

# HEALTH BEHAVIOR AMONG MEDICAL STUDENTS AT UNIVERSITAS PADJADJARAN

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## ABSTRACT

**Background:** Healthy behavior is defined as personal behavior to maintain and improve their health. This includes physical exercise, dietary habit, sleep pattern, stress management, and non smoking behavior, which may greatly contributes to human health. Healthy behavior is essential for medical students as they are becoming future doctors who should advise patients toward healthy lifestyle. This study was conducted to compare healthy behavior between first- and fifth-year medical students.

**Method:** A cross-sectional study was done over 150 medical students of Faculty of Medicine Universitas Padjadjaran (75 first-year students and 75 fifth-year students) between October to November 2013. Data was collected by filling the questionnaire. A scoring mechanism designed to compare healthy behavior between those groups.

**Results:** 75 first and five-year medical students were enrolled in each group. Smoking behavior was more frequent among the fifth-year compared to the first-year students ( $p=0.013$ ). There were no significant differences in physical exercise ( $p=0.594$ ), dietary habit ( $p=0.166$ ) and sleep ( $p=0.504$ ) between the groups. First year students were more likely to experience mental and emotional stress ( $p=0.021$ ) than the five-year students. However, there was no significant difference in overall healthy behavior between first-year and fifth-year medical students ( $p=0.519$ ).

**Conclusion:** Overall healthy behavior is similar between first- and fifth-year medical students. However, in terms of specific behavior, the first-year students tend to be less able to manage mental and emotional stress, whereas smoking is more likely among five-year medical students. Effective intervention needs to be designed to improve healthy behavior among medical students.

**Keywords:** healthy behavior, medical school, medical students

## ABSTRAK

**Latar Belakang:** Perilaku hidup sehat merupakan perilaku individu yang sehat dalam menjaga dan meningkatkan kesehatannya yang terdiri dari aktivitas fisis, kebiasaan makan, tidur, manajemen stres dan perilaku tidak merokok. Perilaku hidup sehat berperan besar terhadap kesehatan masyarakat. Sebagai dokter masa depan, mahasiswa kedokteran harus memperbaiki perilaku hidup sehat mereka untuk mendorong perubahan perilaku hidup sehat pasien. Penelitian ini bertujuan untuk menggambarkan perilaku hidup sehat pada mahasiswa kedokteran tahun pertama dan tahun kelima serta menganalisis perbedaan perilaku hidup sehat di antara keduanya.

**Metode:** Studi potong lintang dilakukan pada 150 mahasiswa kedokteran Fakultas Kedokteran Universitas Padjadjaran yang melibatkan 75 mahasiswa tahun pertama dan 75 mahasiswa tahun kelima pada Oktober hingga November 2013. Pengambilan data dilakukan dengan kuesioner yang diisi sendiri. Suatu mekanisme skoring didesain untuk membandingkan perilaku hidup sehat di antara dua kelompok tersebut.

**Hasil:** Perilaku merokok lebih banyak ditemukan pada mahasiswa tahun kelima ( $p=0,013$ ). Tidak terdapat perbedaan pada aktivitas fisik ( $p=0,594$ ), kebiasaan makan ( $p=0,166$ ) dan tidur ( $p=0,504$ ). Mahasiswa tahun pertama lebih banyak mengalami gangguan mental dan emosional ( $p=0,021$ ). Namun, tidak terdapat perbedaan perilaku hidup sehat secara keseluruhan antara mahasiswa tahun pertama dan tahun kelima ( $p=0,509$ ).

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**Kesimpulan:** Tidak terdapat perbedaan perilaku hidup sehat yang bermakna antara mahasiswa tahun pertama dan tahun kelima. Walaupun demikian, perilaku merokok ditemukan pada mahasiswa tahun kelima dan gangguan mental dan emosional lebih banyak ditemukan pada mahasiswa tahun pertama. Oleh karena itu, regulasi dan program terkait harus dirancang untuk meningkatkan perilaku hidup sehat pada mahasiswa kedokteran.

**Kata kunci:** fakultas kedokteran, mahasiswa kedokteran, perilaku hidup sehat

## BACKGROUND

According to the “Force field and well-being paradigms of health” model proposed by Blum, people lifestyles are one of the main health determinants. Specifically, lifestyle consists of two parts, which are attitude and behavior.<sup>1</sup> Healthy behavior is defined as personal behavior in maintaining and improving their health which consists of physical exercise, dietary habit, sleep, stress management and non-smoking behavior.<sup>2</sup> Healthy behavior may prevent the occurrence of diseases, especially the non-communicable diseases as, the world’s leading cause of death.<sup>3</sup>

Physicians have important roles in encouraging people healthy behavior as they may influence patients to consider, decide, plan, and conduct lifestyle changes through counseling and role-modeling.<sup>4</sup> Two different studies found that the practice of healthy behavior among physicians and medical students is the main predictor in successful health counseling.<sup>5,6</sup> As future doctors, medical students should improve their own healthy behaviour. The learning process in medical school may provide an opportunity for medical students to gain knowledge about healthy lifestyles, however, on the other hand, they are also exposed to many factors that may interfere their health,<sup>7</sup> such as lack of regular physical activity, adoption of poor habits including tobacco smoking, unhealthy dietary habit, and poor stress management.<sup>8</sup> This study was conducted to describe healthy behavior among medical students and to compare healthy behavior between the first-and fifth-year medical students.

## METHODS

A cross-sectional study was conducted among first-and fifth-year medical students of Faculty of Medicine Universitas Padjadjaran, Indonesia, during October to November 2013. To detect mean lifestyle score difference of using a power of 80% and 5% type I error, we consecutively recruited 75 students to each group. Students

were considered to be first-year medical students if they were enrolled in the first semester of academic year of 2013, whereas fifth-year medical students were those who registered in the final semester of academic year of 2013. The study had been approved by the Health Research Ethics Committee of Faculty of Medicine Universitas Padjadjaran and informed consent was obtained from every study participants. Data collection was performed using a questionnaire filled by students. The questionnaire had been validated previously (Cronbach’s alpha = 0.745) and consisted of questions addressing respondent characteristics and lifestyle, including nonsmoking behavior, physical exercise, dietary and sleep patterns, and mental as well as emotional well-being. We also explored stress experienced by students, including causes and coping mechanism. The questions regarding non-smoking behavior, physical exercise, mental and emotional well-being were adopted from the Basic Health Survey year 2007 conducted by the Indonesian Agency for Health Research and Development Ministry of Health.<sup>9</sup> We used the Epworth sleepiness scale to measure sleep behavior and daytime sleepiness.<sup>10</sup> While to measure stress, we applied questions adopted from a previous study by Abdel Aziz and El-Shafei.<sup>11</sup>

We first assigned scores for every response to questions of each behavioral domain and then calculated a total score behavior. To compare the frequency of each behavior between the first- and fifth-year medical students, we used Pearson Chi-Square, Fisher’s Exact, or Kolmogorov-Smirnov test as appropriate. The Mann-Whitney test was used to evaluate the difference in mean behavior score between the groups. A p value of less than 0.05 was considered statistically significant.

## RESULTS AND DISCUSSION

We enrolled 75 students to each group with median ages of 18.0 (16.0 - 19.0) and 22.0 (20.0 - 30.0) years for the first- and fifth-year medical students, respectively (Table 1).

Table 1. Characteristics of study subjects

| Characteristics | First Year<br>(n = 75) |        | Fifth Year<br>(n = 75) |        |
|-----------------|------------------------|--------|------------------------|--------|
|                 | No.                    | %      | No.                    | %      |
| Age (years)*    | 18.0 (16.0 - 19.0)     |        | 22.0 (20.0 - 30.0)     |        |
| Sex             |                        |        |                        |        |
| Female          | 48                     | (64.0) | 56                     | (74.7) |
| Male            | 27                     | (36.0) | 19                     | (25.3) |
| Nationality     |                        |        |                        |        |
| Indonesian      | 70                     | (93.3) | 55                     | (73.3) |
| Malaysian       | 5                      | (6.7)  | 20                     | (26.7) |

\*median (minimum - maximum)

Table 2 depicts the frequency of healthy behavior in the first year compared to the fifth-year students. More smokers were found among fifth-year medical students (8%) than the first-year students (0%) and the difference was statistically significant ( $p = 0.028$ ). Of those who smoked, most were light smokers, male, and started to smoke after entering the medical school. About one-third of smokers used the tobacco in the campus or hospital area besides smoking at home. Only two-third of smokers who ever tried smoking cessation.

In terms of physical exercise, almost half of both first and fifth year performed vigorous-intensity aerobic physical activity for at least 10 minutes (Table 2). The frequency and duration of vigorous or moderate intensity aerobic physical activity was almost similar between the first- and fifth-year medical students as seen in Table 2.

The frequencies of particular nutrient consumption were described in Table 2. The rate of vegetable and fruit consumption was low in the first-year students, while the

fifth years rarely consumed meat protein. The fifth year students were significantly more likely to skip lunch compared to the first-year students (89% vs 73%), while the first-year students more frequently skipped dinner (87% versus 72%) than the fifth-years. None of medical students skipped their breakfast.

When we looked at sleep behavior the majority of first year (88%) and fifth-year (81%) students slept for less than 7 hours per day. Using the Epworth Sleepiness Scale<sup>10</sup>, it was found that 31 (41%) first-year and 40 (53%) fifth-year medical students experienced daytime sleepiness.

Regarding mental and emotional well-being, it was found that the first-year students were significantly ( $p=0.003$ ) more likely to experience mental/ emotional problems than the fifth-years (45% vs 23%). Most stress (around 80%) were related to academic issues. To deal with stress, the first-year students did various kind of activities, whereas most (59%) of the fifth-year students chose to sleep (Table 2).

Table 2. Healthy behavior of the medical students by level of study

| Healthy Behavior  | First Year<br>(n = 75) |       | Fifth Year<br>(n = 75) |        | p-value            |
|---|------------------------|-------|------------------------|--------|--------------------|
|   | N                      | %     | N                      | %      |                    |
| Non-smoking Behavior                                      |                        |       |                        |        |                    |
| Status of tobacco smoking                                 |                        |       |                        |        |                    |
| Non smoker  | 75                     | (100) | 69                     | (92.0) | 0.028**            |
| Smoker  | 0                      | (0)   | 6                      | (8.0)  |                    |
| Type of tobacco smoker                                    |                        |       |                        |        |                    |
| Non smoker  | 75                     | (100) | 69                     | (92.0) | 0.970 <sup>#</sup> |
| Light smoker ( $\leq 15$ cigarettes per day)              | 0                      | (0)   | 5                      | (7)    |                    |
| Moderate smoker (16 - 24 cigarettes per day)              | 0                      | (0)   | 1                      | (1)    |                    |
| Heavy smoker ( $\geq 25$ cigarettes per day)              | 0                      | (0)   | 0                      | (0)    |                    |
| Physical Exercise Behavior                                |                        |       |                        |        |                    |
| Vigorous-intensity aerobic physical activity              |                        |       |                        |        |                    |
| Yes   | 34                     | (45)  | 30                     | (40)   | 0.509*             |
| No  | 41                     | (55)  | 45                     | (60)   |                    |
| Moderate-intensity aerobic physical activity              |                        |       |                        |        |                    |
| Yes   | 56                     | (75)  | 57                     | (76)   | 0.850*             |
| No  | 19                     | (25)  | 18                     | (24)   |                    |
| Dietary Behavior  |                        |       |                        |        |                    |
| Consumption of animal protein                             |                        |       |                        |        |                    |
| Always  | 64                     | (85)  | 62                     | (83)   | 1.000 <sup>#</sup> |
| Sometimes   | 11                     | (15)  | 11                     | (15)   |                    |
| Never   | 0                      | (0)   | 2                      | (3)    |                    |
| Consumption of vegetable                                  |                        |       |                        |        |                    |
| Always  | 52                     | (69)  | 57                     | (76)   | 0.996 <sup>#</sup> |
| Sometimes   | 21                     | (28)  | 18                     | (24)   |                    |
| Never   | 2                      | (3)   | 0                      | (0)    |                    |
| Consumption of fruits                                     |                        |       |                        |        |                    |
| Always  | 23                     | (31)  | 35                     | (47)   | 0.292 <sup>#</sup> |
| Sometimes   | 51                     | (68)  | 40                     | (53)   |                    |
| Never   | 1                      | (1)   | 0                      | (0)    |                    |
| Consumption of milk and dairy products                    |                        |       |                        |        |                    |
| Always  | 41                     | (55)  | 36                     | (48)   | 0.414*             |
| Sometimes   | 34                     | (45)  | 39                     | (52)   |                    |
| Never   | 0                      | (0)   | 0                      | (0)    |                    |
| Mental and emotional well-being and description of stress |                        |       |                        |        |                    |
| The quality of sleep                                      |                        |       |                        |        |                    |
| No daytime sleepiness                                     | 44                     | (59)  | 35                     | (47)   | 0.141*             |
| Daytime sleepiness  | 31                     | (41)  | 40                     | (53)   |                    |

Table 2. Healthy behavior of the medical students by level of study (continued)

| Healthy Behavior  | First Year<br>(n = 75) |      | Fifth Year<br>(n = 75) |      | p-value            |
|---|------------------------|------|------------------------|------|--------------------|
|   | N                      | %    | N                      | %    |                    |
| Mental and emotional well-being and description of stress |                        |      |                        |      |                    |
| Status of mental and emotional well-being                 |                        |      |                        |      |                    |
| Absence of mental and emotional disturbances              | 41                     | (55) | 58                     | (77) | 0.003*             |
| Presence of mental and emotional disturbances             | 34                     | (45) | 17                     | (23) |                    |
| The most frequent cause of stress                         |                        |      |                        |      |                    |
| Academic demands and examination                          | 63                     | (84) | 57                     | (76) | 0.970 <sup>#</sup> |
| Problems with friends                                     | 3                      | (4)  | 6                      | (8)  |                    |
| Problems with family                                      | 7                      | (9)  | 6                      | (8)  |                    |
| Other cause   | 2                      | (3)  | 6                      | (8)  |                    |
| The most frequent method of coping stress                 |                        |      |                        |      |                    |
| Sleeping  | 13                     | (17) | 44                     | (59) | <0.001*            |
| Spending time with friends                                | 16                     | (21) | 7                      | (9)  |                    |
| Listening to the music                                    | 18                     | (24) | 13                     | (17) |                    |
| Doing sport   | 5                      | (7)  | 5                      | (7)  |                    |
| Learning  | 6                      | (8)  | 2                      | (3)  |                    |
| Other method  | 17                     | (23) | 4                      | (5)  |                    |

\*Pearson Chi-Square Test

\*\*Fisher's Exact Test

<sup>#</sup>Kolmogorov Smirnov Test

Table 3 described the comparison of healthy behavior scores, which showed no significant difference between the first- and five-year students ( $p=0.519$ ). However, the

scores of smoking behavior ( $p=0.013$ ) and mental-motional wellbeing ( $p=0.021$ ) were significantly different between the groups.

Table 3. Statistical comparison of healthy behavior's scores by level of study

| Domain                          | First-year          |             | Fifth-year         |             | p-value* |
|---------------------------------|---------------------|-------------|--------------------|-------------|----------|
|                                 | Median              | Mean ± SD   | Median             | Mean ± SD   |          |
| Smoking behavior                | 18.0 (18.0)         | 18.0±0      | 18.0 (9.0 – 18.0)  | 17.33±2.286 | 0.013    |
| Physical exercise behavior      | 10.0 (6.0 – 16.0)   | 10.52±3.151 | 10.0 (6.0 – 16.0)  | 10.39±2.945 | 0.594    |
| Dietary behavior                | 20.0 (14.0 – 24.0)  | 19.65±1.928 | 19.0 (14.0 – 23.0) | 19.0±2.114  | 0.166    |
| Sleep behavior                  | 3.0 (2.0 – 4.0)     | 2.71±0.610  | 2.0 (2.0 – 4.0)    | 2.0±0.668   | 0.504    |
| Mental and emotional well being | 35.0 (21.0 – 40.0)  | 34.61±4.923 | 38.0 (24.0 – 40.0) | 36.60±3.613 | 0.021    |
| Total score of healthy behavior | 84.0 (68.0 – 100.0) | 85.49±7.116 | 87.0 (71.0 – 99.0) | 86.11±6.233 | 0.519    |

\*Mann-Whitney Test

In this study we found no significant difference in overall healthy behavior between the first- and fifth-year medical students. However, in terms of specific behavior, the fifth-year students were more likely to smoke, while the first-year one more frequently experienced mental or emotional stress.

The practice of healthy behavior among medical students could improve the preventive and promotive approach of future doctors. Generally, we did not find a significant difference in healthy behavior between the first and fifth-year medical students, while previous studies showed various results.<sup>11,12</sup> Lawrence Green proposed that the development of behavior was determined by predisposing factors (knowledge and attitude), enabling factors (facility), and reinforcing factors (behavior of reference people).<sup>2</sup> Even though the fifth-year medical students had probably better knowledge and more experiences than the first-year ones, they faced higher academic demands, which may hamper the improvement of their healthy behavior.<sup>11</sup> This could probably explain why the fifth-year medical students in this study did not show a significantly higher healthy behavior score.

Tobacco smoking is a risk factor for many non-communicable diseases. Health professionals have an important role to fight against tobacco.<sup>13</sup> Unfortunately, some of the fifth-year medical students were smokers, while none of the first-year medical students smoked. This finding was similar with a previous finding that tobacco use was higher among final year students.<sup>12</sup> One of the possible explanations for this phenomenon is the cognitive dissonance theory proposed by Festinger.<sup>2</sup> There might be a contradiction between knowledge and belief regarding tobacco smoking among medical students that should be further explored.

Regular physical activity has many benefits for health maintenance and improvement. According to the WHO, adults aged 18-64 are recommended to do at least 75 minutes of vigorous intensity aerobic physical activity or at least 150 minutes of moderate-intensity aerobic physical activity throughout a week. This aerobic activity should be performed for at least 10 minutes.<sup>14</sup> Unfortunately, there were only less than one-fifth of medical students who fulfilled the recommendation for vigorous-intensity aerobic physical activity and moderate-intensity aerobic

physical activity. There was no significant difference regarding the frequency of physical exercise between the first and fifth-year medical students in this study, whereas a previous study showed that the final year students were significantly more likely to practice regular physical exercise.<sup>11</sup>

Most medical students had good dietary pattern in terms of consumptions of meat protein, vegetable, fruits, milk, and dairy products. The minority of the fifth-year students in our study who had never consumed animal protein were Malaysian Indians, who were vegetarians, while those who had never consumed vegetables and fruits were Indonesians. These findings need to be explored further. Another challenge in healthy eating for medical students was to have a regular eating pattern, especially among the fifth-year medical students. This finding was similar to those reported previously.<sup>11</sup> The high work load of the fifth-year medical students may cause this irregular eating pattern.

According to the WHO, the range of average night sleep time for adults is from 7 to 9 hours. Inadequate sleep can interfere with work performance and social function. Furthermore, chronic sleep restriction is associated with viral diseases, diabetes, heart disease, depression and age-related chronic diseases.<sup>15</sup> In our study, most medical students, both the first (88%) and fifth- years (81%), reported that their average sleep duration was less than 7 hours and almost half experienced day time sleepiness. A previous study revealed similar findings, showing that more than half of first-year (56%) and fifth-year (62%) medical students slept for less than 8 hours.<sup>11</sup> The short sleep duration was probably related to high academic demands and activities in medical school.

Medical education is sometimes considered stressful and may potentially cause psychological changes among medical students.<sup>16</sup> Our finding of the higher likelihood of the first year students to experience mental or emotional problems was similar to the findings of a previous study, showing higher anxiety and depression rate among first-year students.<sup>11</sup> Academic demands or exams were the most frequent cause of stress among medical students. Even though the fifth-year students faced higher academic demands, they were probably more able to adapt with the stressful situation as indicated by findings from previous studies.<sup>16</sup>

One of the limitations of the study was the possibility of inaccurate answers due to subjective misinterpretation of the questions. However, we believe that if any had occurred, this would have happened in random both in the first and fifth year student groups so that reporting bias was unlikely. The study merely described the frequency of healthy behavior among medical students without exploring factors underlying these conditions. Another longitudinal study could be conducted to investigate healthy behavior in all level medical students, while exploring associated factors.

## CONCLUSION

In conclusion, overall healthy behavior is similar between first and fifth-year medical students. However, in terms of specific behavior, the first-year students tend to be less able to manage mental and emotional stress, whereas smoking is more likely among five-year medical students. Thus, an effective intervention should be applied to improve the practice of healthy behavior throughout the course of medical school.

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