CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Burnout and physical activity in medical students
Authors	Macilwrait, Philip;Bennett, Deirdre
Publication date	2018-03-01
Original Citation	Macilwrait, P. and Bennett, D. (2018) 'Burnout and physical activity in medical students', Irish Medical Journal, 111 (3), 707. Available online: http://imj.ie/burnout-and-physical-activity-in-medical-students/
Type of publication	Article (peer-reviewed)
Link to publisher's version	http://imj.ie/burnout-and-physical-activity-in-medical-students/
Rights	© 2018, Irish Medical Organisation. All rights reserved.
Download date	2026-11-05 18:00:24
Item downloaded from	https://hdl.handle.net/10468/5744

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Burnout and Physical Activity in Medical Students

P Macilwraith, D Bennett,

Department of Medicine, University College Cork

Abstract

Burnout is associated with increased levels of stress and lower productivity; however, it is unclear what factors contribute to its development. This study aims to quantify levels of burnout in UCC medical students and to investigate whether physical activity levels are associated with burnout in medical students. Medical students (n=383) at University College Cork were surveyed and the collected data analysed. On the Maslach Burnout Inventory-Student Survey (MBI-SS), 44.8% of students reported high levels of Emotional Exhaustion (EE), 25.6% reported high levels of Cynicism (CY), and 51.2% reported low levels of Professional Efficacy (PE). On the International Physical Activity Questionnaire (IPAQ), 53.2% of respondents were found to engage in Health-Enhancing Physical Activity (HEFA-active). Gender, year group and nationality group appear to be associated with the prevalence of burnout and physical activity levels. Higher levels of physical activity are associated with higher professional efficacy but this relationship requires further research.

Introduction

Burnout can be defined as a combination of physical and mental fatigue and unrest accelerated mainly by occupational and professional demands[1]. It has been described as a combination of Emotional Exhaustion, Cynicism and a decreased sense of Professional Efficacy[2]. Burnout is a common occurrence among individuals working in the medical profession and it is estimated to occur in 40% of doctors from the United States, though some studies have cited levels of 76% in doctors working in internal medicine[3,4]. It is uncertain what leads to burnout but we are increasingly realising that for many doctors burnout originates in college, with levels of 49% among US medical students and between 28-61% in Australia[5,6,7]. There is significant published literature on burnout in medical students. Four studies found higher levels of burnout in medical students compared with the general population[1,6,8,9].

The impact of burnout includes lower quality of life, decreased academic performance and reduced levels of mental and physical wellbeing[11]. This in turn reduces an individual's ability to cope with personal and professional responsibilities and perpetuates an increased susceptibility to burnout as they transition through their academic lives[5]. Burnout was linked with increased serious thoughts of dropping out of medical school in one study[10] and with specialty choice in another[7]. Three studies showed an increase in burnout as the years progressed in medical education[11,12,9].

A recognised modifying factor is physical activity and research has identified associations between increased physical activity and decreased burnout levels[13,17,18]. It has been shown that physical activity levels are suboptimal in European students and in medical students in particular[14,15,16]. Seldom has research directly examined the relationship between physical activity and burnout in those studying medicine, with most studies zoning in on medical professionals. This study evaluated the relationship between physical activity and burnout in medical students at UCC.

Methods

This study was an observational, cross-sectional questionnaire based survey of medical students. All undergraduate medical students at University College Cork (n=1004) were eligible to participate in the study. Demographic data was collected including age, sex, nationality, method of entry, examination success rates and extracurricular activities. Tools used consisted of the Maslach Burnout Inventory-Student Survey and the International Physical Questionnaire Short Form. The Maslach Burnout Inventory-Student Survey consists of fifteen questions on an ordinal scale assessing the three components of burnout: Emotional Exhaustion, Cynicism and Professional Efficacy. The International Physical

Questionnaire Short Form quantifies an individual's engagement in physical activity in the past week and scores are calculated using the IPAQ Short Form manual, freely available online. Ethical approval for this study was granted by the Cork Research Ethics Committee (CREC).

Data was coded and analysed using SPSS Statistics® V20.0. Bivariate analyses were used to identify if aspects of burnout were associated with physical activity levels. Pearson's co-efficient was calculated comparing MBI sub-scale scores to Continuous Physical Activity scores. A Pearson's coefficient correlation of $p<0.01$ was considered statistically significant. The Kruskal Wallis Test and Chi Square tests were used to compare the different variables across the year groups.

Results

Of an eligible 1004 students, 383 students were recruited and submitted a questionnaire. The response rate was 38.2%.

Study Demographics:

More female medical students (63.2%, n=240) participated. Most students who took the survey (41.4%, n=158) aged between 21 and 23, and student participation was relatively similar across year groups with the highest participation in the 4th year group (39.8% of 4th year participated, n=94) and the lowest participation in the 3rd year group (26.9% of 3rd year participated n=56). European students made up the bulk of the study at 64.2% (n=246), as did DEMs (77.5%, n=297). Only 14.9% (n=57) of those who participated had ever failed an end of module exam.

Burnout

Only 44.8% reported experiencing high levels of Emotional Exhaustion, and 25.6% of participants reported high levels of Cynicism. Additionally, 51.2% reported low levels of Professional Efficacy. Female students reported significantly higher levels of Emotional Exhaustion ($p=0.02$) than males. Those who had never failed an end of module exam reported significantly higher levels of Emotional Exhaustion ($p=0.03$) and higher levels of Professional Efficacy ($p<0.001$) than those who had. North American students reported significantly higher Professional Efficacy ($p=0.012$) levels than all other nationality groups. Professional Efficacy levels decreased significantly ($p=0.004$) with each year of study reaching lowest levels in 4th year only to rise again to levels similar to the 1st year group in the 5th year group.

Physical Activity

Over half (53.2%) of respondents were found to be HEFA active, and 35.5% of participants were reported as minimally active. Only 11.3% were found to be inactive. Chi-square analysis indicated that there was a significant association between physical activity levels (low, medium and high) and gender ($X2=13.683$,

p=0.001), with more male students (n=79, 66.4% of males) in the high levels of physical activity category than their female counterparts (n=95, 45.2% of females). There was a significant difference in physical activity levels between different nationalities (X6=21.557, p=0.001) with Asian students (n=19, 29.7% of Asians) reporting the lowest proportion in the high physical activity levels category and European students (n=129, 59.7% of Europeans) with the highest proportion. Final years reported the lowest levels of physical activity and third years the highest (p=0.023). Higher levels of physical activity were observed in DEMs compared to GEMs (p=0.005).

Correlations

There was a strong positive correlation between Emotional Exhaustion and Cynicism scores and a weak negative correlation between Professional Efficacy and Cynicism. A weak positive correlation was observed between Professional Efficacy and physical activity levels (Table 1).

Table 1. Correlations

		Total Physical Activity Score (MET-minutes/week)
Emotional Exhaustion score	Pearson Correlation	-.099
	Sig (2-tailed)	.085
Cynicism score	Pearson Correlation	-.014
	Sig (2-tailed)	.812
Professional Efficacy score	Pearson Correlation	.134*
	Sig (2-tailed)	.018

*. Correlation is significant at the 0.05 level (2-tailed).

Discussion

Levels of the burnout components at UCC were similar to those observed in comparable studies[1,6,8,9,11,12]. Female students reported significantly higher levels of Emotional Exhaustion than male students and a greater proportion of male medical students were engaged regularly in physical activity than female medical students.

The burnout component of this statement is in line with current research and suggests that interventions targeting females are vital in tackling issues of burnout. The physical activity element is in direct contrast to previous research where females were shown to perform a significantly greater level of physical activity than their male counterparts[15,20]. This suggests that the factors that influence females to engage in

physical activity in Ireland must be examined to find out why this differs from females in these Asian and British studies.

This study revealed high levels of HEFA active medical students with 53.2% of respondents in this category. This is in line with five studies that showed that medical students engaged in more physical activity than age-matched controls in the general population[20,21,22,23,24].

Three studies analysed found that physical activity levels decreased in medical students over the course of their medical education[18,24,25], and again we observed a different trend with levels highest in third year and lowest in final year with no linear pattern between first to final year. This may be due to lower participation across certain years and a larger sample size may reveal different trends of physical activity across the years of medical school.

Asian individuals had the lowest levels of physical activity and this was in line with international research[20]. European students had higher levels of physical activity than Asian students and again this agrees with the current literature. This finding is very relevant to University College Cork, where this research was carried out, given the large cohort of Malaysian students currently studying medicine in UCC.

We found that increased Professional Efficacy is weakly correlated with increased physical activity levels. This agrees with recent research[11,13]. One of these studies found a negative correlation between increased physical activity levels and Emotional Exhaustion levels but we did not observe a significant correlation between these two variables[11]. Nonetheless, this study suggests that promoting physical activity in medical students may assist in protecting this population from some of the effects of burnout.

It seems that information on how to avoid burnout would be particularly useful early on as we found that levels of Professional Efficacy decreased as the years went on from first to fourth year only to increase to first year levels in final year. This suggests that students begin to feel overwhelmed and disengaged with what they are learning as the years go on and do not feel relatively competent in their learning again until their final year. Perhaps we need to look at the difference in subject matter taught across the years in medical school, particularly in final year, and work to increase relevance in the prior years in an attempt to increase students' academic efficacy.

From this study, we have a better idea of which groups are most at risk to develop burnout and we can aim to put systems in place to identify when a student is struggling. While a system of care, separate from the academic sphere of the medical college, is in place, these findings can help to support existing

services. While these services are available, it would be interesting to see the level of uptake among students and to come up with a way to encourage students to self-refer if they feel they are suffering unduly from burnout. Identification of these high-risk individuals would allow early intervention strategies to take place in the medical school setting.

Measures directed at reducing the incidence of burnout could be offered, in an attempt to reduce the potential negative consequences of burnout. Relatively simple methods such as increased physical activity, mindfulness, group discussion and yoga are all elements that could be included in such a program. The exact form that such an intervention would take is, however, beyond the scope of this study.

In the author's opinion, the recommendations outlined above, which have been based on our study results, may decrease the incidence of burnout among medical students and enhance their experience of medical education.

Correspondence:
Dr Philip Macilwraith, Intern, Mercy University Hospital
Email: 112302221@umail.ucc.ie

Conflict Of Interest

No conflict of interest exists among the authors of this study.

References

1. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, Durning S, Moutier C, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. Burnout and suicidal ideation among U.S. medical students. Ann Intern Med. 2008;149(5):334-41.
2. Dahlin ME, Runeson B. Burnout and psychiatric morbidity among medical students entering clinical training: a three year prospective questionnaire and interview-based study. BMC Med Educ. 2007;7:6.
3. Baldwin DC, Jr., Daugherty SR, Ryan PM, Yaghmour NA. What do residents do when not working or sleeping? A multispecialty survey of 36 residency programs. Acad Med. 2012;87(4):395-402.
4. Olson SM, Odo NU, Duran AM, Pereira AG, Mandel JH. Burnout and Physical Activity in Minnesota Internal Medicine Resident Physicians. J Grad Med Educ. 2014;6(4):669-74.
5. Dyrbye LN, Power DV, Massie FS, Eacker A, Harper W, Thomas MR, Syzdlo DW, Sloan JA, Shanafelt TD. Factors associated with resilience to and recovery from burnout: a prospective, multi-institutional study of US medical students. Med Educ. 2010;44(10):1016-26.
6. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, Shanafelt TD. Burnout among U.S. medical

students, residents, and early career physicians relative to the general U.S. population. Acad Med. 2014;89(3):443-51.
7. Enoch L, Chibnall JT, Schindler DL, Slavin SJ. Association of medical student burnout with residency specialty choice. Med Educ. 2013;47(2):173-81.
8. Dyrbye LN, Thomas MR, Eacker A, Harper W, Massie FS, Jr., Power DV, Huschka M, Novotny PJ, Sloan JA, Shanafelt TD. Race, ethnicity, and medical student well-being in the United States. Arch Intern Med. 2007;167(19):2103-9.
9. Chang E, Eddins-Folensbee F, Coverdale J. Survey of the prevalence of burnout, stress, depression, and the use of supports by medical students at one school. Acad Psychiatry. 2012;36(3):177-82.
10. Dyrbye LN, Thomas MR, Power DV, Durning S, Moutier C, Massie FS, Jr., Harper W, Eacker A, Szydlo DW, Sloan JA, Shanafelt TD. Burnout and serious thoughts of dropping out of medical school: a multi-institutional study. Acad Med. 2010;85(1):94-102.
11. Cecil J, McHale C, Hart J, Laidlaw A. Behaviour and burnout in medical students. Med Educ Online. 2014;19:25209.
12. Galan F, Sanmartin A, Polo J, Giner L. Burnout risk in medical students in Spain using the Maslach Burnout Inventory-Student Survey. Int Arch Occup Environ Health. 2011;84(4):453-9.
13. Gerber M, Brand S, Elliot C, Holsboer-Trachsler E, Pühse U, Beck J. Aerobic exercise training and burnout: a pilot study with male participants suffering from burnout. BMC Research Notes. 2013;6(1):78.
14. Likus W, Milka D, Bajor G, Jachacz-Lopata M, Dorzak B. Dietary habits and physical activity in students from the Medical University of Silesia in Poland. Rocz Panstw Zakl Hig. 2013;64(4):317-24.
15. Webb E, Ashton CH, Kelly P, Kamah F. An update on British medical students' lifestyles. Med Educ. 1998;32(3):325-31.
16. Lumley S, Ward P, Roberts L, Mann JP. Self-reported extracurricular activity, academic success, and quality of life in UK medical students. Int J Med Educ. 2015;6:111-7.
17. Lebensohn P, Dodds S, Benn R, Brooks AJ, Birch M, Cook P, Schneider C, Sroka S, Waxman D, Maizes V. Resident wellness behaviors: relationship to stress, depression, and burnout. Fam Med. 2013;45(8):541-9.
18. Ball S, Bax A. Self-care in medical education: effectiveness of health-habits interventions for first-year medical students. Acad Med. 2002;77(9):911-7.
19. Golembiewski R. Global burnout. 1st ed. London: JAI; 1996.
20. Hao W, Yi H, Liu Z, Gao Y, Eshita Y, Guo W, Zhang H, Sun J. Gender comparisons of physical fitness indexes in Inner Mongolia medical students in China. Glob J Health Sci. 2015;7(1):220-7.
21. Holtz KA, Kokotilo KJ, Fitzgerald BE, Frank E. Exercise behaviour and attitudes among fourth-year medical students at the University of British Columbia. Can Fam Physician. 2013;59(1):e26-32.
22. Stanford FC, Durkin MW, Blair SN, Powell CK, Poston MB, Stallworth JR. Determining levels of

physical activity in attending physicians, resident and fellow physicians and medical students in the USA. Br J Sports Med. 2012;46(5):360-4.
23. Frank E, Tong E, Lobelo F, Carrera J, Duperly J. Physical activity levels and counseling practices of U.S. medical students. Med Sci Sports Exerc. 2008;40(3):413-21.
24. Frank E, Carrera JS, Elon L, Hertzberg VS. Basic demographics, health practices, and health status of U.S. medical students. Am J Prev Med. 2006;31(6):499-505.
25. Peterson DF, Degenhardt BF, Smith CM. Correlation between prior exercise and present health and fitness status of entering medical students. J Am Osteopath Assoc. 2003; 103(8):361-6.

(P707