 0.001$). Paramedics and EMTs working	SR, CSD, convenience sample, low number of respondents. Data collection by supervisors may have impacted anonymity, no gender demographics reported	7/11*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
Clompus & Albarran (2016), United Kingdom ³⁹	Qualitative, free association narrative interviewing	Explore the question of how paramedics 'survive' their work within the current healthcare climate	N = 7. Para (n = 5), emergency care practitioner Para (n = 2), F (n = 5)	Narrative biographical interview, followed by a semi-structured interview	part-time had higher levels of resilience, compared to full-time ($p=0.005$). EMTs had higher levels of PTG than paramedics ($p=0.003$). There were no significant differences in PTG, resilience, STS, or change in outlook due to years of experience Four themes represented the experience of becoming resilient: (1) Motivation to become a paramedic (caring and excitement; early life encounters) (2) Workload pressure (impact of health service reforms; health and social care systems; humanising moments and connections) (3) Coping and resilience (management support; informal peer support and humour; detaching and blocking) (4) External support (support from family	Small sample size. Gender composition and ethnic background not representative. Relied on participants' self-selecting skills and willingness to reflect on life and emotions	8/10**

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
Duschek et al. (2020), Germany and Austria ⁴²	Quantitative, comparative CSD	To investigate stress, personality traits, sensation seeking and resilience in paramedics	N = 395 Paramedics (n = 91). FT (n = 34). Vol (n = 54). Control group (non-emergency, non-medical professionals) (n = 397)	Supervisor invitation for online collection. German versions of the Perceived Stress Questionnaire (PSQ), Stress Coping Style Questionnaire (SVF-78), Big Five Inventory (BFI-44), Sensation Seeking Scale (SSS-V) and Resilience Scale (RS-25) ($\alpha = 0.94$)	and friends; referral to outside agencies) Statistically significant findings showed paramedics had higher resilience than the control group ($p < 0.001$). Higher levels of resilience were associated with lower perceived stress ($\beta = -0.21, p < 0.001$). Subsequently, lower stress burden was reported by paramedics, comparatively demonstrating more positive and fewer negative coping strategies	SR, CSD, potential selection bias as only a subset of paramedics invited to participate by supervisors were accepted. Other variables that may have affected stress and resilience were not assessed, such as social support and eating and sleeping behaviours	6/11*
Fonseca et al. (2021), Portugal ⁴³	Quantitative, cross-sectional and quasi-experimental correlational design, using self-report surveys	To analyse the contribution of resilience and its dimensions and perceived stress on EMTs' dysfunctional coping	N = 503 EMTs (n = 326)	Survey distributed by managers. Portuguese versions of the Brief COPE, Resilience Scale (RS-25) ($\alpha = 0.90$) and Anxiety Depression Stress Scale (stress component only)	EMTs had low levels of stress and dysfunctional coping. EMTs' resilience scores were classified as high for 47.4%, moderate for 46.2% and low for 6.4%. Perceived stress contributed to dysfunctional coping and had a mediating role between the	SR, CSD, a retrospective assessment of resilience, EMTs with sick leave were not assessed in this study	9/11*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
Jurišová (2016), Slovakia ⁴⁰	Quantitative, CSD	To identify relations between coping strategies applied in a stressful situation and PTG in paramedics, and to analyse moderating effects of self-efficacy and affectivity	N = 62 Para. F (n = 32)	Survey including the Posttraumatic Growth Inventory (PTGI) ($\alpha = 0.90$), Multidimensional coping inventory (COPE), The General Self-Efficacy Scale (GSE) and Positive and Negative Affect Scale (PANAS)	resilience dimensions self and life acceptance and their contribution to dysfunctional coping Most intensive growth was found in the PTG dimensions: personal strength and appreciation of life. Significant positive relations were found between total PTG and the coping strategies: active coping ($p < 0.01$), planning ($p < 0.01$), suppression of competing activities ($p < 0.05$), seeking social support ($p < 0.05$), use of emotional social support ($p < 0.05$), focus on and venting of emotions ($p < 0.01$), behavioural disengagement ($p < 0.05$)	SR, CSD, small sample size, PANAS scale not intended for use in times of high stress	6/11*
McAllum (2020), New Zealand ⁴⁴	Qualitative, phenomenology	Explain how mentors managed the asymmetrical mentoring relationship by using delegation of, participation in	N = 120. AO vol (n = 30), EMT (n = 51), (EMT vol = 31), Para (n = 26), (Para vol = 1), ICP (n = 13). Interviews: N = 54.	Individual and group interviews, recordings of interactions at the ambulance stations, field notes about interactions during jobs and organisational documents	In analysing mentor-mentee interactions, relationships were classified as either delegation-based or directive, with the	Some group interviews and non-private interview locations may have influenced responses.	7/10**

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
		and exclusion from the decision-making process	AO vol (n = 10), EMT (n = 24), Para (n = 14), ICP (n = 6)	about volunteer and paid staff roles	sub-themes below: Delegation-based: (1) Coaching (2) Hands-off mentoring (3) Coaxing Directive: (1) Bossing (2) Controlling (3) Criticising Although delegation-based approaches were not found to be wholly positive and directive approaches were not wholly negative, coaching was perceived to contribute to the resilience of mentees. Hands-off mentoring, bossing and criticising were perceived to reduce resilience	Varying interview times due to callouts. Possible selection bias of some stations and crews agreeing to be recorded and interviewed	
Oginska-Bulik & Kobylarczyk (2015), Poland ³⁸	Quantitative, CSD	To investigate the mediating role of coping strategies for stress in the relationship between resiliency and PTG in a group of paramedics	N = 120 Para	Polish adaptations of the Posttraumatic Growth Inventory (PTGI) ($\alpha = 0.93$), Inventory to Measure Coping Strategies for Stress (Mini-Cope), Resiliency Assessment Scale ($\alpha = 0.89$)	Resilience levels and coping strategies were comparable with the general population. Paramedics revealed high (46.2%), moderate (33.8%) and low (20%) levels of PTG. Coping strategies venting and denial played suppressing	SR, CSD, no female participants, no comparative data prior to trauma exposure	6/11*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
Petrie et al. (2018), Australia ⁴⁹	Quantitative, CSD	To examine the importance of different aspects of manager support in determining the mental health of ambulance personnel	N = 1622 AP. Ma = 52.2%	Email survey including the Psychosocial Safety Climate Scale (PSC-12), Manager Behaviour Scale (developed for this study, $\alpha = 0.95$), Kessler Psychological Distress Scale (K6), Short Warwick-Edinburgh Mental Well-being Scale ($\alpha = 0.84$)	roles in the relationship between resilience and PTG. The coping strategy <i>planning</i> had a mediating role between resilience and PTG 7.6% of participants were likely to have a mental disorder. The <i>manager psychosocial safety climate</i> was responsible for a significant amount of the variance in employee wellbeing (13%, $p < 0.01$) and mental disorder symptoms (13%, $p < 0.01$). <i>Manager behaviour</i> also accounted for a significant amount of variance in wellbeing (10%, $p < 0.05$) and mental disorder symptoms (7%, $p < 0.01$)	SR, CSD, low response rate	8/11*
Ragger et al. (2019), Austria ⁴¹	Quantitative, CSD	To examine the interactions of sense of coherence (SOC), posttraumatic stress and PTG in Austrian	N = 266 AP. F = (n = 87). Vol (n = 216). EMT (n = 198), critical care Para (n = 68)	Online survey including the SOC Scale – 29-item version (SOC-29), Posttraumatic Growth Inventory (PTGI) ($\alpha = 0.90$) and Impact of	A significant association was found between SOC and PTG ($r = 0.27$, $p < 0.01$), particularly the SOC subscale	SR, CSD, relying on recall of traumatic events	5/11*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
Shakespeare-Finch & Daley (2017), Australia ⁴⁵	Quantitative, CSD	ambulance personnel To assess workplace belongingness as a predictor of wellbeing, using measures of both psychological distress and resilience, while controlling for the effects of trauma severity and employee assistance program access	N = 740 AP. Ma = 66.6%. Participants must have experienced a traumatic event	Event Scale revised (IES-R) Online survey including the Kessler Psychological Distress Scale (K10), Brief Resilience Scale (BRS) (α = 0.80–0.91) and Psychological Sense of Organisational Membership Scale (PSOM)	<i>meaningfulness</i> ($r = 0.27, p < 0.01$). After a traumatic event, PTG and stress symptoms can exist independently Workplace belongingness significantly predicted variance, both in resilience (9.8%, $p < 0.001$) and in the levels of psychological distress (19.8%, $p < 0.001$)	CSD, self-report with culture of denial and stigma attached to negative mental health outcomes. Response rate of 30%	8/1*
Streb et al. (2014), Switzerland and Liechtenstein ⁴⁶	Quantitative, CSD	To examine whether SOC and resilience are associated with PTSD severity in paramedics	N = 668 Para. F (n = 210), gender not specified (n = 11)	Survey including the Posttraumatic Stress Diagnostic Scale (PDS), Resilience Scale (RS-11) ($\alpha = 0.85$) and Sense of Coherence Scale (SOC-L9)	The mean resilience of paramedics (M = 66.04, SD = 6.57) was significantly higher than the mean of a German representative population sample (M = 58.03, SD = 10.76, $p < 0.05$). Resilience was negatively correlated with severity of PTSD symptoms ($r =$ $-0.225; p < 0.01$), and positively correlated with SOC ($r = 0.522; p <$	SR, CSD, predictions of severity of PTSD cannot be interpreted causally as both SOC and resilience could be a product of PTSD	6/1*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
					0.01). Although SOC and resilience accounted for 19.2% of the variance in severity of PTSD symptoms when combined, only SOC predicted a significant unique amount of variance in severity of PTSD symptoms ($p < 0.001$).		
					Paramedics for whom psychological help was available at work showed less severe PTSD symptoms ($p < 0.01$) and higher SOC ($p < 0.001$). There was no significant difference in their resilience		
Treglown et al. (2016), United Kingdom ⁴⁷	Quantitative, CSD	To test whether specific dark-side traits may be beneficial in manifesting and maintaining resilience, and if others are vulnerability factors for burnout	N = 451 AP F (n = 50)	Survey including the Hogan Development Survey (HDS), Copenhagen Burnout Inventory (CBI: 16) and Resilience Scale-14 (RS-14) ($\alpha = 0.91$)	Of the HDS traits, ambulance personnel with higher <i>Excitable</i> and <i>Cautious</i> scores, but lower <i>Bold</i> and <i>Reserved</i> scores were found to have an increased risk of burnout. Personnel with lower <i>Excitable</i> , <i>Cautious</i>	SR, CSD, skewed gender composition. Factor analysis of RS-14 did not fit with the structures that have been noted in previous literature	5/11*

(continued)

Table 2. Continued.

Author (Year), Country	Design	Aims	Participants (n = x)	Data collection methods	Results/conclusions	Limitations	Quality rating
					and <i>Imaginative</i> scores, but higher <i>Bold</i> and <i>Diligent</i> scores had higher resilience levels. Resilience was found to both mediate and moderate the relationship between burnout and personality		

AO: ambulance officer; AP: ambulance personnel; CSD: cross-sectional design; EMT: emergency medical technician; F: female; FT: full-time; ICP: intensive care paramedics; Ma: male; Para: paramedics; SR: self-report; vol: volunteers.

* Critical Appraisal Checklist for Cross-Sectional Study.³³

** Checklist for Qualitative Research.³² Item 12 of the Cross-Sectional Study tool ('Can the results be applied to your organization?') was omitted as it was not relevant to this review.

burnout and response to trauma.^{37,42,43,46,47} There were mixed results for gender, with some evidence of significantly higher resilience scores in females (females $M=66.91$, $SD=6.17$; males $M=65.60$, $SD=6.82$, $p<0.05$),⁴⁶ but no significant difference found by other researchers.⁴²

Personality traits positively correlated with resilience included *Bold* (unusually self-confident) and *Diligent* (meticulous, critical) ($r=0.23$; $r=0.15$, $p<0.001$), as well as *Colourful* (expressive, dramatic) and *Imaginative* (creative, unusual) ($r=0.12$; $r=0.10$, $p<0.05$).⁴⁷ *Sense of coherence* was also positively correlated with resilience ($r=0.52$, $p<0.01$),⁴⁶ and clinicians who expressed interest in coping training had significantly higher resilience scores than those not interested ($M=23.3$, $SD=3.59$; $M=22.22$, $SD=4.40$, $p=0.02$).³⁷

Conversely, negative correlates of resilience included *Dysfunctional coping* ($r=-0.19$, $p<0.001$), with dimensions of resilience significantly explaining 5.1% of *Dysfunctional coping*'s variance ($p<0.001$).⁴³ Similarly, Treglown et al.⁴⁷ found resilience was negatively correlated with the self-defeating behaviour *Moving away* (socially isolating under stress) ($r=-0.29$), and also with the three sub-traits *Cautious*, *Excitable* and *Reserved* ($r=-0.35$; $r=-0.30$ and $r=-0.19$, $p<0.001$).

Regarding role-related variables, several characteristics of employment were found to be impactful on resilience, with *Sense of workplace belonging* significantly predicting 9.8% of its variance ($p<0.001$).⁴⁵ The nature of employment was also identified as a factor relevant to resilience, with part-time participants reporting significantly higher scores than full-time ($M=25.27$, $SD=2.94$ and $M=22.21$, $SD=3.97$, respectively, $p=0.005$).³⁷ There was some evidence of a relationship with the length of service, with a multiple regression analysis finding this as a significant negative predictor of resilience, although explaining only 1% of variance ($p<0.001$).⁴⁵ No significant relationship was found with the length of service in other research.³⁷ Regarding support in the workplace, Streb et al.⁴⁶ reported that although access to psychological help after a traumatic event was linked to less severe PTSD symptoms, access did not significantly affect resilience. They also found no significant relationship between resilience and receiving trauma training. However, this was a retrospective self-report of various types of training, ranging from external to internal, multi or single session rather than one standardised intervention.

The five studies that investigated resilience's association with burnout and the response to trauma consistently found negative correlations with resilience and perceived stress ($r=-0.32$, $p<0.0001$),⁴³ secondary stress ($r=-0.66$, $p<0.001$),³⁷ PTSD severity ($r=-0.225$, $p<0.01$),⁴⁶ and *Negative change in outlook* ($r=-0.65$, $p<0.001$).³⁷ Resilience also moderated or mediated the relationship between specific personality traits and burnout, with the trait *Bold* being mediated by resilience and the trait

Diligent being moderated by it ($p=0.011$ and $p<0.001$, respectively).⁴⁷

Experience of resilience. Two qualitative studies explored the experience of resilience.^{39,44} Personal and early life challenges could be a double-edged sword, equipping clinicians with emotional reserves and strengths that were useful in their workplace; however, family and childhood memories could be triggered by resonant cases, causing distress.³⁹ When describing the coping strategies used to maintain resilience, paramedics discussed using humour to alleviate tension, as well as compartmentalising and focussing on medical interventions to emotionally distance themselves from traumatic scenes.³⁹

Clompus and Albarran³⁹ also found that role-related factors were pertinent, with non-medical cases such as mental health or alcohol-related incidents negatively impacting paramedics' resilience and contributing to emotional fatigue. The authors linked this finding to the emotional labour of attending such cases, as well as masculine cultural norms in the workplace, which value traumatic physical injuries and critical illnesses, while devaluing non-medical cases related to mental health or substance use.³⁹ In addition, while coping with workload challenges, an overbearing managerial gaze was described by paramedics as detrimental to their ability to provide care and contributed to exhaustion. Similarly, clinical supervisors' mentoring style was described as either supportive or detrimental to resilience, with *Coaching* (briefing, ensuring comfort, modelling) seen as positively contributing, and other styles such as *Bossing* (short, blunt orders) and *Criticising* (publicly critiquing decisions) perceived to be damaging.⁴⁴

Informal and formal support, either in the workplace or externally, was also found to be related to resilience. Paramedics reported that organisational support and peer networks were invaluable to help process emotions, and described how support from family and friends was important in this setting.³⁹ However, paramedics also felt unable to disclose feelings, both from a desire to shield others from distress, but also because of shame associated with masculine-dominated workplace culture, where feelings were not discussed.³⁹

Psychological wellbeing

Psychological wellbeing outcomes. One qualitative and two quantitative studies reported on paramedicine clinicians' psychological wellbeing (Table 2). One quantitative study adapted a survey previously used by the World Health Organization regarding healthcare worker wellbeing,⁴⁸ and the other used a validated measure of psychological wellbeing, the Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS).^{49,55} The SWEMWBS indicated that paramedics had moderate psychological wellbeing scores ($M=25.25$, $SD=4.53$).^{49,55}

Table 3. Key findings.**Posttraumatic growth**

- Paramedics had lower PTG scores than emergency medical technicians.
- PTG was positively correlated with specific coping strategies, including *Focussing on and venting of emotions* and *Behavioural disengagement*, which have previously been considered as maladaptive strategies external to this context.
- PTG was negatively correlated with *Mental disengagement*.
- Clinicians' gender, age, length of service and the amount of time since a traumatic event were not found to be associated with PTG

Resilience

- Clinicians working part-time had higher resilience scores than those working full-time.
- A sense of workplace belonging was a significant predictor of resilience.
- Resilience was positively correlated with the personality traits *Bold*, *Diligent*, *Colourful* and *Imaginative*.
- Resilience was negatively correlated with dysfunctional coping, socially isolating under stress and PTSD severity.
- The style of clinical supervision was perceived as either supportive or detrimental to resilience.
- Workplace culture contributed to reluctance to disclose negative emotions

Psychological wellbeing

- Manager behaviour and psychosocial safety climate had positive linear relationships with psychological wellbeing.
- Support from peers was perceived as essential after challenging cases

The relationship between posttraumatic growth, resilience and psychological wellbeing

- Coping strategies may suppress or mediate the relationship between resilience and PTG.
- There has been limited research on the relationship between these three phenomena in paramedicine

Factors associated with psychological wellbeing. The two quantitative studies that investigated psychological wellbeing^{48,49} did not report results against demographic variables. However, they identified relationships between wellbeing and the internal workplace environment, and external support. Within the workplace, *Manager psychosocial safety climate* and *Manager behaviour* were both found to have significant positive linear relationships with wellbeing, respectively, explaining 13% and 10% of psychological wellbeing variance ($p < 0.01$).⁴⁹ A significant association was also found between having time for friends and paramedics' perception of being welcomed by them ($\chi^2 = 6.893$, $p = 0.009$).⁴⁸

Experience of psychological wellbeing. One qualitative study with a small cohort ($n = 7$) from the United Kingdom explored paramedics' experience of psychological wellbeing, and identified the importance of internal and external support.³⁹ Internal support from peers was described by paramedics as instrumental to wellbeing, such as receiving constructive feedback on their clinical performance after challenging cases, ultimately helping them resolve concerns that they would otherwise ruminate upon.³⁹ Externally, family and friends were also perceived as essential sources of support.³⁹

Relationship between posttraumatic growth, resilience and psychological wellbeing

There were no studies that directly investigated the relationship between wellbeing, resilience and PTG; however, two quantitative studies investigated the relationship between resilience and

PTG.^{37,38} Although Austin et al.³⁷ did not establish a significant direct correlation between the two outcomes, Ogińska-Bulik and Kobylarczyk³⁸ did find that a number of coping strategies significantly affected their relationship. When examining how the predictor variable resilience was associated with the dependent variable PTG, coping strategies *Venting* and *Denial* were found to suppress the relationship between PTG and resilience and their subfactors ($p < 0.05$). Furthermore, the coping strategy *Planning* was found to mediate the relationship between PTG and resilience ($p < 0.05$).

There were several key findings from the review across all four categories, which are summarised in Table 3.

Discussion

This review synthesised evidence on the PTG, resilience and psychological wellbeing of paramedicine clinicians, including the experience of these phenomena and their relationship. Paramedicine clinicians can experience workplace stress and psychological trauma directly and vicariously, and it is evident from this review that a number of factors are involved in strengthening or reducing their PTG, resilience and psychological wellbeing. The quality of included studies varied, with all meeting at least 45% of the appraisal criteria. Shortcomings were primarily noted in the reporting of response rates, statistical power of samples and acknowledgement of researchers' cultural and theoretical position. The determined appraisal scores suggest the need for increased rigour in design and reporting of future research in the field. There was some variation in the quality of scales used; however, Cronbach's alpha scores were in the optimal range, between 0.79 and 0.94

(Table 2).⁵⁶ Although adaptation and translation of some scales can pose a threat to their previous validation studies, alpha scores for those measures remained within desirable parameters.

With regard to PTG, the correlation of role-related factors shows that workplace demands and employment structure can be impactful. While further research is needed to confirm relevant causes of paramedics' poorer PTG compared with EMTs, studies have found that paramedics have a higher risk of anxiety, stress, depression,⁵⁷ and burnout.⁵⁸ Suggested contributors to this disparity include pressure from paramedics' greater clinical scope and responsibility, as well as increased exposure to critically unwell patients.⁵⁸ There is also evidence that paramedics experience workplace incivility more frequently than EMTs, with organisational culture and coping mechanisms of co-workers experiencing high stress suggested to be contributing factors.⁵⁹ In addition, although working longer hours is known to be associated with mental distress, depression and anxiety,⁶⁰ the finding in this review that longer shift duration is associated with lower PTG demonstrates a potential risk to paramedicine clinicians' capacity for growth after trauma. From these findings, it is evident that the development of PTG can be either supported or undermined by malleable organisational factors and is not purely reliant upon the personality traits or dispositions of individual paramedicine clinicians.

The relatively stable dispositional variables found to be pertinent to PTG outcomes, such as *Sense of coherence* and *Positive affectivity* may steer optimal recruitment; however, organisations and paramedicine clinicians also have agency in the pathway to PTG, through utilisation of the identified coping strategies. These include *Active coping*, *Planning*, *Focus on and venting emotions*, *Suppression of competing activities*, *Seeking social support*, *Use of emotional support* and *Behavioural disengagement*. Although connections have been found between paramedicine clinicians' personality types and coping skills,⁶¹ psychoeducation can positively impact the underutilisation of adaptive coping strategies in the healthcare setting.⁶² Interviews with paramedics have suggested that supportive programs such as this should not only be embedded in early career education, but should be ongoing, as new experiences give personal relevance to the targeted skills.⁶³ Coping skills identified as supportive of PTG in this review, such as *Focus on and venting emotions* and *Behavioural disengagement*, have been considered less adaptive outside of this context,⁶⁴ and subsequently may be overlooked in professional development design. The positive role of venting emotions also provides evidence to support the reform of workplace culture, where expression of emotion can be considered a taboo.

Although the resilience scores of paramedicine clinicians were typically average and above average, the measurement of resilience across the studies varied (Resilience Scale, Brief Resilience Scale, Resiliency Assessment Scale). These

measures differ in their conceptualisation of resilience as either a stable trait or adaptable ability of an individual. Importantly, none of these measures adequately take external factors into account, such as clinicians' interaction with the workplace environment.⁶⁵ This indicates an opportunity for future research to align with contemporary understandings of resilience and implement a resilience measure designed specifically for the workplace environment, such as the Resilience at Work Scale.⁶⁶ This may highlight underexamined external factors of resilience in the workplace, and help to address issues of workplace culture including stigmatised views of resilience as solely a personal responsibility.

Similar to the findings for PTG, higher resilience scores were associated with some relatively stable factors, such as *Sense of coherence* and personality traits *Bold*, *Diligent*, *Colourful* and *Imaginative*. However, a number of manipulable correlates were found, including dysfunctional coping strategies, providing guidance for optimising professional development programs. Future investigation of the efficacy of the current training programs is required, specifically those targeting resilience for practicing paramedicine clinicians, as this has not been addressed in the literature. At this stage, programs have been effective for paramedic students^{67,68} and other healthcare workers.⁶⁹ Further research is also required to explain the lower resilience scores for full-time paramedicine clinicians; however, full-time shift work in healthcare has been linked to reduced coping with work demands, poorer mental health, poorer social relationships and work/family conflict.^{70,71} In addition, paramedics have reported significantly lower perceived social support compared to some other public safety personnel.⁷² Irrespective of the cause, providing flexibility in employment fractions may allow organisations to support resilience for some clinicians.

Despite females often accounting for an increasing proportion of the paramedicine workforce,^{73,74} this review identified that masculine cultural norms for paramedicine clinicians to be stoic and perform heroic work⁷⁵ not only persist, but also are detrimentally linked to resilience and psychological wellbeing. With effects including the invalidation of mental health and substance-use-related cases, suppressing the disclosure of emotions, and potentially detrimental interactional styles of managers and clinical supervisors, cultural reform programs should target all staff from frontline to managerial.

Recommendations

From the review of the emergent literature, it is recommended that organisations take a proactive role and support clinicians with tailored continuing professional development programs that target the identified coping strategies. These include *Active coping*, *Planning*, *Focus on and venting emotions*, *Suppression of competing activities*, *Seeking social support*, *Use of emotional support* and *Behavioural disengagement*.

Dysfunctional coping styles such as socially isolating under stress should also be targeted for behavioural change. This ensures programs are aligned with the evidence on how to best support PTG and resilience for this group. This review has also identified a need for further research evaluating the implementation and outcomes of wellbeing, resilience and PTG interventions for this workforce. In addition, future research could explore the relationship between PTG, resilience and psychological wellbeing and pursue in-depth qualitative exploration of how paramedicine clinicians maintain wellbeing and resilience in the face of psychological trauma and workplace adversity. Due to the lack of prior qualitative literature on paramedicine clinicians' experiences of positive outcomes following adversity, there is a need for further understanding of these phenomena.

Strengths and limitations

This integrative review was systematically conducted and contributes new synthesised understandings of how paramedicine clinicians can best be supported through trauma and adversity, by identifying the known factors important for PTG, resilience and psychological wellbeing. These findings can guide the development of evidence-based programs for paramedic staff and students, and be informative for future research in this field. The evidence on wellbeing, resilience and PTG is emergent in the field, so results are bound to the limited current literature, which primarily comprised cross-sectional studies that used convenience sampling. Due to this, as well as the conceptual variation evident in the existing literature in paramedicine and the heterogeneity of resilience and wellbeing measures in the included studies, a meta-analysis was not feasible.

Conclusions

This review synthesised what is known on PTG, resilience and psychological wellbeing of paramedics and other clinicians in paramedicine. These distinct, but interlinked outcomes underpin a strength-based approach to how paramedicine clinicians can persevere and flourish after workplace adversity. To strengthen clinicians' PTG, resilience and psychological wellbeing, paramedicine organisations may consider providing employment fraction flexibility or reducing shift duration. Operational organisations and educational institutions can also implement professional development programs that are aligned with the evidence regarding adaptive and dysfunctional coping. In addition, masculine paramedicine culture and managerial styles that disrupt psychological safety have been found to undermine positive outcomes for paramedicine clinicians, adding weight to existing calls for systemic cultural reform. For a comprehensive understanding of paramedicine clinicians' positive psychological adaptations, further investigation is needed into the relationship between PTG, resilience and psychological wellbeing, as well as the efficacy of interventions to strengthen them.

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Supplemental material

Supplemental material for this article is available online.

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