

DIETARY HABITS AND PHYSICAL ACTIVITY IN STUDENTS FROM THE MEDICAL UNIVERSITY OF SILESIA IN POLAND

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ABSTRACT

Background. Some of the major human health problems being confronted in the 21st century are cardiovascular disease, diabetes and obesity. It is recognised that having proper dietary habits (nutritional behaviour) and taking moderate physical exercise seem to be the best methods for reducing the risk of cardiovascular disease.

Objectives. To assess whether the dietary habits and levels of physical activity in first year medical students (freshers) are suitable for preventing cardiovascular disease.

Material and methods. Subjects surveyed were Polish freshers studying medicine, physiotherapy, nursing and midwifery at the Medical University of Silesia in Katowice situated in South Western Poland (n = 239, mean age 19.82 ± 1.2 years). Assessments, by questionnaire, included daily food intake, frequency of consuming foodstuffs with an adequate nutritional value and evaluating adverse dietary habits. Also considered were students' health, types of physical activity undertaken, or if not, then awareness of the consequences so arising. Statistical analysis was performed by the *Chi*² test.

Results. These showed that 25% of students did not eat breakfast, 45.6% snacked in between main meals and 25% ate just before bedtime. Only 29% ate fruit and vegetables daily and 12% never had fish. Energy drinks were consumed by 39% of students daily and also 40% daily drank sweetened beverages. Furthermore, 40% of all subjects rated themselves as physically active, among which the highest were physiotherapy students at 70%. Regular physical activity was not considered essential to health by 5% subjects and 22% of nursing students believed that a lack of exercise, despite eating a healthy diet, did not affect health. The main reasons cited for not performing physical exercise were a lack of time (60%) and energy (26%).

Conclusions. Despite being aware of the importance that a proper diet and adequate levels of physical activity confers on health, the students of medicine and related disciplines, nevertheless, did not implement theory into practice.

Key words: *medical students, dietary habits, physical activity*

STRESZCZENIE

Wprowadzenie. Choroby układu krążenia, cukrzyca oraz otyłość są istotnymi problemami zdrowotnym XXI wieku. Prawidłowe nawyki żywieniowe oraz umiarkowany wysiłek fizyczny uznano za najlepszy sposób redukcji ryzyka chorób sercowo-naczyniowych.

Cel badań. Celem badań była ocena zachowań żywieniowych i podejmowania aktywności fizycznej przez studentów pierwszego roku studiów medycznych, w aspekcie profilaktyki chorób układu sercowo-naczyniowego.

Materiał i metody. Badania ankietowe przeprowadzono na grupie studentów pierwszego roku studiów, kierunków: lekarskiego, fizjoterapii, pielęgniarstwa i położnictwa Śląskiego Uniwersytetu Medycznego w Katowicach (n = 239, średnia wieku 19,82 ± 1,2 lata). Oceniano ilość spożywanych posiłków, częstość spożywania produktów zalecanych w racjonalnym żywieniu i nawyki żywieniowe. Uwzględniono subiektywną ocenę stanu zdrowia studenta, rodzaj podejmowanej aktywności fizycznej i znajomość konsekwencji jej braku. Istotność statystyczną różnic pomiędzy grupami oceniano za pomocą testu *Chi*².

Wyniki. Analiza wykazała, że 25% studentów uczestniczących w badaniach nie spożywa pierwszego śniadania, 45,6% pojada między posiłkami, 25% spożywa bezpośrednio przed snem. Zaledwie 29% studentów spożywa codziennie owoce i warzywa, natomiast 12% nigdy nie jada ryb. 39% badanych studentów codziennie pije napoje typu *energy-drink*, a 40% napoje słodzone. 40% studentów kierunków: lekarskiego, pielęgniarstwa i położnictwa ocenia siebie jako osoby aktywne fizycznie, a wśród studentów fizjoterapii odsetek ten wyniósł 70%. 5% studentów uważało, że regularna aktywność fizyczna nie jest konieczna dla utrzymania prawidłowego stanu zdrowia, 22% studentek pielęgniarstwa uważa, że brak ruchu, nie wpływa na stan zdrowia człowieka. Jako przyczynę niepodejmowania aktywności fizycznej 60% badanych wskazywało na brak czasu i 26% na brak sił.

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Wnioski. Badania wykazały, że młodzież w wieku 19-20 lat studiująca na kierunkach medycznych, świadoma znaczenia dla zdrowia prawidłowego odżywiania i aktywności fizycznej, nie stosowała tego w praktyce codziennego życia.

Słowa kluczowe: studenci medycyny, zwyczaje żywieniowe, aktywność fizyczna

INTRODUCTION

One of the fundamental health problems afflicting the contemporary world are cardiovascular disease (CVD), diabetes and obesity; these being prime examples of non-communicable disease (NCD). They accompany Metabolic Syndrome (syndrom X) which affects nearly 20% of the adult population in Poland [26]. Acquiring appropriate dietary habits and a sufficient level of physical exercise are well recognised to be the best ways of reducing the risk of CVD [7, 8, 26, 27]. The Mediterranean diet is considered as being one of the best dietary models and consists of cereal products, vegetables, fruit, small quantities of animal derived foods and low amounts of unsaturated fatty acids (especially the trans types), cholesterol, sugar, sweets and salt [2, 26].

Having the proper dietary habits, undertaking sufficient physical activity and tackling overweight and obesity are fundamental aspects of the prophylactic ways of ensuring health, which includes the prevention of CVD [21].

Students demonstrate several unhealthy lifestyle behaviours, some of which lead to inappropriate nutrition that in later life becomes manifest by developing the so-called 'diseases of civilisation' [2]. It is generally accepted that medical students starting their studies have a greater awareness of health issues - despite there being no supporting evidence [3, 11, 13, 15, 16, 18, 27]. Monitoring such subjects about a healthy lifestyle, nutrition and physical activity is vital, because in the future these students will themselves be responsible for ensuring public health care and its promotion.

The aims of the presented study were to thus determine whether the dietary/nutritional behaviour and levels of physical activity are sufficient to avert CVD, using freshers as subjects from the Silesian Medical University in Katowice.

MATERIALS AND METHODS

Study group

These consisted of student subjects attending their first academic year from 2011/2012 in the faculty of medicine and human health at the Medical University of Silesia in Katowice, Poland. The conducted studies were anonymous and voluntary. Respondents were selected at random from those students studying medicine, physiotherapy, nursing and midwifery. In all, 239 subjects were surveyed, comprising of 201 women (84.1%) and

38 men (15.9%) whose ages ranged between 18 to 26 years (mean 19.8 ± 1.2). Table 1 shows the subjects' relevant summary details .

Questionnaire

Both dietary habits and levels of physical activity were assessed by a previously used questionnaire designed by the authors and based on the principles of proper nutrition and physical activity levels as defined by the Council for Promoting Healthy Nutrition [4, 11]. In addition, the recommendations of the European Association for Cardiovascular Prevention and Rehabilitation (EACPR) were used whenever deemed necessary [21]. The questionnaire was divided into 3 parts. The first concerned summary statistics about gender, age, height, body mass, origin and place of residence during studies. Nutritional/dietary habits were investigated in the second part, comprising of number of daily meals as well as the frequencies of consuming foodstuffs of adequate nutritional value, snacking in between meals, eating just before bedtime and how often were fast-food and energy-drinks consumed. The final section was devoted to a self assessment of health and the levels of physical activity undertaken. Questions were also asked about alcohol consumption, smoking tobacco and undergoing slimming diets. The Body Mass Index (BMI) was determined for each subject, where the ranges adopted were according to the WHO classification [29].

Statistics

The principle test used was *Chi squared* with the *Yates* correction. ANOVA was used to compare mean BMI values between each of the four specialisations studied at university to determine if there were any significant differences present, whereas the *post-hoc Tukey* test, for uneven data, was used to determine their location. Analyses included all those studied as well as the differences between gender in all of the 4 aforementioned disciplines. Statistical significance was taken as being $p \leq 0.05$ and statistical calculations were performed via the Statistica 9.0 StatSoft Inc computer software package.

RESULTS

Summary group statistics

It was found that 38.5% subjects came from large cities, 34.3% lived at the family home, 32.2% were in

Table 1. Study group summary statistics

		Numbers of subjects; women(W), men (M)
Disciplines studied at university	Department of Medicine – Medicine	60 (36 W, 24 M),
	Department of Health Sciences- Physiotherapy	52 (38 W, 14 M)
	Department of Health Sciences – Midwifery	77 (77 W)#
	Department of Health Sciences – Nursing	50 (50 W)#
Residence during study	Family home	82
	University digs	77
	Jointly rented accommodation	68
	Own home	12
Place of origin	Village	72
	Town; up to 20,000 inhabitants	30
	Town; between 20-50,000 inhabitants	45
	City; > 50,000 inhabitants	92

Explanation# ; those disciplines chosen only by women

university lodgings and 5% in their own homes. Students from the countryside consisted of 30.1% in whom the most popular subject chosen was physiotherapy at 38.5%. Medicine and nursing were predominantly selected by those living in large cities; respectively 55% and 46%. Students studying physiotherapy mostly chose to live in university lodgings; 65.4%. From those studying nursing and midwifery, 44% and 49.4% respectively chose to remain living at the family home (Table 1).

The BMI was found to be within the normal ranges and there were no significant differences between the various students groups chosen according to medical specialisation at the $p > 0.05$ level. Irrespective of the study subjects chosen, 77% showed a BMI within normal ranges, 10% showed overweight and 12 subjects demonstrated both overweight and obesity, however the last two were totally absent from the medical student group (Table 2).

Students' dietary habits and nutrition

It was found that 78% of all subjects declared their diets to be nutritionally adequate, whilst 14% evaluated their diets as unhealthy and 5% were unable to pass any judgement. A 'somewhat healthy' assessment of

Table 2. Students' BMI values

Disciplines studies	BMI (kg/m ²) (X±SD)	BMI classification	Numbers of subjects; women(W), men (M)
Medicine	21.79 ± 2.60	underweight	7 (7 W)
		normal	53(29 W, 24 M)
		overweight	0
		obese	0
Physiotherapy	22.90 ± 3.56	underweight	1(M)
		normal	39 (34 W, 5 M)
		overweight	12 (4 W, 8 M)
		obese	0
Nursing	21.67 ± 2.61	underweight	7 W
		normal	35 W
		overweight	7 W
Midwifery	20.93 ± 4.60	obese	1 W
		underweight	8 W
		normal	57 W
		overweight	10W
		obese	2 W

Explanation; BMI values according to WHO were classified as; BMI<18.50 – underweight, 18.50 ≤BMI≤ 24.99 – normal, BMI 25.00-29.99 – overweight, BMI≥30.00 – obese.

diet was made by 76% female students and 62% males as opposed to a 'somewhat unhealthy' verdict by 12% and 20% female and male students respectively. Male students more often than females could not properly define their nutritional behaviour; 10% vs 6%.

A significant number of both male and female students (66.5% and 55% respectively) ate breakfast. There were no differences between genders ($p=0.129$) for eating second breakfast (morning tea), however students frequently also never had breakfast or morning tea at all. Male students ate lunch more often than females (85% vs 60.3%; $p=0.019$) and the latter more commonly skipped lunch and dinner; respectively 2.5% and 5.5% (Table 3).

It was seen that 24% either never ate breakfast or only did so 1-2 times weekly. Most frequently, these were students studying medicine (25%) or physiotherapy (31%). Overall, 2% subjects missed lunch and 4.6% dinner. In addition, 45.6% admitted to snacking

Table 3. Frequency (%) of consuming daily meals, according to student gender

Meal	Omitted		1-2 times weekly		3-4 times weekly		Daily	
	W	M	W	M	W	M	W	M
Breakfast	10.0	22.5**	12.5	7.5***	11.0	15.0	66.5	55.0
Morning tea	14.5	35.0***	26.1	17.5	22.1	20.0	37.3	27.5
Lunch	2.5	0.0	13.5	7.5***	23.7	7.5***	60.3	85.0**
Dinner	5.5	0.0	10.5	7.5	17.0	10.0	67.0	82.5*
Snacking	8.5	17.5***	17.7	20.0	27.6	20.0	46.2	42.5

Explanation; p values obtained from comparing genders: * $p \leq 0.05$, ** $p < 0.01$, *** $p < 0.001$. Only statistically significant differences presented; W– women, M – men.

Table 4. Student's dietary habits according to gender, (%).

Consumption/Dietary habits	Never		1-2 times weekly		3-4 times weekly		Daily	
	W	M	W	M	W	M	W	M
Fruit in-between meals	10.5	27.5***	22.6	30.0	37.7	12.5**	29.2	30.0
Crisps and sweets in-between meals	20.1	25.0	42.7	47.5	27.2	12.5*	10.0	15.0
Instant soups	54.9	37.5*	30.1	40.0	10.0	17.5	5.0	5.0
Fast food, (pizza, toasted cheese sandwich, hot dog, chips, kebab)	29.1	20.0	50.7	42.5	15.7	25.0*	4.5	12.5***
Just before bedtime	35.7	20.0*	29.6	37.0	17.6	17.5	17.1	25.5

Explanation; p values obtained from comparing genders: * $p \leq 0.05$, ** $p < 0.01$, *** $p < 0.001$. Only statistically significant differences presented; W – women, M – men.

in-between meals and 26.4% did so even 3-4 times weekly; those completely abstaining from snacking constituted 17.5% male students and 8.5% females; $p < 0.001$. Table 4 shows the dietary habits of the student subjects according to gender.

Snacking in-between meals by eating fruit is considered a very desirable eating habit which was indeed declared by 29.2% female students and 30% males. Significantly higher numbers of male students (27.5%) never ate fruit as a snack between meals compared to females (10.5%). Low fruit consumption was observed in 24% of all subjects i.e. only at a rate of 1-2 times weekly. Female students (37.7%) snacked on fruit between meals only on 1-2 occasions weekly which was 3 times more than for males (12.5%); $p = 0.013$. Female students more often snacked on crisps and sweets 3-4 times weekly than males ($p = 0.027$), whilst 87% of all subjects did not eat fast food. Instant soups and ready-made meals were also consumed 1-2 times weekly by 83.6% overall, where 54.7% female students significantly less ate instant soups compared to males (37.5%); $p = 0.0001$. Meals before bedtime were consumed by 22% of all subjects (2.5% males and 17.1% females), whereas 35% females never ate before retiring as did males at 20%; these differences being significant at $p = 0.028$ (Table 4).

There was no effect of gender on the number of meals eaten which featured brown or rye bread. Female

student more commonly ate cereal products than males (33.7% vs 17.0%); $p = 0.003$. Daily consumption of such products only amounted to 31% in female students and 35% males; furthermore the respective numbers for drinking mineral water were 61.9% and 55%, and for fresh fruit and drinks 40.2% and 37.5%. The consumption of fruit once per month or more rarely was twice higher in male students than in females; $p = 0.046$.

A daily consumption of vegetables within one meal was observed in 36.7% student females but 30% males, whereas respectively 21.2% and 17.5% only ate vegetables a few times per month. Daily milk and dairy products consumption was significantly higher in females at 48.2% than males (30%). Those never drinking milk were 6.5% female students and 2.5% males. Cheese, the main dietary source of calcium, did not appear in the diets of 8% female students and 2.5% males. According to dietary recommendations, at least one daily meal should contain: fish, red meat or poultry as a source of protein. It was found that male students ate more red meat or poultry than females. Those who never ate any fish in their diets were 14% female students and 5% males (Table 5).

The analyses of dietary fat showed that whenever used, butter was the main spread chosen for bread (Table 6). Students also less frequently combined butter with margarine as spreads ($p = 0.017$), but more often did

Table 5. Dietary consumption of selected foodstuffs in student subjects according to gender, (%)

Foodstuffs	Daily		Several times weekly		Several times monthly		Once monthly or less		Never	
	W	M	W	M	W	M	W	M	W	M
Brown bread / rye bread, groats	30.1	35.0	33.7	17.5*	16.6	17.5	10.5	20.0*	9.1	10.0
Mineral water	61.9	55.0	18.0	22.5	5.52	10.0*	4.0	5.0	10.6	7.5
Fresh fruit / fruit juice	40.2	37.5	34.7	30.0	13.6	15.0	5.5	12.5*	6.0	5.0
Vegetables or salads	36.7	30.0	31.6	42.5	21.2	17.5	4.5	7.5	6.0	2.5
Milk and dairy products	48.2	30.0**	30.3	32.5	8.5	17.5*	7.0	12.5	6.0	2.5
Cheese	34.7	32.5	35.7	40.0	14.1	17.5	7.5	7.5	8.0	2.5
Poultry	12.0	30.0*	42.9	50.0	23.6	20.0*	11.5	0.0	10.0	0.0
Sea fish and fish products	8.0	10.0	24.2	22.5	29.1	37.5	24.6	25.0	14.1	5.0*
Red meat	13.6	22.5*	31.2	40.0	29.2	27.5	10.5	10.0	15.5	0.0
Sweetened drinks (Coca cola®, Fanta®, Mirinda® etc)	19.6	40.0**	23.1	30.0	20.6	17.5	15.1	5.0*	21.6	7.5*
Energy drinks	20.6	42.5**	10.6	12.5	10.0	15.0	15.6	12.5	43.2	17.5**

Explanation; p values obtained from comparing genders: * $p \leq 0.05$, ** $p < 0.01$. Only statistically significant differences presented; W – women, M – men.

Table 6. Dietary consumption of fats in student subjects according to gender, (%).

Fats for spreading	Gender		Fats used for frying	Gender	
	W	M		W	M
Butter	45.2	50.0	Vegetable oil	45.2	35.0
Soft margarine	18.1	10.0	Margarine	16.7	5.0***
Hard margarine, (in cubes)	3.0	2.5	Lard	3.5	0.0
Butter + soft margarine	12.1	27.5**	Butter	7.5	22.5***
No spreads used on bread	21.6	10.0*	Olive oil	20.6	27.5
			Frying never used	6.5	10.0***

Explanation; p values obtained from comparing genders:
 *p≤0.05, **p<0.01, ***p<0.001. Only statistically significant differences presented; W- women, M – men.

not use any spreads at all (p=0.049). For frying foods, vegetable oils were the most used (45.2% and 35.8% female and male students). Female students more frequently used margarine for frying than males (p<0.001) and 3.3% choose lard. Male subjects (10%) more often than females (6.5%) never fried their food; p<0.001.

Frequent alcohol consumption (i.e. 5-6 times weekly) was observed in 4% of those studied whereas

16% drank once to twice weekly and 13.8% never at all. Most commonplace however, were the occasional drinkers (64%) of which 67.8% were male students and significantly less were females, 45%; p=0.036. The latter group also more often abstained from drinking (16.6%) compared to males who drank 5-6 times weekly (p<0.001). There were 58.5% non-smokers overall, 23.4% declared occasional smoking, 4.6% had previously given up but 10.6% still smoked. Male subjects significantly smoked more than females daily (17.5% vs 9.0%; p=0.048), whereas the latter more frequently smoked occasionally (63.3%) than males; p=0.037. Slimming diets were adopted by 14.6% subjects overall, of which there were significantly more females (17%) than males (7.5%); p<0.001.

Physical activity

Of those that ate healthily, 49% were also physically active, whilst 50% did not undertake any physical activities. One’s state of health was self-rated as ‘very good’ by 80% subjects. Undertaking physical activity was somewhat rare with 37% subjects doing so once weekly and only 7% did physical exercise daily; the lat-

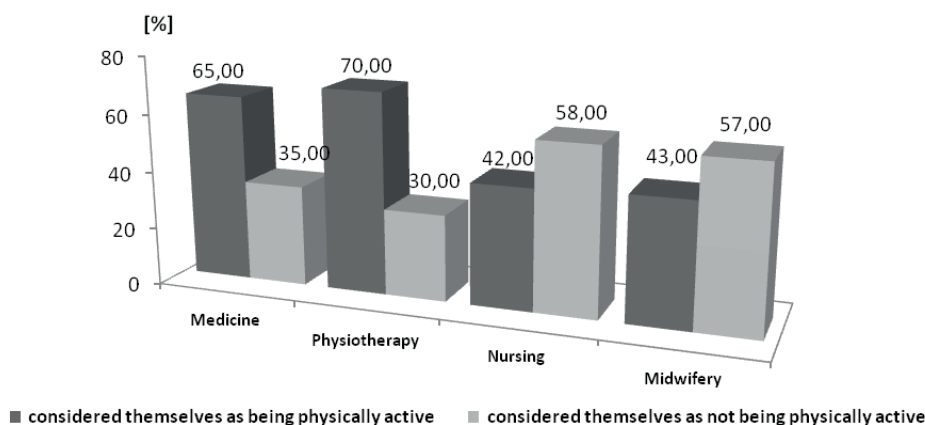


Figure 1. Self-assessment of physical activity among students of four medical faculties [%].

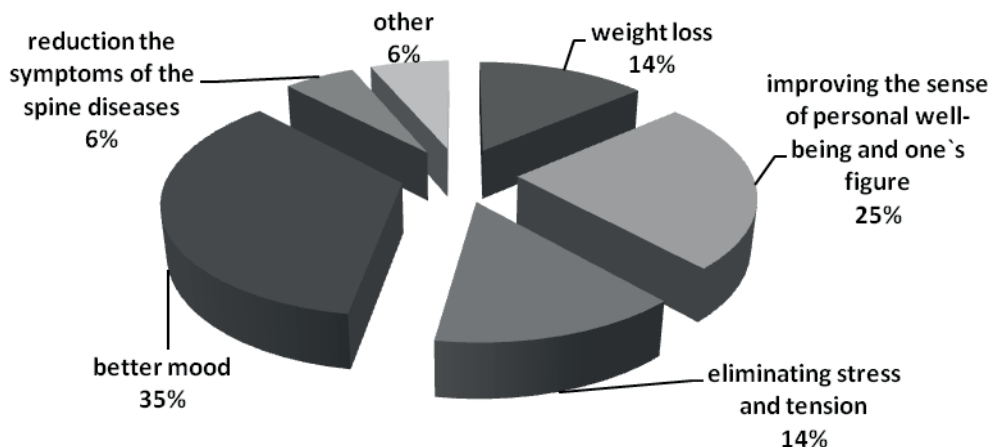


Figure 2. The most common reason for physical activity by students [%].

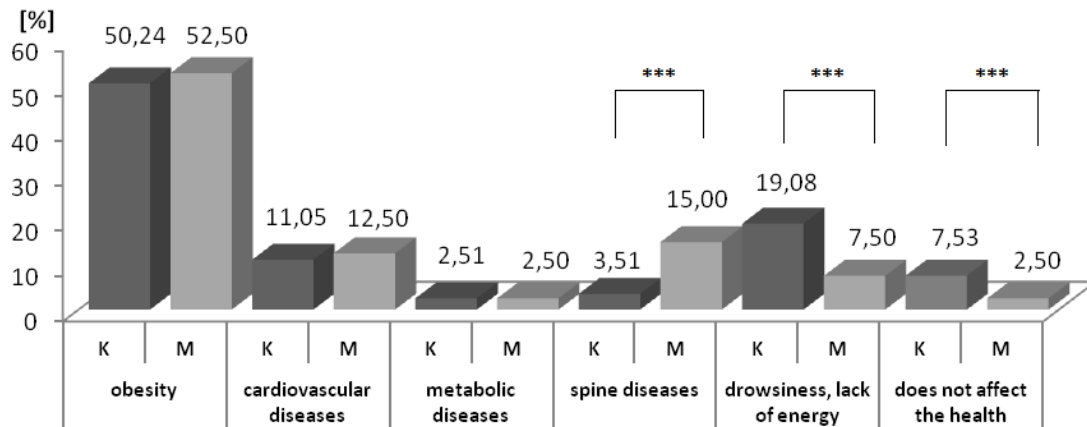


Figure 3. Awareness of the consequences of physical inactivity among medical students with consideration of gender [%], K - woman, M - men, *** $p < 0,001$.

ter most often lasting just 30-45 minutes. Furthermore, 14% subjects expressed unwillingness for doing any physical activity at all. Those physically active however, most commonly chose walking, cycling, 'cardio' exercises and swimming. Of the subjects that declared they ate healthily, only 11% considered themselves to be physically active persons.

When accounting for purely physical activity, i.e. without the nutritional data, 46% subjects in all considered themselves as being physically active. When broken down into the studied disciplines, these consisted of 65% medical students, 42% in nursing, 43% midwifery and 70% doing physiotherapy (Figure 1).

The reason most frequently quoted for undertaking physical exercise was for improving the sense of personal well-being and ones' figure, whereas 14% did so for the purposes of slimming (Figure 2).

Overall, 58% subjects regarded their state of health as being good, 21.7% as satisfactory and 15% as bad. The need for regular physical activity was regarded as desirable by 95% subjects and over half considered that a lack of this leads to obesity. In all, 7.5% of females (including 22% of student nurses), and 2.5% males thought that the state of one's health is independent of taking physical exercise and a healthy diet (Figure 3). The symptoms reported that arose from not doing any physical activity were mainly back pain in men and sleepiness and lethargy in women. The most common reasons for not engaging in physical activity were found to be a lack of time and energy; 60% and 26% respectively.

DISCUSSION

Sensible and balanced nutrition is one way of preventing CVD developing. According to EACPR guidelines [21], three main meals daily should be consumed, which should always include breakfast. The

presented study shows that breakfast and morning tea are often skipped, consistent with other similar studies [11, 16, 27]. Having irregular meals can also lead to obesity [11]. In general, the studied subjects mostly had normal body weight which is in keeping with a similar study by *Siemienuk* [23] that showed normal BMI in 74% subjects attending the Lublin University of Life Sciences. Likewise, a study on students (*Kolarzyk* et al.) from the Jagiellonian University Medical School demonstrated that 77.3% had normal BMI whilst 13% were obese [15]. In all these studies, there were no instances of overweight in specifically medical students which may indicate that they possess a high level of awareness on the consequences of obesity towards human health. The current study demonstrated differences in nutritional behaviour between men and women which was also shown by a previous study *Głodek* and *Gil* [10]. The male student's dietary composition also had low calories, below those recommended, compared to the females.

According to recommended dietary guidelines, cereal/grain products should be eaten daily as they provide the main source of energy and fibre; the presented study however demonstrated that only 30% subjects did so. In similar fashion, a study by *Trafalska* and *Grzybowski* [28] also showed low numbers of students (26% females and 21.6% males) daily eating grain products (rye bread and groats), who were attending the Lodz Medical University. This served to confirm the unpopularity of rye breads amongst academic students.

Vegetables and fruit should also be eaten at main meals and in-between. Furthermore, at least 2 glasses of milk, kefir or yoghurt should be drunk daily together with 1-2 slices of cheese. The presented results showed intake deficiencies of milk, dairy products, vegetables and fruit consistent with other similar studies [15, 16, 19, 27, 28]. Another detrimental dietary habit is low fish consumption, which ought to be eaten at least twice weekly or more. The current study showed that only 25%

students ate fish once monthly and that 15% never did so at all. A study by *Szponar* and *Krzyszucha* from the Lublin Medical University revealed that 2.6% women and 79.1% men ate fish once weekly [27].

Dietary guidelines also recommend that mineral water and vegetable juice should be drunk and that sugar, sweets salt and alcohol consumption should be limited. Unsaturated dietary fat should be replaced with polyunsaturates and processed food kept to a minimum as a source of trans-unsaturated fatty acid isomers. An adverse dietary habit is eating fast food products, snacking between meals or eating very late before bedtime. The reported results confirmed that men more frequently ate fast food as seen in other studies [9, 28].

It is of course also recommended to avoid smoking tobacco due to, amongst many others, the development of CVD. Nevertheless, the findings observed that 10.6% subjects smoked. Other studies report 6% regular smokers at the Medical University of Silesia in 2004 [16] and respectively 20.9% and 8.9% students smoked either occasionally or heavily, *Pawłowski* [20]. Cigarette smoking in students may arise from stress especially in freshers, (i.e. first year students). A Hungarian study on student smoking reported that those studying pharmacology smoked the least and had the desired attitude towards smoking compared to non-medically orientated students [22].

The presented findings show many nutritional irregularities and insufficient physical activity amongst those studied. There are clear differences between daily dietary recommendations and the student's dietary habits/nutritional behaviour. Those claiming that they eat healthily in fact do not adopt the principles of proper nutrition. These nutritional shortcomings appear equally in medical students as well as those studying the other related disciplines. The most appropriate dietary habits were observed in the physiotherapy students.

The EACPR guidelines for CVD prevention also relate to physical activity. Healthy adults should devote 2.5-5 hours weekly, of moderate intensity, for such pursuits. Likewise to the reported findings, a study by *Jagier* and *Stasiotek* [12] showed that students from the Lodz Medical Academy and its University had low awareness that physical activity is conducive to health, where 42.5% were not physically active and a study from the Medical University of Silesia showed a much greater number of 60% with the exception of physiotherapy students (30%) [17]. Regarding the latter, this can be compared with studies on physiotherapy students in Gdańsk that demonstrated that not a single subject considering themselves to be physically active [5, 6, 14, 30].

The most common reason for not doing physical activity has been shown to be a lack of time and a preference for other recreation during leisure time [11, 17].

Latin American studies conducted by *Silva* and *Petroski* on students revealed that 7.1% were smokers, 52.3% drank alcohol, 56.2% snacked in-between meals, 83.2% ate sweets whereas 65.1% did not undertake physical activity [24]. Adverse lifestyle behaviour in adolescents was also noted by a study by *Arliss* [1], particularly in the smoking of many cigarettes and excessive alcohol consumption. Brazilian studies on BMI demonstrated high levels of adipose tissue and the effects of various gender dependent factors on BMI [24, 25]. The observed findings showed that obesity was only recorded to occur in nursing and midwifery students, possibly as a result of nutritional habits carried over from their family life at home and also bearing in mind that such students were still living at home at the time of starting their studies.

It is well recognised that physically active students highly rate their health and fitness as well as their contentment with life but rarely suffer from depression. Furthermore, such students tend to concentrate less on external values such as ones for achieving life's future aims [20]. The reported study demonstrated that student subjects did not follow appropriate nutritional/dietary habits and physical activity. Thus such lifestyle behaviour cannot be taken as a model for preventing the so called 'diseases of civilisation' in the future.

CONCLUSIONS

1. Students studying medicine and related subjects have neither sufficient knowledge of what proper nutrition and its principles constitute nor on the significant role that physical exercise/activity plays in health and wellbeing.
2. The biggest mistakes observed in dietary habits were in irregularly eating breakfast and an insufficient intake of fruit, vegetables and milk in the daily diet.
3. Adverse dietary habits noted were frequent consumption of 'energy-drinks' and sweetened drinks, snacking in-between meals and eating before bedtime.
4. There is therefore a need for pro-healthy education of medical students and those also studying related subjects.
5. It is necessary to increase the awareness of appropriate nutrition and levels of physical activity in students taking medically orientated subjects who in the future will be responsible for promoting public health.

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Conflict of interest

The authors declare no conflict of interest.

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