The Relationship Between Lifestyle, Health Promotion Lifestyle Profile II And High Blood Pressure In University Students

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Abstract

BACKGROUND: Identifying and controlling systemic arterial blood pressure is important in young people, and it is possible to reduce the frequency of systemic arterial hypertension by improving the lifestyle.

AIM: The aim of the study is to assess the relationship between healthy lifestyle behaviors and systemic blood pressure in university students.

MATERIALS: The study sample consisted of 200 university students from a state university in Edirne. Lifestyles and habits were evaluated with Health Promotion Lifestyle Profile II. Students' blood pressure was measured from both arms twice.

RESULTS: The mean HPLP-II score of those who frequently feel good was significantly higher than those who rarely feel good. The mean score of those who frequently wake up between 06:00-09:00 in the morning was statistically significantly higher than those who wake up outside these hours. Those who perform social or artistic activities during their leisure times had a mean scale score higher than those who don't perform. Although there wasn't a statistically significant difference according to smoking status, the mean score of non-smokers was higher than smokers. The mean scale scores were higher in frequent salt users than frequent consumers. The statistically significant difference between blood pressure values of females and males was due to higher blood pressure in male students. Those working in a part-time job had higher blood pressure values than those who weren’t working. Among the students whose body mass indexes could be evaluated, there were differences in blood pressure values.

CONCLUSION: It has been observed in our study that health-related responsibilities and lifestyle behaviours increase with better leisure time activities, improved eating habits and a positive outlook on life. Turning youngs' tendencies towards healthy lifestyle behaviours to habits can make them healthier, more collective and more productive regarding physical, social and psychological well-being.

Introduction

Systemic arterial hypertension is a clinical, multifactorial disease characterised by increased blood pressure. It is generally seen together with structural and functional changes in target organs (heart, brain, kidneys) and as a result risk for cardiovascular events increases [1]. High blood pressure is the biggest contributor to the disease and death burden worldwide, and 9.4 million deaths occur each year [2]. Because it is highly dependent on changeable risk factors, the frequency of deaths can be prevented by directing lifestyle to a healthy pathway [3]. Hypertension and its complications may start at young ages [4]. Identifying and controlling systemic arterial blood pressure is important in young people, and it is possible to reduce the frequency of systemic arterial hypertension by improving the lifestyle [5].

It is accepted that the healthy lifestyle behaviours are the main way particularly to prevent chronic diseases. For this reason, regulation of lifestyle is important for protecting and improving health. A healthy lifestyle is a way of life that sustains and improves one’s health and well-being. Most importantly, it involves a healthy diet, physical activities, regular life, coping with stress, interpersonal communication and health responsibility [6] [7].
In young people, a high body mass index, unhealthy eating habits, family history of hypertension, and the tendency for rising blood pressure are risk factors for hypertension. Hypertension can lead to death silently over the years [8] [9] [10] [11].

To increase the level of a healthy lifestyle, it is first necessary to evaluate behaviours. Before any intervention to improve healthy behaviours, it is very important to evaluate the way of life at present. For this purpose, the Health Promoting Lifestyle Profile which has accepted efficiency and reliability may be used [12]. This scale is widely used in the world. It may be used to evaluate the health of adolescents mothers and their families [13], elderly women and their health sustainability [14], as a preliminary test of a program for the prevention of type 2 diabetes in high-risk adolescents [15], to evaluate lifestyle behaviors after a major surgery [16], in studies that evaluate patient education and lifestyle in chronic diseases [17], and to evaluate health-promoting features in young people [18].

The aim of our study is to assess healthy lifestyle behaviors in university students and their relation to systemic blood pressure. Sociodemographic characteristics, habits, sleep quality, nutritional characteristics, healthy lifestyle behaviors and blood pressure levels were evaluated.

**Materials**

The study universe consisted of university students in Edirne, and the study sample consisted of 201 university students from a state university in Edirne. To evaluate the demographic information and lifestyles of the patients “Personal Information Form” was used. In the personal information form in addition to demographic features questions were asked about sleep hours, cigarette and alcohol use, eating habits, physical activities, social media use, and presence of hypertension in the family.

Lifestyles and habits were evaluated with Health Promotion Lifestyle Profile II. This scale is the revised form of Health Promotion Lifestyle Profile which was developed by Walker et al., [12]. It evaluates health-promoting behaviours related to a healthy lifestyle. It has 52 items. In the assessment of this scale, the lowest possible score is 52, and the highest possible score is 208.

Several studies conducted in various countries and with various study groups have compared this scale with various scales that assess the lifestyles of individuals. It is considered to be effective and reliable to assess healthy lifestyle behaviours [19] [20] [21].

In our study, voluntary students rested for 10 minutes before blood pressure measurement. Using a standard mercury sphygmomanometer covering two-thirds of the upper arm and having an appropriate cuff size, blood pressure was measured at sitting position from both arms twice with a 10-minute interval, and care was exercised to ensure that no cigarettes or caffeinated food were received within 30 minutes before the measurement. The higher of the two measurements was recorded.

**Table 1: Definition and classification of systemic blood pressure levels**

| CLASSIFICATION          | Systolic blood pressure (mmHg) | Diastolic blood pressure (mmHg) |
|-------------------------|-------------------------------|---------------------------------|
| Optimal                 | <120                          | <80                             |
| Normal                  | 120-129                       | 80-84                           |
| High normal             | 130-139                       | 85-89                           |
| Stage 1 hypertension    | 140-159                       | 90-99                           |
| Stage 2 hypertension    | 160-179                       | 100-109                         |
| Stage 3 hypertension    | ≥180                          | ≥110                            |

*2016 European Guidelines on cardiovascular disease prevention in clinical practice. European Heart Journal.

Approval was obtained from the Clinical Trials Ethics Committee of the University and informed consents were obtained from all participants.

All statistical analyses were performed with SPSS 20.0 Package Program. Normal distribution of the data was controlled with Shapiro-Wilk test. Two group comparisons were performed with the Student t-test. Multiple comparisons after one-way analysis of variance were evaluated with the Bonferroni test. Chi-square test was used for the relations between categorical variables. Descriptive statistics for numerical variables were given as mean and standard deviation. Descriptive statistics for categorical variables were given as percentage and frequency. The statistical significance level for all statistical analyses was defined as 5%.

**Results**

Table 2 shows the demographic features of the participants. This study involved university students between 18-24 years of age. The mean age of female students was 20.5 ± 1.73, and male students were 20.9 ± 1.77. Eighty per cent of the study sample was females. Some students from Health Vocational High School and Applied Sciences High School were equal. According to the place of residence during education 172 (86%) were staying at the dormitory and 26 (14%) were staying at home. 176 (88%) participants found their income level adequate, and 24 (12%) said it was low.

The mean score obtained by the students of Health Vocational High School from Health Promotion Lifestyle Profile II (HPLP II) (132.05 ± 1.70) was statistically significantly higher than the mean score obtained by the students from Applied Sciences Vocational High School (126.14 ± 1.91). No difference could be found according to income level and place of
residence during school; the score of those who didn't work in additional jobs during school was found to be statistically significantly higher than those who work.

Table 2: Demographic features and the mean HPL-II scores of the participants in this study

| Gender           | N  | %   | Mean score from the Scale | Standard Deviation | P     |
|------------------|----|-----|---------------------------|--------------------|-------|
| Male             | 40 | 20  | 126.80                    | 2.44               | 0.370 |
| Female           | 160| 80  | 129.69                    | 2.44               | 0.370 |
| School           |    |     |                           |                    |       |
| Health Vocational High School | 100| 50  | 132.05                    | 1.703              | 0.022 |
| Applied Sciences High School | 100| 50  | 126.14                    | 1.911              |       |
| Place of Residence |    |     |                           |                    |       |
| House            | 26 | 14  | 123.65                    | 3.004              | 0.312 |
| Dormitory        | 172| 86  | 129.55                    | 1.424              |       |
| Family income status |    |     |                           |                    |       |
| Low              | 24 | 12  | 123.88                    | 3.718              | 0.151 |
| Good             | 176| 88  | 126.16                    | 1.367              |       |
| Working in a part-time job |    |     |                           |                    |       |
| Yes              | 16 | 9   | 116.97                    | 4.638              | 0.06* |
| No               | 182| 91  | 129.37                    | 2.318              |       |

*indicates those with a statistically significant difference.

Table 3 evaluates lifestyle features of study participants. The mean HPL-II score of those who frequently feel good (131.61 ± 1.47) was significantly higher than those who rarely feel good (123.36 ± 2.44). The mean score of those who frequently wake up between 06:00-09:00 in the morning (131.06 ± 1.46) was statistically significantly higher than those who wake up outside these hours. Although there wasn't a difference in sleep duration, the mean score of those that sleep 6-8 hours a day was higher than those who sleep less or more.

Table 3: Lifestyle features and the mean HPL-II scores of the study participants

| Satisfaction with health | N  | %   | Mean scale score | Standard deviation | P     |
|-------------------------|----|-----|------------------|--------------------|-------|
| Alberta                 | 6  | 3   | 119.67           | 4.410              | 0.187 |
| Moderate                | 104| 52  | 127.39           | 1.769              |       |
| Good                    | 90 | 45  | 131.20           | 1.967              |       |
| How does he/she frequently feel Good/very good | 140| 70  | 131.61           | 1.479              | 0.003*|
| Moderate                | 59 | 29  | 132.36           | 2.443              |       |
| Sleep duration / in 24 hours |    |     |                   |                    |       |
| < 5 hours               | 22 | 11  | 127.27           | 4.805              | 0.652 |
| 5-8 hours               | 166| 83  | 126.70           | 1.284              |       |
| > 8 hours               | 18 | 9   | 126.17           | 4.243              |       |
| Sleeping time           |    |     |                   |                    |       |
| Before 06:00 pm         | 57 | 28  | 132.47           | 2.176              | 0.099 |
| After 07:00 pm          | 143| 71  | 127.78           | 1.567              |       |
| Morning waking time     |    |     |                   |                    |       |
| Before 06:00 o'clock    | 8  | 4   | 113.28           | 6.918              | 0.010*|
| Between 06:00-12:00 o'clock | 144| 72  | 131.06           | 1.016              |       |
| Regular sports/ exercise|    |     |                   |                    |       |
| Never                   | 140| 70  | 125.21           | 1.475              | <0.001|
| < 2 hours / week        | 10 | 5   | 133.70           | 4.412              |       |
| 2-3 hours / week        | 50 | 25  | 139.14           | 2.426              |       |
| Breakfast               |    |     |                   |                    |       |
| 0-3 days/ week          | 39 | 19  | 126.28           | 2.760              | 0.280 |
| 4-7 days/ week          | 161| 80  | 129.80           | 1.451              |       |
| Leisure activities (hobbies, social and artistic activities) |    |     |                   |                    |       |
| Alberta                 | 18 | 9   | 116.94           | 4.838              | <0.001|
| Moderate                | 146| 73  | 127.52           | 1.394              |       |
| Frequent                | 45 | 23  | 136.11           | 2.920              |       |
| Quality of Life         |    |     |                   |                    |       |
| Bad                     | 8  | 4   | 111.75           | 7.091              | 0.005*|
| Moderate                | 146| 73  | 128.55           | 1.436              |       |
| Good                    | 46 | 23  | 135.53           | 2.757              |       |
| Watching TV/week        |    |     |                   |                    |       |
| 0-1 hour/day            | 114| 57  | 128.03           | 1.965              | 0.586 |
| 2-4 hours               | 56 | 28  | 128.07           | 2.197              |       |
| 5 hours or more         | 30 | 15  | 129.60           | 2.597              |       |
| PC, tablet pc, laptop etc|    |     |                   |                    |       |
| 0-1 hour/day            | 31 | 15  | 128.74           | 3.555              | 0.634 |
| 2-3 hours/day           | 74 | 37  | 128.69           | 1.830              |       |
| 4 hours or more/day     | 95 | 47  | 130.22           | 2.000              |       |
| The frequency of social media use |    |     |                   |                    |       |
| 0-1 hour/day            | 22 | 11  | 130.27           | 4.167              | 0.673 |
| 2-3 hours/day           | 70 | 35  | 127.59           | 2.941              |       |
| >4 hours/day            | 106| 54  | 129.89           | 1.961              |       |

*indicates statistically significant difference.

In Table 5 there was a significant difference between systemic arterial blood pressure and the mean scale score. The difference was mainly due to the difference between those with stage 1 hypertension and others. No case with stage 2 or 3 hypertension was detected.
Table 5: Systemic blood pressure values and the mean scale scores of the participants

| Blood Pressure Values | N  | The mean scale of severity | Standard deviation | P    |
|-----------------------|----|---------------------------|--------------------|------|
| Optimal               | 61 | 128.30                    | 2.143              |      |
| Normal                | 107| 132.44                    | 1.658              | <0.001* |
| High Normal           | 20 | 126.25                    | 3.864              |      |
| Stage 1 Hypertension  | 12 | 108.42                    | 6.612              |      |

*Indicates statistically significant difference.

Table 6 demonstrates the association between systemic blood pressure values and sociodemographic features. The statistically significant difference between blood pressure values of female and male students was due to higher blood pressure in male students. No significant difference in blood pressure values could be found according to the school they were attending, the place of residence, and their income status. Those working in a part-time job had higher blood pressure values than those who weren’t working.

Table 6: Change in systemic blood pressure values according to sociodemographic features

| Gender               | Optimal | Normal | High Normal | Stage 1 | P     |
|----------------------|---------|--------|-------------|---------|-------|
| Female               | 57      | 84     | 12          | 7       | 7.44  | 0.001* |
| Male                 | 4       | 23     | 8           | 2       | 1.52  |      |
| School               | 29      | 57     | 11          | 3       | 3.00  | 0.293 |
| Health Vocational    | 31      | 50     | 9           | 1       | 9.1   |      |
| School               | 31      | 50     | 9           | 1       | 9.1   |      |
| High School          | 31      | 50     | 9           | 1       | 9.1   |      |
| Place of residence   | 31      | 50     | 9           | 1       | 9.1   |      |
| Dormitory            | 55      | 91     | 16          | 1       | 1.93  | 0.058 | 0.653 |
| House                | 6       | 16     | 4           | 1       | 1.14  | 0.273 |
| Family income status | Low     | 4      | 13          | 3       | 3.10  |      |
| Good                 | 57      | 94     | 17          | 1       | 1.96  |      |
| Work in a part-time job | Yes    | 5     | 8           | 1       | 6.50  | 4.25  | 0.010* |
| No                   | 3       | 97     | 19          | 1       | 10.4  | 4.44  |      |

*Indicates statistically significant difference.

Table 7 demonstrates the association between lifestyle features and systemic blood pressure of the participants in this study. No difference could be detected in how they frequently feel, daily sleep duration, morning waking time, weekly breakfast frequency, and use of social media and electronic devices such as a computer, tablet pc etc.

Table 7: The association between lifestyle features of the participants and systemic blood pressure values

| How does he/she feel frequency | Optimal | Normal | High Normal | Stage 1 | P     |
|-------------------------------|---------|--------|-------------|---------|-------|
| Good-very good                | 44      | 77     | 13          | 6       | 4.3   | 0.385 |
| Moderate                      | 16      | 30     | 7           | 1       | 11.3  | 6.102 |
| Sleep duration in 24 hours    | <5 hours | 5      | 13          | 1       | 4.5   | 0.205 |
| >5 hours                      | 51      | 87     | 15          | 1       | 2.61  | 0.04 |
| Sleep time                    | Before 24:00 | 12   | 34          | 9       | 5.18  | 2.53  | 0.094 |
| After 24:00                   | 49      | 73     | 11          | 1       | 1.71  | 0.10  |
| Breakfast                      | 11      | 21     | 5           | 2       | 1.28  | 2.15  | 0.912 |
| 0-3 days/week                 | 50      | 86     | 15          | 1       | 3.93  | 16.82 |
| 4-7 days/week                 | 39      | 64     | 14          | 1       | 14.17 | 6.83  |
| The frequency of social media  | 0-1 hour | 9      | 19          | 6       | 3.97  | 0.003 | 0.227 |
| 2-3 hours/day                 | 23      | 42     | 3           | 4       | 6.8   |      |
| 4 hours or more               | 29      | 46     | 4           | 4       | 14.17 | 6.83  |
| The frequency of salt use      | 0-1 hour | 5      | 13          | 2       | 9.1   | 0.21  | 0.458 |
| 2-3 hours/day                 | 25      | 38     | 3           | 4       | 6.8   |      |
| 4 hours or more               | 31      | 56     | 15          | 1       | 13.93 | 6.08  |

*Indicates statistically significant difference.

No statistically significant difference could be found according to whether or not they perform social and artistic activities in their leisure times and whether or not they regularly exercise.

The associations between the risk factors of the study participants and systemic blood pressure values are demonstrated in Table 8. There was a significant difference in systemic blood pressure values between those who use alcohol or not; no difference could be detected according to smoking status, the frequency of salt use, the frequency of consumption of foods including fatty acids, processed food and fast food. Among the students whose body mass indexes could be evaluated, there were differences in blood pressure values. No significant difference could be found according to the stress level.

Table 8: The association between risk factors of the participants and systemic blood pressure values

| Smoking | Optimal | Normal | High Normal | Stage 1 | P     |
|---------|---------|--------|-------------|---------|-------|
| No      | 49      | 87     | 11          | 7       | 9.58  | 0.069 |
| Alcohol use | No    | 53     | 88     | 14     | 8.7   | 6.37  | 0.016* |
| Yes     | 8       | 22     | 17     | 5      | 18.3  | 5.16  |      |
| Salt consumption | Normal | 30   | 63     | 13     | 5.45  | 0.370 |
| Frequency: Every time | Consumption of saturated fat: frying oil | 23 | 52 | 10 | 2.23 | 0.139 |
| 0-1 meal/week | 23 | 52 | 10 | 2.23 | 0.139 |
| 2 or more meals | 38 | 55 | 11 | 3.65 | 0.108 |
| Fast food consumption | Never | 7 | 10 | 4.5 | 0.454 |
| 1-3 meals/week | 45 | 83 | 14 | 4.5 | 0.454 |
| >3 meals/week | 39 | 48 | 6 | 4.17 | 0.039 |
| BMI | Underweight | 24 | 69 | 10 | 4.5 | 0.454 |
| Normal | 51 | 77 | 9 | 4.5 | 0.454 |
| Overweight | 4 | 6 | 2 | 4.5 | 0.454 |
| Stress level | Low | 9 | 2 | 4.5 | 0.454 |
| Moderate | 33 | 56 | 12 | 4.5 | 0.454 |
| High | 19 | 42 | 6 | 4.5 | 0.454 |

*Indicates statistically significant difference.

Discussion

Prevalence of hypertension is increasing worldwide, and research has shown that young age group is affected increasingly more especially in the last 20 years. Hypertension increases morbidity and mortality. Prevalence of hypertension in the young age group is important because of the serious consequences of hypertension and the probability of secondary hypertension in this age group. Hypertension is an important preventable risk factor for cardiovascular diseases [22, 23].

Due to changing conditions in every aspect of life in our age, a more passive lifestyle which is not compatible with people's natural structure has become widespread. In every day, school or business.
life, stressful and unfavourable conditions can trigger unexpected physical problems as well as some psycho-social disadvantages. Improving physical activity, supporting healthy eating habits, and improving the ability to cope with stress play an important role in maintaining both physical and psychosocial well-being.

In our study, the rate of high-normal systemic arterial pressure in university students was 8.1%, and the rate of hypertension was 5.6%. Results of our study are consistent with studies that found 7.4% hypertension in Ethiopia and 7% hypertension in Kuwait [24]. In Saudi Arabia, 7.5% of the students were hypertensive [25]. These results are consistent with the study that reported 9.3% hypertension prevalence in medical students in Jeddah [26]. In a study conducted at King Fahd University in Dammam, blood pressure was reported to be 13.8% among male students [27]. But this finding is low compared with reported hypertension rates in Nigeria (19.3%), Tunisia (35.1%), and Gambia (38%) [28]. The differences may be due to data collection methods, the socioeconomic status of the evaluated population, and differences in healthy lifestyle behaviours.

As the number of positive health behaviours increases, the score of Health Promotion Lifestyle Profile II also increases [12]. The mean scale score in our study was detected to be 129.69 ± 1.44 in females and 126.80 ± 2.84 in males.

A study published by the American Pediatric Academy reported that young people are more likely to reduce their intake of food than to increase physical activity in healthy lifestyle behaviours to maintain their physical appearance [29]. It has been observed in our study that health-related responsibilities and lifestyle behaviours increase with better leisure time activities, improved eating habits and a positive outlook on life. As the ability of individuals to feel healthy grows, the healthy lifestyle they have acquired will become a habit.

Turning young people’s tendencies towards healthy lifestyle behaviours to habits can make them healthier, more collective and more productive regarding physical, social and psychological well-being. Supporting healthy lifestyle behaviours in educational institutions will help to protect youth from chronic diseases such as hypertension as well as contribute to the social development of young people. Thus, healthy and dynamic young people, who are exemptified in the society, will lead the way of making healthy lifestyles attitudes in the whole society.

References

1. Brandão AA, et al. VI Diretrizes Brasileiras de Hipertensão.[errata]. Arq Bras Cardiol. 2010; 95(4):553-553.

https://doi.org/10.1590/S0066-782X2010000400023

2. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, AliMozaffari MA, Amann M, Anderson HR, Andrews KG, Aryee M. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. The lancet, 2012; 380(9859):2224-60. https://doi.org/10.1016/S0140-6736(12)61766-8

3. Arena R, Guazzi M, Lianov L, Whitelst, Berra K, Laviuj CJ, Kaminsky L, Williams M, Hivert MF, Cherie Franklin N, Myers J. Healthy lifestyle interventions to combat noncommunicable disease—a novel nonhierarchical connectivity model for key stakeholders: a policy statement from the American Heart Association, European Society of Cardiology, European Association for Cardiovascular Prevention and Rehabilitation, and American College of Preventive Medicine. European heart journal. 2015; 36(31):2097-109. https://doi.org/10.1093/eurheartj/ehv207

PMid:26138925

4. Tringler M, et al. High Blood Pressure, Overweight and Obesity Among Rural Scholars from the Vela Project. High Blood Pressure & Cardiovascular Prevention. 2012; 19(1):41-46. https://doi.org/10.2165/11632090-000000000-00000

PMid:22670586

5. Bruno RM, et al. Association between lifestyle and systemic arterial hypertension in young adults: a national, survey-based, cross-sectional study. High Blood Pressure & Cardiovascular Prevention. 2016; 23(1):31-40. https://doi.org/10.1007/s00292-016-0195-6

PMid:28909755

6. Baheiraei A, et al. Health-promoting behaviors and social support of women of reproductive age, and strategies for advancing their health: Protocol for a mixed methods study. BMC public health. 2011; 11(1):191. https://doi.org/10.1186/1471-2458-11-191

PMid:21443803 PMCid:PMC3073903

7. Whitehead D. Health promotion and health education: advancing the concepts. Journal of advanced nursing. 2004; 47(3):311-320. https://doi.org/10.1111/j.1365-2648.2004.03095.x

PMid:15238126

8. Luma GB, Spiotta RT. Hypertension in children and adolescents. Am Fam Physician. 2006; 73(9):1558-68. PMid:16719248

9. Van der Sande M, et al. Geographical variation in prevalence of hypertension within The Gambia. Journal of human hypertension. 2001; 15(10):733. https://doi.org/10.1038/sj.jhh.1001259

PMid:11607805

10. Hendriks ME, et al. Hypertension in sub-Saharan Africa: cross-sectional surveys in four rural and urban communities. PloS one. 2012; 7(3):e2638. https://doi.org/10.1371/journal.pone.002638

PMid:22427857 PMCid:PMC3299675

11. Lee DE, Cooper RS. Recommendations for global hypertension monitoring and prevention. Current hypertension reports. 2009; 11(6):444. https://doi.org/10.1007/s11906-009-0075-9

12. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: development and psychometric characteristics. Nursing research. 1987. https://doi.org/10.1097/00006199-19870000-00002

PMid:3644262

13. Black C, Ford-Gilboe M. Adolescent mothers: resilience, family health work and health-promoting practices. Journal of advanced nursing. 2004; 48(4):351-360. https://doi.org/10.1111/j.1365-2648.2004.03204.x

PMid:15500529

14. Craft BJ, Grasser SC. The relationship of reciprocity to self health care in older women. Journal of women & aging. 1998; 10(2):35-47. https://doi.org/10.1300/J074v10n02_02

PMid:9870040

15. Grey M, et al. Preliminary Testing of a Program to Prevent Type 2 Diabetes Among High-Risk Youth. Journal of School Health. 2004; 74(1):10-15. https://doi.org/10.1111/j.1746-1581.2004.tb06556.x

PMid:15022370

16. Salyer J, Sneed G, Corley MC. Lifestyle and health status in long-term cardiac transplant recipients. Heart & Lung: The Journal of Acute and Critical Care. 2001; 30(6):445-457. https://doi.org/10.1067/mlh.2001.119351

PMid:11723449

17. Saito YA, et al. Effects of multidisciplinary education on

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https://www.id Press.eu/mjms/index
outcomes in patients with irritable bowel syndrome. Clinical Gastroenterology and Hepatology. 2004; 2(7):576-584. https://doi.org/10.1016/S1542-3565(04)00241-1

18. Hui W-HC. The health-promoting lifestyles of undergraduate nurses in Hong Kong. Journal of Professional Nursing. 2002; 18(2):101-111. https://doi.org/10.1053/jpnu.2002.32346

19. Haddad LG, et al. An Arabic language version of the health promotion lifestyle profile. Public Health Nursing. 1998; 15(2):74-81. https://doi.org/10.1111/j.1525-1446.1998.tb00325.x PMid:9564211

20. Hawks SR, Madanat H, Merrill R. Cross-cultural comparison of health promoting behaviors among college students. International electronic journal of health education. 2002; 5:84-91.

21. Walker SN, et al. A Spanish language version of the health-promoting lifestyle profile. Nursing research. 1990; 39(5):268-273. https://doi.org/10.1097/00006199-199009000-00003 PMid:2399130

22. Kemppainen V, Tossavainen K, Turunen H. Nurses’ roles in health promotion practice: an integrative review. Health Promotion International. 2013; 28(4):490-501. https://doi.org/10.1093/heapro/das034 PMid:2288155

23. El-Zanaty F, Way A. Egypt Demographic and Health Survey 2008. Cairo: Ministry of Health, El-Zanaty and Associates, and Macro International, 2009.

24. Al-Majed HT, Sadek AA. Pre-hypertension and hypertension in college students in Kuwait: a neglected issue. Journal of family & community medicine. 2012; 19(2):105.

https://doi.org/10.4103/2230-8229.98296 PMid:22870414 PMCid:PMC3410173

25. Baig M, et al. Prevalence of obesity and hypertension among University students’ and their knowledge and attitude towards risk factors of Cardiovascular Disease (CVD) in Jeddah, Saudi Arabia. Pakistan journal of medical sciences. 2015; 31(4):816. PMid:26430410 PMCid:PMC4590388

26. Ibrahim NK, et al. Risk factors of coronary heart disease among medical students in King Abdulaziz University, Jeddah, Saudi Arabia. BMC public health. 2014; 14(1):411. https://doi.org/10.1186/1471-2458-14-411 PMid:24775684 PMCid:PMC4036426

27. Sabra AA, et al. Coronary heart disease risk factors: prevalence and behavior among male university students in Dammam City, Saudi Arabia. The Journal of the Egyptian Public Health Association. 2007; 82(1-2):21-42. PMid:18217333

28. Tadesse T, Alemu H. Hypertension and associated factors among university students in Gondar, Ethiopia: a cross-sectional study. BMC public health. 2014; 14(1):937. https://doi.org/10.1186/1471-2458-14-937 PMid:25201163 PMCid:PMC4168247

29. Krebs NF, Jacobson MS. Prevention of pediatric overweight and obesity. Pediatrics. 2003; 112(2):424-430. https://doi.org/10.1542/peds.112.2.424