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Burnout syndrome in the Anaesthesia and Intensive Care Unit

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Abstract

Background and aims. This study aims to identify the extent to which Burnout syndrome is present among medical staff in the anaesthesia and intensive care units in Romania and if there are significant differences dependant on age or sex.

Methods. Maslach Burnout Inventory (MBI), structured in three dimensions: Emotional Exhaustion – 9 items (EE), Depersonalization – 6 items (D) and Reduction of personal achievement – 10 items (RPA), was used for the evaluation of Burnout Syndrome in 275 medical staff in anaesthesia and intensive care physician and nurses from departments in Romania.

Results. Burnout syndrome among medical staff with MBI had a total score of 68 and average scores for all syndrome categories. There were no statistically significant differences dependant on age and sex ($p < 0.05$, chi-squared test). The logistic regression has highlighted three elements that are risk factors, which belonged to the psycho-emotional sphere, communication abilities and the degree of organization and professional planning (item – *I feel at the end of my rope*, item – *I do not communicate easily with people regardless of their social status and character*, and item – *I have professional disillusion*). The risk factor with the most reliable range was the item "I feel at the end of my rope".

Conclusion. The level of Burnout syndrome is medium regardless of sex or age category. Possibly, the concern of the ICU medical staff for the psycho-emotional life is not efficient, as well as for identifying/ developing communication abilities. The association between risk factors for burnout syndrome and psycho-emotional life development require further research.

Keywords: burnout syndrome, intensive care, anaesthesiology, emotional exhaustion, depersonalization, personal achievement, communication

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Introduction

Burnout represents the mental state of certain professional categories defined by the sacrifice of personal needs for the benefit of others [1]. Burnout Syndrome is composed of a triad of emotional exhaustion, depersonalization and reduction of personal achievement [2].

In 2002, a Belgian study including 151 anaesthetists was conducted to measure the level of burnout and work-related stress among anaesthesiologists, as well as to identify stressors and the characteristics of the work environment to propose stress management strategies. This highlighted moderate stress among anaesthetists without significant differences in relation

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to other professional categories. It was concluded that the differences are insignificant due to professional satisfaction, trust and commitment in the system and the challenges of anaesthesiology [3].

In 2007 a French study, including 2392 nurses from 165 intensive care departments, highlighted a very high level of Burnout syndrome in 785 (32%) nurses, without significant differences on criteria such as the level of training, seniority or position but only a difference at institution level in the sense of a higher incidence in the teaching hospitals compared to other hospitals (36% vs. 31%).

In 2012, a moderate sample, study in Romania involving 146 anaesthetist physicians from eight Anaesthesiology and Intensive Care Departments, identified an increased Burnout Syndrome in almost 30% of respondents and a moderate level at almost 53% of them [4].

Goal of the study

In this study, we evaluate to what extent the Burnout syndrome is present among the medical staff in the ICU departments in Romania and if there are significant differences depending on age or sex. We investigated the level of burnout among the medical staff in Romanian intensive care units.

Material and Method

For this cross-sectional study, we used the Maslach Burnout Inventory (MBI) developed by Christina Maslach and Susan E. Jackson in 1981 [2]. The questionnaire comprises 25 items structured in 3 dimensions: emotional exhaustion (EE) (9 items), depersonalization (D) (6 items), and reduction of personal achievement (RPA) (10 items).

Items in the emotional exhaustion category are: *I have a state of depression and apathy / I feel indifference for things that I was interested in before / I become tense and troubled when I think about my current concerns / I feel at the end of my rope.*

Items in the depersonalization category are: *Sometimes I'm indifferent to what happens to my subordinates, my colleagues / I do not communicate easily with people regardless of their social status and character.*

Items in the category of reducing personal achievements are: *Nothing happens as I wish/ I have many future plans and I believe in achieving them / I have professional disillusions / I feel like someone who has gone bankrupt.*

The questionnaire was distributed online, in a survey, with the help and the approval of the Ethical Committee of the Romanian Society of Anaesthesia and Intensive Care, via an e-mail addressed to its members, containing an invitation to participate accompanied by the link to the survey. The grid of interpretation for the burnout syndrome questionnaire is presented in Table 1.

Epi Info is a statistical software developed by the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia (US) and licensed as a public domain and this was used for our data statistical analysis.

The associations between the response categories were analyzed using the chi-squared test, the 3×4 contingency table between the age groups and the three levels of the burnout syndrome, low, medium and high levels.

With logistic regression, the interaction between the dependent variable (total burnout score) and the three independent associated variables represented by the three items in the three categories of the burnout syndrome was analyzed. The logistic model analyzes the data using the maximum likelihood method of estimating maximum of fidelity and the results obtained are statistically significant $p < 0.05$. *Odds Ratio*: odds are determined from probabilities and range between 0 and infinity. Odds are defined as the ratio of the probability of success and the probability of failure; *95%* – the margin of error for C.I.; *C.I.* – confidence interval who some of the uncertainty in estimation; *Coefficient* – regression coefficient which represent the mean change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant; *S.E.* – standard error is an estimate of the standard deviation of an estimated coefficient; *Z-statistic* – is the regression coefficient divided by its standard error; *P-value* – a predictor with a low p-value is a meaningful addition to model because changes in the predictor's value are related to changes in the response variable; *Constant* – guarantees that the residuals do not have an overall

Table 1. Burnout syndrome categories level

Category	Low level	Medium level	High level
Emotional exhaustion	9-18	19-27	28-45
Depersonalization	6-12	13-18	19-30
Reduction of personal achievement	10-20	21-30	31-50
Total	25-50	51-75	76-125

positive or negative bias, and serves as a garbage bin for any bias that is not accounted for by the terms in the model.

Results

This study comprised a group of 295 participants, of whom 275 completed the questionnaire. The group of participants consisted of 198 women and 77 men aged between 25 and 82 years (M = 41 years ± 10 SD, CI 95%). In terms of professional training, 238 were doctors and 37 nurses in various anaesthesia and intensive care units and 219 (80%) obtained medium and high levels of the burnout syndrome.

The level of burnout among ICU medical personnel was medium, with mean MBI scores of 68. We used the grid of interpretation of burnout syndrome questionnaire and the obtained scores for each of the categories of the syndrome were medium levels (EE 27, D 14, RPA 23).

Considering sex as an independent variable, the quantitative results indicated medium scores on all categories of the syndrome for both women (EE 27, D 14, RPA 23) and males (EE 27, D 15, RPA 24), with no significant differences ($p > 0.05$, chi-squared test).

Age was considered as an independent variable and the results were analyzed for each category of burnout syndrome for the age group 25-30 years (EE 28, D 14, RPA 24), 31-40 years (EE 28, D 15, RPA 25), 41-50 years (EE 25, D 14, RPA 22) and over 50 years (EE 25, D 14, RPA 22) (Table 2). High level scores were only reached in the Emotional Exhaustion dimension for the age range of 25-40 years; the rest of the scores were medium with no significant differences ($p > 0.05$, chi-squared test).

Associations were made and each item was associated with the other items in the questionnaire and ten of them had a statistically significant association ($p < 0.05$, chi-squared test): four items from the emotional exhaustion category, two from the depersonalization category and four from the personal achievement category.

Table 2. Burnout syndrome level by age category

Burnout dimension	25-30 years	31-40 years	41-50, >50 years
RPA	48%	50%	44%
EE	62%	62%	56%
D	47%	50%	47%

RPA – reduction of personal achievement, EE – emotional exhaustion, D – depersonalization

From the individual items, those with the highest score in each category were: *I feel at the end of my rope* (EE) / *I do not communicate easily with people regardless of their social status and character* (D) / *I have professional disillusion* (RPA). We also specify that each item was statistically significant associated ($p < 0.05$, chi-squared test) with the total burnout score and the total score for each area in this syndrome.

The statistically significant association also occurred depending on the age groups in relation to the total burnout score, and the obtained value was statistically significant $p = 0.04$ ($p < 0.05$, chi-squared test; degrees of freedom df = 6) (Table 3).

With logistic regression, the interaction between the dependent variable (total burnout score) and the three independent associated variables, represented by the three items in the three categories of the burnout syndrome, were analyzed and according to the results the three items are risk factors and the risk factor with the most trusted interval is the Item (I feel at the end of my rope) from the EE category. The interaction

Table 3. Burnout level by age category – contingency table

Burnout - total	Age range				Total
	25-30	31-40	41-50	over 50	
Low level	7	12	26	11	56
Row%	12.50%	21.43%	46.43%	19.64%	100.00%
Col%	15.91%	12.37%	27.96%	26.83%	20.36%
Medium level	24	55	51	24	154
Row%	15.58%	35.71%	33.12%	15.58%	100.00%
Col%	54.55%	56.70%	54.84%	58.54%	56.00%
High level	13	30	16	6	65
Row%	20.00%	46.15%	24.62%	9.23%	100.00%
Col%	29.55%	30.93%	17.20%	14.63%	23.64%
Total	44	97	93	41	275
Row%	16.00%	35.27%	33.82%	14.91%	100.00%
Col%	100.00%	100.00%	100.00%	100.00%	100.00%

Row% – is a percent of the total burnout score representing each age category on a low, medium and high level; Col% – is many as one percent of each age group representing each level of burnout

between the dependent variable and other categorical independent variables were also analyzed and the results of the applied logistic models were statistically significant with p = 0.0000 (p < 0.05, likelihood ratio test) (Table 4).

The interaction between the dependent variable EE and the two independent variables represented by the two items of the D and RPA categories was analyzed with logistic regression, and according to the results the two items were risk factors and the risk factor with the best confidence interval was the RPA item (*I have professional disillusion*), the results of the applied logistic models being statistically significant with p = 0.0000 (p < 0.05, likelihood ratio test) (Table 4).

We analyzed the interaction between the variable D and the two associated variables represented by the two items of the EE and RPA categories using logistic regression, the two items being risk factors. The risk factor with the best confidence interval was the RPA item (*I have professional disillusion*), the results of the applied logistic models being statistically significant with p = 0.0000 (p < 0.05, likelihood ratio test) (Table 4).

The interaction between the variable RPA and the two associated variables represented by the two items in the EE and D categories was analyzed using logistic regression, highlighting that the two items are risk factors and the risk factor with the best confidence interval was the D item (I cannot communicate easily with people regardless of their social status and character). The results of the applied logistic models were statistically significant with p = 0.0000 (p < 0.05, likelihood ratio test) (Table 4).

Discussion

The results of the present study reveal that the level of Burnout Syndrome is medium regardless of the biological genre or age. Taking this into account together with identified risk factors from the psycho-emotional sphere, communication abilities and the degree of organization and professional planning (item – *I feel at the end of my rope*, item – *I do not communicate easily with people regardless of their social status and character*, item – *I have professional disillusion*), we can state that possibly, the concern of the ICU medical staff for the psycho-emotional life is not efficient, as well as for identifying/developing communication abilities. In the future, it would be interesting to investigate the associations between the risk factors from syndrome burnout and psycho-emotional life development. Burnout syndrome is often confused with stress due to the symptoms resemblance, so we need to make a clear distinction.

Table 4. Analysis of risk factors through the logistic model

Term	Odds Ratio	95%	C.I.	Coefficient	S.E.	Z-Statistic	P-Value
I feel at the end of my rope	5.1286	2.5707	10.2317	1.6348	0.3524	4.6393	0.0000
I do not communicate easily with people regardless of their social status and character	3.8007	1.5757	9.1675	1.3352	0.4492	2.9721	0.0030
I have professional disillusion	3.4065	1.6492	7.0363	1.2257	0.3701	3.3117	0.0009
Constant	*	*	*	-5.9635	1.1638	-5.1241	0.0000
Item *I feel at the end of my rope*							
I do not communicate easily with people regardless of their social status and character	2.5505	1.4089	4.6173	0.9363	0.3028	3.0919	0.0020
I have professional disillusion	3.3782	2.1484	5.3119	1.2173	0.2309	5.2713	0.0000
Constant	*	*	*	-2.5851	0.6639	-3.8940	0.0001
Item *I do not communicate easily with people regardless of their social status and character*							
I feel at the end of my rope	1.7054	1.2605	2.3074	0.5338	0.1542	3.4611	0.0005
I have professional disillusion	2.2518	1.6408	3.0904	0.8117	0.1615	5.0258	0.0000
Constant	*	*	*	-3.2626	0.4998	-6.5279	0.0000
Item *I have professional disillusion*							
I feel at the end of my rope	2.7997	2.0090	3.9015	1.0295	0.1693	6.0799	0.0000
I do not communicate easily with people regardless of their social status and character	2.5168	1.5699	4.0350	0.9230	0.2408	3.8327	0.0001
Constant	*	*	*	-3.7982	0.6306	-6.0227	0.0000

Stress can intensify Burnout but it is not the cause of it. More importantly, stress-related symptoms are predominantly physical rather than emotional as with Burnout Syndrome [5].

Burnout also has similar manifestations with mood disorders such as depression. A distinction between the two is the context in which it occurs. Burnout occurs when reciprocity is lost and labor interpersonal relations deteriorate, whereas loss of reciprocity and deterioration in private relationships leads to the emergence of depression that extends over several aspects of life of the individual [5].

Burnout Syndrome and Chronic Fatigue Syndrome result from prolonged exposure to stress. Chronic fatigue syndrome affects the mechanisms of stress response that generates a state of physical exhaustion as a result of overloading, a condition that improves after a rest period, while in the case of Burnout syndrome the state of exhaustion is generated by interrelation and is accentuated by the passage of time [6].

Burnout Syndrome symptoms are divided into three levels according to the classification made by Schaufeli and Enzman (1998), these being symptoms at the individual level (emotional, cognitive, physical, behavioural and motivational), interpersonal and organisational [7].

Among the causes of Burnout syndrome are those related to the professional environment, namely: high workload, ambiguity and roles conflict, lack of autonomy, multiple responsibilities [8], overworking, prolonged working hours, unsatisfactory relationships with colleagues, negative impact events (e.g., death of a patient) and lack of appreciation [9].

Also, lifestyle causes include inadequate rest, lack of leisure time involving relaxing and social activities as well as poor social and family support [10, 11]. At the same time, certain personality traits such as: low emotional stability, low adaptability and resistance to stress, idealised self-image, career exaggerated expectations, increased need for control and perfectionism, can contribute to the development of Burnout Syndrome [12]. Moreover, the vulnerability to emotional burning is not only due to stress resistance, perception of events and level of involvement but also due to image and self-esteem, control place, personality type and temperament type [13, 14]. Cañadas-De la Fuente et al. claim that certain temperamental features such as neuroticism, extroversion/introversion may influence the occurrence of burnout syndrome [15].

Moreover, according to the study of Joanna Kłosowska, the predictors of an increased level of emotional exhaustion are the volume of work and the specificity of the anaesthesia and intensive care work with a variation of 31.9%. In the case of depersonalization the predictors are the volume of work, the daily work and the managerial role with a variation of nearly 25% [13].

Our study is important by identifying the risk factors of burnout syndrome in the three categories: emotional exhaustion (EE), depersonalization (D), reduction of personal achievements (RPA). Risk factors help to develop and implement effective actions to improve the quality of life and possibly reduce the burnout syndrome score among medical staff in anaesthesia and intensive care units.

Conclusions

The average level of the burnout score among medical staff in the anaesthesia and intensive care units leads to the conclusion that there is no real assumption of the factors that lead to emotional exhaustion, lack of effective communication and conflicts at the workplace and implicitly of a personalized plan for professional and personal development, for quality life.

For the management of Burnout syndrome, a two-way plan of action might be required: making interdisciplinary communication more efficient and establishing and implementing effective conflict management strategies.

Conflict of interest

Nothing to declare

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