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ORIGINAL RESEARCH

Impact of the level of physical activities on emotional exhaustion, depersonalization, lack of personal accomplishment and burnout among students in the city province of Kinshasa

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Abstract

The impact of the practice of physical activities on burnout and its dimensions remains very little documented among students living in subaerial African countries. The present study was to determine the impact of the level of physical activities on Burnout. In a cross-sectional analytical study, students from the Faculty of Medicine of the University of Kinshasa were recruited by convenience in the period from February 1 to August 1, 2023. The parameters of interest included intensity, frequency, duration of the practice of physical activities and the dimensions of Burnout. Analysis of Variance (ANOVA) was used to research the influence between the intensity, frequency and duration of physical activity practice on emotional exhaustion, depersonalization, lack of personal accomplishment and burnout syndrome. The moderate and high level of physical activity practice significantly reduces emotional exhaustion by -14 (30.08 ± 13.04 vs 16.10 ± 10.38; $p < 0.001$), depersonalization by -7 (12. 45 ± 6.42 vs 5.89 ± 5.99; $p < 0.001$), burnout of -17 (28.17 ± 10.05 vs 11.00 ± 8.47; $p < 0.001$) and increases the personal accomplishment of students of the faculty of medicine of +31 (42.00 ± 10.7 vs 11.00 ± 8.47; $p < 0.002$). The duration of the practice of physical activities of 30 minutes or more positively influences personalization in 28% ($p < 0.001$), 75% personal accomplishment ($p < 0.003$) and 63% burnout ($p < 0.004$). Furthermore, the frequency of 3 or more times per week of practicing physical activities positively improves emotional exhaustion by 56% ($p < 0.001$), professional accomplishment by 79% ($p < 0.002$) and 83% by burnout ($p < 0.001$). Young medical school students with burnout are inactive and sedentary. The latter are associated with a decrease in personal accomplishment and an increase in burnout syndrome. The duration of physical activities of 30 to 45 minutes per day practiced three or more times per week positively improves emotional exhaustion, personalization, and personal accomplishment and burnout syndrome. The dissemination of information programs, particularly to medical students, seems urgent.

Introduction

The world of work presents two opposite faces, one favorable, source of pleasure, factor of accomplishment, support of identity and friend of health, the other unfavorable, source of suffering and possible various disorders (Canoui et al., 2001). Burnout is one of the professional pathologies characterized by a state of psychological, physical and moral fatigue against which the person implements adaptation strategies which take the form of disengagement from one's tasks (Canoui et al., 2001; Vidal et al., 2001). The regular practice of physical activity is an effective approach to reduce burnout and is still very poorly understood in the professional and student environment in subaerial Africa. Indeed, two systematic reviews of the literature carried out in 2020 showed a positive but weak effect of the practice of physical activities on emotional exhaustion justified by the absence of studies that could define the intensity, frequency and duration necessary, physical activity to reduce the risk of burnout in the professional environment in general and among

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students in particular (Dreher et al., 2020; Ochentel et al., 2018; Ertek et al., 2012). In Africa, the number of research carried out on burnout does not exceed the number of fingers on the hand. We find research carried out by three Moroccan psychiatrists in five hospital departments in Morocco and a study carried out in Algeria on the conditions determining this professional pathology, they conclude that additional studies are necessary to show the impact of the intensity, duration and frequency of physical activities on the fundamental dimensions of burnout syndrome (Vaquin et al., 2007). In the Democratic Republic of Congo in general and in Kinshasa in particular, measures to prevent and treat burnout are non-existent and study has investigated the influence of the level of physical activity on burnout syndrome among students. It is for this reason that we chose to carry out this study in order to research the Impact of the intensity, duration and frequency of the practice of physical activities on emotional exhaustion, depersonalization, accomplishment personal and burnout syndrome.

Methods

Type and Period of Study

This is a cross-sectional analytical study carried out during the period from February 1 to August 1, 2023, i.e.

Setting and Participants

The Faculty of Medicine of the University of Kinshasa served as the setting for this study. Included in this study were all baccalaureate students one, two, three and trainee doctors from the biomedical and physical medicine and rehabilitation sector of the said faculty in apparent good health, aged 18 to 40 years who answered all the questions of the research. A convenience sample consisted of 200 participants including 100 (50%) students from the department of physical medicine and rehabilitation and 100 (50%) from medical biology.

Data Collection Procedure

International Physical Activity Questionnaire (IPAQ) allowed us to assess the Level of Physical Activities high, moderate, low or physical inactivity and sedentary behavior (Lee et al., 2011). The Maslach burnout Inventoy (MBI) scale was used to measure Emotional Exhaustion, Depersonalization, Lack of Professional Accomplishment and Burnout (Maslach et al., 1986; Le Tourneur & Komly, 2011).

Parameters and Measurement Scales

Physical activity level

The IPAQ assesses three levels of physical activity and sedentary behavior. The Moderate and High Level of Physical Activity are defined by practicing moderate and intense physical activity of 30 to 45 minutes or more per day three times or more per week. Physical inactivity or low level of physical activity was defined by 20 minutes of moderate physical activity once or twice a week. Sedentary behavior is determined by the absence of light physical activity for 10 minutes per week (Mabele et al., 2019; Lee et al., 2011).

Burnout and its dimensions

The three fundamental dimensions of the syndrome are: Emotional exhaustion (EE), depersonalization (D) and lack of personal accomplishment (PA). Emotional exhaustion (EE) manifests internally as a feeling of emptiness, unusual, emotional fatigue at work and difficulty being in contact with the emotions of others. Depersonalization is marked by detachment, a relational impoverishment akin to cynicism. The student is considered more as an object than as a person (Maslach et al., 1986; Le Tourneur & Komly, 2011). Lack of personal accomplishment is the consequence of the other dimensions. It is expressed by a feeling of inefficiency, of inability to help others, of frustration in one's work. In other words, it is the feeling of no longer doing a good job. The relationship with others is/or was the foundation of the caregiver's work, and the main motivation for their professional and personal choice (Maslach et al., 1986; Le Tourneur & Komly, 2011). The MBI scale is a protocol comprising 22 items grouped into three subscales including 9 items for the EE score (1+2+3+6+13+14+16+20), 5 items for the depersonalization score (5+10+11+15+22) and 8 items for the Lack of PA score (4+7+9+12+17+18+19+21). A rating protocol accompanies the MBI which has the principle of calculating the scores which are obtained by adding the circled figures which represent the respondent's responses to the items making up the MBI. This operation results in 3 scores which reflect the three degrees of the burnout dimensions as follows, low Emotional Exhaustion determined by a score of items of the dimension equal to 17, moderated by a score of items of the dimension of 18 to 29 and high by a dimension item score greater than or equal to 30. Low depersonalization is determined by a dimension item score equal to 5, moderated by a dimension item score of 6 to 11 and high by a dimension item score greater than or equal to 12. Low PA is determined by a

dimension item score equal to 33, moderated by a dimension item score of 34 to 39 and elevated by a dimension item score greater than or equal to 40 (Maslach et al., 1986; Le Tourneur & Komly, 2011). The evaluation of the presence of burnout syndrome is revealed by the score of its three components. Burnout is high if the subject obtains a pathological level for three scores on the MBI scale, moderate if the subject obtains a pathological level for two scores on the MBI scale and low if the subject obtains no pathological level for only one of the three scores on the MBI scale and burnout is zero if the subject does not obtain any pathological level for the three scores on the MBI scale (Maslach et al., 1986; Le Tourneur & Komly, 2011).

Data Collection and Analysis

After validation, the data were analyzed by SPSS version 21.0 for Windows. Quantitative data were presented as means ± standard deviation and qualitative data as percentage proportion. We use parametric tests to test the influence of these variables on the different distributions of the results of our study. The multiple regression test allowed us to determine the relationship between the dependent variables and the independent variables. Analysis of variance (ANOVA) and the Chi-square test were indicated to determine the influence of sex, age, level of physical activity, duration and frequency of Physical Activities on the dimensions of Professional Exhaustion Syndrome or Burnout. The p-value < 0.05 was used as the threshold for statistical significance.

Results

Table 1 shows that 42% of students at the Faculty of Medicine are inactive and 45.5% sedentary. Low level of physical activity and sedentary behavior increase the dimensions of Burnout respectively: 30.08 ± 13.04 for Emotional Exhaustion, 12.45 ± 6.42 for Depersonalization, 42.00 ± 10.7 for Lack for Personal Accomplishment and 28.17 ± 10.05 for Burnout.

Table 1

Frequencies and means of emotional exhaustion, depersonalization, lack of professional accomplishment and burnout according to the study variables.

Variables (n: 200)	*n*	*%*	EE	D	MAP	SBU	*p*
			25.14 ± 10.19	8.00 ± 5.66	32.04 ± 9.94	21.72 ± 6.17	
Sex							
Male	107	53.5	25.89 ± 10.31	8.61 ± 5.5	32.11 ± 9.45	22.53 ± 6.15	0.061
Female	93	46.5	24.40 ± 9.78	7.23 ± 5.73	31.98 ± 10.43	21.16 ± 6.16	0.071
Age Groups							
19-23 years old	99	49.5	29.57 ± 10.65	13.1 ± 6.32	31.78 ± 9.93	20.78 ± 6.21	0.002
25-29 years old	77	38.5	21.64 ± 9.451	7.51 ± 4.516	29.62 ± 9.682	19.6 ± 5.98	0.081
30-34 years old	24	12	28.75 ± 12.69	12.75 ± 7.68	20 ± 7.35	20.25 ± 8.88	0.004
Level of PA							
Sedentary	91	45.5	30.08 ± 13.04	12.45 ± 6.42	42.00 ± 10.7	28.17 ± 10.05	0.001
Low	84	42	28.40 ± 11.02	9.10 ± 3.76	40.33 ± 11.53	26.00 ± 8.77	0.001
Moderate and High	25	12.5	16.10 ± 10.38	5.89 ± 5.99	10.63 ± 9.03	11.00 ± 8.47	0.002
Duration of PA							
Less than 10 min per day			33.35 ± 10.39	17.45 ± 6.4	43.06 ± 5.59	31.28 ± 4.24	0.001
10-29 min per day			29.03 ± 10.09	9.45 ± 6.42	31.61 ± 10.7	23.36 ± 9.07	0.004
30 min or more per day			15.87 ± 10.52	5 ± 3.76	22.33 ± 11.53	14.40 ± 9.00	0.001
Frequency of PA							
Less than once a week			34.17 ± 10.11	16.09 ± 6.12	40.00 ± 9.55	30.08 ± 8.00	0.003
Once or twice a week			23.35 ± 10.39	8.00 ± 4.4	32.6 ± 5.59	21.31 ± 7.00	0.006
Three times or more per week			13.92 ± 11.60	10.0 ± 3.76	29.10 ± 10.33	17.67 ± 8.56	0.001

EE: Emotional Exhaustion; D: Depersonalization; MAP: Lack of Professional Accomplishment; SBU: Professional Exhaustion or Burnout Syndrome; PA: Physical Activity.

Table 2
Impact of physical inactivity, sedentary lifestyle, intensity, duration and frequency of the practice of physical activities on the dimensions of burnout according to students of the faculty of medicine.

Variables	Dimensions of Burnout	Unstandardized Coefficient		Standardized Coefficient	t	*p*
		Beta	SE	Beta		
Ages	*Emotional Exhaustion*	0.64	0.69	0.66	0.92	0.723
	Depersonalization	-0.99	0.72	-0.75	-1.37	0.001
	Lack of Professional Accomplishment	-1.01	0.7	0.35	1.46	0.123
	Burnout Syndrome	2.85	2.08	0.85	1.37	0.458
Sedentary lifestyle and physical inactivity	*Emotional Exhaustion*	0.02	0.06	0.29	0.3	0.076
	Depersonalization	0.03	0.07	0.27	0.48	0.063
	Lack of Professional Accomplishment	0.05	0.06	-0.79	-0.84	0.001
	Burnout Syndrome	-0.09	0.19	- 0.82	-0.67	0.004
AP practice of 30 minutes or more per day	*Emotional Exhaustion*	-0.02	0.11	-0.2	-0.21	0.840
	Depersonalization	-0.02	0.11	0.28	0.13	0.001
	Lack of Professional Accomplishment	0.03	0.11	0.75	0.71	0.003
	Burnout Syndrome	0.02	0.33	0.63	0.66	0.002
AP practice 3 times or more per week	*Emotional Exhaustion*	0.01	0.09	0.56	0.51	0.001
	Depersonalization	-0.02	0.09	-0.13	-0.23	0.820
	Lack of Professional Accomplishment	-0.04	0.09	0.79	0.71	0.002
	Burnout Syndrome	0.02	0.27	0.83	0.87	0.001

AP: Physical activity; SE: Standard Error.

On the other hand, the moderate and high level of physical activity practice significantly reduces Emotional Exhaustion by -14 (30.08 ± 13.04 vs 16.10 ± 10.38; $p < 0.01$), Depersonalization by -7 (12.45 ± 6.42 vs 5.89 ± 5.99; $p<0.01$), Burnout of -17 (28.17 ± 10.05 vs 11.00 ± 8.47; $p<0.01$) and increases Accomplishment Faculty of Medicine student staff of +31 (42.00 ± 10.7 vs 11.00 ± 8.47; $p < 0.01$).

Physical inactivity and sedentary behavior negatively influence Lack of Professional Accomplishment in 79% ($p < 0.01$) and Burnout syndrome in 82% ($p < 0.01$). The duration of the practice of physical activities of 30 minutes or more positively influences personalization in 28% ($p<0.01$), personal accomplishment in 75% ($p<0.01$) and Burnout in 63% ($p=0.004$). Furthermore, the frequency of 3 times or more per week of practicing physical activities positively improves Emotional Exhaustion by 56% ($p = 0.001$), professional accomplishment by 79% ($p < 0.01$) and 83% by Burnout ($p < 0.01$).

Discussion

Our study consisted mainly of young, inactive and sedentary male students. Age is not associated with EE, Lack of PA and burnout. Furthermore, depersonalization is associated with age. Physical inactivity and sedentary behavior are associated with decreased PA and increased burnout syndrome. The duration of physical activities of 30 to 45 minutes per day practiced three or more times per week positively improves EE, personalization, personal accomplishment and burnout syndrome. Our results are consistent with the postulate of Truchot (2019) who showed that there is an association between age and depersonalization, the older the people, the higher the personal accomplishment and the lower the depersonalization (Truchot, 2019). Gerber et al. (2013) showed that younger people have a more marked tendency toward depersonalization, while older people tend to show a lack of personal accomplishment (Gerber et al., 2013). Truchot's (2003) study among private doctors in Champagne Ardenne revealed that men had a higher depersonalization score than women (Truchot, 2003). Shanafelt's (2002) study on the prevalence of burnout in general medicine led to the same result as ours (Shanafelt et al., 2002). According to Ogus (1990) and Guinauld (2006), it is more emotionally attentive attitudes that protect women from depersonalization. In

contrast, men have more instrumental attitudes (Ogus et al., 1990; Guinauld et al., 2006). The physical inactivity and sedentary behavior revealed in our study are justified by the lack of time and the lack of interest in the organization of physical and sporting activities for students in Kinshasa. Furthermore, Olson et al. (2014), Schuch et al. (2016) and Gerber et al. (2013) found that feeling professionally exhausted was therefore stressful. It is therefore likely that physical activities and sports affect professional life to the extent that their existence allows individuals to counteract certain negative perceptions of work (Olson et al., 2014; Weight et al., 2013). The latter are therefore potentially very favorable to emotional fulfillment and depersonalization, making it possible to combat the feeling of lack of accomplishment at work and to provide means of putting professional difficulties into perspective (Garrett et al., 2011).

Conclusion

Burnout has recently become a hot topic in the Democratic Republic of Congo. Students at the medical faculty of the University of Kinshasa are also affected. Age is not associated with emotional exhaustion, lack of personal accomplishment and burnout syndrome. Moreover, depersonalization is associated with age. Physical inactivity and sedentary behavior are associated with decreased personal accomplishment and increased burnout syndrome. The duration of physical activities of 30 to 45 minutes per day practiced three or more times per week positively improves emotional exhaustion, personalization, personal accomplishment and burnout syndrome. The dissemination of information programs, particularly to medical students, seems urgent. Implementation of concrete support measures, like other Western countries, also seems necessary for the future doctor.

Authors' Contribution

Study design: GKM, Data collection: LEK, SNT, CNE Statical Analysis: GKM, CKE, Manuscript preparation: GKM, CKE, Fund collection: CBN, DKM.

Ethical Approval

The study protocol was approved by the Medical Ethics Committee of the Ministry of Public Health of the Democratic Republic of Congo and its approval number is N° 26/ CNES/BN/PMMF/2023 of 20/O1/2023 association also known as the declaration of Helsinki.

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Conflict of Interest

The authors declare that they have no conflict of interest. They are solely responsible for the writing and content of this.

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