



Psychological immune competency predicts burnout syndrome among the high-risk healthcare staff: A cross-sectional study

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ARTICLE INFO

Keyword:

Burnout syndrome
Emergency care
Intensive care
Nursing
Prevention
Psychological immune competency
Surgery

ABSTRACT

Background: Burnout and psychological immune competency have not been investigated together among employees of high-risk specializations such as emergency medicine, intensive care or surgery.

Aim: In this study we aim to examine the prevalence of burnout among high-risk clinical staff and explore whether the strength of psychological immune competency predict burnout.

Design: A cross-sectional design utilizing a self-administrated questionnaire was used to collect data from the participants (n = 216). Nurses (n = 145) and physicians (n = 71) from emergency medicine, intensive care and surgery departments participated in the study.

Method: Burnout syndrome was measured using the Maslach Burnout Inventory, while psychological immune competency was measured using the Psychological Immune Competency Questionnaire. The data collection started in June of 2018 and was finished in March of 2019.

Results: Participants with higher psychological immune competency reported lower levels of burnout: emotional exhaustion (r = -0.478; p < 0.001), depersonalization (r = -0.459; p < 0.001) and personal accomplishment (r = 0.543; p < 0.001). Multiple linear stepwise regression analysis revealed the psychological immune competency to be a stable predictor of burnout on all three scales.

Conclusion: Psychological immune competency shows a strong relationship with scales of burnout syndrome and as such should be further examined due to development of successful intervention and prevention programs.

1. Introduction

Burnout is a syndrome of emotional, mental and cognitive exhaustion. It is an important consequence of workplace stress and as such it is receiving increased attention [1,2]. The 11th revision of the International Classification of Diseases, published in 2019 by the World Health Organization, includes burnout syndrome as an occupational phenomenon in the chapter on factors influencing health status or contact with health services. According to the ICD-11, burnout syndrome is a phenomenon interpretable in the occupational context, which occurs as a result of chronic workplace stress coupled with unsuccessful stress-management. It is characterized by three dimensions: feelings of energy depletion or exhaustion; increased mental distance, feelings of negativism or cynicism related to one's job; and reduced professional efficacy [3].

According to the work of Christina Maslach, burnout syndrome is defined by three dimensions: emotional exhaustion, depersonalization, and a sense of inefficacy, decrease in personal accomplishment [4,5]. Emotional exhaustion is the most important indicator of personal burnout, characterized by depletion of psychological and emotional resources, negative attitudes towards work and life, fatigue, loss of energy, resistance to work and feeling of purposelessness [6]. Depersonalization is a social component, defined by cynicism and impersonal attitude in relationships with patients associated with negative emotions. Personal accomplishment dimension describes the relationship between a person and their work, one's assessment of their own work performance [5,7].

The prevalence of burnout syndrome among the helping professions (such as teachers or clinical staff) seems to be higher than among other occupations [5,8,9]. The long working hours, delay in positive feedback,

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<https://doi.org/10.1016/j.ienj.2021.101114>

Received 18 October 2020; Received in revised form 3 November 2021; Accepted 16 November 2021

Available online 23 December 2021

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difficulty in maintaining work-life balance, emotionally stressful patient relationships in a constantly changing healthcare environment all contribute to increased burnout levels among the medical professionals [8,10,11]. The occurrence of burnout syndrome among healthcare workers is significantly higher in some specializations, such as surgery, emergency medicine, intensive care, traumatology or general physician practice [5,7,10,12]. Stronger psychological immune competency might be of paramount importance for clinical professionals working in these fields. The psychological immune competency is an integration of different coping skills for adequate adaptation and stress-management [13], and it has been previously reported that general practitioners with higher psychological immune competency show lower levels of burnout [14].

2. Background

In the field of emergency medicine, intensive therapy and surgery the clinical staff is facing high expectations in terms of professional responsibilities, however they have only limited control and authority over their work. Caring for patients in critical conditions, performing various medical procedures with absolute precision, responding accurately and quickly to extremely urgent situations are all daily tasks for nurses and physicians in these medical fields [15].

Such organizational characteristics, in accordance with Robert Karasek's job demand-control model, provide perfect conditions for burnout [16]. Exhausting pressure and duties coupled with limited control over job circumstances present a breeding ground for high levels of work-related stress. For healthcare professionals in the above-mentioned fields the excessive workload [17,18], the time pressure and task complexity, the intensive use of sophisticated technology all contribute to work-related stress, while the level of control and authority (development of new skillsets, influence over workflows, decision-making power) in many cases stays low [15,16,18]. In past decades burnout research has identified a plethora of organizational risk factors, which are represented in six domains, namely: workload, control, reward, fairness, community and values [18,19]. First two areas are reflected in the previously discussed demand-control model of job stress. Insufficient recognition and reward devalue the work and the workers and is closely associated with feelings of inefficacy. Fairness is the extent to which decisions at work are perceived as being fair and equitable, while the area of community has to do with the quality of workplace relationships. Finally, the area of values is the alignment of personal and organizational values, ideals and motivations that originally attracted people to their job [18,19]. Among healthcare professionals working in critical care several organizational risk factors have been identified, such as excessive workload and job strain [20], lack of manager support [21,22], work-life and effort-reward imbalance [23] or burdensome working conditions for instance understaffing [24] or shift work [25] all of which increase workplace stress and contribute to demoralization and development of burnout.

In present study we attempt to understand how personality traits, specifically the strength of psychological immune competency affect burnout, while acknowledging that there are several organizational and situational factors that have not been the focus of this research. In order to better understand the interactional nature of coping mechanisms manifesting during successful adaptation, Oláh has conceptualized and operationalized the construct of psychological immune system as a pool of psychological adaptive resources providing protection against the ill effects of stress [13]. The psychological immune competency incorporates coping strategies, protective personality resources, and dimensions of resilience such as control capacity, learned resourcefulness, constructive thinking, hardiness, dispositional optimism, ego resiliency, and emotional intelligence. It combines 16 protective personality traits (namely, positive thinking, sense of control, sense of coherence, creative self-concept, sense of self-growth, challenge orientation, social monitoring capacity, problem-solving capacity, self-efficacy, social

mobilizing capacity, social creating capacity, synchronicity, goal orientation, impulse control, emotional control, irritability control) into a specific protective apparatus granting a certain immunity when faced with "psychological pathogens" such as stress, trauma or their negative outcomes [14].

The psychological immune competency integrates different coping skills into a multidimensional complex network providing capabilities of successful adaptation, strengthening invulnerability and raising the coping capacity of individuals [26,27]. It monitors situations, mobilizes resources, designs and executes adaptive pathways, furthermore it ensures the integrated functioning of the personality and facilitates development and self-growth. The psychological immune competency has been reported to have a strong correlation with well-being and life-satisfaction dimensions, for example: environmental mastery, purpose in life, personal growth, self-acceptance, positive relations, and autonomy [28]. Personality's protective qualities, such as sense of coherence, sense of self-growth, synchronicity, impulse control, emotional control, and irritability control, have a strong relationship with mental and physical health, and those, who have higher levels of immunity on these scales show less signs of burnout on all three scales [13,14,28,29]. The coping strategies of psychological immune system, such as positive thinking, sense of control, sense of coherence, and sense of self-growth play a mediating role in psychological adjustment and mental health in cases of acute psychopathology [28,30].

Even though the Central European region is underrepresented in burnout research, there have been some studies on burnout syndrome executed on Hungarian samples [6,31–33], which partially mapped out the occurrence, background factors and risk factors of burnout syndrome among general practitioners, medical students or female physicians [7,31,34]. These studies confirm the relationship between work stress, physical and emotional burden and burnout, and define the emotional exhaustion, depersonalization, depletion of performance, poor relationship with colleagues and lack of communication to be key factors contributing to higher levels of burnout [6,31–33]. There is so far no data on relationship between the psychological immune competency and burnout syndrome among employees of emergency departments, intensive care units or surgery departments, which is particularly important, as these healthcare professionals are working in high-stress environments.

Aim: The aim of this study is to assess the prevalence of burnout syndrome among critical care professionals in three organizations of University Hospital and to understand the role psychological immunity plays in development of burnout. This is the first study in Hungary, to our knowledge, targeting these high-risk specializations.

3. Methods

3.1. Participants

A sample of the working age population was recruited from three different organizations: Department of Emergency Medicine, Department of Surgery and Department of Anaesthesiology and Intensive Care at the University of Szeged, Hungary. In each organization the distribution of the questionnaires was organized by one contact person, who was previously trained in providing clear and comprehensive verbal instructions to the participants. Participants were informed verbally and in writing, that participation in the study is voluntary and anonym. The questionnaires and the statements of consent were separate documents and were collected independently from one another, so the anonymity stayed guarded. A total of 400 questionnaires were distributed, and 222 were returned by the specified deadline, amounting to a response rate of 56%. 6 participants were excluded due to incomplete burnout inventory. The final sample consisted of 216 physicians and nurses.

3.2. Data collection

Data was collected using a test battery consisting of socio-demographic questions, Maslach Burnout Inventory and Psychological Immune Competency Questionnaire. Burnout syndrome was measured by the 22-item Hungarian version of the Maslach Burnout Inventory [9,35]. When evaluating the Maslach Burnout Inventory, higher scores on the emotional exhaustion and depersonalization scales indicate a stronger burnout level, whereas the personal accomplishment scale is to be interpreted in the opposite direction, so a lower score means higher burnout [36]. The Psychological Immune Competency Questionnaire was used to assess the psychological immunity, an 80-item, 16-factor (positive thinking, sense of control, sense of coherence, creative self-concept, sense of self-growth, challenge orientation, social monitoring capacity, problem-solving capacity, self-efficacy, social mobilizing capacity, social creating capacity, synchronicity, goal orientation, impulse control, emotional control, irritability control) inquiry [13]. The responses are made on a 4-point scale ranging from (1) completely does not describe me to (4) completely describes me. The higher the scores the stronger and more active the psychological immune system when confronting stress. The Cronbach Alpha ranged from 0.62 to 0.80 and the retest reliability ranged from 0.77 to 0.89 for all the sixteen scales. The test battery took approximately 15–20 min to complete and was completed in paper form during work time. The data collection started in June of 2018 and was finished in March of 2019.

The study was conducted with the permission of the Regional Medical and Research Ethics Committee of the University of Szeged (approval No.: 237/2018-SZTE).

3.3. Data analysis

Since the data was not normally distributed we examined the differences in means using Kruskal-Wallis test (KW test) and Mann-Whitney *U* test (MW *U* test). Spearman correlation, was used to map out the relationship between the scales of burnout (emotional exhaustion, depersonalization, personal accomplishment) and the psychological immune system. Multiple stepwise linear regression analysis was conducted to explore the factors affecting the scales of burnout. Statistical analysis was performed with the SPSS 23.0 (IBM Corporation, USA), and significance level was defined at $p < 0.05$.

4. Results

4.1. Sample

In total, 65 employees of the Department of Emergency Medicine (DEM), 71 of the Department of Surgery (DS) and 80 of the Department of Anaesthesiology and Intensive Therapy (DAIT) took part in the survey. The sample consisted of 71 doctors and 145 nurses. The participants were between 23 and 69 years of age, (*Mdn* = 40; *IQR* = 31–48). 26% of the sample was male ($n = 57$), while 73% of participants ($n = 157$) were female.

63% of the participants are in a relationship, while 36% are single, divorced or widowed. 34% of the participants have university degree, 18% have advanced qualifications, 17% have high-school education, while 16% have a diploma from a vocational school. 43% of the participants don't have children, while 57% have children ranging from one child to five.

4.2. Burnout results

78% of the sample shows at least moderate burnout on at least one of the three scales. 66% of the sample shows at least moderate emotional exhaustion, 47% moderate depersonalization, while 50% of participants admit to at least moderate decline in personal accomplishment.

The median on emotional exhaustion scale was 23 points (*IQR* =

14–32), on depersonalization scale 6 points (*IQR* = 2–12), while on personal accomplishment scale 38 points (*IQR* = 44–31). All three results fall into moderate category. Doctors ($n = 71$) show higher levels of emotional exhaustion (*Mdn* = 25.5; *IQR* = 16–35), higher depersonalization (*Mdn* = 9; *IQR* = 4–13), and no difference in decline in personal accomplishment (*Mdn* = 38; *IQR* = 44–33.75) compared to nurses ($n = 145$) who report lower levels of emotional exhaustion (*Mdn* = 22; *IQR* = 13–30) and depersonalization (*Mdn* = 5; *IQR* = 2–11) and average decline (*Mdn* = 38; *IQR* = 43–30) on personal accomplishment scale. The difference in emotional exhaustion ($p = 0.046$) and depersonalization ($p = 0.007$) results reached by the doctors and nurses is statistically significant, while the difference in personal accomplishment ($p = 0.255$) is not (Table 1).

Results of Kruskal-Wallis test found significant differences between the three departments in all cases: emotional exhaustion ($p = 0.018$), depersonalization ($p = 0.001$), personal accomplishment ($p = 0.001$).

4.3. Burnout and psychological immune competency

Comparing the strength of psychological immune system between subjects who are at least moderately burnt out on at least one of the scales to their colleagues who are not, we find the difference to be significant (MW *U* test, $p < 0.001$). The correlation between the scores reached on the Maslach Burnout Inventory and the total value of psychological immune system is significant on the scale of emotional exhaustion ($r = -0.478$; $p < 0.001$), depersonalization ($r = -0.459$; $p < 0.001$) and personal accomplishment ($r = 0.543$; $p < 0.001$).

The scales of the psychological immune competency almost in all cases correlate with all three scales of burnout (Table 2).

Between the three subsamples we found significant difference in results on the following scales: Positive Thinking (KW test, $p = 0.024$), Sense of Self-Growth (KW test, $p = 0.01$), Synchronicity (KW test, $p = 0.01$), Impulse Control (KW test, $p = 0.021$) and Emotional Control (KW test, $p = 0.5$). In all cases the lowest scores on these scales were recorded at the Department of Anaesthesiology and Intensive Therapy, who also presented with the highest scores of burnout (Table 3).

4.4. Factors for predicting the level of burnout

In order to identify which significant variables predict the levels of burnout, multiple regression was employed. Five variables (age, number of children, level of education, marital status and strength of psychological immune competency) were entered into the regression equation using the stepwise solution. The best predictor of emotional exhaustion is psychological immune competency, followed by the level of education and the number of children (adjusted $R^2 = 0.341$). The best predictor of depersonalization (adjusted $R^2 = 0.312$) is also the strength of psychological immune competency, followed by the number of children and level of education, while the personal accomplishment (adjusted $R^2 = 0.347$) is best predicted by the strength of psychological immune competency and age (Table 4). Marital status was not a significant predictor of burnout in any case.

5. Discussion

The prevalence of burnout in current study is higher, than previously reported in general sample of the Hungarian healthcare professionals [32]. Participants exhibit moderate burnout on all three scales, although the depersonalization results seem to be on the border between moderate and low. Similarly, moderate burnout has been reported among Croatian and Romanian ICU colleagues [1,37]. Even though previous findings suggest some variables which may influence the level of burnout like improvements in working conditions, better work-life balance [32], higher levels of autonomy or more focus on quality relationships [22], the exact nature of the connection between all these factors and burnout remain unclear without comparative studies.

Table 1
Summary of Burnout results.

		Median and IQR	Doctors	Nurses	DEM	DS	DAIT
Burnout	Emotional exhaustion	Mdn = 23 IQR = 14–32	Mdn = 25.5 IQR = 16–35 MW <i>U</i> test <i>p</i> = 0.046*	Mdn = 22 IQR = 13–30	Mdn = 21 IQR = 13–31 KW test <i>p</i> = 0,018*	Mdn = 20 IQR = 11.5–28	Mdn = 26 IQR = 16–35.75
	Depersonalization	Mdn = 6 IQR = 2–12	Mdn = 9 IQR = 4–13 MW <i>U</i> test <i>p</i> = 0.007**	Mdn = 5 IQR = 2–11	Mdn = 7 IQR = 3–13 KW test <i>p</i> = 0.001**	Mdn = 4 IQR = 1.75–7	Mdn = 8 IQR = 4–14
	Personal accomplishment	Mdn = 38 IQR = 44–31	Mdn = 38 IQR = 44–33.75 MW <i>U</i> test <i>p</i> = 0.255	Mdn = 38 IQR = 43–30	Mdn = 37 IQR = 42–31 KW test <i>p</i> = 0.001**	Mdn = 42.5 IQR = 45–34	Mdn = 36.5 IQR = 42–28.25

Note: ***p* < 0,01; *0,01 < *p* < 0,5; †: 0,05 < *p* < 0,1.

Table 2
Correlations between the scales of psychological immune competency and burnout.

	Emotional exhaustion	Depersonalization	Personal accomplishment
Positive Thinking	<i>r</i> = -0.425 <i>p</i> < 0.001**	<i>r</i> = -0.394 <i>p</i> < 0.001**	<i>r</i> = 0.449 <i>p</i> = 0.001**
Sense of Control	<i>r</i> = -0.118 <i>p</i> = 0.086 †	<i>r</i> = -0.213 <i>p</i> = 0.002**	<i>r</i> = 0.320 <i>p</i> = 0.001**
Sense of Coherence	<i>r</i> = -0.396 <i>p</i> < 0.001**	<i>r</i> = -0.402 <i>p</i> < 0.001**	<i>r</i> = 0.465 <i>p</i> = 0.001**
Creative Self Concept	<i>r</i> = -0.524 <i>p</i> < 0.001**	<i>r</i> = -0.464 <i>p</i> < 0.001**	<i>r</i> = 0.492 <i>p</i> = 0.001**
Sense of Self-Growth	<i>r</i> = -0.524 <i>p</i> < 0.001**	<i>r</i> = -0.464 <i>p</i> < 0.001**	<i>r</i> = 0.492 <i>p</i> = 0.001**
Change Challenge Orientation	<i>r</i> = -0.316 <i>p</i> < 0.001**	<i>r</i> = -0.275 <i>p</i> < 0.001**	<i>r</i> = 0.362 <i>p</i> = 0.001**
Social Monitoring	<i>r</i> = 0.017 <i>p</i> = 0.811	<i>r</i> = -0.035 <i>p</i> = 0.611	<i>r</i> = 0.207 <i>p</i> = 0.002**
Problem Solving	<i>r</i> = -0.264 <i>p</i> < 0.001**	<i>r</i> = -0.292 <i>p</i> < 0.001**	<i>r</i> = 0.452 <i>p</i> < 0.001**
Self-Efficacy	<i>r</i> = -0.331 <i>p</i> < 0.001**	<i>r</i> = -0.404 <i>p</i> < 0.001**	<i>r</i> = 0.464 <i>p</i> < 0.001**
Social Mobilizing Capacity	<i>r</i> = -0.155 <i>p</i> = 0.024*	<i>r</i> = -0.102 <i>p</i> = 0.137	<i>r</i> = 0.198 <i>p</i> = 0.003**
Social Creating Capacity	<i>r</i> = -0.294 <i>p</i> < 0.001**	<i>r</i> = -0.289 <i>p</i> < 0.001**	<i>r</i> = 0.482 <i>p</i> < 0.001**
Synchronicity	<i>r</i> = -0.472 <i>p</i> < 0.001**	<i>r</i> = -0.447 <i>p</i> < 0.001**	<i>r</i> = 0.431 <i>p</i> < 0.001**
Goal Orientation	<i>r</i> = -0.280 <i>p</i> < 0.001**	<i>r</i> = -0.388 <i>p</i> < 0.001**	<i>r</i> = 0.385 <i>p</i> < 0.001**
Impulse Control	<i>r</i> = -0.334 <i>p</i> < 0.001**	<i>r</i> = -0.273 <i>p</i> < 0.001**	<i>r</i> = 0.155 <i>p</i> = 0.023*
Emotional Control	<i>r</i> = -0.419 <i>p</i> < 0.001**	<i>r</i> = -0.359 <i>p</i> < 0.001**	<i>r</i> = 0.218 <i>p</i> = 0.001**
Irritability Control	<i>r</i> = -0.428 <i>p</i> < 0.001**	<i>r</i> = -0.365 <i>p</i> < 0.001**	<i>r</i> = 0.286 <i>p</i> < 0.001**

Note: ***p* < 0,01; *0,01 < *p* < 0,5; †: 0,05 < *p* < 0,1.

Physicians report higher scores than nurses on both emotional exhaustion and depersonalization scales, while there is no difference in decline of personal accomplishment between the two groups. The employees of the Department of Anaesthesiology and Intensive Therapy disclose higher levels of burnout on all three scales, while lowest depersonalization was recorded at the Department of Surgery. We are unable to establish direct causation between variables, however according to some previous studies [38] one possible reason for high depersonalization value measured among employees working in emergency medicine and intensive care is in connection to the difficulties in communication and unresponsiveness of the patients. These professionals work in a highly responsible environment, where loss of performance is not acceptable, however due to the limited time spent with patients and due to the communicational barriers (as a consequence of patients' critical condition, unconsciousness, intubation or cognitive impairment because of shock or high levels or pain) the depersonalization could be a plausible way for burnout to manifest.

Table 3
Comparison of data for designated scales of psychological immunity in three organizations.

	DEM	DS	DAIT
Positive Thinking	Median = 16 IQR = 13–19 KW test <i>p</i> = 0.024*	Median = 16 IQR = 13–18	Median = 14 IQR = 13–16.75
Sense of Self-Growth	Median = 17 IQR = 15–19 KW test <i>p</i> = 0.010**	Median = 17 IQR = 15–18	Median = 16 IQR = 13–18
Synchronicity	Median = 16 IQR = 14–18 KW test <i>p</i> = 0.010**	Median = 16 IQR = 13–18	Median = 15 IQR = 12–17
Impulse Control	Median = 15 IQR = 13–17 KW test <i>p</i> = 0.021*	Median = 15 IQR = 12–17	Median = 14 IQR = 11.25–16
Emotional Control	Median = 14 IQR = 12–16 KW test <i>p</i> = 0.050*	Median = 13 IQR = 11–15	Median = 13 IQR = 10–16

Note: ***p* < 0,01; *0,01 < *p* < 0,5; †: 0,05 < *p* < 0,1.

Surgery departments are more traditional inpatient facilities, where the patients stay responsive and spend several days on the surgical wards during the preoperative and the postoperative period. The longer time spent together presents an opportunity for the clinical staff to gain genuine insight into the patient and form a more complex relationship. Further research is needed in order to define the precise influence responsiveness of patients has on depersonalization and burnout.

Consistent with previous findings, the strength of person's psychological immune system is a stable predictor of burnout [29]. In addition to the psychological immune competency, we established that the level of education and number of children also predict emotional exhaustion and depersonalization, while age predicts personal accomplishment. The role of age in predicting the levels of perceived personal accomplishment could be supported by the theory, that healthcare workers develop skills and gain professional confidence over time, as it has been previously reported that age is a protective factor in burnout [7,12,39,40]. Clinical employees develop certain coping mechanisms through time that guard them in various stressful situations [7], meanwhile, workers who are unable to cope with the stressors of the healthcare system with time leave the profession and retire [41], explaining why higher levels of burnout are reported among younger population [12]. Professionals in emergency medicine and critical care report higher numbers of stressors than general population and more frequent intention to leave [42,43]. Similarly, in some international findings the number of children has been listed as a protective factor [39,44]. Our data suggests some connection between age, number of children and burnout levels as well, but this requires further qualitative exploration.

Psychological immune competency is a construct encapsulating coping strategies, whose strength and diversity predict the success of one's adaptation. These results support the theory according to which more adequate coping strategies and a higher degree of resilience

Table 4
Results of multiple linear stepwise regression analysis.

Block	Dependent variable/variable entered	Adjusted R ²	R square change	Standardized coefficient β	t	p
Emotional exhaustion						
1	Psychological immune competency	0.280	0.283	-0.578	-9.779	0.000
2	Level of education	0.328	0.051	0.231	-3.849	0.000
3	Number of children	0.341	0.017	-0.129	-2.242	0.024
Depersonalization						
1	Psychological immune competency	0.244	0.248	-0.532	-8.833	0.000
2	Number of children	0.283	0.043	-0.202	-3.427	0.001
3	Level of education	0.312	0.032	0.183	-3.041	0.003
Personal accomplishment						
1	Psychological immune competency	0.325	0.328	0.575	10.063	0.000
2	Age	0.347	0.026	0.161	2.810	0.005

contribute to the proper management of increased work-related stress and limit burnout [33,45]. The scales of the psychological immune competency all correlated with the scales of burnout, meaning that investing in development of these capabilities would be a reliable point of intervention when confronting burnout. We identified the scores on positive thinking, sense of self-growth, synchronicity, impulse control and emotional control scales to be significantly lower at the Department of Anaesthesiology and Intensive Therapy, compared to the other two units. Since the intensive therapy colleagues reached the highest scores on burnout scales, further investigation of these coping strategies would be important, in order to clarify whether there is a pattern of strengths and weaknesses of non-burnt out clinical staff. The sense of self-growth, synchronicity, impulse control and emotional control are all personalities protective capabilities, it seems that lacking in these protection skills leaves a person vulnerable to the effects of stress and development of burnout.

In their work with breast cancer patients, Vargay reports the increase of psychological immune competency during the active period, when patients received psychological interventions together with their treatment [28]. This suggests, that psychological immune competency is not a fixed personality trait, but rather that it can be developed and improved over time. For example, impulse control and emotional control functions of psychological immunity both help in managing momentarily overwhelming emotions and shifting one's focus toward more realistic and logical actions. As such, these functions are both stabilizing in the process of coping. People with high impulse control think through their decisions thoroughly, while people with high emotional control regulate their negative emotions well, they are able to distance themselves from negative, pessimistic emotions in order to better achieve their goals [28]. Both of these capabilities are exceptionally important in managing stressful situations during intensive or emergency patient care. Engaging clinical health psychologists in development of burnout prevention and intervention programs for healthcare personnel focused on growth of psychological immune competency would present an opportunity for personal development beneficial in managing several types of stressors. Present results indicate that availability of such individual and group interventions in occupational setting is vital in prevention of burnout, so drawing the attention of management of high-risk departments to these psychological intervention opportunities is as important as improvement of working conditions and infrastructure. It is, however important to state, that the psychological immune competency only partially predicts burnout. Further research is needed in order to map out additional – individual and organizational – predictors dominant in burnout.

6. Limitations

Present study is a cross-sectional design, which prevents the causal interpretation of the data. Future research should focus on better definition of causes and consequences of burnout among intensive care

professionals through experimental or causal data sets, focusing not only on personal, but organizational aspects as well. We recommend further qualitative research which would enrich the findings of this work by painting a clearer picture of relations between present variables, as well as through discovery of new variables, their influence on burnout and through forming new hypotheses.

Although the used measures were carefully selected and are validated as suitable self-report tools, the study is limited by reliance on self-reported data, which could have led to bias in responses. Convenience sample was used in this study, resulting in findings that may not necessarily be representative. The generalizability of the findings also might be limited, since the sample was selected from only one clinic. We recommend the inclusion of further healthcare facilities in future research.

We did not focus on organizational and situational components of burnout, but rather individual. Broadening the focus to impacts of working environment on burnout in the future studies would give a more detailed result.

7. Conclusion

This study reveals that 78% of workers of emergency department, intensive care unit and department of surgery report at least moderate burnout. The research presents the importance of psychological immune competency in protection from burnout syndrome, which could be an adequate intervention point for development of prevention programs.

Ethics

The study was conducted with the permission of the Regional Medical and Research Ethics Committee of the University of Szeged, Hungary (approval No.: 237/2018-SZTE).

Funding

No external funding.

CRedit authorship contribution statement

Mona Stankovic: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – original draft. **László Papp:** Methodology, Formal analysis, Writing - review & editing. **László Ivánkovits:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – original draft. **György Lázár:** Resources, Writing - review & editing, Supervision. **Zoltán Petó:** Conceptualization, Resources, Writing - review & editing, Supervision. **Annamária Tőreki:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – original draft, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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