

Predicting mental burnout among Israeli Home Front Command soldiers during the COVID-19 pandemic

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Summary

Background: The present study examined personality, situational and organizational predictors of burnout during COVID-19 in a military setting, based on the salutogenic theory of health (Antonovsky, 1987).

Method: Questionnaires were completed by 116 reserve Israeli Home Front Command medical staff (71% males). Background variables (e.g., gender), personality variables (self-efficacy and sense of coherence - SOC), situational variables (state-anxiety, self-rated health and sense of threat) and organizational variables (satisfaction with military's and government's handling of the COVID-19 crisis) were measured as predictors of burnout.

Results: Females had higher levels of state anxiety and burnout compared to males. Females also reported a lower level of satisfaction with the military's handling of the COVID-19 crisis than males. SOC and state anxiety were the only statistically significant predictors of burnout after controlling for sociodemographic variables. The entire model explained 59.4% of the burnout variance.

Conclusion: In accordance with salutogenic theory, SOC is associated with active adaptation through use of generalized and specific resistance resources to avoid burnout in a stressful milieu. Psychological support, psychoeducation and simulation training are offered to increase manageability in crisis situations.

Limitations: Following a large dropout rate due to being quarantined, the final sample size was much smaller than planned. Also, although previous longitudinal studies have found SOC to be a causal factor in burnout, the present cross-sectional design limits such conclusions.

Key words: COVID-19, sense of coherence, self-efficacy, burnout, state anxiety, military

INTRODUCTION

Studies conducted on healthcare workers during the COVID-19 pandemic found that they are experiencing mental distress (Ayanian, 2020; Chen *et al.* 2020; Cohen

et al., 2020; Huang and Zhao, 2020; Inchausti *et al.*, 2020; Koh, 2020; Rimmer, 2020; Shanafelt *et al.*, 2020). For example, a study conducted among 1,257 healthcare workers from 34 hospitals in China during

COVID-19 revealed high levels of symptoms of depression (50.4% of the sample), anxiety (44.6%) and insomnia (34.0%). In general, mental distress was reported by 71.5% of the participants (Lai et al., 2020). Of 470 healthcare workers in Singapore who were caring for patients with COVID-19, 14.5% screened positive for anxiety, 8.9% for depression and 7.7% for clinical concern of PTSD (Tan et al., 2020). These results are in line with a review of existing COVID-19 literature (Rajkumar, 2020). In the above-mentioned reports, the rates in Singapore, although high, were lower than in China; this may be due to the difference between the two countries in the exposure rate of healthcare workers to carriers of the virus. Another study conducted in Italy during the first week of quarantine ($N = 5,683$) found that more than 40% suffered mental distress (measured by SCL-90-R) and about 30% showed clinically significant posttraumatic stress symptoms (Marazziti et al., 2020).

Burnout, an important outcome of intense and continuous stress (Maslach and Leiter, 2016), was only rarely examined in the context of COVID-19 (Hartzband and Groopman, 2020; Wu et al., 2020). This study therefore addresses burnout among the reserve Israeli Home Front Command (hence HFC) medical staff in order to begin closing the gap in the literature.

While workload is a well-known contributing factor to burnout (Maslach and Leiter, 2016), sense of threat (hereinafter SOT) is another contributing factor which is more unique to crisis situations such as the COVID-19 pandemic. The experience of SOT was documented as related to direct exposure to COVID-19 (Chen and Zhao, 2020; Inchausti et al., 2020). Nevertheless, during the COVID-19 pandemic, indirect exposure, i.e. suspected exposure to the virus (Zhang et al., 2020a), and perceived loss of safety were also related to SOT (Huang et al., 2020; Pakpour and Griffiths, 2020; Van Bavel et al., 2020). SOT was associated with mental distress reactions such as insomnia, negative feelings of unhappiness and depression, and perceived severity of the COVID-19 (Li et al., 2020), and therefore may also be associated with burnout. Hence, the greater the exposure to COVID 19, the greater the SOT.

Most studies so far focused on risk factors for psychopathological outcomes. The current study adopts a different viewpoint based on the salutogenic theory of health (Antonovsky, 1987). This approach offers a paradigmatic shift from focusing on risk factors for illness to a search for protective factors and generalized resistance resources (hereinafter GRRs), which are ‘any characteristic of the person, the group, or the environment that

can facilitate effective tension management’ (Antonovsky, 1972, p. 99). The core concept of the salutogenic model related to GRRs is the ‘sense of coherence’ (hereinafter SOC). SOC is defined as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (i) the stimuli deriving from one’s internal and external environments in the course of living are structured, predictable, and explicable; (ii) the resources are available to one to meet the demands posed by these stimuli; and (iii) these demands are challenges, worthy of investment and engagement (Antonovsky, 1987, p. 19).

The three components in the definition of SOC refer to what Antonovsky (1987) termed *comprehensibility*, *manageability* and *meaningfulness*. These three components become relevant when it comes to high-functioning populations such as military personnel and health workers. This is especially true during a crisis which requires the conservation or strengthening of resistance resources, which may help to move toward psychological strengths and in turn enhance people’s sense of ability to cope with stressors (Antonovsky, 1996; Mittelmark and Bauer, 2017). Applied to the current context, it can be said that soldiers who *understand* their mission, feel they have the resources needed to *manage* their mission, and find *meaning* in their mission, will cope well with the demands and challenges that the COVID-19 pandemic has brought upon them.

Another characteristic of the person, which can facilitate effective tension management related to coping in times of crisis, is self-efficacy. Self-efficacy is a personal judgment of ‘how well one can execute courses of action required to deal with prospective situations.’ (Bandura, 1982, pp.122–147) People with high self-efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an outlook produces personal accomplishments and lowers vulnerability to depression (Bandura, 2010) and burnout (Collins, 2015).

On a conceptual level, SOC and self-efficacy share underlying principles and have areas of convergence (Posadzki and Glass, 2009). For example, Bandura’s assumptions regarding the positive effect of one’s belief about his or her ability to act (a behavioral component of self-efficacy) is analogical to one’s sense of manageability as an SOC component, while Bandura’s motivational–emotional component resembles the sense of meaningfulness in Antonovsky’s theory. Posadzki and Glass offered a conceptual synthesis of SOC and self-efficacy which can be useful in creating a combined model to help predicting, as well as affecting, health outcomes.

Empirical support for the usefulness of enhancing both SOC and self-efficacy in individuals as means toward health promotion was provided in a national Danish survey (Trap *et al.*, 2016). Further analysis of the relationship between SOC and self-efficacy was reported recently by Krok and Kleszczewska-Albańska, who found that SOC had a strong direct effect on psychological well-being but was also partially mediated by self-efficacy (Krok and Kleszczewska-Albańska, 2019).

Our focus on SOC and self-efficacy as salutary factors relies on their predictive ability toward subjective coping with crisis situations. SOC directs the individual to focus on active adaptation to challenging situations through the use of GRRs and specific resistance resources (hence SRRs) and thus to remain well even in a stressful milieu (Antonovsky, 1979, 1987). Thus, SOC is positively associated with coping with stressors (Antonovsky, 1979; Sethuraman, 2020). The three inter-related components of SOC (comprehensibility, manageability and meaningfulness) were found to be positively related to psychological adjustment, well-being and operational efficiency in military contexts (Antonovsky, *in press b*; Ohayon *et al.*, 2018) as well negatively related to burnout e.g. (Collins, 2015; Galletta *et al.*, 2019; Gilbar, 1998; Love *et al.*, 2011; Masanotti *et al.*, 2020). With the COVID-19 pandemic, medicine is at a crisis point. Healthcare professionals are caring for patients despite the risk of profound personal harm, in intensive work environments and with feelings of uncertainty about the duration of the crisis (Hartzband and Groopman, 2020). The current unique situation calls for examining whether or not previous findings can generalize to coping with the COVID-19 pandemic. There are preliminary, yet unpublished, findings from the Israeli military pointing to SOC and self-efficacy as positively related to well-being and negatively related to burnout among soldiers (O. Ohayon and A. Antonovsky, unpublished results, Department of Mental Health, Medical Corps, Israeli Defense Forces, 2020).

In the context of the COVID-19 pandemic, self-efficacy and SOC were inversely associated with levels of mental distress among healthcare workers from several provinces in China (Xiao *et al.*, 2020). There are also a few COVID-19-related publications on the psychological consequences of COVID-19 based explicitly on salutogenic theory [e.g. (R. Brauchli *et al.*, in preparation; S. Lischer *et al.*, in preparation; R. Maass *et al.*, submitted for publication; C. Meier Magistretti *et al.*, in preparation; S. Sagy and A. Mana, in preparation)]. Most of them showed that SOC predicted positive (e.g. adjustment, well-being) and less negative (e.g. anxiety, burnout, PTSD, suicidality) outcomes. Nonetheless, to the

best of our knowledge, the salutogenic theory has not yet been applied to the military context during the very unique conditions of the COVID-19 pandemic.

Over and above personality characteristics or orientations such as self-efficacy and SOC, there may be situational variables such as state anxiety, SOT and self-rated health (hereinafter SRH) that could also contribute to our understanding of burnout in the current context. Therefore, these situational variables were also examined as a second group of predictors in the current study.

On top of personality and situational variables, we chose to examine the role of two organizational–attitudinal variables, namely satisfaction with the way that the government and the military have been handling the COVID-19 crisis. As a major health crisis is several countries, ministries of health and finance are generally in charge of steps taken to reduce the negative impact of the pandemic on public health and economy. (G. Génereux *et al.*, submitted for publication) have pointed out the importance of understanding the information diffusion by authorities and its consequent psychosocial and behavioral changes in the context of large-scale outbreaks such as the COVID-19 pandemic.

In Israel, the crisis is managed by the Israeli Defense Forces (hereinafter IDF) as well. The steps taken by the government and the military (led by a HFC unit) have an impact on the population's behavior. The higher the public trust and evaluation of crisis management, the greater the compliance of the public with guidelines (Elran and Even, 2020; Gesser-Edelsburg *et al.*, 2020). Several publications following SARS pointed out the effect of people's trust in authorities' actions on their psychological stress levels see (Brooks *et al.*, 2020). But to the best of our knowledge, no empirical studies have examined the association between organizational variables (e.g. government or ministry of health actions) and military personnel well-being and burnout during COVID-19.

The context of the current study

Following the first case of COVID-19 in Israel, the HFC was assigned by the IDF to work with the Israeli Ministry of Health in order to aid and maintain functional continuousness of the Israeli health system (first and foremost—hospitals and medical emergency services). Among its assignments, HFC was to reinforce Magen David Adom (abbreviated as MDA), translated as 'Red Shield of David'; Israel's national emergency medical, disaster, ambulance and blood bank service, similar to the Red Cross, at its operational call center. The number of civilians' calls rose dramatically (at its peak, more than 80,000 calls a day registered in the call center, as opposed to a few hundred on any given day

before the outbreak). Alongside this assignment, HFC and other IDF units recruited reserve soldiers to aid civilians and medical institutions in many ways including supplying food and medical supplies, assisting the Israeli Police in reinforcing quarantine, and working in quarantine hotels and hospitals. Military aid to civilian populations is not unique to Israel e.g. (Capanna *et al.*, 2020; Dyner, 2020; Gentile *et al.*, 2020; Nicastrì *et al.*, 2020; Rasmussen and Koelling, 2020). Although there has been accumulating evidence for the contribution of SOC and self-efficacy to operational efficiency and to prevention of psychological distress in combat and combat support units (Antonovsky, *in press b*), we know of no such military studies among reserve soldiers who are torn out of civilian life and assigned to missions they haven't been trained for.

In sum, the purpose of the current study was to examine the role of protective factors for burnout related to COVID-19. Specifically, our main purpose was to examine the predictive capacity of personality variables (self-efficacy and SOC), situational variables (state anxiety, SRH and SOT) and organizational variables (satisfaction with the way the military and the government have handled the COVID-19 crisis) toward burnout among IDF reserve rescue soldiers during the COVID-19 pandemic. We hypothesized that self-efficacy, SOC, SRH and satisfaction with military and government would be positively associated with burnout, while state anxiety and SOT will be negatively associated with burnout.

METHODS

Participants, design, settings and procedures

Two hundred and fifty reserve medical professionals were recruited to aid at MDA's operational call center between 11 March and 2 April 2020. Toward the end of March, 81 of them were sent to quarantine, following exposure to COVID carriers. The remaining 169 reserve soldiers were asked to fill out a paper and pencil survey questionnaire. Of those, 116 (68.6%) agreed to participate, and completed the questionnaire during the first 2 weeks of April. Respondents were given an explanation about the purpose and the anonymity of the survey, which was approved by the Institutional Review Board of the IDF Medical Corps. The final sample included 82 men (71%) and 33 women (29%) (one participant did not indicate gender). The median age was 27.5, ranging from 22 to 48 years. The HFC's medical department started recruiting reserve medics following the first few days during the quarantine in Israel. HFC reserves medical soldiers and commanders are ordinarily trained for

Table 1: Distributions of participants' sociodemographic variables ($N=116^a$)

Variables	Total	
	<i>n</i>	%
Gender	Male	82 71
	Female	33 29
Religion	Jewish	108 95
	Other	6 5
Religiosity	Secular	91 81
	Traditional or religious	21 19
Country of birth	Israel	96 86
	Other	16 14
Socioeconomic status	Very low	2 2
	low	5 4
	Average	46 40
	high	50 44
Workplace sector	Very high	11 10
	Employee in the public sector	35 31
	Private sector employee	50 44
Education	Independent	6 5
	Other	22 19
	High school education	52 47
	Bachelor's degree	51 46
Marital status	Master's degree or above	7 6
	Single	60 53
	Married	54 47

^aPercentages were rounded to the closest integer, therefore two of them add up to 99%.

search-and-rescue missions but were now serving as telephone receptionists as needed during the quarantine time. The distributions of their socio-demographic variables are presented in Table 1.

Measures

In the current study, measurements included the following Hebrew-language validated questionnaires.

Dependent variable

Burnout was measured by a short version of the *Maslach Burnout Inventory (MBI)* (Maslach *et al.*, 1993). This 22-item questionnaire was designed to examine the intensity of burnout. The inventory is comprised of three subscales: (i) emotional exhaustion (EE, 9 items), manifested in fatigue, loss of energy and feelings of overload; (ii) depersonalization (DP, 5 items), manifested in negative attitudes or keeping one's distance; (iii) lack of personal accomplishment (LPA, 8 items), expressed in negative reactions to one's own sense of success and failure. The questionnaire factor

structure has been validated in several studies. e.g. (Leiter and Schaufeli, 1996; Poghosyan *et al.*, 2009). Leiter and Schaufeli reported that the internal consistency of each of the subscales is satisfactory, ranging from .70 to .90.

The MBI has been translated to Hebrew and adapted (and validated) for many uses in the educational and work environments. The scale's internal consistency was high, alpha circa .90 in most studies e.g. (Friedman, 1999). In order to prevent redundancy, and due to the length of the whole battery of questionnaires, we used 11 of the original items: 4 EE items, 3 DP items and 4 LPA items. This shortened version has been used in other studies in the IDF and has shown high content and construct validity. For example, this measure was highly correlated with measures of anxiety, SOC and job-related self-efficacy, in the same way that the full MBI was related to them in past studies. Participants responded on a 4-point Likert scale, ranging from 0 (never experienced in the past week) to 3 (often experienced in the past week). The total score was the sum of all item scores (after reverse-coding items 5, 7, 10, 11). Cronbach's alpha for the 11-item scale in the current study was .84.

Independent variables

Personality variables. General self-efficacy. This scale was designed to assess a general sense of self-efficacy, aiming to predict coping with daily hassles as well as adaptation after experiencing stressful life events (Schwarzer and Jerusalem, 1995). The original scale comprises 10 statements. In order to prevent redundancy, and due to the length of the whole battery of questionnaires, we used five items, which participants responded to on a 4-point Likert scale, ranging from 0 (doesn't describe me at all) to 3 (describes me very well). The use of a short version of the GSE (e.g. GSE-6) has proven efficient, and the 5-item scale we used is similar to the validated GSE-6 version see (Brünger and Spyra, 2018; Romppel *et al.*, 2013). Cronbach's alpha for the 5-item scale in the current study was .78 and its construct validity was supported by the associations found between GSE and other personality and situational variables, both in past studies in the IDF as well as in the current study, as reported later.

SOC. We used the short version (SOC-13) of the *Orientation to Life* questionnaire (Antonovsky, 1987). Ratings are done on a 7-point semantic-differential scale and the total SOC score is the sum of item scores (following reverse coding of five items). Higher scores reflect a stronger SOC (Antonovsky, 1987). There is an extensive body of literature on the questionnaire's test-

retest reliability, internal consistency and construct and predictive validity see (Eriksson and Mittelmark, 2017). In a review of 127 studies worldwide Cronbach's alpha ranged from .70 to .92 (Eriksson and Lindström, 2005). Cronbach's alpha in the current study was .82.

Situational variables. State anxiety was assessed by the State-Trait Anxiety Inventory (STAI). The STAI measures two types of anxiety: state anxiety (current anxiety level related to a specific situation or event) and trait anxiety (anxiety level as a personal characteristic). As this study has focused on reactive anxiety due to environmental and circumstantial factors, we used the state anxiety scale only, consisting of 20 items on a 4-point Likert scale, ranging from 0 (doesn't describe me at all) to 3 (describes me very well). The total score is the sum of item scores (following reverse coding of 10 items). Higher scores reflect a higher level of anxiety (Spielberger *et al.*, 1983). Cronbach's alpha for the state anxiety scale in the current study was .93.

SRH (Strawbridge and Wallhagen, 1999) is a simple, easy to administer measure of general health. SRH is typically measured as a single item, the most common wording of which is 'In general, would you say your health is' with the response options 'excellent', 'very good', 'good', 'fair' and 'poor'. Early studies using SRH involved assessing the relationships between SRH and sociodemographic status, physical health and psychosocial variables, because it is a valid and reliable measure among those without cognitive impairment (Bombak, 2013).

SOT (Chong *et al.*, 2004). The aim of the original questionnaire was to examine the SOT by exposure to SARS and working experiences. The questionnaire was adopted for this study in the context of COVID-19 and the workplace. It included items pertaining to the perception of respondents regarding chances that they, their family or their friends would be infected by the virus in their workplace (or due to their proximity to COVID patients). Responses were given with referral to the past week on a 4-point Likert scale ranging from 0 (never experienced) to 3 (often experienced). Cronbach's alpha for the scale in the current study was .77. The total score was the sum of item scores.

Organizational variables. Satisfaction with military and government actions was measured by two questions about the participants' satisfaction with the handling of the COVID-19 crisis by the military and the government, on a 10-point scale, from 1 (very dissatisfied) to 10 (very satisfied).

Control variables

Socio-demographic variables were measured as control variables. These included gender; religiosity level (secular/traditional/religious); country of birth (Israel/other); and socio-economic status (Likert scale ranging from very low [1] to very high [5]).

Data analysis

The Statistical Package for the Social Sciences (SPSS, version 20.0 for Windows) was used for all analyses. The level of statistical significance was set at $p = .05$. Analyses included: (i) descriptive analyses of the data, including mainly measures of central tendency, dispersion and Pearson correlations; (ii) inferential statistics (null-hypothesis significance testing), accompanied by measures of effect size; (iii) hierarchical multivariate linear regression analysis for predicting burnout.

RESULTS

Among the control variables, gender was the only one that was related to other variables. Therefore, it is the single control variable for which we present a comparison between other variables (see Table 2) and include in the regression analysis described later.

As can be seen in Table 2, females reported greater state anxiety and burnout than males. Females also showed less satisfaction with the military's and government's handling of the COVID-19 crisis compared to males. Looking at personality characteristics, females scored moderately higher than men on the general self-efficacy scale. These findings had an effect size of 0.40 or above and all but the last were statistically significant.

There were no substantial or statistically significant gender differences in SOC, SRH or SOT.

To examine the relationships between the studied variables, Pearson correlations were computed, and are presented in Table 3, along with possible score range, means, medians and standard deviations. Compared to the possible range of scores, median scores were in the moderate to high range for self-efficacy, SOC and satisfaction with military and government, and in the low range for state anxiety, SOT and burnout. SRH was very high. The SOC scores in this sample (median age 27.5) are similar to the average SOC score of 63 found in several samples (ca. 4000 participants) of Israeli young adults e.g., a sample of 843 people measured in the context of living close to the Gaza border in a period of missile attacks; see (Braun-Lewensohn and Mosseri-Rubin, 2014). In addition, participants expressed a greater satisfaction with the military handling of the COVID-19 crisis, compared to their satisfaction with the government. This difference was moderate in its magnitude, and was statistically significant: $t(112) = 5.70, p < .001; d = 0.54$.

The pattern of correlations between variables presented in Table 3 reveals positive intercorrelations between general self-efficacy and SOC, as well as between state anxiety, SOT and burnout. The two general personality variables (general self-efficacy and SOC) were associated with all situational variables. Satisfaction with the military and the government were positively correlated with one another, and both were negatively correlated with state anxiety and burnout.

To estimate the predictive power of the variables toward burnout, hierarchical multivariate linear regression analysis was conducted. The outcome of this analysis

Table 2: Gender differences in the study's variables

Variables	Variables	Gender							
		Male ($n = 82$)		Female ($n = 33$)		t	p	d	r
		Mean	SD	Mean	SD				
Burnout		12.98	6.06	16.00	6.60	-2.36	.020	-0.48	.21
Personality	General self-efficacy	11.40	2.81	12.33	1.81	-1.76	.081	-0.40	.17
	Sense of coherence	62.32	12.30	61.45	10.69	0.35	.725	0.08	-.03
Situational	State anxiety	18.85	10.57	26.15	13.09	-3.11	.002	-0.62	.28
	Sense of threat	10.07	5.20	10.48	5.12	0.39	.700	-0.08	.03
	Self-rated health	4.63	0.55	4.70	0.52	-0.59	.554	-0.13	.06
Organizational ^a	Satisfaction with military	7.21	1.87	6.38	2.09	2.07	.041	0.42	.19
	Satisfaction with government	6.06	2.36	4.97	2.44	2.22	.029	0.45	.20

^aSatisfaction with the military's/government's handling of the COVID-19 crisis; effect size (d) values of 0.20, 0.50, 0.80 are considered weak, moderate and strong, respectively (Cohen, 1988).

Table 3: Pearson correlations between study variables

	Burnout	Self- efficacy	SOC	State anxiety	SOT	SRH	Attitude toward military	Attitude toward government
Self-efficacy	-.36**							
Sense of coherence	-.48**	.47**						
State anxiety	.72**	-.41**	-.45**					
Sense of threat	.40**	-.29**	-.23*	.41**				
Self-rated health	-.19*	.22*	.31**	-.19*	.04			
Satisfaction with military	-.40**	.17	.16	-.48**	-.28**	.10		
Satisfaction with government	-.35**	.05	.18	-.39**	-.12	.13	.53**	
Range	0-33	0-15	13-91	0-60	0-27	1-5	1-10	1-10
Mean	13.83	11.65	61.91	20.91	10.16	4.65	6.94	5.75
SD	6.32	2.59	11.89	11.74	5.15	0.55	1.99	2.42
Median	13	12	62.5	19	9	5	7.0	6.0

Note. Correlation coefficients of .10, .30, .50 express a weak, moderate and strong relationship, respectively (Cohen, 1988). For the current sample size, correlation values higher than 0.18 and 0.23 are statistically significant at the significance levels of .05 (*) and .01 (**), respectively.

Table 4: Hierarchical multivariate linear regression analysis for predicting burnout

Variables		B	Beta	LB	UB	Part. corr.	F	R ²	p
Block 1:	Intercept	16.097		13.941	18.252		5.22	.044	.001
Control	Gender	-2.847	-.211	-5.404	-289	-.211	ΔR^2	.044	.029
Block 2:	Intercept	35.275		29.237	41.314		17.27	.331	.001
Personality	Gender	-3.209	-.237	-5.413	-1.006	-.274			.005
	Self-efficacy	-.645	-.256	-1.122	-.169	-.256	ΔR^2	.287	.008
	SOC	-.183	-.359	-.278	-.088	-.352			.001
Block 3:	Intercept	13.271		3.867	22.675		24.987	.589	.006
Situational	Gender	-.603	-.045	-2.480	1.274	-.041			.526
	Self-efficacy	-.059	-.023	-.470	.353	-.018			.778
	SOC	-.092	-.180	-.173	-.010	-.143			.028
	State Anxiety	.319	.617	.230	.407	.458	ΔR^2	.302	.001
	Self-rated health	.058	.005	-1.467	1.583	.005			.940
	Sense of threat	.066	.054	-.112	.244	.047			.465
Block 4:	Intercept	15.861		5.354	26.368		17.932	.594	.003
Organizational	Gender	-.557	-.041	-2.444	1.329	-.038			.559
	Self-efficacy	-.075	-.030	-.490	.339	-.023			.719
	SOC	-.097	-.189	-.179	-.014	-.149			.022
	State anxiety	.296	.574	.199	.394	.389			.001
	Self-rated health	.136	.012	-1.404	1.676	.011			.861
	Sense of threat	.052	.042	-.130	.233	.036			.574
	Satisfaction with military	-.242	-.077	-.772	.287	-.058	ΔR^2	.292	.366
	Satisfaction with government	-.036	-.014	-.439	.367	-.011			.859

Note. Computed using alpha = .05.

takes into account the interdependence among predictor variables (their multicollinearity) and the partial correlations between them and the outcome variable, i.e. in this case, the correlation between each predictor variable and burnout while controlling for the effects of all other variables on burnout. Predictor variables were entered into the model in four blocks: (i) gender as a control

variable; (ii) personality variables (self-efficacy and SOC); (iii) situational variables (state anxiety, SRH and SOT); (iv) organizational variables (satisfaction with the military and government handling of the crisis). The resulting regression model is presented in Table 4.

Table 4 shows that in the first block, gender explained 4.4% of the variance with burnout ($p =$

.029). In the second block, the personality variables (self-efficacy and SOC) were added to the analysis and contributed 28.7% to the shared variance. Specifically, a statistically significant association was found for self-efficacy ($p = .008$) and SOC ($p < .001$). The negative B coefficients indicate that people's feelings of self-efficacy and SOC are inversely related to their burnout experience. The third block incorporated situational variables (state anxiety, SRH and SOT). At this stage, only SOC ($p = .028$) and state anxiety ($p < .001$) had a statistically significant association with burnout, with a negative B for SOC and a positive B for state anxiety; this indicates that the higher the level of people's state anxiety, the stronger their burnout experience is. In the fourth and final block, we added organizational variables (satisfaction with the military and government). However, state anxiety and SOC remained the only variables with a statistically significant association with burnout. The entire model reached 59.4% of the shared variance in the regression, and the variance inflation factor (VIF, indicating multicollinearity) was very low (below 2.2 for all variables). Overall, the regression analysis indicated that state anxiety and SOC are the variables with the strongest predictive power toward burnout.

DISCUSSION

The novelty of the present study, based on the salutogenic model of health (Antonovsky, 1979, 1987), was its examination of personality, situational and organizational predictors of burnout among IDF medical staff during the COVID-19 pandemic. The current research question was whether personality variables (self-efficacy and SOC), situational variables (state-anxiety, SRH and SOT) and organizational variables (satisfaction with the military's and government's handling of the COVID-19 crisis) will predict burnout.

In general, our findings indicated that SOC and state anxiety were the only statistically significant predictors of burnout after controlling for sociodemographic variables and the other independent variables. These findings partially supported our hypotheses and warrant an explanation.

Regarding control variables, gender was the only variable that was associated with other study variables. Specifically, females scored higher than males in state anxiety and burnout. These findings coincide with evidence in the literature regarding gender differences in the mental reactions to COVID-19 [e.g. (Schiff *et al.*, 2020), who found that Israeli and Ukrainian female students showed more COVID-19-related concern, such as worry for family and own health and financial status].

In several studies it was found that females reported more mental distress such as PTSS, anxiety and depression symptoms than males (Liu *et al.*, 2020; Mazza *et al.*, 2020; Qiu *et al.*, 2020; Özdin and Bayrak Özdin, 2020; Wang *et al.*, 2020). Similarly, female healthcare workers experienced more mental distress than males (Huang, Han, *et al.*, 2020; Zhang *et al.*, 2020b) and higher anxiety rates compared to males (Cai *et al.*, 2020).

Another gender difference found among healthcare workers was that factors of reducing stress, such as strict infection control guidelines by the government, had a larger impact on females than on males (Cai *et al.*, 2020). Moreover, other studies pointed out that women tend to comply with restraining public policy measures more than men (Galasso *et al.*, 2020) and show greater support for the government's crisis management than men (Coninck *et al.*, 2020). However, in our study women showed more anxiety than men, but also less satisfaction with the military's and government's handling of the COVID-19 crisis (although in general both men and women were more satisfied with the military's handling of the crisis compared to that of the government). One possible explanation for this is that at least at the time of data collection, early in the crisis, there was a strong feeling of uncertainty, and the government—followed by the military—did not really have a clear policy or management plan which could be followed.

Women's greater fear of an economic crisis compared to men (as reported by Coninck *et al.*, 2020) could lead to less satisfaction than men with government's and military's (lack of) systematic plan to combat the pandemic. Support for this explanation is found in a study done in Belgium (Coninck *et al.*, 2020). The researchers found that women showed a stronger general belief than men that public health measures protect the population, but at the same time were more critical toward the Belgian government's handling of the crisis. Thus, the positive relationship between public trust in crisis management and compliance with guidelines (Elran and Even, 2020; Gesser-Edelsburg *et al.*, 2020) may be true on condition that there are a systematic (versus chaotic) management plan and clear (versus contradicting) guidelines, which could have been lacking at least for the reserve soldiers, called from their homes to help in an emergency situation they had never been trained for.

One way or another, for both males and females, satisfaction with military and government handling of the crisis did not strongly predict burnout. While the entire research model explained 59.4% of the variance in

burnout, only SOC and state anxiety had a statistically significant association with burnout.

Based on salutogenic theory, SOC is associated with active adaptation through the use of GRRs and SRRs to remain well even in a stressful milieu (Antonovsky, 1979, 1987). A strong SOC promotes coping with stressors like crises and diseases (Antonovsky, 1979; Sethuraman, 2020).

In the context of the COVID-19 pandemic, as expected, it was found in several studies that SOC is inversely associated with levels of mental distress among healthcare workers e.g. (Xiao *et al.*, 2020). There are also a few COVID-19-related publications on the psychological consequences of COVID-19 based explicitly on salutogenic theory that show that SOC was positively related to positive emotion and behavior such as adjustment and well-being, and negatively related to symptoms of anxiety, burnout, PTSD and suicidality (R. Brauchli *et al.*, in preparation; S. Lischer *et al.*, in preparation; R. Maass *et al.*, submitted for publication; C. Meier *et al.*, in preparation; S. Sagy and A. Mana, in preparation).

The HFC aims to prepare the population for emergencies. The unit performs search-and-rescue missions in Israel and worldwide, aiding in rescue and recovery from terror attacks, floods, conflagrations, earthquakes and more. During peacetime, the team is recruited for military training days. This training may strengthen the ability to save lives, to assess and foresee the challenges (comprehensibility), to perceive the availability of resources to cope with the challenges (manageability) and to find it worthwhile and motivating to deal with the challenges (meaningfulness). As we mentioned above, these components of SOC were found as good predictors of adjustment, well-being and operational efficiency in military contexts (Antonovsky, in press b; Ohayon *et al.*, 2018).

However, the current situation was new for the HFC reserve soldiers. They needed to function in an unknown, at times unpredicted, environment, carrying out missions they had not been trained for. As SOC is developed through past experiences of consistency, overload-underload balance and participation in meaningful social action (Antonovsky, 1987), it was of interest and importance to examine how those may generalize to an unfamiliar arena and provide military personnel with the mental fitness needed to withstand the stressors they were facing.

Past studies among healthcare workers have also found strong relationships between state anxiety and burnout e.g. (Jocic and Krajnovic, 2014; Turnispeed, 1998). Future research could benefit from studying the

relationship between *trait* anxiety (as a personality variable) and burnout, in light of some findings linking the two e.g. (Turnispeed, 1998).

Moreover, there is evidence of the negative relationship between SOC and anxiety in general, and in this study, as well, there was such an association between SOC and state anxiety. Nonetheless, the regression analysis pointed to the independent association of these two variables with burnout. For several years, SOC has been known as a strong predictor of burnout in general, and in healthcare occupations specifically e.g. (Gilbar, 1998; Levert *et al.*, 2000; Tselebis *et al.*, 2001; Van der Colff and Rothmann, 2009). Thus, our findings may serve to strengthen the ecological validity of psychological models linking between SOC and state anxiety, on the one hand, and burnout, on the other.

One of the positive outcomes of SOC, therefore, seems to be the ability to cope with stressful events and reduce burnout, as well as other psychopathological outcomes. For example, in a recent large-scale survey done in eight countries (Canada, the United States, England, Switzerland, Belgium, Hong Kong, the Philippines and New Zealand, $N=8,806$), SOC was found to predict COVID-19-related anxiety and major depression (M. Généreux *et al.*, submitted for publication). Généreux *et al.* reported that such outcomes were predicted better by SOC than by isolation, level of trust in authorities, financial loss and several other variables. They concluded that the most important finding emerging from their study was ‘precisely the key role that the SOC plays in predicting common psychopathological symptoms in the face of adversity’ (p. 17). They added that ‘SOC appears to be a very important, and apparently underestimated, resource in minimizing the psychosocial impacts of the pandemic’ (p. 17).

Our findings support the importance and relevance of the salutogenic model of health (Antonovsky, 1979, 1987) in which SOC is the core construct, in the study of coping with stressful situations.

Finally, unexpectedly, the regression analysis revealed that self-efficacy and the organizational variables (satisfaction with military and government handling of the COVID-19 crisis) were not good predictors of burnout. There are a few possible explanations for these findings.

As expected, self-efficacy was negatively related to state anxiety. Based on salutogenic theory, a person who feels unable to carry out the mission may experience a set of negative emotions that may be manifested in state anxiety (versus trait anxiety or disorder). Given this, and the predictive power of state anxiety toward burnout, it may be that self-efficacy didn’t have much to add

in prediction. This makes sense if we examine the concepts of self-efficacy and state anxiety more closely. While self-efficacy is mainly a *cognitive* assessment of one's self (i.e. thoughts and beliefs), state anxiety is mainly an *emotional* response, and so is burnout, especially its emotional exhaustion component. Therefore, while self-efficacy is correlated with burnout, it loses from its predictive power when state anxiety is involved.

Furthermore, self-efficacy, as a personality variable, is concerned mainly with intra-psychic processes of self-reflection and self-awareness (Posadzki and Glass, 2009). The role of social support, underload–overload balance and feelings of contribution to society—which are crucial for the development of a strong SOC and may also be major determinants of burnout—are absent, at least as major factors, in the conceptualization of self-efficacy. Perhaps, when examining burnout in the specific context of our study, self-efficacy—while related to SOC—has no direct effect on burnout. Our data support this explanation: while zero-order (regular Pearson) correlations between SOC, self-efficacy and burnout are all moderate to strong, the partial correlation between self-efficacy and burnout controlling for SOC drops significantly, and when controlled for state anxiety as well—it drops to practically zero. Further studies may shed light on the contexts in which a conceptual synthesis of SOC and self-efficacy, as proposed by Posadzki and Glass, would be empirically applicable.

As for the organizational variables—in our study, participants expressed greater satisfaction with the way the military was handling the COVID-19 crisis compared to their satisfaction with the government. This difference was moderate in its magnitude, yet statistically significant. Additionally, 81 of the participants filled out the questionnaire 2 weeks through quarantine; the remaining 169 filled out the questionnaire 4 weeks through quarantine. This period may be too short for being sensitive to organizational variables as predictors.

Limitations

This study has two noticeable limitations. The first is the sample size. After recruiting 250 participants, about a third of them were not able to participate because they were sent to quarantine, and only two-thirds of the remaining soldiers returned full questionnaires. Yet, these 116 reserve soldiers constitute a large and representative part of reserve personnel in the HFC reserve unit. In the current study, questionnaires were administered by paper and pencil, thus it was not possible to collect data from the quarantined. At the time of writing, the COVID-19 pandemic is still present; thus, in future

similar studies, it is suggested to collect data online and include those who have been sent to quarantine.

The second limitation of the study is its cross-sectional design. Data were collected at one point in time, thus limiting the establishment of causal relationships. Therefore, although SOC has been found as a good predictor of burnout in previous longitudinal studies cited above, and although SOC is a fairly stable orientation to life while burnout is more of a situational construct, in the current study it may be presumptuous to interpret SOC as a causal factor influencing burnout.

Still, to the best of the authors' knowledge, this is the first study investigating symptomatology and protective factors in medical staffs, during the COVID-19 pandemic among military reserve personnel. Our focus on protective personality factors offers a paradigmatic shift from concentrating on risk factors for illness to a search for GRRs. Such resources are social support and team cohesion, which were found to be important in soldiers' well-being (Antonovsky, *in press b*). This paradigm can be used as a model for exploring other unique military populations and first aid teams. Some steps in this direction, involving military first responders, have already been taken by the mental fitness branch in the department of health and well-being of the IDF (Antonovsky, *in press a*).

Practical implications and recommendations

The study described here bears evidence of the importance of psychosocial factors in the context of military operational efficiency and soldiers' mental well-being. The general level of burnout in our sample was not high; still, burnout is known for its negative effect on personal and organizational competence and productivity. Therefore, measures should be taken to diminish workers' burnout. Some such measures could be training by simulation and psychoeducation. Another measure, mostly relevant to the context of reserve soldiers in an unknown emergency, is having available resources—such as mental health officers—which could alleviate feelings of anxiety. In terms of SOC, simulation training, psychoeducation and mental support are resources that increase the sense of manageability. Emphasizing the importance of reducing uncertainty and providing as much relevant information as possible in the chaotic context of crisis intervention will enhance the sense of comprehensibility. Finally, stressing the importance of their work for the community they are serving, and their contribution to the battle against the COVID-19 pandemic, may raise the reserve soldiers' motivation and meaningfulness. All these actions taken together, accompanied

by commanders' awareness of the importance of consistency, load balance, and participation in decision-making, have the potential of strengthening SOC, thus reducing the chances of burnout. At both the individual and the unit levels, taking these measures can contribute to operational continuity in serving the population in its combat with COVID-19.

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