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Protective effect of paramedics' sense of personal accomplishment at work: Mitigating the impact of stress on sleep

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Research

Protective effect of paramedics' sense of personal accomplishment at work: Mitigating the impact of stress on sleep

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Abstract

Introduction

Paramedics are at greater risk of developing post-traumatic stress disorder (PTSD), trauma-related symptoms and burnout. Despite a large amount of research linking poor sleep quality with both PTSD and burnout, there has been no research linking all three variables (in emergency workers or otherwise). Given the importance of sleep in a profession that is largely reliant on shift work, the goal of the current study was to examine the moderating role of burnout in the association between post-traumatic stress and sleep quality.

Methods

A sample of 87 paramedics from major urban centres across Canada completed the Maslach Burnout Inventory and the PTSD Checklist Civilian Version, in addition to reporting sleep quality for a period of 1 week.

Results

In support of our hypotheses, self-reported post-traumatic stress was associated with lower-than-average sleep quality. Standard regression analyses further revealed that this effect was moderated by reports of burnout, such that higher burnout exacerbated the effect of post-traumatic stress on sleep. In examination of the subscales of the Maslach Burnout Inventory, this effect was maintained for personal accomplishment only, which interacted with stress in such a way that quality of sleep appeared to be further compromised.

Conclusions

These findings offer important considerations regarding the mitigating role of more positive workplace variables in paramedics suffering from post-traumatic stress, PTSD, and/or sleep problems. Interventions aimed at fostering a sense of personal accomplishment on the job may improve the health of emergency medical personnel via multiple pathways.

Keywords

post-traumatic stress, burnout, personal accomplishment, sleep, psychological health

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Introduction

Paramedics are at greater risk of experiencing sleep disturbances and sleep disorders, with only 30% of paramedics reporting high sleep quality (1,2). Although paramedics play a vital role in pre-hospital care, turnover remains high in this occupation, indicating a need to better understand how the impact of work stress on health may be mitigated (3,4). Given its associations with depression and cardiovascular disease, among other health-related outcomes, sleep quality is of particular importance (5,6). In addition to every day work stress, between one-fourth and one-third of actively employed paramedics are estimated to display clinical symptoms of post-traumatic stress disorder (PTSD), leading to one of the highest rates of post-traumatic stress (PTS) among emergency service workers (3,7-9). PTSD is a clinical condition that occurs in individuals who have witnessed or experienced a traumatic event and who continue to experience severe and persisting distress related to the event (10). Of the implications for daily functioning, PTSD has been shown to significantly impair sleep through delayed onset, reduced total sleep time and increased duration of nightly awakenings (11,12). In the current study, PTS will be used to refer to symptoms of PTSD without the presumption of clinical diagnosis.

Having been implicated in both PTS and sleep, burnout is a subclinical condition that results from chronic work stress. It encompasses three dimensions, including emotional exhaustion, a state of feeling emotionally overextended at work; depersonalisation, a state of callousness towards and difficulty relating to patients; and personal accomplishment, a sense of competence and personal satisfaction derived from one's vocation (13). Previous research has suggested that individuals suffering from burnout experience more fragmented sleep, less time spent in restorative stages of sleep and greater fatigue between shifts that does not decline during time off (14-17).

Burnout has been further implicated in PTS. In a study of physicians, those with PTS were not only more likely to exhibit symptoms of burnout, but also likely to exhibit a more severe manifestation of the condition (18). Among nurses, high rates of comorbidity between PTS and burnout have been found, with 98% of those meeting criteria for PTSD also meeting criteria for burnout (19).

Burnout is highly prevalent in the paramedic population, with the majority of paramedics experiencing at least some degree of burnout, and up to one-third exhibiting symptoms of all three dimensions (20). Given the previously documented rates of PTSD and burnout in paramedics, the current study aimed to examine the potentially interactive effects of these

key variables on the sleep quality of paramedics. While PTS and burnout have been linked to poor sleep individually, little is understood regarding the impact of burnout on PTS and the potential implications for sleep – one critical health outcome for emergency medical personnel.

Building on previous research, it was hypothesised that burnout would display a significant moderating effect on the relationship between PTS and sleep quality in paramedics, such that high levels of burnout would exacerbate this association. This was examined according to total burnout scores as well as the three aforementioned components of burnout. Furthermore, the potential protective effect of personal accomplishment on paramedics' sleep quality was investigated.

Methods

Study Design

The current study utilised an initial questionnaire assessment of trait measures along with daily diary assessments of process variables (eg. sleep). PTS and burnout were measured via self-report in the initial questionnaire assessment using the PTSD Checklist Civilian Version (PCL-C) and Maslach Burnout Inventory – Human Services Survey respectively. The response rate for this segment of the study was 96%. Sleep quality was tracked daily, with 89% of paramedics having completed at least three of the four time points across the four work days.

Participants

The current sample consisted of 87 licensed paramedics working full-time or full-time equivalent hours in Canadian metropolitan areas, with an average of 15.2 years on the job (SD=7.7). Full-time work was equivalent to four 12-hour shifts per week. Of these paramedics, 82 self-identified as Caucasian, four as Asian and one as Hispanic. The mean age was 42.1 years (SD=8.3), with a range of 27–62 years. The majority of participants (n=71) were male. For study inclusion, it was required that participants work four consecutive shifts during the week of sleep assessment.

Instrumentation

All variables were measured using previously validated self-report questionnaires. Participants reported sleep quality daily for a period of 1 week, in order to more accurately estimate average sleep quality. This week encompassed four consecutive workdays with 1 day off before and 2 days off after. Within 1–2 hours of waking, participants rated the quality of their sleep on a 4-point scale from 'very good' to 'very bad'. This question was derived from the most representative item on the Pittsburgh Quality of Sleep Index, a well-established and validated self-report measure of sleep (21,22).

At the end of this period, participants completed the MBI, designed specifically to assess burnout in health care workers (13). The MBI is a 22-item self-report measure that consists of three subscales corresponding to the previously outlined factors of emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA). Responses were indicated on a 7-point Likert scale from 0 ('never') to 6 ('every day'). Cut-off scores for clinically significant levels of burnout are 27 or greater for EE (possible range of 0–54), 10 or greater for DP (possible range of 0–30), and 33 or less for PA (possible range of 0–48) (13). The MBI has been consistently demonstrated as a reliable and valid measure of burnout (13,23).

The PCL-C was also administered to measure symptoms of PTS (24). The PCL-C is a 17-item self-report scale designed to measure symptoms of PTS as experienced in the last 30 days. Responses are indicated on a 6-point Likert scale ranging from 0 ('not at all') to 5 ('extremely'). The scale has been well validated in diverse populations and has good test-retest reliability, convergent validity and discriminant validity (25-27). Scores fall within a possible range of 17–85, with a cut-off score of 44 indicating scores in the clinical range for PTSD in a non-military population (28).

Procedures

Paramedics were recruited via online advertising, internal organisation notifications (with the cooperation of employers), and by word-of-mouth. Participants first provided informed consent, followed by basic demographic information and questionnaire responses online (using a secure university server) at participants' leisure. The data collection process for each participant lasted 1 week.

Data analysis

SPSS software was employed to run a series of standard multiple regression models with average sleep as the dependent variable. Gender was included as a control in all models. Standardised scores on the PCL-C and MBI were included as independent variables, with four separate models run including total and individual subscale scores on the MBI. Interaction terms between burnout variables and PTS were created using the multiplicative method (29). Where interaction terms were significant, tests of simple slopes were calculated based on procedures outlined by Aiken and West and subsequently graphed (30). Descriptive statistics, internal reliabilities and unpaired t-tests comparing results to normative data were also examined.

Ethics

All aspects of this research, including recruitment and data collection, were approved by the University of British Columbia Behavioural Research Ethics Board.

Results

Descriptive statistics and internal consistency estimates (Cronbach's alphas) are first reported for all questionnaires (see Table 1). Values of $p < 0.05$ were considered significant and are shown in all tables; 29% of participants exceeded the recommended cut-off for PTSD symptomology on the PCL-C (28).

Table 1. Means, standard deviations, 95% confidence intervals and internal consistency estimates (Cronbach's α) for cross-sectional measures among paramedics (N = 87)

Variable	M	SD	95% CI	α
Average sleep quality	2.93	.48	2.8–3.0	–
Post-traumatic stress	36.71	14.18	33.7–39.7	.93
Total burnout	50.01	19.49	45.9–54.2	.74
Emotional exhaustion	26.36	10.87	24.0–28.7	.89
Depersonalisation	13.07	6.76	11.6–14.5	.77
Personal accomplishment ^a	37.42	6.17	36.1–38.7	.66

^aHigher scores on the personal accomplishment subscale indicate higher personal accomplishment. This subscale was reverse-scored when calculating Total Burnout.

On an individual basis, 49%, 67% and 21% of paramedics reported high levels of burnout on the EE, DP and PA subscales respectively, while 74% of all paramedics reported at least one symptom of high burnout, according to established cut-offs (13). Unpaired t-tests were used to compare burnout in the current sample of paramedics to normative data from a sample of 1104 nurses and physicians (13). The current sample scored significantly higher on EE, $t(1189) = 3.84$ ($p < 0.001$), and DP $t(1189) = 9.68$ ($p < 0.001$).

In all regression models, PTS displayed a significant and negative association with sleep quality ($p < 0.001$). In the first regression model (see Table 2), total burnout interacted with PTS to predict lower sleep quality, $\beta = -0.20$ ($p = 0.04$) (see Figure 1). PTS was associated with lower sleep quality when burnout was high only ($p < 0.001$). No significant relationship was observed between PTS and sleep quality when burnout was low.

Table 2. Results from standard multiple regression models predicting average sleep quality from post-traumatic stress (PTS), burnout and all subscales of the Maslach Burnout Inventory (MBI; Maslach, Jackson and Leiter, 1996) (N = 87)

	Model 1; MBI = Total score		Model 2: MBI = EE		Model 3: MBI = DP		Model 4: MBI = PA ^a	
	β	SE	β	SE	β	SE	β	SE
Intercept	2.81***	.19	2.80***	.19	2.80***	.20	2.84***	.19
PTS	-.22***	.05	-.22***	.05	-.22***	.05	-.22***	.05
MBI	-.03	.05	-.03	.05	-.04	.05	-.01	.05
MBI x PTS	-.10*	.05	-.08	.05	-.04	.05	.11*	.05

Note: β = unstandardised regression coefficient; SE = standard error; EE = emotional exhaustion subscale of the MBI; DP = depersonalisation subscale of the MBI; PA = personal accomplishment subscale of the MBI. All models control for gender.

^aHigher scores on the personal accomplishment subscale indicate higher personal accomplishment. This subscale was reverse-scored when calculating Total Burnout.

* $p < .05$; ** $p < .001$, *** $p < .001$

In modelling the subscales of burnout (see Table 2) neither emotional exhaustion nor depersonalisation emerged as significant moderators of the association between PTS and sleep. Only the interaction between PTS and the personal accomplishment subscale was significant, $\beta = 0.23$ ($p = 0.02$). Tests of simple slopes revealed a significant effect of PTS on sleep at low personal accomplishment, such that sleep quality decreased when stress was high and personal accomplishment was low ($p < 0.001$) (30) (see Figure 2).

Discussion

The goal of the present study was to examine the interactive effects of PTS and burnout on sleep quality in a sample of full-time Canadian paramedics. This was in order to elucidate potential protective factors in paramedics'

sleep. A series of multiple regression analyses were conducted in order to examine the role of burnout and its three main components, including emotional exhaustion, depersonalisation and personal accomplishment. Results suggest that burnout is a key factor in the association between PTS and sleep. A heightened sense of personal accomplishment at work may be an effective buffer to the impact of PTS on the sleep quality of paramedics.

Our finding that PTS was significantly associated with lower sleep quality is in line with previous research and suggests one potentially deleterious role of PTS in the daily health of paramedics (8,10). This implication should be interpreted with caution, however, as we did not determine the source of the stress (ie. the trauma) in the current sample, and therefore cannot conclusively link it to the job (4).

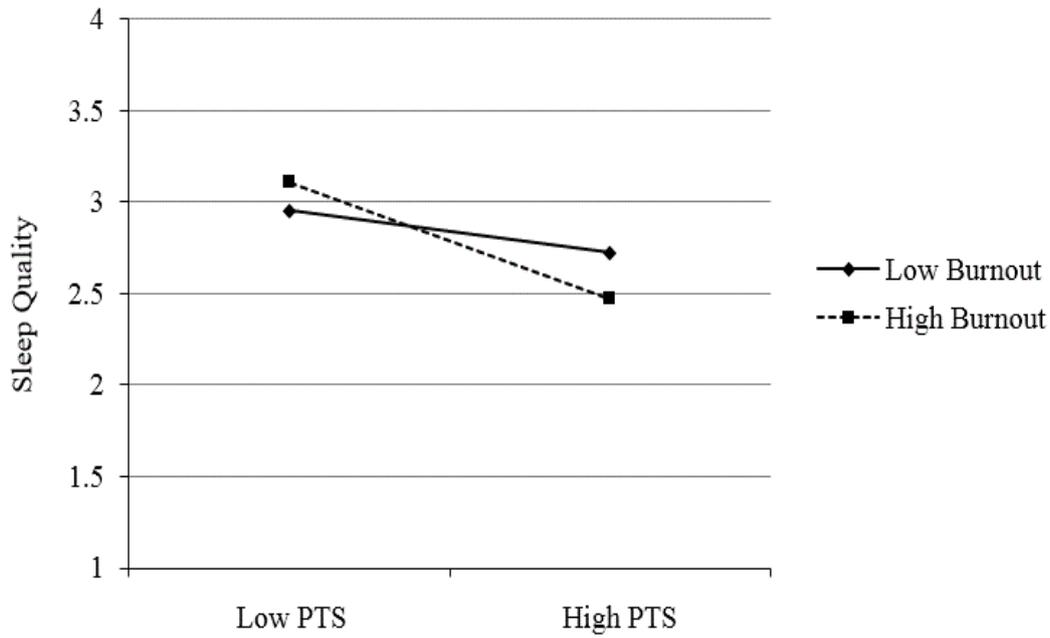


Figure 1. Interaction between PTS and total burnout predicting sleep quality

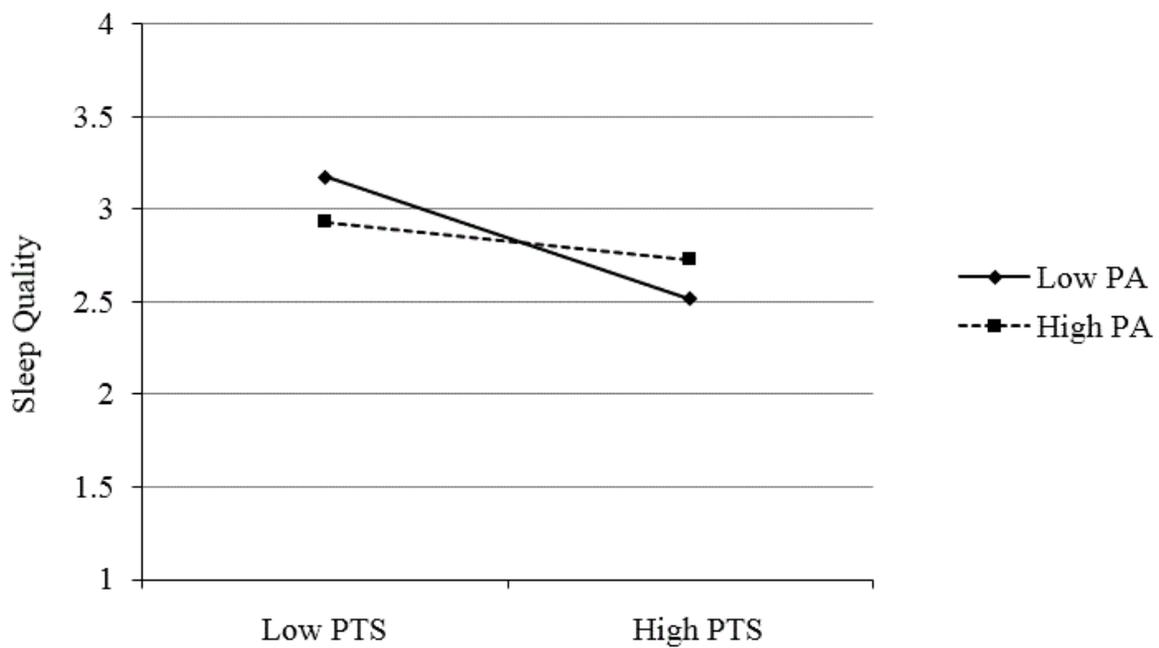


Figure 2. Interaction between PTS and personal accomplishment predicting sleep quality

In support of our hypothesis, total burnout scores moderated the relationship between PTS and sleep quality in this sample, such that higher levels of burnout were associated with a stronger effect of PTS on sleep. This extends the findings of previous studies examining associations among these factors. Both PTSD and burnout have been found to be negatively associated with sleep quality, and both appear to be highly comorbid in emergency service workers (8,12,19). High levels of burnout negatively affect a host of health and occupation-related factors, including job performance, perceived efficacy on the job and social functioning (32,33). Given the physical and emotional impact of burnout, high levels of burnout may make it difficult for paramedics to cope with occupational stress, thus exacerbating the effects of traumatic stress on sleep.

When examining the subscales of the MBI, only personal accomplishment was found to significantly moderate the relationship between PTS and sleep, such that individuals with a low sense of personal accomplishment tended to experience a more severe effect of self-reported stress on sleep quality. One possible explanation for this effect is the positive emotion that accompanies personal accomplishment. Positive emotions have previously demonstrated an inverse association with sleep problems and can therefore act to buffer the effect of PTS on sleep (34,35). Purpose in life, which is similar to personal accomplishment in that it relates to meaning derived from one's circumstances or actions, has also been related to better sleep (35). Given this finding, it is plausible that personal accomplishment serves as a protective resource for those who are experiencing PTS.

Future research should investigate whether workplace interventions aimed at fostering a sense of personal accomplishment might improve the sleep quality and overall health of paramedics. Previous research has established a link between on-the-job support and job satisfaction, suggesting that increasing employee satisfaction through fostering a sense of personal accomplishment could reduce employee turnover (36,37). Further, a low sense of personal accomplishment has been associated with decreased job performance, suggesting that it may also be in the best interest of employers to maximise their employees' sense of personal accomplishment in the workplace (32). For emergency workers experiencing PTS, controlling levels of burnout may be one essential step in improving sleep quality and, therefore, overall health.

Given our relatively small Canadian sample of paramedics, future research should examine these relationships in larger, international samples. As all data collected in this study were self-report, future studies may benefit from the inclusion of more objective measures of these variables, including sleep. Current findings were based on a mainly male, Caucasian sample, potentially limiting generalisability of the associations observed. When interpreting these results, it should also be noted that there is a small but significant overlap between the constructs of burnout and PTS, therefore making it more difficult to ascertain a causal relationship between the two

variables. Future research should examine these effects longitudinally, so as to better approximate a causal link among sleep, burnout and PTS.

Conclusions

Findings from this study underscore the need for subsequent research identifying workplace variables that may help to limit the impact of PTS on health outcomes among paramedics. Indeed, such research may offer benefits on both individual and organisational levels. Paramedics and emergency workers remain understudied. As such, this research contributes to an improved understanding of the health and work-related phenomena unique to this occupation.

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Conflict of interest

The authors declare they have no competing interests. Each author of this paper has completed the ICMJE conflict of interest statement.

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