Correlation Between Health Beliefs And Lifestyle Among Medical Students In Malaysia: A Cross-Sectional Study

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ABSTRACT

In student population, physical activity, dietary pattern, stress, screen time are intertwined to achieve a healthy lifestyle. Therefore, this study aimed to investigate the health beliefs, lifestyle, and dietary habits among the medical student population. This cross-sectional study was conducted by recruiting medical students from a private medical university with purposive sampling. Demographic characteristics, health belief model and lifestyle information were collected by using Google form. Data was analyzed by descriptive statistics, unpaired t-test, one-way ANOVA by using Epi info software (Version 7). A total of 160 students responded to this study. Age of the respondents was significantly associated with nutritional confidence (P=0.033) and barrier (P=0.032) domains of health belief. While gender was significantly associated

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with barriers (P=0.041) and behavioral intention to do physical activity (P=0.018). Academic year was found to be associated with susceptibility domain (P=0.013) of health belief. Gender was significantly associated with the physical health and exercise (P<0.001) and psychological health (P=0.012) domains. Age was significantly associated with accident prevention domain (P=0.013). While BMI was significantly associated with physical health and exercises (P=0.001). Academic year was significantly associated with social concern (P=0.028) and sense of purpose (P=0.009) domains. Health beliefs among respondents were correlated with the nutritional and physical activity in their daily lifestyle. Especially having nutritional confidence, knowing the benefits of a healthy diet, behavioral intention to eat healthy food and to do physical activity were significantly correlated with the respondent's nutrition intake and physical activities. Educational interventions and activities such as talks, trainings related to adopting healthy and active lifestyles could help the medical students in attaining a better lifestyle habit.

INTRODUCTION

Many factors can affect a person's health, including physical activity, nutrition, and a healthy body weight [1]. In student population, physical activity, dietary pattern, stress, screen time are intertwined to achieve a healthy lifestyle [2,3]. A study in Italy showed that close to 62% of students were inactive to a degree and spent more than two hours a day in front of screens, an indicator of an unhealthy lifestyle [2]. In Brunei, 58.7% students favoured eating unhealthily compared to healthier alternatives, even while cooking for themselves [3]. In a study done by Moy et al, 35.3% Malaysian students ate fast food at least once a week while being at university. In another study among college students revealed that they stand a higher chance of eating unhealthily, especially with opening of fast-food places and the overabundance of delivery services which negate the need for the student to prepare their own meals, which are commonly healthier [4,5]. Medical students need a good understanding about their general health, both in terms of exercise and the prevention of illness, that being with a healthy diet [6]. A sedentary lifestyle is also tied to snacking, which leads to overconsumption of caloric food with low roughage intake [7].

The triggers to this unhealthy behaviour are mainly due to peer pressure, stress, performance anxiety due to competitive culture among medical students, adjustment problems, homesickness, independent monthly income and lack of parental supervision. The rigorousness of medical school is well known, as is their toll on medical students. It makes it hard then for medical students to religiously maintain a healthy diet, get enough sleep and make it to the gym in their entire program, and that's not even including the attempts to maintain a healthy social life [8]. A study by Kurubaran et al. reported that the stressful academic life also was a factor in why students ate more fast food in particular due to its ease and palatability. The affordable price is also a factor that is at play

[9]. However Lin et al. (2020), uncontrolled eating behaviours among students could also be due to food addiction and psychological distress [10].

The Health Belief model is a tool designed to give more insight into a patient's attitude and overall reaction in contracting an illness, as well as the risk of contracting the illness [11]. Health behaviour is given as 'any action undertaken by any individual that will affect their state of health and/ or mortality' [12]. The health belief model states that a person's view of their health behaviour can be affected by three reasons including general health values, specific health beliefs and their individual beliefs of the consequences of the problem. If the individual in question sees their health on the line, they will naturally take action and if they belief the advantages to be more than the cons they might even take further action and preventive measures [13].

The World Health Organization (WHO)'s definition of health is "being in a state of well-being mentally, physically and socially and not just being free of disease or physical and mental weakness" [14]. A healthy lifestyle is a way of life which decreases the chance of becoming sick or having the chance or risk of having an early death [15]. In a study done in 2004, the WHO has also given an individual's quality of life would depend almost 60% on their choice of lifestyle, at least from a health aspect [16]. It is also widely accepted and there is an inverse relationship between practicing health centered lifestyle and mortality rates [17,18]. In a study done by the transitional period between high school and university interestingly came with an inverse relationship between diet quality and weight [19]. Choi et al also noted that the period of time in a university students' life is one of heightened pressure, which can lead one to take up unhealthy habits, inevitably leading to obesity [20]. Naturally we would look towards pinpointing and straightening out these unsavoury habits while the individual is still young [21]. Therefore, it is important for university students to comprehend what constitutes a healthy lifestyle as they are in a position where personality shaping is being finalised and it is relatively less costly to impart health education on said students [22].

Malaysia is considered the country with the highest number of cases with obesity in Southeast Asia [23]. Medical students in Malaysia are actually more prone to be obese compared to their peers, demonstrating the needs for further research [24], and the studies as far back to the secondary school age showing nearly 16% of students being overweight, a whopping 11.5% obese [25]. However, it is noted that research pertaining to the lifestyle of medical students is limited and would be well worth the effort to investigate it [26]. Therefore, this study aimed to investigate the health beliefs, lifestyle and dietary habits among the medical student population.

METHODS

Study design and setting

A cross-sectional study assessed health beliefs and lifestyle among medical students in MUCM through an online questionnaire in English from February to April 2022. The students from MBBS programs in a private medical institution in Malaysia were recruited in this study. The purpose of the study was explained in the Google form and consent was taken from the respondents. Confidentiality of the respondents was maintained.

Sample size and sampling

The sample size for the study was calculated using Epi Info software (version 7) with an expected frequency of outcome (50%), with a 5% margin of error and 95% confidence level. While taking into consideration the non-response rate 10%, the final estimated sample size is 157 students. The respondents were recruited with "purposive" sampling method.

Data collection

The questionnaire consists of three different components, which are (i) demographic, (ii) health belief model and (iii) lifestyle. The demographic profile included age, gender, accommodation status, study year, nationality, ethnicity, current height and weight. Health belief model questionnaire included seven domains, including (1) nutritional confidence, (2) susceptibility, (3) severity, (4) benefits, (5) barrier, (6) behavioural intention to eat healthy and (7) behaviour intention to do physical activity [27]. The answers were recorded in 5- point Likert scale which consist of "strongly disagree, disagree, neutral, agree and strongly agree" options. The questionnaires for lifestyle included eight domains, including (1) Health & Exercise (2) Psychological health, (3) Substance use (4) Nutrition (5) Environmental concern (6) Social concern (7) Accident prevention / safety (8) Sense of purpose [28]. The responses were recorded using 5- point Likert scale consisting of "strongly disagree, disagree, neutral, agree and strongly agree" options.

Data analysis

The data was analyzed using Epi info version 7.2.5.0. software. Results were presented through frequency counts and other descriptive statistics; mean, median, standard deviation. Inferences and association between the independent variables and health beliefs, lifestyle and dietary habits were assessed. Statistics tests, including unpaired t-test, one-way ANOVA, and correlation were used in analysis. The significant level (p value) was set up at 0.05 with 95% confidence interval.

Ethical consideration

Ethical approval to conduct this study was granted by the Research Ethics Committee, Manipal University College Malaysia. Informed consent was obtained from the respondents.

RESULTS

Table 1 shows the demographic details of the students who participated in the study. A total of 160 students participated, among them, 60.63% were female students and 39.38% were male students. Among the respondents, 43.75% were Indian ethnicity, 30.63% were Chinese and 5.63% were Malay ethnicity. BMI was assessed under 4 subgroups which are underweight, healthy, overweight and obese. More than half of the respondents (58.13%) were healthy, 29.38% were overweight, 7.50% were underweight and 5% of the students were obese (Table 1).

Table 1. Sociodemographic characteristics of respondents (n=160)

Variable	Frequency (%)
Age	
≤ 22 years	77(48.43)
>22 years	83(51.88)
Gender	
Male	63(39.38)
Female	97(60.63)
Ethnicity	
Malay	9(5.63)
Chinese	49(30.63)
Indian	70(43.75)
Others	32(20.00)
Nationality	
Malaysian	133(83.13)
International	27(16.88)
Study year	
Pre-clinical years	20(12.50)
Clinical years	140(87.50)
BMI (category)	
Underweight	12(7.50)
Healthy	93(58.13)
Overweight	47(29.38)
Obese	8(5.00)

Table 2 presents the association between the demographic characteristics of the respondents and health belief domains. Age of the respondents was significantly associated with nutritional confidence (P= 0.033) and barrier (P = 0.032) domains of health belief. While gender was significantly associated with barriers (P = 0.041) and behavioral intention to do physical activity (P = 0.018). Academic year was found to be associated with susceptibility domain (P = 0.013) of health belief (Table 2).

Table 2. Factors associated with health beliefs among medical students

Variables	Health Belief											
	Nutritional confidence		Susceptibility		Benefit		Barrier		Behavioral intention to eat healthy food		Behavioral intention to do physical activity	
Age	Mean(SD)	P*	Mean (SD)	P*	Mean (SD)	P*	Mean (SD)	P*	Mean (SD)	P*	Mean (SD)	P*
≤ 22 years	10.51 (2.09)	0.033	13.96 (3.16)	0.283	23.91 (3.45)	0.378	17.45 (4.51)	0.032	10.40 (2.23)	0.718	11.01 (2.32)	0.750
>22 years	11.27 (2.36)		13.39 (3.56)		24.43 (4.01)		19.06 (4.85)		10.53 (2.23)		11.13 (2.41)	
Gender												
Male	11.17 (2.63)	0.216	13.11 (3.53)	0.096	24.22 (3.73)	0.912	19.24 (4.98)	0.041	10.75 (2.33)	0.205	11.62 (2.17)	0.018
Female	10.72 (1.98)		14.02 (3.24)		24.15 (3.78)		17.67 (4.50)		10.29 (2.14)		10.72 (2.42)	
Academic year												
Pre-clinical	10.55 (2.11)	0.460	15.40 (2.80)	0.013	24.25 (3.43)	0.930	17.15 (5.41)	0.253	11.25 (2.22)	0.093	11.70 (2.13)	0.206
Clinical	10.95 (2.28)		13.41 (3.39)		24.17 (3.80)		18.45 (4.64)		10.36 (2.21)		10.99 (2.38)	
BMI												
Underweight	10.67 (1.50)	0.464	13.17 (2.70)	0.598	24.67 (4.56)	0.819	18.08 (3.63)	0.496	10.25 (1.60)	0.447	9.67 (1.87)	0.203
Healthy	11.04 (2.35)		13.51 (3.50)		24.32 (3.92)		17.88 (5.04)		10.70 (2.32)		11.18 (2.42)	
Overweight	10.87 (2.36)		13.87 (3.44)		23.91 (3.22)		18.85 (4.51)		10.19 (2.17)		11.21 (2.33)	
Obese	9.75 (0.89)		15.00 (2.27)		23.38 (3.89)		20.00 (3.93)		9.75 (2.12)		11.13 (2.10)	

*Unpaired t-test to compare the means between two groups, one-way ANOVA to compare the means among three groups and above

Table 3 presents the factors associated with lifestyle domains among the respondents. Gender was significantly associated with the physical health and exercise (P <0.001) and psychological health (P = 0.012) domains. Age was significantly associated with accident prevention domain (P = 0.013). While BMI was significantly associated with physical health and exercises (P = 0.001). Academic year was significantly associated with social concern (P = 0.028) and sense of purpose (P = 0.009) domains (Table 3).

Table 3. Factors associated with lifestyle among medical students

Variables	Lifestyle							
	Physical health and exercise		Psychological health		Substance use		Nutrition	
	Mean (SD)	P*	Mean (SD)	P*	Mean (SD)	P*	Mean (SD)	P*
Age								
≤ 22 years	20.25 (4.38)	0.315	23.73 (4.88)	0.110	34.58 (6.30)	0.185	12.57 (3.22)	0.504
>22 years	21.00 (5.01)		24.93 (4.56)		33.24 (6.46)		12.89 (2.83)	
Gender								
Male	22.49 (4.44)	<0.001	25.51 (4.00)	0.012	32.76 (6.20)	0.073	13.25 (2.85)	0.081
Female	19.43 (4.52)		23.60 (5.04)		34.62 (6.45)		12.40 (3.09)	
Academic year								
Pre-clinical	21.10 (4.34)	0.641	25.00 (5.79)	0.514	35.40 (5.65)	0.259	12.35 (2.85)	0.541
Clinical	20.57 (4.78)		24.26 (4.59)		33.67 (6.49)		12.79 (3.04)	
BMI								
Underweight	20.08 (4.14)	0.001	24.08 (6.53)	0.483	35.33 (5.02)	0.234	13.42 (2.84)	0.094
Healthy	21.31 (4.86)		24.43 (5.03)		34.17 (6.48)		12.60 (3.12)	
Overweight	20.47 (4.19)		24.68 (3.61)		32.51 (6.47)		13.21 (2.79)	
Obese	14.63 (2.39)		21.88 (4.16)		36.50 (6.09)		10.50 (2.67)	
	Lifestyle							
	Environmental concern		Social concern		Accident prevention		Sense of purpose	
	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Age								
≤ 22 years	17.40 (3.72)	0.354	20.38 (3.09)	0.109	16.06 (2.60)	0.013	11.53 (2.43)	0.451
>22 years	17.89 (2.91)		19.54 (3.44)		15.05 (2.51)		11.27 (2.04)	
Gender								
Male	18.22 (3.00)	0.083	19.54 (3.63)	0.212	15.08 (2.59)	0.072	11.40 (2.14)	0.989
Female	17.29 (3.48)		20.21 (3.04)		15.84 (2.58)		11.39 (2.30)	
Academic year								
Pre-clinical	18.00 (2.75)	0.622	21.45 (2.67)	0.028	16.30 (1.98)	0.161	12.60 (2.28)	0.009
Clinical	17.61 (3.40)		19.73 (3.32)		15.43 (2.66)		11.22 (2.18)	
BMI								
Underweight	18.33 (2.53)	0.824	19.83 (2.92)	0.957	15.50 (2.54)	0.594	10.67 (2.10)	0.580
Healthy	17.70 (3.58)		20.05 (3.36)		15.52 (2.57)		11.56 (2.19)	
Overweight	17.36 (2.95)		19.83 (3.24)		15.38 (2.65)		11.30 (2.36)	
Obese	17.88 (3.68)		19.50 (3.74)		16.75 (2.87)		11.13 (2.23)	

*Unpaired t-test to compare the means between two groups, one-way ANOVA to compare the means among three groups and above

Table 4 presents the correlation between health beliefs and nutritional lifestyle among medical students. benefit, behavioral intention to eat healthy food and behavioral intention to do physical activity health belief domains were fairly corrected with nutrition domain of life style (Table 4).

Table 4. Correlation between health beliefs and nutritional lifestyle among medical students

Health Belief domains	Nutrition	
	Correlation coefficient	P*
Nutritional confidence	0.26	0.001
Susceptibility	0.10	0.274
Severity	0.00	0.457
Benefit	0.30	<0.001
Barrier	0.00	0.453
Behavioral intention to eat healthy food	0.46	<0.001
Behavioral intention to do physical activity	0.46	0.001

Table 5 presents the correlation between health beliefs and physical activity among medical students. Nutritional confidence, benefits, and behavioral intention to eat healthy food health belief domains were fairly correlated with physical activity domain of life style. While behavioral intention to do physical activity health belief domain revealed moderately strong correlation with physical activity lifestyle domain (Table 5).

Table 5. Correlation between health beliefs and physical activity among medical students

Health Belief domains	Physical activity	
	Correlation	P*
Nutritional confidence	0.41	<0.001
Susceptibility	0.14	0.078
Severity	0.00	0.474
Benefit	0.47	<0.001
Barrier	0.10	0.269
Behavioral intention to eat healthy food	0.58	<0.001
Behavioral intention to do physical activity	0.60	<0.001

*Pearson correlation

DISCUSSION

This cross-sectional study was conducted to assess the health beliefs and lifestyle among the medical students in a private medical university in Malaysia. Among the health beliefs domains, nutritional confidence and barriers are significantly associated with age of the respondents. The extent to which the respondents were knowledgeable in terms of nutritional info and the difficulties faced in changing their diet for the better. Similar findings were reported by Kim et al [27] about the health belief differences in age and gender categories. In the first category, nutritional confidence and barrier are proven to be significant, aligning with Kim et al. Barrier is especially a factor as it is often out of the medical student's control, or any student for that matter where time and resources are limiting factors in a student's ability to live a healthy lifestyle. The longer a student stays in this field the higher the workload, which could be an attributing factor as to why the barrier mean goes up significantly beyond the age of 22. This is supported by a study in 2019 by Christin et al [29] where many respondents faced a multitude of barriers in their lifestyle management. The nutritional confidence factor is also important as it is a fundamental feature in being a medical student, correlating with studies done by Macaninch, Elaine et al [30] where over half of the respondents felt strongly about the role of nutritional confidence and knowledge towards a healthy lifestyle. However, a separate study in the UK by Radenkovic et al [31] showed that medical students, even until final year, were massively underwhelming in their exercise and health related knowledge, so more testing could be done to further isolate the issue, or a regional factor could be at play.

Barrier and behavioural intention to do physical activity from health belief and gender were significantly associated in our study. Behavioral intention to do physical activity and that revealed the resistance faced by students to engage in exercise and the likelihood they would exercise to begin with. For the barrier category concerning age, there has not been much research into the matter but Liviu et al. [31] has made an argument that women do indeed care more for their health, following more medical advice and going to check-ups regularly, hence becoming knowledgeable and cautious concerning their health. Another study by Ostberg, Halling, & Lindblad et al. in 1999 [32] also supports this motion, with oral health as the measure. In the other paper we referred to, Dinzeo et al. [28], physical health and exercise, together with psychological health are significant, aligning with our findings. The physical health and exercise category is not too conclusive however, as studies from Nasir U et al and Margareta I et al have shown. Nasir U et al. shows a 2.5% more likely chance of males engaging in a healthy lifestyle compared to their female peers [34], while Margareta I et al. shows in fact a higher level of obesity and physical inactivity among Swedish university students [35]. However, Kathryn S et al. in a study from Ohio, has managed to point men exercising at a higher intensity level than women, together with frequency [36], so the factor might be up for further debate. Gender on physical health is also a factor that in our study, puts males a whole 2 points higher than females. This is supported by A Jorgensen [37], where he

found women to be less likely to receive emotional support which leads to feeling less hopeful towards the future. Nutritional confidence, benefit, behavioral intention to eat healthy food and behavioral intention to do physical activity from health belief and nutritional lifestyle and physical activity are also significant in our findings and Kim et al. The above points are interlocking and self-explanatory and coincidentally corroborated by Nasir U et al. [34], where nearly 93% of respondents were shown to have a lifestyle that was at least healthy, which would lead to them having a better diet and propensity to exercise.

In our research, susceptibility of getting obesity and related diseases is significantly different among students in different academic year, while Dinzeo et al. has this category as not significant, Christian et al. would list it as a viable factor [29], through the use of an interesting paradox of sorts, where the medical student, who enters medical school to treat people, is then jeopardizing their own health in turn. The higher they studied in academic year, the more knowledge they accrued and with it the fear of self-diagnosing. For the category concerning accident prevention and age there was little to no academic research to back up the claim although it has been shown to be significant in our study, this being how astute the individual was towards safety rules. Social concern, which is the level at which the individual is understanding of his fellow man, and sense of purpose, which is their self-actualization, so to speak, in regards to academic year is also significant in our paper, but not so in Kim et al. however Iorga M et al. has made an intriguing finding in 2018 showing medical students get more and more likely to have depression the higher their academic year, which would serve to explain the lack of sense of purpose as is the sign of depression, even if not fully diagnosed as in most cases [38]. Carroll S et al. has also shown that the amount of physical health undertaken does indeed decrease with the increase of body weight or BMI in our case, which does align with the findings we have shown in this particular study [39].

There is a fair correlation between physical and four health belief domains; nutritional confidence, benefits, nutrition and behavioural intention to eat healthy food, and the nutrition and behavioural intention to do physical activity. While nutrition lifestyle domain was fairly correlated with benefits, nutrition and behavioural intention to eat healthy food, and the nutrition and behavioural intention to do physical activity. These findings could be related to the previous research findings on the positive correlation of health knowledge, beliefs and improving their diet pattern [27, 40].

There were some limitations in this study. The study was a cross-sectional study, hence a temporal relationship of the correlation between health beliefs, lifestyle and dietary habits among medical students was difficult to establish. Weight and height of respondents were collected via google forms, instead of using a weighing scale and a stadiometer. Hence, it might impose to the self-reported bias. Our study was only done among medical students in a single university; hence the findings cannot be generalized to other medical students from

different universities. The sampling method used was purposive sampling, hence, the generalization of the findings might be limited.

CONCLUSION AND RECOMMENDATION

To conclude our findings, health beliefs among respondents were correlated with the nutritional and physical activity in their daily lifestyle. Especially having nutritional confidence, knowing the benefits of a healthy diet, behavioral intention to eat healthy food and to do physical activity were significantly correlated with the respondent's nutrition intake and physical activities.

Educational interventions and activities such as talks, trainings related to adopting healthy and active lifestyles could help the medical students in attaining a better lifestyle habit. Even though a sufficient amount of theoretical syllabus regarding healthy lifestyles and eating habits have been implemented, the medical students still need to follow and improve nutrition and physical activity. Thus, such purposive initiative activities could be the first step in attaining self-efficacy and self-awareness to model healthy behaviours among the medical students.

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