ORIGINAL ARTICLE

DETERMINANTS ASSOCIATED WITH BLOOD LIPID LEVEL AMONG STUDENTS AND EMPLOYEES WORKING IN UNIVERSITY OF THAILAND

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Background: Noncommunicable Diseases (NCDs) are considered as major public health threats and contributes a high burden of diseases on health system of Thailand. Around 74% of deaths occur due to NCDs, and more than 40,000 people die annually in Thailand due to this problem. Objectives of the study were to know the blood lipid level and its determinants among university students and employees of Thailand. **Methods:** This study was cross-sectional to determine the relationship between various factors with blood lipid level among university students and employees. A total 219 participants were invited and included randomly in this study. Only those respondents who had their lipid profile checked recently during one of time were included and those who had other associated diseases were excluded in this study. Chi-square and Binary logistic regression were used to assess the factors associating with blood lipid level among the study participants. Study was ethically approved from the ethical review board of university and written consent was taken prior to start the data collection. **Results:** Total 219 respondents were included in this study, majority 84% were females. The mean age of participants was 26.18 (SD±9.81) years. About three-fifth (63%) had normal blood lipids, when we considering those with abnormal blood lipids, it was found that the sample group had the most abnormal cholesterol 37.44% and LDL 28.77%. Study found that only the variable of age was statistically significant in bivariate analysis. By people aged 26 and over had abnormal blood lipid 2.953 times more than those age 20–25 years. The income variable was found to have no relationship with blood lipid status at $p>0.05$. **Conclusion:** This study concludes that the university students and employees are on high risk to develop the cardiac diseases and the factor like age has a greater impact on abnormal blood lipids.

Keywords: Blood Lipid Status; Students; Personnels; University

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INTRODUCTION

Noncommunicable Diseases (NCDs) are considered as major public health threats and contributes a high burden of diseases on health system of Thailand.[1] Around 74% of deaths occur due to NCDs, and more than 40,000 people die annually in Thailand due to this problem.[2] Hence, NCDs are directly affecting on health and the economy, especially the costs of medical care and the lack of manpower who lost their lives before the time[1]. Health survey of Thailand shows that Thai people have blood cholesterol levels higher than the required standard of 200 mg/dl. Around 44% and 26 million people have high blood cholesterol level in Thailand. It was found that People with hyperlipidaemia more than 200 mg/dl are 2–5 times on higher chance of having ischemic heart disease compared with those who have a normal blood lipid level.[2] Hypercholesterolemia is major risk factor for cardiac diseases that contributes a high mortality and morbidity.[3] Hight cholesterol results due to increased intake of sweet, salt, fats and seafood that contains trans fats found in crunchy snacks and non-dairy creamers. Moreover, it was also found that this high cholesterol level may be found due to hereditary transmission.[4] Low Density Lipoprotein (LDL), which is a dangerous type that accumulates in the arterial walls, causing the arteries to narrow and harden, that can cause of coronary artery disease and ischemic stroke. High Density Lipoprotein (HDL) is known as a good fat that serves to remove dangerous fat from the bloodstream, resisting the accumulation of fat and cholesterol, reducing the risk of coronary artery disease.[1] Triglyceride may be elevated due to certain diseases such as obesity, diabetes, drinking alcohol and certain drugs such as hormones, steroids, etc. Some patients may have high triglyceride levels due to

their heredity[4]. Blood lipid level varies according to age and gender.[5] Preventing hyperlipidaemia is depend on the food types are being used by the individuals. If the family has a history of ischemic heart disease, diabetes, and hypertension, they should be checked every 6 months.[6] Study found that there was a high-level Body Mass Index, waist circumference, and blood lipid cholesterol level and triglyceride than normal.[7] It was also found that the level LDL in the blood of the students was higher with the average value was 112.90–115.90 mg/dl.[7] It can be predicted that these students are on high risk for developing chronic non-communicable diseases. Therefore, promoting healthy behaviour exercise and eating proper food will prevent the development of NCDs among nursing students in the future.[8] Hence, it is imperative to know the determinants and blood lipid level among the students and employees in the university. This evidence will support in policy making for healthy life in the university.

MATERIAL AND METHODS

A cross-sectional study was conducted at Kanchanabhishek Institute of Medical and Public Health Technology, Sai Noi district, Nonthaburi province, Thailand in 2022. A total of 219 participants were included through random sampling method who had their lipid profile checked in 2022. The tool was piloted in similar population of 30 students and personnels in the same district, Nonthaburi province. The questionnaire included closed ended question on socio-demographic characteristics, knowledge, attitude and practices of health (dietary, exercise, emotional management, not smoking, not drinking alcohol), and blood lipid status from health checkup report. The overall score of knowledge in health were given from 0–15 scores, high (11–15 scores), moderate (6–10 scores), and low (0–5 scores).[9] As for Attitude of health was separated; Very good (≥60 scores), Good (45–59 scores), moderate (38–44 scores), and few (≤37 scores). Practice of health was separated into; very good (≥42 scores), good (31–41 scores), moderate (26–30 scores), and few (≤25 scores).[10] The content validity (IOC) for all questions was 1.00. The reliability of knowledge in health used Kuder-Richardson the value was found as 0.75[11] and the attitude and practice of health used formula coefficient of Cronbach's alpha with value of 0.82[12]. This research was approved by the Human Research Ethics Committee of the College of Medical Technology and Public Health, Kanchanapisek, number KMPHT-66020036 on July 1, 2022. Association was measured by using Chi-square and Binary logistic regression.

RESULTS

The total participants were 219, the most of the participants were female, 84%. The mean age of students and personnel was 26.18 (SD±9.809). Most (78%) of them had income <276 USD per month. Majority (84%) of them showed that they didn't have health problem and more than three-fifth (62%) reported their Body Mass Index (BMI) had low than normal level. However, the BMI of overweight of the participants were 380% (Table-1).

In table-2, the results showed that more than half (58.90%) had high level on knowledge of health. In term of attitude of health, we found that three-fifth (61%) had very good level. The practice of health showed that more than half (53%) had a low level.

In term of blood lipid status of participants reported that more than half (55%) had blood lipid normal level. When we considering the people with abnormal blood lipid, we found that the sample group had the highest abnormal cholesterol values at 37% and LDL values at 29%. (Table-3)

We measured the statistical significance of various factors with blood lipid status using the chi-square test, we found that age (p=.001), and income (p= .021) as the statistically significant in the sample. However, all variables were not statistically significant with blood lipid status at p>0.05. (Table-4).

Enter method of binary logistic regression was used to measure the associations of independents variables. We found that only the variable of age was statistically significant in bivariate analysis. By people aged 26 and over had abnormal blood lipid 2.953 times more than those age 20–25 years. The income variable was found to have no relationship with blood lipid status at p> .05. (Table-5)

Table-1: Socio-Demographic characteristics of university students and personnel

Socio-Demographic characteristics		n	%
Gender	Male	36	16.44
	Female	183	83.56
Age (Mean 26.18±9.809 SD)	20–25	159	72.60
	26 and over	60	27.40
Income, USD	< 276	170	77.63
	>276	49	22.37
Health problems	Not have health problems	184	84.02
	Have health problems	35	15.98
Body Mass Index (BMI) (from report)	Low/thin/normal	136	62.10
	Overweight/fat	83	37.90

Table-2: Knowledge, attitude, and practice of health of university students and personnel

	n	%	
Knowledge of Health (dietary, exercise, emotional management, not smoking, not drinking alcohol)			
High level (11–15 scores)	129	58.90	
Moderate level (6–10 scores)	88	40.18	
Low level (0–5 scores)	2	0.92	
Attitude of Health (dietary, exercise, emotional management, not smoking, not drinking alcohol)			
Very good level (≥ 60 scores)	133	60.73	
Good level (45–59 scores)	80	36.53	
Moderate level (38–44 scores)	5	2.28	
Low level (≤ 37 scores)	1	0.46	
Practice of Health (dietary, exercise, emotional management, not smoking, not drinking alcohol)			
Very good level (≥ 42 scores)	10	4.57	
Good level (31–41 scores)	42	19.18	
Moderate level (26–30 scores)	51	23.28	
Low level (≤ 25 scores)	116	52.97	

Table-3: Prevalence of blood lipid status of the university students and personnel

	n	%
Blood Lipid status		
Normal	121	55.25
Abnormal	98	44.75
Cholesterol		
Normal (< 200 mg/dl)	137	62.56
Abnormal (> 200 mg/dl)	82	37.44
Triglyceride		
Normal (< 150 mg/dl)	209	95.43
Abnormal (> 150 mg/dl)	10	4.57
HDL		
Normal (≥ 40 mg/dl)	210	95.89
Abnormal (< 40 mg/dl)	9	4.11
LDL		
Normal (< 130 mg/dl)	156	71.23
Abnormal (> 130 mg/dl)	63	28.77

Table-4: Factors related with blood lipid status of the University students and personnel

	Blood Lipid Status		x^2	***p*-value***
	Normal n (%)	**Abnormal n (%)**		
Gender				
Male	15(41.70)	21 (58.30)	3.216	0.073
Female	106 (57.90)	77 (42.10)		
Age				
20-25	99 (62.30)	60 (37.70)	11.545	**0.001**
26 and over	22 (36.70)	38 (63.30)		
Income, USD				
< 276	101 (59.40)	69 (40.60)	5.320	**0.021**
>276	20 (40.80)	29 (59.20)		
Health problems				
Not have health problems	101 (54.90)	83 (45.10)	0.060	0.806
Have health problems	20 (57.10)	15 (42.90)		
Body Mass Index (BMI) (from report)				
Low/thin/normal	58 (55.20)	47 (44.80)	0.000	0.997
Overweight/fat	63 (55.30)	51 (44.70)		
Knowledge of Health				
High level	77 (63.60)	52 (53.10)	2.501	0.114
Moderate level, Low level	44 (36.40)	46 (46.90)		
Attitude of Health				
Very good level, Good level	73 (60.30)	60 (61.20)	0.018	0.893
Moderate level, Low level	48 (39.70)	38 (38.80)		
Practice of Health				
Very good level, Good level	54 (44.60)	67 (55.40)	0.018	0.893
Moderate level, Low level	49 (50.00)	49 (50.00)		

*Chi-Square test

Table-5: Bivariate analysis of the factors related with blood lipid status of the students and personnels in the University, Thailand

	B	SE	Wald	Exp(B)	95% CI	*p*-value*
Age						**.014**
20–25						
26 and over	1.083	0.443	5.979	2.953	1.240-7.033	
Income, USD						.909
< 276						
>276	-0.054	0.473	0.013	0.948	0.375-2.397	

*Binary logistic regression

DISCUSSION

The blood lipid status of participants had the most abnormal cholesterol and LDL value and the students and personnel in the university have health problems related to hyperlipidaemia. These findings are consistent with study conducted on the nursing students in Boromarajonani College of Nursing, Chiang Maii where it was found that the cholesterol level in 2nd,3rd, and 4th year students were higher than normal (> 200 mg/dl) by 25.00%, 26.00%, and 33.00%[8]. Also, in term of LDL blood lipid level in 2nd,3rd, and 4th year students were higher than normal (>130 mg/dl) by 5.00%, 5.00%, and 8.00% respectively.[8] Another study shows the incidence of abnormal blood lipids among personnel at Faculty of Medicine, Khonkaen University and found to be 68.10 per 100 cases per year (95% CI 64.70–71.40).[13]

Factors related to blood lipid status in this study, it was found that only age had an effect on blood lipid status. It has been shown that increasing age has a greater impact on abnormal blood lipids. This is in line with the study of health care behaviour of people with hypercholesterolemia in Lampang province found that personal factors such as age and education level were related to hypercholesterolemia.[14] Similar study supports our findings on prevalence of dyslipidaemia and factors among university employees and students in Bangladesh found that age, obesity, diabetes, and inadequate physical activity were significantly associated with dyslipidemia.[15] As for other variables such as gender, income, health problem, and Body Mass Index, there were no relationship with blood lipid status. Not similarly, the study prevalence and factors associated with dyslipidaemia among adolescents in Saudi Arabia found that male gender (OR=2.19, 95% CI 1.78–2.70) BMI (underweight OR =0.80, 95% CI 0.69-0.94, overweight OR=1.76, 95% CI 1.50-2.06, obese OR=2.80, 95% CI 2.34–3.34) were associated with dyslipidaemia at $p<0.001$.[16] Due to the different study methods and the sample of this study were people who received annual health examinations, they were both normal and abnormal lipid levels. This may result in different factors that are related to hyperlipidemia.[15]

As for the variable of knowledge, attitude, and practice of health (dietary, exercise, emotional management, not smoking, not drinking alcohol) we found that they had no effect on blood lipid status at $p>0.05$. This is because most of the sample group had a level of knowledge and attitude in high level, 58.90%, 60.73% respectively and they are studying and working in public health. This is consistent with the study of factors predicting blood lipid levels in people with abnormal blood lipid in the community found that dietary factors, exercise, emotion management, smoking, and drinking did not jointly predict total cholesterol and LDL levels (R^2=.019, p < .705 and R^2=.023, p <.590).[17] There should be a health care program in the university, in terms of dietary, exercise, emotional management, not smoking, not drinking alcohol since adolescence and carry out health care activities appropriate to the age group for reducing the risk of abnormal blood fats as people get older. employees and students to be more practice and continue to practice about health care (dietary, exercise, emotional management, not smoking, not drinking alcohol) until it becomes a daily routine.[17–19]

CONCLUSION

This study concludes that the university students are on high risk to develop the cardiac diseases and the factor like age has a greater impact on abnormal blood lipids. By people aged 26 and over had abnormal blood lipid 2.953 times more than those age 20-25 years.

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AUTHORS' CONTRIBUTIONS

YT: Research ideas and data collection. NB: Manuscript methodology and analysis. SK, RK, DF support in the data collection process. PE: Data entry,

compilation, and analysis. All other authors supervised the research process and reviewed the manuscript.

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