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### RESEARCH ARTICLE

#### STRESS AND BURNOUT SYNDROME AMONG MOROCCAN MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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#### Abstract

**Background:** Christina Maslach and colleagues define burnout as “a psychological syndrome in response to chronic interpersonal stressors on the job” which is further characterized by its three dimensions of exhaustion, depersonalization, and a decreased sense of accomplishment. Burnout and stress are symptomatically similar, with burnout attributed specifically to occupational or academic stressors. Both can cause serious consequences on student health, professionalism, and patient care. There are few studies evaluating the level of stress and burnout syndrome among medical students in Morocco. The aim of this study was to assess the prevalence and levels of burnout syndrome to identify associated factors as well as the level of stress among a group of medical students in Morocco.

**Method:** Our study was descriptive and cross-sectional. It focused on 5th grade level medical students and was carried out during the month of November 2014. Data was collected through a self-administered questionnaire based on volunteering.

**Results:** The study was conducted in a total of 178 fifth-year medical students. The response rate was 97.2% (n = 173). The mean age was 22.2 years (SD = 0.87 years) with a female predominance (74%). The average daily working hours were 8.33 hours (SD = 2.74) and the average daily hours of sleep was 7 hours (SD = 1.1). The majority of students (96.5%) were single. The prevalence of burnout, based on Maslach Burnout Inventory, was 49% (n = 87) of students. The prevalence of high emotional exhaustion was 44%, high depersonalization was 33.3% and high burnout score for personal accomplishment accounted for 64%. We found a positive correlation between the number of working hours and the burnout score (r = 0.341, p < 0.001) as well as the stress score (r = 0.3, p = 0.009). We also found a negative correlation between the number of hours of sleep and the Burnout score (r = -0.215, p = 0.019). Clearly, this study provides an idea for necessity to plan specific interventions to reduce student stress and avoid burnout.

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**Introduction:-**

Christina Maslach and colleagues define burnout as “a psychological syndrome in response to chronic interpersonal stressors on the job” which is further characterized by its three dimensions of exhaustion, depersonalization, and a decreased sense of accomplishment. It is a common phenomenon among medical students with significant potential consequences for student health, professionalism, and patient care.

Burnout is typically linked to a relationship that is experienced as difficult, tiring, and stressful. For Maslach and et al., it is different from a depression because it would disappear during holidays. Depersonalization, or loss of empathy is characterized by a decrease in positive consideration towards others (patients, colleagues ...); it is an attitude where the emotional distance is important and observable by cynical speeches, depreciation, or even by indifference. Personal accomplishment is a “safety valve” feeling that would provide balance in case of burnout and depersonalization. It ensures a flourishing work and a positive look at professional achievements. Burnout and stress are symptomatically similar, with burnout attributed specifically to occupational or academic stressors. [1].

There are few studies comprehensively evaluating stress and burnout among medical students in Morocco where repercussion on the students' experience can be fatal. The purpose of this study was to assess the prevalence and levels of burnout syndrome to identify associated factors as well as the level of stress among a group of medical students at the Faculty of Medicine of Rabat in Morocco.

**Methods:-**

Our observational cross-sectional study was carried out among fifth-year medical students at Faculty of Medicine of Rabat in Morocco during November 2014.

The data was collected through an anonymous self-administered questionnaire, manually distributed to all students. The questionnaire was divided into two sections. The first contains socio-demographics characteristics which include the following items: age (per year), gender, marital status (single or married), average hours of work and sleep per day. The second section, on the other hand, comprises the validated versions of Maslach Burnout Inventory (MBI) and Cohen's Perceived Stress Scale-10. (10-items PSS). Participation was voluntary after signed consent.

**Instruments and Variables****Maslach Burnout Inventory Student Version (MBI)**

Burnout is a variable that continues to sustain international research interest. The most widely adopted tool measuring the burnout syndrome is the Maslach Burnout Inventory (MBI).[2]

MBI is a 22-item to measure the burnout levels of students. It contains three dimensions (subscales): a) The emotional exhaustion (EE): The feeling of being emotionally overrun and exhausted by one's work (9 items) b) the depersonalization (DP): The tendency to view others as objects rather than as feeling persons (5 items), c) the personal accomplishment (PA): The degree to which a person perceives performing well on worthwhile tasks (8 items). The frequency of burnout symptoms is rated on a seven point Likert scale ranging from “never” to “always”. In application, and whilst measuring a single construct, the MBI produces three separate scores, one for each of the three subscales. For diagnosis purposes, burnout is experienced when at least 2 of the 3 dimensions yield a high score [3].

High emotional exhaustion (EE) was defined as a score of 27 or higher. While high score of depersonalization (DP) was defined as a score of 10 or higher, burnout was defined as having high EE ( $\geq 27$ ) and DP ( $\geq 10$ ) or low personal accomplishment [4].

**Cohen's Perceived Stress Scale-10 (10-item PSS):**

The level of stress was commonly measured by the Cohen scale (10-item PSS). Items were designed to measure how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with

at least a junior high school education.[5] The items are easy to understand, and the alternative responses are simple to grasp. Moreover, the questions are of a general nature, and hence are relatively free of content specific to any subpopulation group. The questions in the PSS are raised about feelings and thoughts during the last month. In each case, respondents are asked how often they had a certain feeling.[6]

### **Statistical Analysis**

The data were collected and analyzed using the “statistical package for social sciences” (SPSS) version 13.0 software. Descriptive analysis was performed for quantitative variables with means and standard deviation and for qualitative variables with effectives and percentages. Proportions were compared using Chi-square test or Fischer exact test. Mean scores were compared using independent t-Student tests. The Kolmogorof Simonov test gave pvalue > 0.05 for all the variables indicating that these are normally distributed. Hence, correlations of scores were calculated using Pearson's r test.

We conducted a logistic regression to determine the associated factors to the burnout syndrome. Univariate analysis of different variables was considered significant when p value  $\leq$  5% and for multivariate analysis when p<30%.

### **Results:-**

#### ***Description of the Population of the Study***

The study was conducted in a total of 178 fifth-year medical students, the response rate was 97.2% (n = 173). The mean age was 22.2 years (SD = 0.87) with a female predominance (74%).

The average daily working hours were 8.33 hours (SD= 2.74) and the average daily hours of sleep was 7 hours (SD= 1.1).The characteristics of residents are summarized in table 1. Distribution of the MBI, score was summarized in figure 1. The majority of students (96.5%) were single.

The prevalence of Burnout,based on Maslach Burnout Inventory,was 49% (n = 87) of students.

The high emotional exhaustion was 44%. 33.3% reported experiencing high levels of depersonalization and low personal accomplishment was described for 64 %.(Fig 1).

The mean score of stress based on Cohen's Perceived stress scale was 24.27.(Table2)

#### ***Comparative Analysis***

We also found that Emotional Exhaustion was higher among female students (87.3% versus 12.7% Male, p = 0.001).

On the other hand, there was no statistically significant difference in subscale of depersonalization and personal accomplishmentby gender.Cohen's score was higher among female students 25.73 (SD= 6.7) compared to male 20.41 (SD= 6.9) (p <0.001) (Table 3).

We found a positive correlation between the number of working hours with the burnout score (r = 0.341, p <0.001) as well as stress score (r=0.3, p=0.009). We also found a negative correlation between the number of hours of sleep and the Burnout score (r = -0.215, p = 0.019).

#### ***Factors Related to the Level of Burnout and Stress***

The items that were significantly different in a group that had a burnout syndrome and a group without, the female gender, were high average hours to work, low hours to sleep per day, residency(when they live alone) and stress score.(Table 4)

### **Discussion:-**

Burnout is a universally understood word amongst medical professionals, and indeed, many students, residents, and faculty perceive burnout to be an inevitable part of education and training. Contrary to popular belief, however, burnout is not a benign rite of passage but a painful and disorienting experience with serious potential consequences for a student's health, professionalism, and patient care. [7]

The present study was designed to: (i) determine the prevalence of burnout among a group of Moroccan medical students, (ii) compare the levels of burnout to different variables, and (iii) describe level of stress among a group of medical students in Morocco.

### **Burnout prevalence and levels:**

Burnout is another measure of physical exhaustion and mental distress which is catalyzed primarily by occupational and professional demands. This syndrome of emotional exhaustion, depersonalization and low personal accomplishment culminates in decreased effectiveness at work.[8] A broad range of professions that heavily involve human interactions experience burnout. The development of burnout begins during the preclinical years in which the setting entails overwhelming work and facts to be learned with limited resources of time and memory, and continues throughout the clinical years.[9,10,11]

One in two students are categorized as burned-out according to the appropriate cut-offs in the MBI [12]. The present finding seems to be consistent with other researches that found medical students suffering from burnout. Numerous studies note rates of burnout between 25% and 60% in a wide spectrum of health-related specialties. [13-18]. Nine studies conducted in the US on burnout in medical students reported a prevalence ranging between 45% and 71%. [8,19,20,21,22-26]

Our study results show that the level of burnout among students differs in respect to demographics variables. Female students were reported to have a higher level of emotional exhaustion than male students. These results confirm previous research indicating that female students are more emotional than exhausted males [27].

This high prevalence of burnout syndrome among Moroccan students could have considerable consequences. Researches have revealed that students' burnout is related to internal consequences like perceived workload,[29,28] perceived stress,[29,30] examination anxiety,[31] and academic performance.[32] At the same time, external (workload) factors may influence students in terms of both internal and external consequences. For example, low academic achievement could be considered as an external consequence of burnout on students. Studies suggested that burnout has an adverse effect on academic performance. [31,32,33,34]

We found out that degrees of stress differ according to gender. Female students have higher levels of stress than male. In comparison with female dental students, we observed that academic work was more stressful. Based on these findings, it can be speculated that gender differences on emotional exhaustion might serve as a function of stress difference among genders.

To a certain degree, it is a normal part of medical education and can be a motivator for certain individuals; however, not all students find stress constructive.[6] Cohen et al. (1988) showed correlations with PSS and Stress Measures, Self-Reported Health and Health Services Measures, Health Behavior Measures, Smoking Status, and Help Seeking Behavior. For many students, stress arouses feelings of fear, incompetence, uselessness, anger and guilt, and can be associated with both psychological and physical. The literature reports varying rates of stress among samples of medical students evaluated through different questionnaires. Studies that report perceived stress using the same PSS score described higher, the mean of PSS score was  $24.27 \pm 7.18$ , then French studies who reported mean ranged between 25, 8[48] and 41,15[49].

Through our study, we found that increasing hours of work increased burnout, and that the increase in the number of hours of sleep decreased the burnout score

Interventions to prevent burnout should handle the associated factors affecting the work environment (primary prevention) and the individual (secondary prevention). When you interpret the Cohen score, it is a person who generally knows how to deal with stress, but there are a number of situations that she does not know how to handle. A feeling of helplessness that leads to emotional disturbances sometimes animates it. She can emerge from this feeling of helplessness by learning methods of strategies for change.

These include coping strategies to help students cope with problems encountered, the conservation of individual resources and social support (colleagues, Hierarchical superiors, the entourage).

It is important to note the limitations of this study. Only 1 class of the 5 -year curriculum was considered in this study due to the technical administration of the survey. Thus, the validity of this study maybe limited to this one class and the results of the study may have weak external validity when other medical schools are considered.

Thus, students who have experienced feelings of burnout were less motivated to complete the survey or more likely to complete the survey because the topic was relevant to them.

We reported the slight over-representation of female medical students in our sample, due to the predominance of females in Moroccan medical schools, which may have influenced the results. Other prospective studies, including a big sample of students, could have been more interesting.

### Conclusion:-

Burnout Syndrome and Stress remain high for all students. A stress management program included in the medical curriculum maybe beneficial in reducing the perceived stress level in this vulnerable population. It will be interesting to conduct other multicentric studies, including a more important number of students. Future research should incorporate associated factors within models of burnout in medical students in an effort to contribute to the development of preventive interventions.

### Competing Interests:

The authors declare that they have no competing interests.

### Authors' Contributions

RR made the Study design. LL data collection and made the analysis. LL and MO collaborated in the interpretation of data. LL and SB collaborated in writing of the manuscript. MO and RR made the decision to submit the manuscript for publication after corrections.

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**Table 1:-** Socio-demographic and professional characteristics of students.

Variables	Descriptive (n=178)
Consent      yes	173(97.2%)*
Age (yr)	22.2±0.9*
Gender	
Female	128 (73.6%)*
Male	46 (26.4%)*
Marital status	
Single	164 (96.5%)*
Married	6 (3.5%)*
Working hours per day	8.34±2.75*
Sleeping hours per day	6.92±1.13*
Residence	
with family	90(52.9%)*
alone	17(10%)*
University campus	49(28.8%)*
in Group	14(8.2%)*

\* Mean ±Standard Deviation \* number of students (percentage)

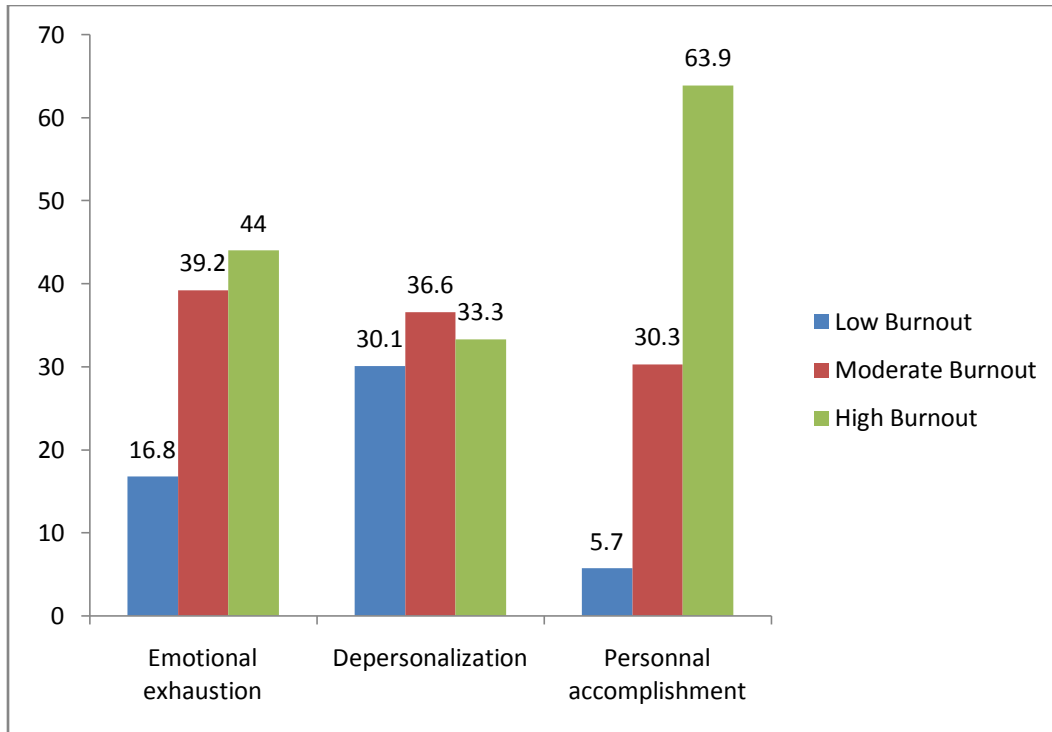


Fig. 1:- Repartition of subscale scores of the MBI.

Table 2:- Prevalence of Burnout based on each subscale of Maslach Burnout Inventory and average of stress based on Cohen’s Perceived stress scale among Medical Students in Morocco

Subscales	Scores
Emotional exhaustion	
Low Burnout	21 (16.8%)*
Moderate Burnout	49 (39.2%)*
High Burnout	55 (44%)*
Depersonalization	
Low Burnout	46 (30.1%)*
Moderate Burnout	56 (36.6%)*
High Burnout	51 (33.3%)*
Personal accomplishment	
Low Burnout	7 (5.7%)*
Moderate Burnout	37 (30.3%)*
High Burnout	78 (63.9%)*
Emotional exhaustion	28.6±10.8 <sup>x</sup>
Depersonalization	9.3±6.3 <sup>x</sup>
Personal accomplishment	29.3±7.8 <sup>x</sup>
PSS Score	24.27±7.18 <sup>x</sup>

\* Mean ±Standard Deviation \* number of students (percentage)

Table 3:- Comparison of scores of the MBI and Stress by gender.

variables	Females	Males	p-value
Emotional exhaustion			0.001
Low Burnout	10(47.6%)	11(52.4%)	
Moderate Burnout	31(63.3%)	18(36.7%)	
High Burnout	48(87.3%)	7(12.7%)	
Depersonalization			0.5
Low Burnout	35 (31.8%)	11 (26.2%)	

Moderate Burnout	41 (37.3%)	14 (33.3%)	
High Burnout	34 (30.9%)	17 (40.5%)	
Personal accomplishment			0.3
Low Burnout	7 (100%)	0	
Moderate Burnout	28 (75.7%)	9(24.3%)	
High Burnout	56 (72.7%)	21(27.3%)	
PSS-score	25.73±6.7	20.41±6.9	<0.001
Emotional exhaustion	31.09±10.7	22.53±8.7	<0.001
Depersonalization	8.8±6.3	10.02±6.5	0.2
Personal accomplishment	29.9±7.6	27.5±8.2	0.1

**Table4:-** Logistic regression model results of an univariate and multivariate analysis of factors related to Burnout.

Variables	OR	p value	CI (95%)*	Adjusted OR	p value	CI (95%)*
Age	1.07	0.70	0.74-1.55			
Gender(M/F)	1.8	0.08	0.9-3.6	1.65	0.2	0.67-4.07
Hours of work per day	1.08	0.1		1.06	0.3	0.91-1.20
Hours of sleep per day	0.7	0.01		0.75	0.08	0.54-1.04
Résidency		0.05			0.03	
with family	2.9	0.08	1.8-10.2	3.10	0.1	0.7-13.7
alone	6	0.02	1.2-28.5	6.58	0.04	0.3-6.5
in campus	1.7	0.4	1.4-6.2	1.34	0.7	0.9-1.04
with a group	1			1		
PSS-score	1.05	0.02	1.00-1.09	1.02	0.3	0.9-1.08
Marital Status	0.5	0.4	0.08-2.7			

\*95% Confidence interval

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