THE CONTRIBUTION OF ALEXITHYMIA TO BURNOUT IN FORENSIC PHYSICIANS

Magdalena Iorga1, Corina Dondas2, Beatrice-Gabriela Ioan3*, F. D. Petrariu1
“Grigore T. Popa” University of Medicine and Pharmacy Iasi
Faculty of Medicine
1. Department of Preventive Medicine and Interdisciplinarity
2. S.C.O.P. Center
3. Department of Medical Specialties (III)
*Corresponding author. E-mail: ioanbml@yahoo.com

BURNOUT AND ALEXITHYMIA AMONG FORENSIC PHYSICIANS (Abstract): The aim of the study was to identify the relationship between the level of burnout subdomains and alexithymia among forensic physicians working in forensic institutions in Romania. Material and methods: A number of 37 forensic physicians were included in the survey. Burnout and alexithymia were measured by using the Maslach Burnout Inventory and Toronto Alexithymia Scale. The obtained data were processed using the SPSS 17.00 statistical software. Results: The subjects obtained an average of 43.27±3.71, which corresponds to a low level of alexithymia. For burnout scores, we have obtained M=14.97±13.13 for emotional exhaustion, M=7.91±6.87 for depersonalization and M=33.18±10.59 for personal accomplishment (low-level for emotional exhaustion and medium-level burnout for the other two factors). Among the socio-demographic variables, only the age correlated positively with the burnout factor personal accomplishment. Positive correlations were identified between burnout factors and TAS-20. Comparative analysis results are important for the presence of insomnia, depression, teaching activity and looking for professional support after critical events. Conclusions: Scores for forensic physicians are low-level for emotional exhaustion and medium-level for two subdomains and low-level for alexithymia. Factors revealed by the comparative analysis are important to adjust professional activity and to find strategies to cope with stressful professional events. Keywords: FORENSIC PHYSICIANS, EMOTIONAL EXHAUSTION, BURNOUT, ALEXITHYMIA.

The burnout syndrome was originally described in relation to the healthcare profession or educators, professions that usually provide care. Burnout is characterized by a high level of emotional exhaustion, a high level of depersonalization and a low level of personal accomplishment. The most important factors related to burnout are the individual ones like personality traits such as neuroticism, extraversion, depression, conscientiousness, alexithymia or type A behavior or socio-demographic and environmental factors such as age, gender, length of experience, working conditions, number of work hours, multiple tasks in a short period, insufficient payment and reward, relationship with colleagues and superiors, or conflicting values (1).

Burnout was considered endemic in the last decades among healthcare profession-
The contribution of alexithymia to burnout in forensic physicians

...als (2) and it was proved to be associated with a low level of professional performance and with difficult relationships with colleagues and patients. Some studies targeting the different medical specialties identified among doctors suffering from burnout a higher risk of suicidal thoughts, engagement in risky behaviors like tobacco or alcohol, and an increasing number of medical errors.

In a study of Gleichgerrcht and Decety they proved that physicians who have difficulty regulating their negative arousal and describing and identifying emotions are more prone to emotional exhaustion, detachment, and a low sense of personal accomplishment (3). On the other hand, the ability to be aware of emotions and the tendency to help others is in strong correlation with the sense of compassion. Identifying emotions is important in dealing with occupational stress (4, 5). This brings consistent help in clinical practice, where the doctor-patient relationship is important and represents the basis of a trustworthy and more appropriate medical evaluation (3).

Professionals facing critical events are more exposed to high levels of burnout and these scores may result in later psychological distress.

The aim of the study is to identify the relationship between burnout levels for each separate domain and the score for alexithymia among forensic physicians. We wanted to find a correlation between the association of the capacity to identify and describe emotions and levels of emotional exhaustion, depersonalization and personal achievement. As a secondary goal, socio-demographic characteristics and the self-evaluated presence of depression, insomnia and the impact of critical events was established. Less information is available about professional activity, burnout or related factors among forensic physicians in Romania.

MATERIAL AND METHODS

A group of 37 forensic physicians working in 11 different forensic institutions from Romania answered two questionnaires. The research was approved by the Legal Medicine Institute of Iași. The questionnaires were self-administered and socio-demographic data were recorded on a separate sheet. The participants were informed about the goal of the study, data privacy and dissemination of results and informed consent was obtained before filling in the questionnaires.

The burnout syndrome was evaluated using the Maslach Burnout Inventory (MBI). The MBI is a 22-items questionnaire used for measuring 3 domains: emotional exhaustion (describing the feeling of being exhausted and drained by one's work, fatigued at the very idea of work, chronic fatigue, sleeping and physical troubles), depersonalization (describing emotional coldness and impersonal reactions to the beneficiaries of one's work – leading to cynicism and negative attitudes with regard to patients or colleagues, feelings of guilt, avoidance of social contacts and withdrawal into oneself), and personal achievement (describing feelings of competence and accomplishment in one's work with other people) (8). The burnout score represents evaluation at three levels: for emotional exhaustion: low (17 or lower), medium (18-29) and high level (over 30) and Cronbach's alpha coefficient was 0.85; for depersonalization, a score under 5 means a low level, a score of 6 - 11 is medium and one over 12 is high and we obtained a Cronbach's alpha of 0.69. For the personal...
achievement domain, a total of 33 points or fewer characterizes a high level of burnout, one between and including 34-39 defines a medium level of burnout and a total greater than 40 shows low-level with Cronbach's alpha coefficient 0.82.

To evaluate alexithymia, we have used the Toronto Alexithymia Scale (TAS) to assess difficulties with emotional processing and emotional awareness. Forensic physicians rated personal statements on a Likert– scale of 1 (strongly disagree) to 5 (strongly disagree). The scores of the 20 items represent three domains: difficulty of describing feelings, difficulty of identifying feelings, and externally oriented thinking. The third scale evaluates the tendency of individuals to focus their attention externally. It is in fact a cognitive style that avoids introspective thought. A general alexithymia score is calculated as the sum of these three subscales and the final scores provide the level of alexithymia: subjects not having alexithymia (scores equal to or less than 51), subjects having borderline alexithymia (scores of 52 to 60), and subjects having scores equal to or greater than 61 are characterized by alexithymia.

Socio-demographic data were also registered, including: age, gender, department, number of children, length of experience, the self-evaluated presence of depression and insomnia, the use of pills to cope with stress or to evaluate which critical events impressed them the most during their professional work.

**RESULTS AND DISCUSSION**

*Descriptive analysis*

The study included 37 forensic physicians: 17 males, (45.95%) and 20 females (54.05%), from 11 forensic medicine institutions in 11 counties, with a mean age of 39.13±11.78 (with a minimum of 25 years and a maximum of 64 years). Considering the professional level, 17 (45.95%) are residents, 3 (8.11%) are specialists physicians and 17 (45.95%) are senior consultants. Regarding the length of experience as a forensic doctor, M=10.61±10.65 years of work experience was recorded, with a minimum of 1 year and a maximum of 32 years. The number of work hours per week was 33.51±9.56 and the mean number of medical shifts per month was 2.94±2.1. Almost ¼ (N=9, 24.32%) of the subjects have academic teaching activity.

Seven subjects (18.92%) were in a relationship, 21 (56.76%) were married, 4 (10.81%) were divorced and 5 (13.51%) were single; 17 subjects have declared that their partner has the same profession (47.22%).

The data collected also focused on recording the subjects' number of children. Over half of them (N=19, 51.35%) did not have children, 10 (27.03%) had one child and 8 (21.62%) of the surveyed forensic doctors had 2 children.

Regarding the alexithymia scale TAS-20, the cut-off scoring is the following: less than or equal to 51 (low-level alexithymia or no alexithymia), greater than or equal to 61 (high-level alexithymia) and 52-60 is possible alexithymia. Our participants obtained an average of 43.27 ± 3.71, which corresponds to low-level alexithymia.

The MBI is comprised of three factors: emotional exhaustion - our subjects obtained an average of 14.97±13.13 in this factor, which corresponds to a low level of burnout, depersonalization-our subjects obtained an average of 7.91±6.87 in this factor, which corresponds to a medium level of burnout and personal accomplishment - our subjects obtained an average of
33.18±10.59 in this factor, which corresponds to a medium level of burnout.

**Correlational analysis**

To make the correlational analysis and to know which tests we should use in our statistical analysis, we first tested the normality of our data distribution. For this, we used the Kolmogorov-Smirnov (K-S) test for all the variables we investigated. For the total score of the Toronto Alexithymia Scale we obtained K-S z=0.120, p=0.195 and because p > 0, we conclude that for this variable our scores are normally distributed. For the three factors of TAS-20: difficulty describing feelings K-S z=0.137, p=0.076; difficulty identifying feelings K-S z=0.156, p=0.024 and externally oriented thinking K-S z=0.120, p=0.196. We can see that for almost all the factors of the TAS-20, the score distributions are normal, except for the difficulty identifying feelings, because p<0.05. For the factors of the MBI we obtained the following results: emotional exhaustion K-S z=0.168, p=0.010; depersonalization K-S z=0.195, p=0.001 and personal accomplishment K-S z=0.175, p=0.006 and we can say that the scores are not normally distributed, since for all the factors p<0.05. For the other socio-demographic variables that we considered in this correlational analysis we obtained the following results: age - K-S z=0.160, p=0.018; number of children - K-S z=0.402, p<0.001; years of experience - K-S z=0.263, p< 0.001; hours per week - K-S z=0.300, p<0.001; shifts per month - K-S z=0.222, p<0.001. Since almost none of these variables are distributed normally, especially the burnout factors, to perform the correlational analysis, we used Spearman correlations, a non-parametric test. The results between subdomains of burnout and the other variables in our study are presented in Table I.

**TABLE I**

**Correlation analysis burnout domains - TAS–20 and other socio-demographic variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Emotional Exhaustion</th>
<th>Depersonalization</th>
<th>Personal Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAS-20</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty identifying feelings</td>
<td>R = .400*, p = .014</td>
<td>R = .374*, p = .023</td>
<td>R = -.399*, p = .014</td>
</tr>
<tr>
<td>Difficulty describing feelings</td>
<td>R = .288, p = .083</td>
<td>R = .126, p = .459</td>
<td>R = -.238, p = .157</td>
</tr>
<tr>
<td>Externally oriented thinking</td>
<td>R = .193, p = .253</td>
<td>R = .339*, p = .040</td>
<td>R = -.087, p = .610</td>
</tr>
<tr>
<td>Total score in alexithymia</td>
<td>R = .317, p = .056</td>
<td>R = .342*, p = .038</td>
<td>R = -.323, p = .051</td>
</tr>
<tr>
<td><strong>Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>R = .130, p = .443</td>
<td>R = -.016, p = .926</td>
<td>R = .324*, p = .050</td>
</tr>
<tr>
<td>Number of children</td>
<td>R = -.055, p = .746</td>
<td>R = -.052, p = .758</td>
<td>R = .283, p = .090</td>
</tr>
<tr>
<td>Experience in years</td>
<td>R = .045, p = .796</td>
<td>R = -.225, p = .187</td>
<td>R = .293, p = .082</td>
</tr>
<tr>
<td>Work hours/week</td>
<td>R = .317, p = .064</td>
<td>R = -.105, p = .547</td>
<td>R = .168, p = .336</td>
</tr>
<tr>
<td>Shifts/month</td>
<td>R = -.032, p = .859</td>
<td>R = -.074, p = .684</td>
<td>R = .274, p = .123</td>
</tr>
</tbody>
</table>

No correlation was identified between the following variables: number of children, years of work experience, the number of hours per week or the number of shifts per month and the factors of burnout: emotional exhaustion, depersonalization and personal accomplishment. Among the socio-demographic variables, only the age correlated positively with the burnout factor personal accomplishment. On the other hand, we can see that positive correlations are highlighted between TAS-20's factor
difficulty identifying feelings and the burnout factors: emotional exhaustion and depersonalization while the factor difficulty identifying feelings correlates negatively with personal accomplishment. Also, both the TAS-20’s externally oriented thinking factor and the total score in alexithymia correlate positively with the burnout factor depersonalization. Despite this, the TAS-20 factor difficulty describing feelings did not correlate with any of the burnout factors.

Comparative analysis
To identify statistically significant differences, we used the t-test for independent samples even though the scores for most of the variables we analyzed were not distributed normally. There are a lot of authors that suggest that Independent Sample T-Tests are sufficiently robust and can be used even if not all the variables that we analyze are distributed normally. After statistical processing, no statistically significant differences were found between subjects per their gender regarding the burnout factors: emotional exhaustion, depersonalization and personal accomplishment or regarding the TAS-20 factors or the total score of TAS-20.

A recent study focusing on burnout in medical residents suggests that significant differences between male and female subjects have been identified. Gender seems to play an important role when it is about protective factors against burnout: male residents mention social support from colleagues more often, while female residents consider more often that home resources are protective factors against emotional exhaustion (6). Our lot was a small one and comparative analysis was difficult to perform considering these criteria.

Statistical differences have not been observed between the burnout factors (emotional exhaustion, depersonalization, personal accomplishment) in cases when the participant’s partner works in the medical field, when the victims of the cases they work on are children, whether these children have been abused sexually or physically, whether women have been abused sexually, whether they have faced aggressive prisoners’ suicides, whether they talk to a family member or whether they talk to nobody when they are affected by an event at work or whether they suffer from chronic diseases.

Regarding teaching activity (at universities or forensic institutions), there are significant differences in emotional exhaustion (t (35) =2.08, p=0.045), in that those with no teaching activity show lower values (M=12.53) than those who teach (M=22.55), the ones with teaching activity showing a higher level of emotional exhaustion. There are also significant differences in personal accomplishment (t (35) =4.77, p<0.001); those who do not teach have obtained lower values (M=30.39) than those who teach (M=41.88), the ones with teaching activity showing a higher level of personal accomplishment.

Regarding whether the participants have witnessed a critical event or not in the last five years, there are significant differences in emotional exhaustion (t (35) =2.96, p=0.006), in that those who have not witnessed any critical events show lower values (M=8.60) than those who have (M=19.31), the latter showing a higher level of emotional exhaustion.

When it comes to the cases our participants have worked on, there are significant differences in personal accomplishment, concerning some of the things that affect them the most, for example, decomposing...
The contribution of alexithymia to burnout in forensic physicians

bodies (t (35) =4.51, p=0.001); the participants who have worked on this kind of cases (M=42.00) show higher levels of personal accomplishment than those who haven't (M=32.68).

When they were affected by an event at work, the participants who talked to one of their colleagues obtained significant differences in personal accomplishment (t (35) =2.51, p=0.017); those who talked to one of their colleagues obtained higher results in personal accomplishment (M=36.76) than those who did not (M=28.50). Also, there were significant differences in personal accomplishment if the participants talked to a specialist (psychologist, psychotherapist, social worker, officer) (t (34) =4.45, p<0.001); those who talked to a specialist (M=41.50) showed higher levels of personal accomplishment than those who did not (M=33.11).

When we consider if the participants suffer from insomnia, we obtain significant differences in emotional exhaustion (t (35) =2.74, p=0.019), those who suffer from insomnia (M=26.00) obtaining higher scores in emotional exhaustion than those who do not suffer from insomnia (M=10.88).

When we consider if the participants suffer from depression, we also obtain significant differences in emotional exhaustion (t (35) =4.93, p<0.001), those who suffer from depression (M=33.83) obtaining higher scores in emotional exhaustion than those who do not suffer from depression (M=11.32).

Regarding the drugs the participants take to relieve stress, we have obtained significant differences in emotional exhaustion (t (35) =3.15, p=0.003), the participants who take drugs to relieve stress (M=30.40) obtaining higher scores in emotional exhaustion than those who do not (M=12.56).

We have obtained significant differences in emotional exhaustion, when it comes to whether the participants think the specialty they chose has changed their vision of life (t (35) =3.41, p=0.002), the participants who think that the specialty they chose has changed their vision of life (M=17.85) have obtained higher scores than those who do not think the same (M=7.20).

All the variables presented above were considered as grouping variables when we wanted to determine if there were any significant statistical differences concerning the total scores at TAS-20, but none of the differences were statistically significant.

Regression analysis

The correlational study emphasized the influence of some variables on others (for example, the statistically significant connection between some of the alexithymia factors and some burnout factors). To identify the most effective model for estimating the burnout factors, multiple linear regression was used by the hierarchical method and the following prediction models were defined for emotional exhaustion, depersonalization and personal accomplishment. The results are presented in Table II.

For the depersonalization factor, none of the three predictive models proved to be significant.

Of the three models where emotional exhaustion was the criterion, only the first one was found to be significant. This consists of the difficulty identifying feelings factor and it explains 11% of the variance of emotional exhaustion. Also, the alexithymia factor difficulty identifying feelings has a significant influence on emotional exhaustion.
(p=0.026) explaining most of the variance of the dependent variable (b=0.852, beta=0.367), its effect on the criterion being positive. So, based on these results, we appre-ciate that the more present this alexithymia factor (difficulty identifying feelings) is in a person's structure, the higher the emotional exhaustion scores will be.

**TABLE II**

<table>
<thead>
<tr>
<th>Models</th>
<th>Test</th>
<th>Emotional Exhaustion</th>
<th>Depersonalization</th>
<th>Personal Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> Difficulty identifying feelings</td>
<td>R² adj</td>
<td>0.110</td>
<td>0.000</td>
<td>0.131</td>
</tr>
<tr>
<td></td>
<td>ΔR²</td>
<td>0.134</td>
<td>0.028</td>
<td>0.155</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td><strong>5.437</strong>*</td>
<td>0.995</td>
<td><strong>6.409</strong>*</td>
</tr>
<tr>
<td><strong>Step 2</strong> Difficulty identifying feelings, difficulty describing feelings</td>
<td>R² adj</td>
<td>0.087</td>
<td>-0.018</td>
<td>0.105</td>
</tr>
<tr>
<td></td>
<td>ΔR²</td>
<td>0.003</td>
<td>0.011</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>2.720</td>
<td>0.676</td>
<td>3.119</td>
</tr>
<tr>
<td><strong>Step 3</strong> Difficulty identifying feelings, difficulty describing feelings, externally oriented thinking</td>
<td>R² adj</td>
<td>0.060</td>
<td>0.026</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>ΔR²</td>
<td>0.000</td>
<td>0.068</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>1.762</td>
<td>1.314</td>
<td>2.153</td>
</tr>
</tbody>
</table>

Of the three models where personal accomplishment was the criterion, only the first one was found to be significant as well. This consists of the difficulty identifying feelings factor and it explains 13.1% of the variance of personal accomplish-ment. Also, the alexithymia factor difficulty identifying feelings has a significant influence on personal accomplishment (p=0.016) explaining most of the variance of the dependent variable (b=-0.737, beta=-0.393), its effect on the criterion being negative. This way, based on these results, we appreciate that the more present this alexithymia factor (difficulty identifying feelings) is in a person's structure, the lower the personal accomplishment scores will be. Our results confirm a recent study proving that only a single aspect of the alexithymia construct serves as a possibly independent predisposing factor for specific burnout dimensions (7).

From the results obtained we can see that the age correlated positively with personal accomplishment, this meaning that the older our participants get, the more personal accomplishments they will obtain. Also, significant correlations were highlighted between alexithymia factor difficulty identifying feelings and all the burnout factors: emotional exhaustion, depersonalization and personal accomplishment, this meaning that the more difficulties our participants will have in identifying feelings, the more feelings of emotional exhaustion and depersonalization they will experience and the fewer problems they will have in identifying feelings, the more accomplished they will feel personally. At the same time, alexithymia factor externally oriented thinking and the total score in alexithymia correlated positively with the burnout factor depersonalization, which means that the more alexithymia they will experience or the more they will have an externally oriented thinking style, the more they will experience feelings of depersonalization.

Regarding teaching activity, there are significant differences in emotional ex-
The contribution of alexithymia to burnout in forensic physicians

haustion; the participants with no teaching activity feel less emotionally exhausted than those who teach, but the ones who teach show a higher level of personal accomplishment than those who do not.

Also, the participants who have witnessed a critical event in the last five years show higher levels of emotional exhaustion than those who haven't witnessed such an event.

When it comes to the cases our participants have worked on, there are significant differences in personal accomplishment regarding some of the things that affect the participants the most, for example, decomposing bodies; those who have worked on this kind of cases show higher levels of personal accomplishment than those who haven't.

When they were affected by an event at work, the participants who talked to one of their colleagues or to a specialist (psychologist, psychotherapist, social worker, officer) obtained significant differences in personal accomplishment, those who talked to one of these categories obtained higher results in personal accomplishment than those who did not.

When we consider if the participants suffer from insomnia, depression or whether they take drugs to relieve stress, we also obtain significant differences in emotional exhaustion, those who suffer from insomnia or depression or who take drugs to relieve stress obtaining higher scores in emotional exhaustion than those who do not.

We have obtained significant differences in emotional exhaustion when it comes to whether the participants think that the specialty they chose has changed their vision of life; the participants who think that the specialty they chose has changed their vision of life have obtained higher scores than those do not think the same.

Additionally, the linear regression results showed that alexithymia factor difficulty describing feelings has a positive effect on the criterion emotional exhaustion, so we can appreciate that the more present this alexithymia factor (difficulty identifying feelings) is in a person's structure, the higher the emotional exhaustion scores will be. At the same time, the alexithymia factor difficulty identifying feelings also has a significant influence on personal accomplishment, its effect on the criterion being negative; this way, we can appreciate that the more present this alexithymia factor (difficulty identifying feelings) is in a person's structure, the lower the personal accomplishment scores will be.

One of the strengths of the present study is because less literature is available regarding forensic physicians. The limitation of the study is represented by the small number of subjects included in the research.

CONCLUSIONS
Scores for forensic physicians are low-level for emotional exhaustion and medium-level for two subdomains and low-level for alexithymia. Factors revealed by the comparative analysis are important to adjust professional activity and to find strategies to cope with stressful professional events.

REFERENCES

**NEWS**

**INFLUENCE OF APPLICATION OF CHLORHEXIDINE GEL AND CURCUMIN GEL AS AN ADJUNCT TO SCALING AND ROOT PLANING**

Periodontitis describes a group of related diseases resulting in the destruction of the tissues that support the tooth. The most common destructive disease of the periodontal attachment apparatus is initiated by oral microflora. Scaling and root planning remains the “gold standard” treatment for periodontal diseases against which other treatments are compared. However, after nonsurgical therapy, several deep periodontal pockets may persist and in such cases, the treatment consists of surgical procedures. Since the systemic antibiotics therapy has various disadvantages such as the development of resistant bacteria and also requires higher dosage to attain required gingival crevicular fluid concentration at the target site, this led to use of local drug delivery system. The aim of a study realized by a group of researchers was to evaluate the efficacy of subgingival application of chlorhexidine gel and curcumin gel as an adjunct to SRP in the treatment of mild to moderate (4–6 mm) periodontal pockets. The study was conducted on thirty chronic periodontitis patients who were divided into two groups as control and experimental groups using a split-mouth design. After scaling and root planning, chlorhexidine gel was applied in control and curcumin gel in experimental groups. The plaque index, gingival index, sulcus bleeding index, probing pocket depth were recorded at baseline and subsequently after 1 month and 45 days. The results revealed that both chlorhexidine gel and curcumin gel have an effect on mild to moderate periodontal pockets in chronic periodontitis patients, but greater reduction was observed in the experimental group than the control group. It can be concluded that both control and experimental gel can be used as an adjunct to scaling and root planning, but the curcumin gel was more effective than the chlorhexidine gel in the treatment of mild to moderate periodontal pockets with a significant reduction in the indices scores when compared to the baseline values. (Hugar SS, Patil S, Metgud R, Nanjwade B, Hugar SM. Influence of application of chlorhexidine gel and curcumin gel as an adjunct to scaling and root planning: A interventional study. *J Nat Sci Biol Med.* 2016 Jul-Dec; 7(2):149-154).

Irina Grădinaru