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Leading healthy lives: lifestyle medicine for medical students

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Running Title: Lifestyle Medicine for Medical Students

Abstract:

Background: Doctors have a special role in helping patients make lifestyle changes, and are more credible and effective if they are role models. Yet, few medical schools incorporate lifestyle medicine into their curricula. We ascertained the influence of a lifestyle medicine curriculum during the first year of medical school.

Methods: The curriculum, involving 140 students, consisted of one intensive day at medical school entry and 16 hours eight months later. It addressed students' own lifestyle and lifestyle medicine topics. A survey was delivered at the beginning and end of the academic year.

Results: 114 students completed the first survey and 64 the second. The course was rated highly for personal and professional value. At baseline students exhibited lifestyle behaviors typical for young adults and appreciated the physician's role in lifestyle change. However over time they showed significant reductions in quality of lifestyle, with increased stress, weight gain and fast food consumption, and less exercise.

Conclusions: Although lifestyle medicine is valued by medical students, a 24 hour lifestyle medicine curriculum delivered over three days appears to be ineffective in preventing worsening behaviours. This is especially concerning as physicians are unlikely to provide effective guidance if they cannot sustain healthy behaviours themselves.

Key-words: lifestyle medicine; health behaviours of medical students; lifestyle curriculum; lifestyle medicine teaching

Introduction:

The greatest challenge of medicine at the beginning of the third millennium is dealing with the epidemic of chronic diseases that are caused or exacerbated by poor quality lifestyle. The costs to society and health systems are increasing. The World Health Organization predicts that by 2020 two-thirds of all diseases worldwide will be the result of unhealthy lifestyle[1]. Guidelines call uniformly for lifestyle change as the first line of therapy for prevention and treatment of chronic diseases[2,3]. However, in practice physicians often fail to counsel patients about healthy behaviours[4]. The need to include lifestyle medicine teaching in undergraduate medical education is evident, yet remains a neglected area in most medical schools[5,6].

The health behaviour of medical students is crucially important not only for their own health but also for their future patients' health. Research shows that healthier personal practice during medical school positively predicts physicians' preventive counselling practices[7-9]. An association has been found between physicians' health practices and their ability to influence their patients' lifestyle behaviours[10-12].

While students appear to exhibit typical lifestyle behaviours for young adults on entering medical school in the USA[13], these are not necessarily optimal for future health and the heavy burden of academic requirements and high levels of stress adversely affect students' health behaviours and status[14] further. The need for medical schools to promote student wellness is clear, yet in reality there are few initiatives aimed at encouraging healthy lifestyle behaviours[9,15,16].

The Bar Ilan Medical School, established in 2011, was located in the north of Israel to promote the health status of this peripheral and disadvantaged region of the country. An emphasis has been laid on the health habits of medical students, with the aspiration that over time this would contribute to a positive wave of change towards better health for the surrounding population. To this end, a personal lifestyle behaviour program was incorporated into the Public Health course which is delivered on entry into medical school. Towards the end of the first year teaching on lifestyle medicine is given to introduce students to their professional role and responsibilities in this area.

We studied the influence of the lifestyle curriculum on our students through a survey conducted during the first week of medical school and at the end of the first preclinical year. Our intention was to document students' health behaviours as well as their attitudes towards the role of the medical profession in the delivery of lifestyle medicine.

Methods:

Lifestyle curriculum:

An intensive lifestyle day (8 hours) is delivered within the framework of the required 3 week public health course, the first course students receive on starting medical school. The aim is to expose students to the importance of health behaviours in health and disease, the importance of lifestyle for their own health and wellbeing and to encourage them to develop healthier behaviours. The formal lectures included an introduction to healthy lifestyle, exercise, nutrition and healthy eating, stress and emotional well-being, and motivation for lifestyle change. Each lecture is followed by practical and interactive exercises, including a healthy cooking demonstration, aerobic and anaerobic physical activity and a yoga class. All sessions provide practical tools to encourage lifestyle changes for personal and professional use.

Lifestyle medicine teaching is incorporated towards the end of the first year in the bioenergetics course which covers different aspects of chronic diseases. In this component of the lifestyle curriculum, the relevance of lifestyle behaviours to health and disease and the central role of the medical profession are addressed. The 2 day program includes more in-depth knowledge of nutrition (4 hours), sports medicine (4 hours), motivational interviewing (4 hours), smoking (2 hours) and sleep medicine (2 hours).

Study population:

All medical students enrolled in 2012 and 2013 at Bar Ilan University Faculty of Medicine. The program is a 4 year graduate program with students commencing following a first degree and 3 years compulsory military service.

Outcome measures:

An anonymized survey was administered during the first week of medical studies and again 8 months later at the end of the lifestyle medicine teaching sessions. Students were questioned on demographic data, perceived health status, body weight, stress levels and personal health behaviours including smoking, exercise, sleep and diet. The survey was a composite of the Israeli Ministry of Health national survey of Knowledge, Attitude and Practices (KAP) 2011[17] with further questions relating to diet and eating behaviours adapted from the UK HENRY obesity prevention program[18]. Attitudes towards physicians' role in relation to lifestyle medicine were ascertained using three items. These were selected from a validated instrument developed to assess physicians' attitudes to lifestyle counselling[19]. The three items focused upon the perceived role of the physician. Items in this scale are ranked on a Likert scale from 1 = strongly disagree; 4 = strongly agree.

Students also completed an online questionnaire at the end of the Public Health course, evaluating the intensive lifestyle day, using a Likert Scale of 1-5, anchored with descriptors. They were given space to freely comment on the course.

Data analysis:

Initial checks compared participants who completed questionnaires at both time points with those who only completed the baseline measure. Continuous variables were tested using independent groups t-tests, and categorical variables using Chi-square or Mann-Whitney U tests, as appropriate.

Changes in continuous outcomes (e.g. dietary consumption, frequency of physical activity) were analysed using repeated measures t-tests. Due to the level of data provided, changes in perceived weight and health status, eating habits and sleep quality were analysed using the non-parametric paired-sample Wilcoxon signed rank test. Change in smoking status was analysed using McNemar's test for paired nominal level data.

Results:

140 students were enrolled in the medical school between 2012 and 2013 of whom 114 completed the surveys on entry and 64 eight months later. Mean age was 27 years (sd 3.4); 54 were

male and 60 female; 22 were immigrants; 111 were Jewish, 3 Arab; 42 were married of whom 11 had children.

Students who provided data at both time points did not substantially differ from those who only completed the first measure. The groups were comparable in terms of gender, age, weight (reported weight and perceived weight status), BMI, lifestyle and perceived health and stress level (all $p>0.05$).

Medical students' perceptions of health and reported health behaviours on entry to medical school

Medical students' perceptions of their health status and their reported health behaviours are shown in Table 1. At the start of medical school they perceived their health to be good and mean BMI was in the healthy range. Almost 1 in 5 reported smoking but only one student smoked more than ten cigarettes daily; alcohol consumption was low. Taking vegetable and sweet drink consumption as markers of diet, their nutrition was satisfactory and most engaged in physical activity regularly. Stress levels were moderate and they slept on average 6 to 7 hours each night, with reasonable quality sleep.

Insert Table 1: Medical student lifestyle behaviours on entry to medical school and their attitudes to lifestyle medicine (n=114)

Students' views regarding the lifestyle curriculum:

All 114 students participated in the lifestyle day over the two academic years. Students rated the lifestyle day highly and found it valuable as shown in Figure 1. They saw the day as being of professional (4.0±1) and personal value (4.1±1). Overall it was ranked as a positive learning experience (4.2±0.9), and rated higher than the public health course overall. Comments indicated that the session was excellent and should be extended in length and breadth. They noted too that the combination of lectures with practical experience was enriching and fascinating, and gave motivation to put into practice what was learned.

Insert Figure 1: Students' perceptions regarding the lifestyle day

Change in health behaviours over the first year of medical school:

64 of the 114 students (56%) completed the survey again eight months later at the end of the lifestyle teaching curriculum, 28 were from the 2012 and 36 from the 2013 cohort. Students who failed to complete the second survey (n=50) did not differ at baseline in terms of age, gender, reported weight/BMI, perceived health and stress levels, smoking, exercise, eating habits or dietary intake.

As shown in Table 2, there was a significant increase in self-reported weight (and hence BMI) with a mean gain of 1kg. Perceptions of weight status did not change, but there was significant deterioration in perceived overall health status. Self-reported stress levels were also significantly higher at follow-up, with reduction in the use of exercise in response to stress.

Insert Table 2: Change in medical student weight and health status during their first year at medical school (n=64)

More detailed analysis of health behaviours are shown in Table 3. A significant reduction was found in all forms of physical activity except for walking. When asked about the support they would find helpful to increase their physical activity (not shown in table), 35 responded at baseline that group activities would be helpful but only 14 felt this was a good idea later (p=.001). Eating habits changed little over time except for reported consumption of fast foods which increased significantly (p=0.041). Questions relating to sleep and smoking were only introduced for the second cohort. Students showed no change in quantity or quality of sleep. Smoking and alcohol consumption also showed no change.

Insert Table 3: Change in reported health and lifestyle behaviours following 8 months at medical school and after completion of the lifestyle medicine curriculum

On questioning students regarding the role of the doctor in lifestyle medicine, there was little change with most continuing to see that they had a role as providing guidance to patients, and that this area was not only the role of paraprofessionals.

Insert Table 4: Attitudes towards lifestyle medicine and the physicians' role (1=strongly disagree, 4=strongly agree)

Discussion:

In light of the recognition that doctors have a significant role in the prevention and management of lifestyle related diseases, we introduced a lifestyle curriculum into the first year of medical studies, based on our successful experience of training family physicians[20]. The program consisted of 24 hours of teaching delivered in two concentrated blocks – as much as could be negotiated into an already stretched and demanding curriculum. We determined to ascertain students' views regarding the program, and to see if it impacted their health and lifestyle over the course of the following year. We hoped that the program would reinforce healthy behaviours and help them realize the importance of role modelling these behaviours in their career as physicians.

While the lifestyle curriculum amounted to only a relatively small proportion of their preclinical studies, survey of the literature indicates that lifestyle medicine receives more attention in our medical school than the subject is given elsewhere[5,6,15,16]. We were gratified that the students received the program well and their comments indicated that they took the subject seriously and were intending to lobby for healthier opportunities within their student union and the medical school itself. The results of our survey of health behaviours towards the end of the first year of medical training were therefore disappointing to say the least.

On entry to medical school, students' lifestyle was satisfactory in terms of weight, stress levels and perceived health, and was comparable to medical students in the US[13] and other individuals of their age in Israel[20]. Most reported participating in active sport at least once per week, their daily vegetables consumption was adequate and consumption of sweet drinks was moderate. While they commonly ate fast foods, they also prepared home-cooked food for themselves. They appeared to be a population who would be receptive to the lifestyle curriculum, especially as they saw the relevance of lifestyle as part of the doctor's role in caring for patients.

However, after only eight months of medical school, their lifestyle had deteriorated considerably. They reported an increase in weight, poorer health, increased stress and a reduction in exercise to counter stress. They changed from being active to reducing their physical activity across a range of activities. Their consumption of fast foods increased (although eating habits appeared to change little in other ways). As they are mature students, this change cannot be explained by a move from sheltered home life. While reports on this sort of deterioration over the course of medical studies is not new[14] our findings indicate that greater efforts are needed to reduce the stress and burden of medical studies, provide a healthier medical school environment and to incorporate lifestyle medicine more effectively into the medical curriculum. Medical schools must take responsibility to consider ways to reduce stress and support students to cope with it, especially as stress is likely to be inherent in the study of medicine.

Changing lifestyle behaviours is difficult and requires time and continued efforts. Our results suggest that more substantial resources and time need to be allocated to lifestyle medicine. A more effective way may be to incorporate it into the entire medical curriculum, across both the preclinical and clinical years. Individual help for students is also a necessary component. We are presently seeking resources to design an integrated curriculum that provides students with the competences doctors require to effectively deliver lifestyle medicine.

There are limitations to our study. The lifestyle program amounted to only a limited proportion of the medical curriculum; with a ‘single dose’ addressing their own lifestyle at the start of their studies followed by two days of academic study relating to lifestyle medicine. We were perhaps naïve to imagine that, however well received, it could counteract the well acknowledged burden of medical studies. The response rate to the second survey was less than 60%, although we saw this as something of an achievement given the students’ weariness of teaching satisfaction surveys to which they are often subjected. The finding that responders did not differ from non-responders in their personal characteristics and lifestyle behaviours provides some reassurance that our findings have validity.

Tackling the issue of lifestyle goes beyond the health and wellbeing of medical students. Health behaviours during medical school are important as they predict physicians' later preventive counselling practices[7-9]. There is evidence too that physicians who lead healthier lifestyles are more able to influence their patients' lifestyle behaviours for the good[10-12]. Appropriate investment in the medical school years and instilling 'healthy' policies into the medical school environment are essential to maximize the chances of overcoming the epidemic of lifestyle related diseases which is dominating health across the world. No doubt this requires inclusion through a longitudinal curriculum with frequent 'touch points' emphasising the importance of personal health behaviours and professional skills in supporting lifestyle change. Given the inevitability of stress during medical studies, medical schools must also take responsibility to help students cope with their stress, as well as focusing on how to help future patients.

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Table 1: Medical student lifestyle behaviors on entry to medical school and their attitudes to lifestyle medicine (n=114)

Health and lifestyle behavior	**Mean (SD)**
BMI kg/m^2 (calculated from reported weight, height)	22.0 (3.4)
Perceived weight status (1=underweight, 4= overweight)	1.7 (1.1)
Perceived health status (1=excellent, 5= generally poor)	1.5 (0.7)
Self-rated stress level (0-100%)	42%
Physical activity (times per week)	
- Walking	1.7 (1.3)
- Swimming	0.9 (0.7)
- Gymnastics/dance	1.1 (0.8)
- Gym	1.6 (1.1)
- Ball games	1.1 (0.9)
- Running	1.6 (1.1)
- Other	1.2 (1.1)
Frequency of eating habits (0=never, 4=always)	
- Eating with friends/family	2.5 (0.8)
- Eating while using computer/ phone/ TV/ reading	2.2 (1.0)
- Stopping eating when full	2.6 (1.0)
- Choosing healthy foods	2.6 (0.7)
- Consumption of fast foods	1.5 (0.8)
- Consumption of self-prepared foods	2.7 (0.7)
- Eating vegetables (times per day)*	2.1 (1.5)
- Consumption of sweetened drinks (times per day)*	0.8 (1.1)
Sleep	
Hours of sleep each night*	6.6 (0.8)
Quality of sleep (1=very good, 4=very poor)	2.2 (0.8)
Smoking and alcohol	
Number of students who smoke (%)	18 (16%)
Alcohol consumption (times per day)*	0.4 (0.6)
Attitudes to lifestyle medicine (1=strongly disagree, 4=strongly agree)	
My role as a doctor in the future is to treat illness and provide guidance about healthy lifestyle	3.5 (0.7)
Patients expect their doctors to be role models for a healthy lifestyle	3.3 (0.6)
Advice regarding healthy lifestyle is the role of paraprofessionals and not the doctor	2.0 (0.7)

*data available for 2013 cohort only (n=36)

Table 2: Change in medical student weight and health status during their first year at medical school (n=64)

		First week at medical school		At completion of lifestyle curriculum (after 8 months)		
	n	Mean	SD	Mean	SD	p
Reported weight (kg)	62	64.5	12.5	65.3	12.7	**.026**
BMI kg/m^2 (calculated from reported weight, height)	61	21.9	2.7	22.3	2.9	**.006**
Perceived weight status (under- to overweight)	63	2.3	0.6	2.3	0.7	.439
Perceived health status (excellent to generally poor)	63	1.6	0.7	1.9	0.8	**.020**
Stress level (0-100%)	60	50.9	21.0	58.8	21.8	**.010**

Table 3: Change in reported health and lifestyle behaviours following 8 months at medical school and after completion of the lifestyle medicine curriculum

		First week at medical school		At completion of lifestyle curriculum (after 8 months)		
	n	Mean	SD	Mean	SD	p
Physical activity – number of times students participated in exercise per week						
Walking	43	1.5	0.9	2.1	2.4	.165
Swimming	32	1.0	0.7	0.2	0.5	**<.001**
Gymnastics/dance	36	1.1	0.6	0.4	1.1	**<.001**
Gym	37	1.5	1.0	0.8	1.4	**.002**
Ball games	34	1.2	0.8	0.2	0.6	**<.001**
Running	41	1.5	1.0	0.9	1.2	**<.001**
Other	33	1.4	1.2	0.9	1.8	.054
Frequency of eating habits (0=never, 4= always)						
Eating with friends/family	64	2.5	0.9	2.4	0.8	.482
Eating while using computer/phone/TV/reading	64	1.8	0.9	1.8	0.9	.737
Stopping eating when full	64	2.6	0.9	2.4	1.0	.085
Choosing healthy foods	64	2.6	0.6	2.7	0.7	.194
Eating fast food	63	2.5	0.8	2.7	0.6	**.041**
Eating self-prepared foods	64	2.7	0.7	2.8	0.8	.130
Consumption of vegetables (times per day)*	35	2.1	1.2	2.0	1.2	.683
Consumption of sweet drinks (times per day)*	34	0.7	0.9	0.7	0.9	1.00
Sleep*						
Hours of sleep each night	11	6.4	1.1	6.1	1.5	.240
Quality of sleep (1=very good, 4=very poor)	13	2.3	1.0	2.5	1.1	.608
Smoking and alcohol						
Number of students who smoke	60	11		14		.453
Alcohol consumption (times per day)*	33	0.3	0.4	.2	.4	.491

*Data only available for 2013 cohort

Table 4: Attitudes towards lifestyle medicine and the physicians' role (1=strongly disagree, 4=strongly agree)

		T1		T2		
Variable	N	Mean	SD	Mean	SD	p
My role as a doctor in the future is to treat illness and provide guidance about healthy lifestyle	55	3.5	.5	3.4	.6	.178
Patients expect their doctors to be role models for a healthy lifestyle	55	3.2	.6	3.3	.6	.433
Advice regarding healthy lifestyle is the role of paraprofessionals and not the doctor	54	1.9	.5	2.2	.6	.849