

## A survey of medical students attending an international student conference

Jonathan Mamo MD MSc<sup>1</sup>, Chantal Fenech MD<sup>1</sup>

<sup>1</sup> Peterborough City Hospital, Peterborough, United Kingdom, Tell: (44) 7824756792, jonathan.mamo@yahoo.com

---

### Abstract

**Objectives:** To explore the lifestyle choices of international medical students attending a student conference.

**Study Design:** Questionnaire-based census study.

**Methods:** A pre-tested structured questionnaire was given to the 481 delegates attending an international medical student conference in 2009 in Macedonia. The respondents were asked questions on their demographics, physical activity, smoking habits, alcohol consumption, sexual activity and nutritional intake. The results obtained from statistical analysis using SPSS version 16 were used to outline the socio-demographic variables under survey.

**Results:** An overall response rate of 60.9% (n=293) was achieved. The sample population had a mean age of 22.45, 44% (128) of the respondents were male and 56% (165) were female. 89% were undergraduate students and 62% were from Europe. 78.8% reported practicing physical activity at least once a week, with 4.5% reporting no physical activity at all. Of those who reported practicing physical activity, half carry out more than one hour of activity daily. 22.2% (n=65) smoke on a regular basis, of which 88.7% smoked cigarettes and 11.3% reported smoking marijuana over the previous 12 months. The Eastern Mediterranean Region reported the highest percentage of smoking (31.6%), followed by Europe (23.1%). 84.6% of the respondents reported regular consumption of alcohol. The majority of respondents (97%) reported consuming vegetables and fruit at least on a weekly basis. 37% reported consuming fast food at least once a week. 76.9% of the subjects reported having been sexually active. Of the sexually active population; 82.4% reported always using contraception, with the condom and the pill being the more popular methods.

**Conclusions:** Medical students are in constant contact with health promotion and this should reflect in their own personal lifestyle choices. A very low percentage was observed to smoke on a regular basis, a high percentage carry out physical activity regularly and the majority include healthy food in their diet. The same population did however report a high percentage of alcohol and fast food consumption. The latter may be due to lifestyle choices made somewhat inevitable by their educational schedule, many of whom live away from home.

---

**Keywords:** medical students; lifestyle; health

---

## **Introduction**

Medical students and doctors experience high rates of psychological morbidity due to their work and study environment [1][2]. Medical students are initially similar to the general student population prior to commencing their medical course [3]. As the training commences the reductions in psychological well-being have been demonstrated to increase [4]. Stress may be a contributing factor for unhealthy behaviours and co-morbidities. Previous research has estimated that up to half of the medical students reportedly abuse of alcohol as well as illicit substances such as marijuana [5]. Other aspects of student health and lifestyle, such as reduced physical activity and poor diet, also suffer with increasing workload [6].

With increases in obesity levels [7], fast-food consumption [8], smoking rates [9], alcohol consumption [10], and illicit drug use [11], it is uncertain what the increase of these socio-economic factors will cause over the next couple of decades. It is inevitable, however, that the diseases which will progress from poor lifestyle choices such as regular smoking, poor nutrition and poor exercise will be dealt with by the doctors of the future. The medical students currently in their education phase will have to deal with today's population's poor lifestyle choices. The aim of this study was to view the lifestyle choices made by the medical students themselves as they are in constant contact with health promotion facilities and education which they themselves will be teaching in the years to come as health professionals.

## **Objectives**

The objective was to explore the lifestyle choices made by a sample of international medical students attending a student conference.

## **Method**

A cross-sectional study was conducted at an international medical student congress held in Macedonia in August 2009. The survey was given as a 21-question survey to all participants of the congress (n=481) over a two-day period. A pre-tested structured questionnaire was self administered to the students with their consent. The socio-demographic data was collected on lifestyle choices, tobacco consumption (cigarette, pipe tobacco and tobacco use in any other form), exercise that lasts for 30 minutes or longer, dietary habits (including fruit, vegetable and fast food consumption), alcohol consumption and sexual activity. The collected data was analysed using the statistical program SPSS version 16.

## **Results**

The survey had a response rate of 60.9% (n=293) and the study subjects included 56.3% females and 43.7% males. The majority of the students were undergraduate students (89.0%) and the remaining subjects were at postgraduate level (11.0%). The mean age of the students was 22.45 years with the ages of the subjects ranging from 18 to 29 years. The study subjects

were then divided into five regions similar to those maintained by the World Health Organisation. The majority of the subjects originated from European countries (62.3%) with the remainder of the subjects hailing from the Eastern Mediterranean Region (12.3%), Asia (12.0%), the Americas (11.6%) and Africa (1.7%).

Less than a quarter of the subjects (19.9%) reported exercising for more than 30 minutes a day with the majority (58.9%) reportedly exercising between once and six times a week. A very small proportion (2.7%) of subjects reported infrequent (less than monthly) exercise and just a fraction of the respondents (4.5%) did not engage in physical activity. There was no significant difference in the physical activity carried out between the gender groups in the study population.

The majority of respondents consume fruit (63.1%) and vegetables (78.8%) on a daily basis, however, more than a third of the respondents (37.2%) also reported the regular consumption of fast food with a small proportion (7.6%) reported consuming fast food on a daily basis. Just 5.2% reported never consuming fast food products. Chi squared analysis showed that females were significantly healthier in their nutritional choices with higher consumption of fruit and vegetables than their male counterparts ( $p < 0.05$ ). No significant difference was seen, however, in the consumption of fast foods.

Less than a quarter of the respondents (22.3%) reported that they smoked on a regular basis. This included cigarettes, pipe tobacco, and any other forms of tobacco as well as the use of marijuana. In fact, 77.1% reported never smoking any form of tobacco. When reviewing the regions in relation to smoking; the Eastern Mediterranean had the greatest number of smokers with just under a third (31.6%) of the study population. European and American subjects were not far behind with these respondents making up 23.1% and 21.2% of the population respectively. The respondents from the African region did not report any form of smoking whatsoever. When comparing genders; males were significantly more likely to be smokers than females ( $p < 0.05$ ).

More than three-quarters of the study population (76.9%) reported having intercourse at least once in their lifetime. Age of first intercourse ranged from 13 to 25 with a mean of 17.7 years. Regarding sexual orientation; an absolute majority (94.3%) reported being heterosexual with a small fraction reporting their orientation as homosexual (1.8%) or bisexual (3.5%).

An overwhelming majority stated regular contraceptive use with 82.4% of the sexually active cohort stating always to use contraception and 15.4% stating regular use. Just 2.2% of the sexually active respondents reported never using contraception. The most popular methods of contraception were the condom (68.0% of active males) and the contraceptive pill (41.7% of active females). A small percentage (9.6%) of the study population also reported using other forms of contraception such as withdrawal, intra-uterine devices, contraceptive patches and the diaphragm. Almost half (46.4%) of the sexually active respondents reported using more than one form of contraception and this was especially seen in the female population with condoms being used in the event of intercourse even when the contraceptive pill was being used (35.0%).

Over half of the sexually active respondents (51.0%) reported having just one sexual partner over the previous twelve months. Of the sexually active respondents 16.7%, 15.1% and 7.8% reported having two, three or four sexual partners respectively over the previous twelve months. Sexually active males had an average of 2.44 partners over the previous 12 months whereas females had an average of 1.16 partners over the same time period. 9.4% of the sexually active group reported having five or more sexual partners over the same time period. The subjects from the European (90.0%) and the American (87.9%) regions reported the highest proportion of sexual activity with the lowest proportion of sexually active populations being the Eastern Mediterranean and Asia with 35.1% and 39.4% respectively. Chi squared analysis showed males to be more likely to be sexually active ( $p < 0.05$ ) and T-test analysis showed that they were also more likely to have multiple sexual partners ( $p < 0.05$ ). There was, however, no significant difference in the age of first intercourse between the two gender groups.

A high proportion of medical students (43.1%) reportedly consume alcoholic beverages once or more times a week. A proportion of the respondents (15.4%) reported binge drinking on a regular basis with a small percentage (2.7%) reporting the daily consumption of alcohol. Only 15.5% of the respondents reportedly did not consume alcohol. 4.6% reported having consumed alcohol before the age of 12 with the majority commencing alcohol consumption between the ages of 15 and 18. Statistical analysis did not elicit any difference between genders with regards to prevalence of alcohol consumption and age of first consuming alcoholic substances.

[TABLE1]

## **Discussion**

Regardless of predisposing factors, lifestyle choices have a great influence on morbidity and mortality in life. Due to the cumulative effect of adverse factors throughout the life of individuals, it is important to adopt a healthy diet and lifestyle practice. This study assessed the dietary habits and lifestyle choices made by medical students, who are a significant community of future health-care practitioners. If correct lifestyle choices are made early on during the medical education period this would produce physicians practising as well as promoting a healthy lifestyle. There is a visible need for improvement in some of the lifestyle choices made by medical students. The response rate of the study may have been limited by the sensitive nature of some of the questions and also due to possible language barriers.

Similar studies conducted in Pakistan and the United Arab Emirates have shown similar findings with poor lifestyle choices made by medical students [12][13]. Nisar et al. [14] found a very low smoking prevalence which correlates with our study's regional results described for smoking. A number of American studies also found a relatively low prevalence of smoking amongst medical students [15][16][17][18]. It is a well known fact that health providers (including medical students) smoke and in 2005 the WHO Centre for Disease Prevention and the Canadian Public Health Association developed the Global Health Professionals Survey to survey smoking habits of medical, nursing, dental and pharmacy students in a variety of WHO member states and published their results in 2005 [19]. Although a large number of medical students smoke regularly there is also evidence to support the fact that the same subset of

healthcare students know and understand the health risks of smoking and are ready to promote smoking cessation to their patients [20]. In a recent review of smoking in medical students the rates of smoking were described to increase incrementally with year of study and it was also suggested that smoking cessation strategies should be put in place by the medical schools themselves [21]. There is, however, no mention in the literature that this has since been implemented.

A study conducted in the United Arab Emirates found a very poor level of physical activity whereas the surveyed international community does not show such poor levels [22]. A high prevalence of fast food consumption was once again confirmed in both the United Arab Emirates study as well our study population. Poor diet has been documented in medical students with even worse nutritional intake being documented closer to exam periods [23][24]. British and Greek studies found similar results when reviewing the amount of fruit consumed by medical students with the majority eating fruit regularly but with very few actually consuming the five portions of fruit a day advised by health authorities [25][26].

Studies on sexual activity in medical students have found similar results as found in our survey with similar mean ages for first intercourse as well as similar preferences of contraceptive methods [27][28]. It may be possible that the two studies carried out in Pakistan and the United Arab Emirates did not include this variable due to social constraints. The results of the international survey show a high prevalence of sexual activity and an equally high prevalence of contraceptive use with a proportion of the subjects reportedly using two or more forms of contraception; the male condom and the oral contraceptive pill being the most common forms. Same-sex behaviour described in the literature correlates well with the low levels of homosexual or bisexual activity elicited in the medical student international community [29].

## **Conclusion**

The self-reported lifestyle choices and habits of international medical students displayed choices of a healthy and unhealthy nature with a predominance of high proportions of consumption of tobacco, fast food and alcohol. The healthy choices made by the study group however both displayed that some aspects of health promotion do permeate into the lifestyle choices made by medical students as is shown in the positive prevalence of contraceptive use. The high rates of exercise as well as the clearly demonstrated levels of fruit and vegetable consumption were also some of the positive behaviours elicited. It is possible that the lifestyle choices made by medical students may be inevitable due to the educational schedule, many of whom live far away from home. It is possible that more directed dietary and tobacco advice may be required as a preventive strategy for this study group. The findings of our study as well as other studies held in the past suggest the need for a larger study across more countries so that adequate arrangements can be made for student healthcare [30].

**Funding:** None

**Competing interests:** None declared

**Ethical approval:** In 2009, prior to the start of the study, the Executive Board organising the conference decided that ethical approval was not required.

---

## References

1. Stewart SM, Betson C, Marshall I, Wong CM, Lee PW and Lam TH. Stress and vulnerability in medical students. *Medical education* (2006) 29(2), 119-127
2. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety and other indicators of psychological stress among U.S and Canadian medical students. *Academic Medicine* (2006) 81(4), 354-373. doi:10.1097/00001888-200604000-00009
3. Singh G, Hankins M and Wienman JA. Does medical school cause health anxiety and worry in medical students? *Medical Education* (2004) 38(5), 479-481. doi:10.1046/j.1365-2929.2004.01813
4. Guthrie EA, Black D, Shaw CM, Hamilton J, Creed FH and Tomenson B. Embarking upon a medical career: Psychological morbidity in first year medical students. *Medical Education*. (1995) 29, 337-341
5. Newbury-Birch D, White M, Kamali F. Factors influencing alcohol and illicit drug use amongst medical students. *Drug and Alcohol Dependence* (2000) 59(2), 125-130.
6. Ball S, Bax A. Self-care in medical education: Effectiveness of health-habits interventions for first year medical students. *Academic Medicine* (2002) 77(9),911-917.doi:10.1097/00001888-200209000-00023
7. Rodríguez-Martín A, Novalbos Ruiz JP, Martínez Nieto JM, Escobar Jiménez L. Life-style factors associated with overweight and obesity among Spanish adults. *Nutricion Hospitalaria*. 2009; 24(2): 144-151
8. Banerjee A. Coronary heart disease: Awareness of risk factors and lifestyle among school-going adolescents. *Indian Journal of Medical Science* 2007;61:474-6. doi: 10.4103/0019-5359.33713
9. Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, Murray C, et al. The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Medicine* (2009) 6(4): e1000058. doi:10.1371/journal.pmed.1000058
10. Schaus JF, Sole ML, MCCoy TP, Mullett N, Bolden J, Sivasthamparam J, et al. Screening for high-risk drinking in a college student health centre: Characterizing students based on quantity, frequency, and harms. *Journal of Studies on Alcohol and Drugs*.(2009) Suppl No. 16, 34-44
11. Webb E, Ashton CH, Kelly P, Kamali F. An update on British medical students' lifestyles. *Medical Education* (2002) 32(3):325–31. doi:10.1046/j.1365-2923.1998.00204.x
12. Carter AO, Elzubeir M, Abdulrazzaq YM, Revel AD, Townsend A. Health and lifestyle needs assessment of medical students in the United Arab Emirates. *Med Teach* 2003; 25: 492-6
13. Nisar N, Qadri MH, Fatima K, Perveen S. Dietary habits and life style among the students of a private medical university Karachi. *J Pak Med Assoc* 2009; 59: 98-101
14. Nisar N, Qadri MH, Fatima K, Perveen S. Dietary habits and life style among the students of a private medical university Karachi. *J Pak Med Assoc* 2009; 59: 98-101
15. Conard S, Hughes P, Baldwin DC, Achenbach KE, Sheehan DV. Substance use by fourth-year students at 13 U.S. medical schools. *Journal of Medical Education* (1988) 63:747-758
16. Coe RM, Cohen JD. Cigarette smoking among medical students. *Am J Public Health* (1980) 70:169-171

17. Coe RM, Miller DK, Wolff M, Predergast JM, Pepper M. Attitudes and health promoting behaviours of medical and law students. *Am J Public Health* (1982) 72:725-7
18. Maynard L, Goldberg R, Ockene J, Levy B, Howe J, Dalen J. Behaviors and attitudes among medical students concerning cigarette smoking and alcohol consumption. *Journal of Medical Education* (1986) 61:921-2
19. Centers for Disease Control and Prevention (CDC). Tobacco use and cessation counselling – Global health professionals survey pilot study, 10 countries, 2005. *MMWR Morb Mortal Wkly Rep* 2005;54:505-9.
20. Springer CM, Tannert Niang KM, Matte TD, Miller N, Bassett MT, Frieden TR. Do medical students know enough about smoking to help their future patients? Assessment of New York City fourth-year medical students' knowledge of tobacco cessation and treatment for nicotine addiction. *Acad Med.* (2008) 83:982–989.
21. Smith DR, Leggat PA. An international review of tobacco smoking among medical students. *J Postgrad Med* (2007) 53:55-62
22. Carter AO, Elzubeir M, Abdulrazzaq YM, Revel AD, Townsend A. Health and lifestyle needs assessment of medical students in the United Arab Emirates. *Med Teach* 2003; 25: 492-6
23. Škėmienė L, Ustinavičienė R, Piešinė L, Radišauskas R. Peculiarities of medical students' nutrition. *Medicina (Kaunas)* 2007; 43(2)145-152
24. Wolf TM, Kissling GE. Changes in life-style characteristics, health, and mood of freshman medical students. *Journal of Medical Education.* (1984) 59:806-814
25. Chahal A, Oakeshott P. What students say about '5 a day'. *British Journal of General Practice*, April 2007 p.325
26. Bertias G, Linardakis M, Mammias I, Kafatos A. Fruit and vegetables consumption in relation to health and diet of medical students in Crete, Greece. *International Journal for Vitamin & Nutrition Research.* (2005) 75(2):107-17
27. Nair H, Oakeshott P. Sexual activity before the age of 16 years. *Family Practice* (2001) 18(3):344
28. Ortiz-Ortega A, García de la Torre G, Galván F, Cravioto P, Paz F, Díaz-Olavarrieta C, et al. Abortion, contraceptive use, and adolescent pregnancy among first-year medical students at a major public university in Mexico City. *Rev Panam Salud Publica/Pan Am J Public Health* (2003) 14(2): 125-130
29. McConaghy N, Armstrong MS, Birrell PC, Buhrich N. The incidence of bisexual feelings and opposite sex behaviour in medical students. *The Journal of Nervous and Mental Disease.* (1979) 167(11):685-8
30. Ashton CH, Kamali F. Personality, lifestyles, alcohol and drug consumption in a sample of British medical students. *Medical Education.* (1995) 29(3):187-192. DOI:10.1111/j.1365-2923.1995.tb02828.x

Table 1: Study Demographics

<b>Study Demographic</b>	<b>Males (%)</b>	<b>Females (%)</b>	<b>Comments</b>
Study Group Gender	128 (43.7)	165 (56.3)	-
Regular Physical Activity	102 (80.4)	128 (77.6)	No significance

---

Regular Smokers	35 (27.6)	30 (18.2)	P < 0.05
Sexually Active	104 (82.5)	118 (72)	P < 0.05
Sexual Partners (mean)	2.44	1.16	P < 0.05
Always Use Contraception	83 (65.9)	99 (60.4)	No significance
Regular Drinkers	63 (49.5)	63 (38.2)	No significance
Regular Fruit Consumption	72 (56.2)	114 (70.4)	P < 0.05
Regular Vegetable Consumption	91 (71.0)	141 (86.5)	P < 0.05
Regular Fast Food Consumption	56 (43.7)	53 (32.5)	No significance

---