

Symptoms and responses to critical incidents in paramedics who have experienced childhood abuse and neglect

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ABSTRACT

Background Mental and physical symptoms are common in paramedics, which may relate to high work stress, including critical incidents. As previous trauma is a risk factor for psychological symptoms after exposure to critical incidents, the prevalence of childhood experiences with abuse and neglect and paramedics' adaptation to critical incidents may be important.

Methods 635 paramedics were surveyed regarding childhood experiences of physical, sexual or emotional abuse as well as an index critical incident from the past, acute stress responses to that event and current mental and physical symptoms. A comparison group of 159 female hospital-based healthcare workers completed the same survey of childhood abuse and neglect in a separate study.

Results 232 paramedics (36.5%) responded. Among these, physical, sexual or emotional childhood abuse was reported by 38.4%. Female paramedics reported significantly more emotional and physical abuse and neglect than female hospital workers. Paramedics who reported childhood abuse or neglect more frequently experienced signs of acute stress immediately following the index critical incident and for the following 2 weeks. Childhood abuse and neglect were associated with significantly higher scores for depressive symptoms, physical symptoms and burnout, and a higher prevalence of 'cases' scoring above thresholds of clinical significance.

Conclusion Childhood abuse may be more common in paramedics than in other healthcare workers, at least in women. Childhood abuse and neglect is associated with acute stress responses to critical incidents and to current physical and mental symptoms. These results are based on a low response rate and may not be generalisable.

Paramedics face many stressors in their work including critical incidents, which range from highly public mass disasters¹ to less sensational events that provoke distressing feelings because of their personal meaning.² Relative to the general working population, ambulance workers experience elevated rates of standardised mortality and of early retirement for medical reasons, as well as more frequent accidental injury and musculoskeletal symptoms.³ Mental health concerns among ambulance workers are common, including an incidence of posttraumatic stress disorder symptoms greater than 20%, and high rates of anxiety and other psychopathology,³ which are thought to be partly due to the chronic effects of exposure to critical incident stress.¹ In addition to the cost of

these symptoms to individuals, the conditions that contribute to stress may also make recruitment and retention of professionals more difficult and may affect patient outcomes.

Not all paramedics are equally affected. Identifying the determinants of paramedics' resilience or vulnerability to critical incidents may lead to better individual health, and in turn enhance patient-provider interaction and quality of care. Although not enough is known about the individual differences that contribute to stress and resilience, emergency personnel who are prone to dissociation after a critical incident are at higher risk of long-term sequelae,¹ and personality characteristics such as neuroticism may also contribute.⁴ Importantly, a leading cause of the propensity to dissociation is previous experience with severe trauma, especially childhood abuse.⁵ Similarly, previous trauma experience is a marker of posttraumatic stress disorder risk after exposure to a traumatic event.⁶ While the experience of childhood abuse or neglect is a plausible risk factor for adverse consequences of work stress among paramedics, there is no information available about its prevalence or relationship with response to critical incidents or current symptoms.

The experience of childhood abuse and neglect is common in the general population,^{7,8} but has received little study in healthcare workers,⁹⁻¹² and we have found no reports of this prevalence in police, paramedics or firefighters. The purpose of this study is to determine the prevalence of childhood abuse and neglect in a sample of paramedics, and whether the experience of childhood abuse and neglect is associated with paramedics' responses to critical incidents and with current physical and psychiatric symptoms.

METHODS

Participants and procedure

Paramedics study

Paramedics and supervisors in a large urban emergency medical services (EMS) organisation completed a survey. Recruitment has been described previously.¹³ Participants were recruited from attendees of a mandatory continuing education programme. Paramedics who were on leave were informed of the study by mail. Subjects chose a paper or identical web-based survey. The study was approved by a hospital research ethics board.

Of approximately 1000 paramedics working for the EMS organisation, 635 signed a consent form and received the survey, and 243 (38.3%) partly or fully completed it over the following 8 months.

The survey package was long (59 pages) and there was attrition over its course, which resulted in missing data for questionnaires that were later in the package. The trauma instrument, which was early in the package, was completed by 232 participants, with the number of subjects completing subsequent questionnaires, in the order in which they occurred, as follows—identification of index critical incident 218, physical symptoms 203, depressive symptoms 200, burnout 195. We report here on variables from the survey package that are relevant to the experience of childhood abuse or neglect. Other results have been reported elsewhere.¹³

Hospital workers study

A comparison group with respect to the prevalence of child abuse and neglect is drawn from a separate study of hospital-based healthcare workers. The study methodology is reported in detail elsewhere.¹⁴ Briefly, hospital workers at 13 hospitals in the same region as the EMS organisation were surveyed about 1 year before the paramedic survey. This survey of hospital workers was a study of responses to a specific shared stressful event (the 2003 outbreak of severe acute respiratory syndrome; SARS) rather than to individually identified critical incidents. Although many of the instruments in the hospital study differed from those used in the survey of paramedics, the same trauma inventory (including child abuse and neglect) was completed by 176 hospital workers as was completed by the paramedics.⁹ As in the survey of paramedics, recruitment occurred in the workplace, the survey instrument was long and the response rate was similar (39%).¹⁴ The survey of hospital workers was conducted in two parts: the first was a 22-page questionnaire surveying experiences and responses to the SARS outbreak as well as physical and psychological symptoms; the second was a 15-page questionnaire, which included the trauma instrument and was accompanied by a diagnostic interview. Data confirming the representativeness of participants with respect to the institutions where they work have been published.¹⁴ Respondents included 159 women (90%) and 17 men (10%). The participants were mostly nurses (81%). The mean age was 45 years and the mean number of years of healthcare experience was 20 years. The gender ratios among staff of the 13 hospitals from which this sample is drawn are not known, although it likely that female subjects are overrepresented in this sample.

Instruments

Exposure to child abuse and neglect

Lifetime experience with adverse events and trauma was surveyed with the Traumatic Stress Institute (TSI) life event questionnaire,¹⁵ a 19-item questionnaire that surveys exposure to potentially traumatic events and the earliest age at which event each occurred. We calculated the prevalence of items that measure physical trauma ('observed domestic violence, neglect or physical abuse', or 'experienced domestic violence, neglect or physical abuse as a child'), emotional trauma ('observed emotional abuse of a significant other', 'experienced emotional abuse') or sexual trauma ('observed sexual abuse or rape', 'experienced sexual contact with someone in your family who was at least 5 years older', 'experienced sexual contact with someone who was not in your family who was at least 5 years older') if it occurred in childhood. To avoid overestimates of child abuse and neglect, events that could occur at any age (eg, 'experienced emotional abuse') were only counted if the earliest age of occurrence was reported to be at age 12 years or younger. As some participants left the age item for these events blank and thus were not counted as experiencing childhood trauma or

abuse, this method underestimates the prevalence of childhood trauma. The item 'experienced domestic violence, physical abuse, or neglect as a child' did not require a report of earliest age to be counted as a childhood event.

Critical incidents

Critical incidents were defined as 'calls that have generated unusually strong feelings, either because of the incident itself, or how it was handled or some other reason'. Participants were asked to identify an incident that was 'still troubling'. Those who could not identify a still troubling incident were asked to identify an incident that 'had been troubling in the past'. Those who could not identify a single incident of this type were asked to describe 'a composite of a number of critical incidents'. Finally, those who were unable to describe a composite were asked to describe 'one of your worst calls'. Participants reported on responses to the event: physical reactions ('like sweating, shaking and pounding heart'), disturbed sleep ('sleep disrupted by the incident'), interpersonal irritability ('irritable, mean or snappish') and social withdrawal ('if you withdrew or pulled back from other people'). For each dimension, participants reported the occurrence in response to the incident and how long it took to get back to normal by choosing one of seven options: (1) did not have this reaction; or returned to normal (2) soon after the call (a few hours), (3) by the next night, (4) by the next week, (5) by the next month, (6) within a few months, or (7) still not normal. As a return to normal sleep 'by the next night' is a more meaningful interval than 'within a few hours' for most people, the latter interval was rarely endorsed for sleep and was collapsed with 'by the next night' for analysis for that domain.

Somatic symptoms

The Brief Symptom Inventory is an abbreviated version of the reliable and valid Symptom Checklist 90-Revised.^{16 17} The seven-item somatic symptoms subscale probes how much the participant was distressed by the discomfort of a physical symptom over the last block of shifts on duty using a five-point scale from 0 ('not at all') to 4 ('extremely'). The Brief Symptom Inventory has been validated against the Symptom Checklist 90-Revised and comparable scales of the Minnesota Multiphasic Personality Inventory (MMPI). In the current study, internal reliability was 0.79. Scores were non-parametrically distributed and skewed towards the minimum score (median 0.36, interquartile range 0.14–0.64). To determine the prevalence of distress about physical symptoms, symptom scores were recoded into a dichotomous variable (no='not at all' or 'a little bit'; yes='moderately' or higher).

Depressive symptoms

Depressive symptoms were measured with the 10-item abbreviated version of the Center for Epidemiologic Studies depression scale (CES-D-10). Responses rated the frequency of depressive phenomena over the most recent block of shifts worked. CES-D-10 scores show concurrent validity with measures of positive affect ($r=-0.63$) and poor health status ($r=0.37$). The 10-item scale is highly correlated with the 20-item scale, which has been validated against clinical diagnoses of depression.¹⁸ A cut-off score of 10 discriminates Diagnostic and Statistical Manual of Mental Disorders III criteria for clinical depression.¹⁹ The time period 'your current or most recent block of shifts on duty' was used because paramedics interviewed in the earlier phase of this research reported that perceived psychological distress was worse during blocks of shifts on than it was during time off. Internal reliability was 0.77.

Table 1 Demographic, psychological and symptom indices of male and female paramedics in sample

	n (M:F)	Male	Female	Significance
Demographic characteristics				
Age (years)	147:81	40.1±9.2	33.0±7.4	<0.001
Married or common law	150:81	108 (72.0%)	33 (40.7%)	<0.001
Children	150:80	91 (60.7%)	16 (20.0%)	<0.001
Years as paramedic	149:81	8.7±2.8	5.8±3.2	<0.001
Level of training				
Level 1	147:81	52(35.4%)	45 (55.6%)	
Level 2		26 (17.7%)	16 (19.8%)	
Level 3		65 (44.2%)	20 (24.7%)	
Level 4		4 (2.7%)	0 (0.0%)	0.005
Psychological and symptom characteristics				
Physical symptoms score				
No symptoms	128:74	0.3 (0.1–0.6)	0.4 (0.2–0.8)	0.3
One symptom		76 (62.3%)	44 (60.3%)	
Two symptoms		21 (17.2%)	10 (13.7%)	
Three or more symptoms		14 (11.5%)	10 (13.7%)	
Depressive symptoms score				
Above screening cut-off	125:74	7 (4–10)	6 (4–11)	0.8
Burnout score	121:73	21.5±11.5	22 (29.7%)	0.6
Above 'high' cut-off		33 (26.4%)	22 (29.7%)	0.6
		42 (34.7%)	25 (34.5%)	0.9

Categorical data are presented as number (%); continuous and parametrically distributed data are presented as mean±SD; continuous and non-parametrically distributed data are presented as median, interquartile range.

Professional burnout

Professional burnout was measured with the Maslach Burnout Inventory Human Services Survey emotional exhaustion scale, a nine-item subscale of the 25-item Maslach burnout inventory. Responses describe the frequency of phenomena over a long period (up to a year) in seven categories from 1 (never) to 7 (every day). A cut-off of 27 was used to identify burnout, based on the recommendations of the scale's authors.²⁰

Data analysis

Descriptive data were calculated. Between-group comparisons, first for comparison between genders, were made using univariate analysis of variance for continuous parametrically distributed variables (age, years of experience and burnout), the Mann–Whitney U test for continuous non-parametrically distributed variables (depressive and somatic symptom scores) and the χ^2 test for categorical and ordinal variables. The prevalence and 95% CI for each category of childhood abuse and neglect were calculated. Comparisons of the prevalence of child abuse and neglect between female paramedics and female hospital healthcare workers were made in the same way. The number of men in the comparison sample was too small to allow comparison. Between-group comparisons were then used to contrast paramedics who reported childhood abuse or neglect and those who did not with respect to the time course of recovery from acute stress response symptoms after the index critical incident (excluding paramedics who were reporting on an index incident that was a composite of several incidents or

their 'worst call' in order to restrict recollections to singular particular incidents) and current symptoms of depression, burnout and physical symptoms.

RESULTS

Of 635 paramedics who agreed to participate, 232 (36.5%) provided completed surveys. Of these, 150 (65%) were men, 81 (35%) were women and one did not report gender. Their mean age was 37.6±SD 9.3 years. Mean years of service was 5.7±3.0 years. Demographics characteristics were representative of the organisation, except that female gender was over-represented. In the organisation, 24% of ambulance workers are women compared with 35% in this study. Table 1 demonstrates that there were sex differences in demographic and professional characteristics, with female paramedics being younger, less likely to be in a marital or common-law relationship, less likely to have children and more junior with respect to years of service and level of training. Nonetheless, psychological and symptom characteristics were similar in male and female paramedics.

Childhood abuse and neglect

The prevalence of childhood sexual, physical and emotional abuse among paramedics is presented in table 2. The prevalence of any type of childhood abuse in the sample as a whole was 38.4%. There was no significant difference between sexes in the prevalence of physical abuse, emotional abuse or overall childhood abuse, although childhood sexual abuse was more prevalent among women than among men. A comparison of the

Table 2 Prevalence of childhood physical, sexual and emotional abuse among paramedics

	Male paramedics (n = 150)			Female paramedics (n = 81)			All paramedics (n = 232)*		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Sexual abuse†	9	6.0	2.2 to 9.8	12	14.8	7.1 to 22.6	21	9.1	5.4 to 12.7
Physical abuse and neglect	38	25.3	18.4 to 32.3	30	37.0	26.5 to 47.6	68	29.3	24.5 to 35.2
Emotional abuse	35	23.3	16.6 to 30.1	26	32.1	21.9 to 42.3	61	26.3	20.6 to 32.0
Any type	53	35.3	27.7 to 43.0	36	44.4	33.6 to 52.3	89	38.4	32.1 to 44.6

*One participant did not report gender.

†Gender difference significant, $p=0.03$.

Table 3 Prevalence of childhood abuse among female paramedics and female hospital workers

	Female hospital workers		Female paramedics		Significance
Sample size (n)	159		81		
Age, mean±SD	44.9±9.4		33.0±7.4		<0.001
Years of experience, mean±SD	20.8±10.1		5.8±3.2		<0.001
Married or common-law, n (%)	117 (73.6%)		33 (40.7%)		<0.001
Any children, n (%)	105 (66.0%)		16 (19.8%)		<0.001
	n (%)	95% CI	n (%)	95% CI	Significance
Sexual abuse	15 (9.4)	4.9 to 14.0	12 (14.8)	7.1 to 22.6	0.21
Physical abuse and neglect	20 (12.6)	7.4 to 17.7	30 (37.0)	26.5 to 47.6	<0.001
Emotional abuse	19 (11.9)	6.9 to 17.0	26 (32.1)	21.9 to 42.3	<0.001
Any type	36 (22.6)	16.1 to 29.2	36 (44.4)	33.6 to 52.3	<0.001

prevalence of childhood abuse in female paramedics and in female hospital workers who completed the same measure of abuse (table 3) demonstrates that while rates of childhood sexual abuse were not different between groups, each other form of childhood abuse or neglect was almost three times higher among female paramedics.

Relationship between childhood abuse and neglect and recovery from index critical incident

Most paramedics reported experiencing multiple critical incidents over their career (table 4). The majority (52.8%) chose an incident that was still troubling to them as their index critical incident, with most of the remaining paramedics choosing an incident that had been troubling in the past but was not still troubling. Among the 209 paramedics who were able to isolate a single index incident to report upon, 53 (25.4%) described an incident that had occurred within 1 year of the survey.

Three aspects of an acute stress response following an index critical incident occurred more frequently among paramedics with a history of childhood abuse or neglect: physical arousal (Mann–Whitney U test 3893, $p=0.03$), irritability (Mann–Whitney U test 4027, $p=0.048$) and social withdrawal (Mann–Whitney U test 3931, $p=0.03$; figure 1). The trend towards a similar distinction with respect to sleep disturbance was not significant (Mann–Whitney U test 4191, $p=0.09$). There was no significant difference in the occurrence or recovery from these symptoms between sexes (data not shown).

Relationship between childhood abuse and neglect and current psychological indices

Current depressive symptoms, physical symptoms and professional burnout were more severe among paramedics who reported childhood abuse or neglect (table 5). When analysing these data categorically in order to explore clinical significance, depressive scores above a screening cut-off for major depression and burnout scores in the 'high' range are more than 60% more

common among paramedics who report childhood abuse or neglect. Multiplicity of physical symptoms was also more common among paramedics who reported childhood abuse or neglect.

DISCUSSION

Paramedics reported that childhood abuse or neglect was common, occurring in more than one third of participants. Abuse or neglect of any type was present in over 35% of male paramedics and over 44% of female paramedics. The occurrence of childhood abuse or neglect was associated with the increased severity or prevalence of a range of physical and psychiatric symptoms, both currently and in the acute aftermath of a critical incident. Understanding the context, implications and limitations of these observations requires further discussion.

Prevalence of childhood abuse or neglect

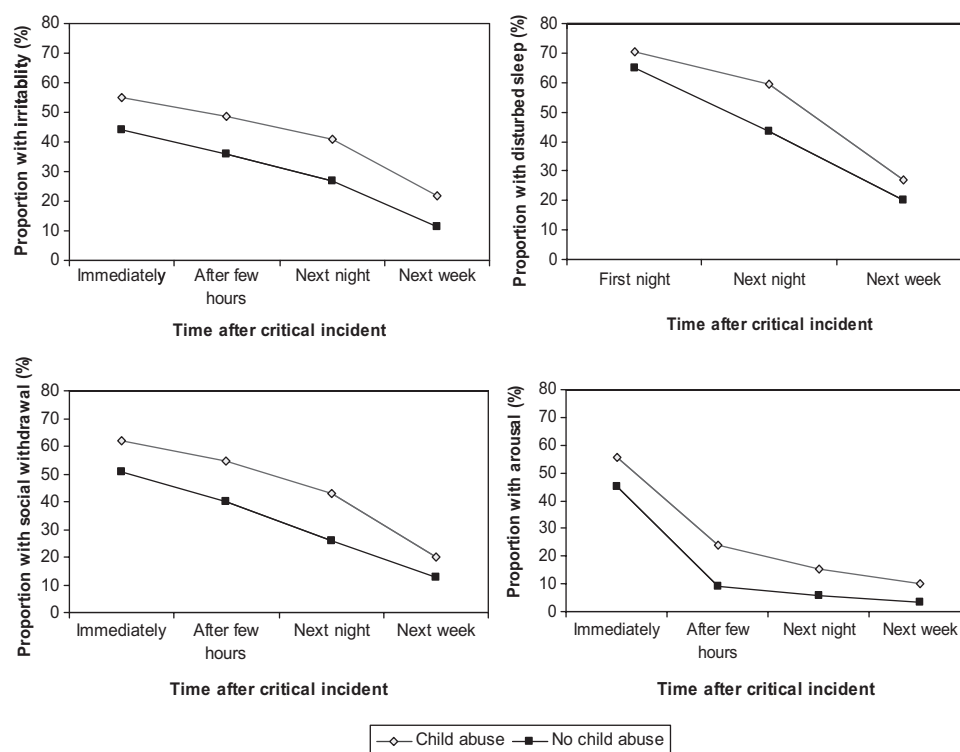
Estimates of the prevalence of childhood abuse are sensitive to response rate, the question that is asked, definitions of abuse and the format of enquiry.^{7–21} Compared with structured interviews, self-report measures of abuse may underestimate prevalence.²² In this study we were able to compare the prevalence of abuse and neglect reported by female paramedics with the prevalence reported by female hospital workers working in the same region using the same instrument (embedded in a survey package that was otherwise different) and similar recruitment methodology in each group, which should optimise comparability. The greater prevalence of childhood physical, emotional and overall abuse or neglect among paramedics, therefore, appears to be related to the profession and is not a general characteristic of healthcare workers in this community. Comparison data for healthcare professionals in other settings, and other community first responders (such as police and firefighters), would be valuable because the work of paramedics differs from the work of hospital workers in many ways, including the tendency to work alone or in pairs in the community. Comparison data for men and for members of the general community would provide a greater context.

Childhood emotional abuse was almost as common as childhood physical abuse and neglect among paramedics. The study of emotional abuse has been limited by difficulties with its definition. One definition identifies several varieties of emotional abuse that occur in relationships of power and control (for example behaviour; ie, rejecting, degrading, terrorising, isolating, exploiting and unresponsive) and suggests that 43% of women have experienced emotional abuse while growing up.²³ In the instrument used in this study, emotional abuse is undefined and so means to each participant what he or she interprets it to mean. It is noteworthy, then, that because of the frequent

Table 4 Experiences with critical incidents among paramedics in sample

Characteristics of index critical incident (n=229)		
Still troubling	121	52.8%
Troubled in past	88	38.4%
Difficult to isolate	4	1.7%
Worst call	16	7.0%
No of critical incidents (career) (n=223)		
0	7	3.1%
1–5	147	65.9%
6–10	21	9.4%
>10	48	21.5%

Figure 1 Occurrence and recovery from four aspects of acute stress response following critical incident in paramedics who report or do not report childhood abuse or neglect.



co-occurrence of different forms of childhood abuse and neglect, of the 89 paramedics reporting any type of childhood abuse and neglect, only 17 (19.1%, 14 men and three women) reported childhood emotional abuse exclusively.

Estimates of the prevalence of abuse are often higher in studies that have a lower response rate.^{7,21} The prevalence found in the current study may thus not be representative of paramedics in general because of the low response rate to the survey. No information is available about paramedics who did not return a survey in order to compare respondents and non-respondents. However, the main focus of the overall survey was on responses to critical incidents and current functioning (reported elsewhere)¹³ rather than on personal trauma, which makes it less likely that the decision to provide or not provide data was due to a specific reaction to being asked about trauma. The rate of attrition was much lower among paramedics who provided some data, and therefore read through at least part of the survey instrument (48 partial completers/243 respondents, 19.8%) than among those who provided no data and therefore may not have read the survey at all (392 non-respondents/635

consenting, 61.7%), which supports the hypothesis that non-participation was related to a general response to the overall survey rather than a specific reaction to one of its components (such as trauma). With respect to the comparison between paramedics and hospital workers the results of different surveys using the same instrument to measure trauma are being compared. As the methods used in recruitment were very similar in the paramedic and hospital worker studies, it is unlikely that response rates account for between-group differences. It seems likely that exposure to childhood abuse is actually higher among female paramedics than among female hospital workers in the same city.

It is unusual that in this study physical abuse was not more common among men than among women. A large and methodologically robust survey of childhood physical and sexual abuse in the same province where the current study was conducted found that sexual abuse was more common in girls, physical abuse was more common in boys, and the composite total of any form of abuse was more common in boys.⁸ Furthermore, the finding that physical abuse and neglect was

Table 5 Current psychological and symptom indices of paramedics who report child abuse and those who do not

	n (abuse:no abuse)	Child abuse	No abuse	Significance*
Physical symptoms score	74:130	0.5 (0.3–0.7)	0.3 (0.1–0.5)	0.002
No symptoms		39 (52.7%)	87 (66.9%)	
One symptom		19 (25.7%)	18 (13.8%)	
Two symptoms		5 (6.8%)	17 (13.1%)	
Three or more symptoms		11 (14.9%)	8 (6.2%)	0.01
Depressive symptoms score	72:128	8.0 (6.0–12.0)	5.5 (3.0–9.0)	<0.001
Above screening cut-off		26 (36.1%)	29 (22.7%)	0.04
Burnout score	69:126	24.1±10.7	20.7±11.8	0.049
High burnout score		31 (44.9%)	36 (28.6%)	0.02

Categorical data are presented as number (%); continuous and parametrically distributed data are presented as mean±SD; continuous and non-parametrically distributed data are presented as median, interquartile range.

*Significance of non-parametric Mann–Whitney U test, Pearson t test or χ^2 test, as appropriate to comparison.

more common than sexual abuse among female paramedics is quite unusual. These findings suggest that further research would be useful to understand if choosing a career as a paramedic (a non-traditional healthcare career choice for women) is more common among women with particular types of life experience. The female hospital workers in this comparison were older and more experienced in their profession than the female paramedics. Although a cohort effect in which rates of childhood abuse are reported to be higher among younger adult women than among older adult women has been reported,⁸ the previously reported cohort differences are much smaller (approximately 10–15%) than the almost 100% greater rate in younger female paramedics compared with older female hospital workers. A high prevalence of childhood abuse is plausible in a helping profession, because it may serve as a motivation for pursuing this career;²⁴ however, if child abuse is more common in paramedics than in other helping professions, further research may help to explain why.

Relationship between childhood abuse or neglect and current symptoms

One of the consequences of childhood abuse and neglect is an increased risk of psychiatric and physical symptoms and disorders in adulthood,²⁵ although more is known about sexual abuse than emotional or physical abuse or neglect. Nonetheless, many individuals who experience childhood neglect and abuse do not develop such difficulties. In the current study, acute responses to critical incidents are more frequent among paramedics who have experienced child abuse or neglect, and remain more prevalent over the 2 weeks after the incident. There is also a significant and consistent link between reporting childhood abuse and various physical and psychological symptoms. As we have previously reported that the time-course of recovery from acute arousal is associated with current symptoms,¹³ it is possible that an impaired ability to regulate distress and recover from acute arousal could be one mechanism by which the sequelae of adverse childhood experiences affects the wellbeing of paramedics. However, the effect sizes of the relationships between abuse or neglect and symptoms are modest (partial η^2 ranging from 0.02 to 0.09 for burnout, physical symptoms and depression), and so the impact of child abuse and neglect should not be over-stated. The modest effect sizes are consistent with a view that paramedics generally show resilience to adverse childhood experiences. Nonetheless, the rate of potentially clinically relevant symptoms (high burnout, depressive symptoms above a screening cut-off, multiple physical symptoms) is greater in paramedics who report child abuse or neglect by approximately 60% and so this potential source of increased personal risk merits further study, especially given the functional impact of these common symptoms.³

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