Prevalence, risk awareness and health beliefs of behavioural risk factors for cardiovascular disease among university students in nine ASEAN countries

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The 9th International Conference on Public Health
Among Greater Mekong Sub Regional Countries,
Yangon, 23 Nov 2017

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Background

Understanding behavioural risk factors of cardiovascular disease (CVD) is of great importance for CVD prevention and control

- Tobacco use, unhealthy diet, obesity, physical inactivity and harmful alcohol use → major behavioural CVD risk factors (WHO, 2016)

Background

- The prevalence of behavioural CVD risk factors is high in Southeast Asian countries (Dans et al., 2011)
- Malaysia: 72.8% inadequate vegetable and fruit intake; 41.3% physical inactivity (Ghazali et al., 2015), 55.2% among men and 65.3% among women overweight/obesity (Ng et al., 2014)
- Smoking prevalence among men ranged from 23.1% in Singapore to 67.4% in Indonesia among 10 ASEAN countries (VINACOSH, 2015).
- Problem drinking: 8.2% in the Thai population (Assanangkornchai et al., 2010), 25% in a rural community in Cambodia (Yeung et al., 2015).
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Background

Aim of the study
prevalence, risk awareness and health beliefs of behavioural risk factors (tobacco use, unhealthy diet, obesity, physical inactivity and harmful use of alcohol) for cardiovascular disease among university students in nine ASEAN countries (Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam).

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Methods

In a cross-sectional survey a questionnaire on various health behaviours was self-administered, Body weight and height were measured among university students in nine ASEAN countries

Measures: Behavioural risk factors

- *Unhealthy diet* was assessed with the question, "Do you make a conscious effort to avoid eating foods that contain fat and cholesterol?"
- *Body mass index (BMI*) was classified according to Asian criteria: normal weight (18.5 to <23.0 kg/m^2), overweight (23.0 to <25.0 kg/m^2) and 25.0 or more kg/m^2 as obese
- *Current tobacco use*
- *Past month binge drinking*
- *Physical activity (IPAQ)*

Measures-other

The risk awareness items included the knowledge (yes/no) whether or not each of the health behaviours contributed to health problems. For *overweight*, heart disease and high blood pressure were acceptable (0-2), for *exercise*, heart disease and high blood pressure (0-2), for *smoking*, heart disease, lung cancer and high blood pressure (0-3), for *alcohol*, heart disease, high blood pressure (0-2), and for *eating fat*, heart disease and breast cancer (0-2)

Measures: Beliefs in health benefits

Study participants were asked to rate the importance of five health behaviours (keep body weight within normal range, take regular exercise, non-smoking, not drinking too much alcohol, and not to eat too much animal fat) for health maintenance on 10-point scales, ranging from 1=of very low importance to 10=of very great importance

Results-Sample

Country	Total number N (%)	Men n (%)	Women n (%)	Age Mean (SD)	Tertiary enrolment ratio, 2013-2015 [27]
Cambodia[1]	1357 (15.4)	667 (20.2)	690 (12.5)	21.3 (2.2)	13.1
Indonesia[1]	981 (11.1)	286 (8.7)	695 (12.6)	19.3 (2.4)	24.3
Laos[1]	806 (9.1)	273 (8.3)	533 (9.7)	22.2 (1.8)	16.9
Malaysia[2]	1023 (11.6)	504 (15.3)	519 (9.4)	20.7 (1.4)	26.1
Myanmar[1]	491 (5.6)	209 (6.3)	282 (5.1)	20.1 (1.1)	13.5
Philippines[1]	782 (8.9)	201 (6.1)	581 (10.6)	18.7 (1.0)	35.7
Singapore[3]	891 (10.1)	449 (13.6)	442 (8.0)	21.2 (1.6)	69.8
Thailand[2]	1658 (18.8)	308 (9.3)	1350 (24.5)	20.0 (1.3)	48.9
Vietnam[1]	817 (9.3)	404 (12.2)	413 (7.5)	21.4 (1.6)	28.8
All	8806	3301 (37.5)	5505 (62.5)	20.6 (2.0)	

Results-Behavioural risks-Men

Country	BMI-Overweight or obesity	Physical inactivity	Tobacco use	Binge drinking	Non-avoidance of fat and cholesterol
	%	%	%	%	%
Men					
Cambodia	15.2 (12.7, 18.1)	56.1 (52.4, 59.8)	1.3 (0.7, 2.5)	7.5 (5.8, 9.8)	1)
Indonesia	38.2 (32.7, 44.0)	48.4 (42.6, 54.3)	18.9 (14.7, 23.8)	1.4 (0.5, 3.7)	50.5 (44.7, 56.4)
Laos	23.8 (19.0, 29.4)	26.0 (21.1, 31.5)	10.6 (7.5, 14.9)	46.2 (40.3, 52.1)	72.2 (66.5, 77.2)
Malaysia	38.2 (34.0, 42.5)	30.0 (26.1, 34.1)	6.0 (4.2, 8.4)	0.2 (0.03, 1.4)	66.1 (61.8, 70.1)
Myanmar	38.6 (30.7, 47.2)	44.9 (39.8, 49.8)	2.4 (1.0, 5.6)	3.3 (1.6, 6.9)	51.0 (44.1, 57.8)
Philippines	34.0 (27.7, 41.0)	33.0 (26.9, 39.7)	13.6 (9.5, 19.1)	13.4 (9.4, 18.9)	68.0 (61.2, 74.1)
Singapore	29.3 (24.6, 34.4)	31.4 (27.2, 35.9)	5.8 (4.0, 8.4)	8.5(6.2, 11.4)	66.2 (57.6, 66.6)
Thailand	25.5 (20.8, 30.8)	42.8 (37.2, 48.5)	12.3 (9.0, 16.6)	22.4 (18.1, 27.4)	53.1 (47.3, 58.7)
Vietnam	22.3 (18.3, 26.9)	32.4 (28.0, 37.2)	3.7 (2.1, 6.1)	2.7 (1.5, 4.9)	71.5 (66.9, 75.7)
All	27.5 (26.0, 29.2)	39.0 (37.3, 40.7)	6.9 (6.2, 7.9)	10.1 (9.1, 11.1)	62.7 (60.8, 64.5)

Health awareness ratings

Country[1)]	Overweight (0-2)			Lack of exercise (0-2)		
	All	Men	Women	All	Men	Women
Indonesia	1.30	1.22	1.33	0.58	0.50	0.61
Laos	1.08	1.02	1.11	0.52	0.57	0.50
Malaysia	1.52	1.55	1.49	0.65	0.64	0.65
Myanmar	1.68	1.65	1.71	0.88	0.89	0.88
Philippines	1.73	1.81	1.70	0.73	0.76	0.72
Singapore	1.68	1.68	1.68	0.91	0.90	0.93
Thailand	1.28	1.27	1.29	0.69	0.63	0.70
Vietnam	1.72	1.73	1.72	1.32	1.24	1.39
All	1.46	1.50*	1.44	0.78	0.80	0.76

Health benefits ratings

Country	Keep body weight within normal range			Taking regular exercise		
	All	Men	Women	All	Men	Women
Cambodia	8.05	8.15	7.94	8.17	8.09	8.24
Indonesia	8.53	8.40	8.58	7.97	8.19	7.88
Laos	7.86	7.66	7.96	7.84	8.40*	7.56
Malaysia	8.25	8.05	8.44*	7.91	8.12	7.71
Myanmar	7.50	7.25	7.67	7.13	7.22	7.06
Philippines	8.31	7.98	8.43	7.26	7.53	7.16
Singapore	7.78	7.57	7.99	8.01	8.22*	7.80
Thailand	7.51	7.23	7.57	6.40	6.88*	6.29
Vietnam	7.96	7.61	8.30*	7.93	7.92	7.93
All	7.96	7.82	8.05*	7.58	7.92*	7.37

Predictors of CVD risk factors-1

Variable	Overweight or obesity vs. normal weight	Low physical activity
	AOR (95% CI)	AOR (95% CI)
Gender		
Female	1 (Reference)	1 (Reference)
Male	1.68 (1.49-1.90)***	0.57 (0.51-0.63)***
Age		
18-20	1 (Reference)	1 (Reference)
20-21	0.90 (0.78-1.05)	1.02 (0.91-1.15)
22-30	1.07 (0.92-1.26)	1.01 (0.89-1.15)
Family wealth		
Poor	1 (Reference)	1 (Reference)
Wealthy	1.26 (1.10-1.43)***	1.22 (1.10-1.36)
Country income		
Upper middle/high	1 (Reference)	1 (Reference)
Lower middle	0.91 (0.79-1.03)	1.03 (0.93-1.15)
Residence		
Away from parents	1 (Reference)	1 (Reference)
With parents	0.99 (0.86-1.13)	0.94 (0.84-1.05)
Negative subjective health status (scale)	0.94 (0.87-1.00	1.12 (1.06-1.18)***
Risk awareness (scale)	0.99 (0.89-1.09)a	0.97 (0.91-1.03)b
Benefits (scale)	0.97 (0.94-0.97)*A	0.90 (0.89-0.92)***B

Predictors of CVD risk factors-2

Variable	Tobacco use	Binge drinking	Not avoiding fat and cholesterol
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Gender			
Female	1 (Reference)	1 (Reference)	1 (Reference)
Male	3.17 (2.49-4.03)***	2.18 (1.80-2.64)***	1.20 (1.08-1.33)***
Age			
18-20	1 (Reference)	1 (Reference)	1 (Reference)
20-21	0.72 (0.53-0.98)*	1.52 (1.18-1.97)***	0.89 (0.79-1.00)*
22-30	1.34 (1.00-1.80*	2.22 1.72-2.88)***	1.15 (1.01-1.32)*
Family wealth			
Poor	1 (Reference)	1 (Reference)	1 (Reference)
Wealthy	1.69 (1.31-2.17)***	1.03 (0.83-1.27)	1.04 (0.93-1.15)
Country income			
Upper middle/high	1 (Reference)	1 (Reference)	1 (Reference)
Lower middle	1.55 (1.20-2.00)**	1.07 (0.87-1.31)	1.56 (1.40-1.74)***
Residence			
Away from parents	1 (Reference)	1 (Reference)	1 (Reference)
With parents	1.12 (0.87-1.43)	0.91 (0.76-1.12)	1.00 (0.90-1.12)
Negative subjective health status (scale)	0.97 (0.86-1.09)	1.17 (1.05-1.27)*	1.08 (1.02-1.14)**
Risk awareness (scale)	0.88 (0.77-1.00)*c	0.79 (0.70-0.90)***d	1.03 (0.95-1.11)e
Benefits (scale)	0.79 (0.77-0.81)***C	0.83 (0.80-0.85)***D	0.84 (0.82-0.85)***E

Discussion-1

The prevalence of behavioural CVD risk factors (overweight, low physical activity, tobacco use, binge drinking, and avoidance of eating fat) in this study was similar to a study among emerging adults in eight European countries, except for tobacco use, which was lower in this study than among European university students

Discussion-2

Men had a higher prevalence of behavioural risk factors than women in terms of obesity, tobacco use, binge drinking and eating foods containing fat and cholesterol, while women had a higher prevalence of low physical activity than men.

Discussion-3

Generally, the risk awareness for the five behavioural CVD risk factors was low, but comparable to what was found in a European emerging adults study

Discussion-4

The assessment of health benefits of five health behaviours found that university students seem to be given high ratings of each health behaviour in their importance to health

Not smoking (8.7, range 1-10) and not drinking too much (8.5) were rated overall as more important than keeping the body weight within normal range (7.9), which was in turn rated more important than taking regular exercises (7.6) and not eating too much fat (6.7).

Discussion-5

In multivariable logistic regression, lack of risk awareness was found to be associated with tobacco use and binge drinking, however, no associations were found between risk awareness and overweight, low physical activity and dietary behaviour (non-avoidance of fat and cholesterol).

One message from this finding could be that risk awareness programmes targeting tobacco use and alcohol drinking could be effective, while such programs may not be effective for the other behavioural risk factors (overweight, low physical activity and poor dietary behaviour).

Discussion 6

Poorer health benefits beliefs predicted overweight, low physical activity, tobacco use, binge drinking and non-avoidance of fat and cholesterol.

Discussion-7

- Although there is an emergence of national policies and non-communicable Disease, including CVD, control programmes in the ASEAN region (Dans et al., 2011), efforts need to be considerably strengthened.
- Interventions targeting this university student population should improve dietary behaviour, decrease alcohol and tobacco use and increase physical activity by using “multiple health behaviour change interventions” that could be administered through university health centres and health promotion programmes

Conclusion

- High prevalence of behavioural risk factors of CVD: overweight, unhealthy diet, physical inactivity, tobacco use and binge drinking
- Risk awareness was partially and positive health beliefs were negatively associated with behavioural risk factors.
- Development of health promotion programmes targeting these risk factors in the university environment may help to prevent subsequent CVD development

Acknowledgement

Partial funding for this study was provided by the South African Department of Higher Education & National Research Foundation

The following colleagues participated in this ASEAN student health survey and contributed to the design and data collection and are considered co-authors (locations of universities in parentheses): Cambodia: Siyan Yi (Phnom Penh); Indonesia: Erna Rochmawati (Yogyakarta), Indri Hapsari Susilowati (Jakarta); Laos: Vanphanom Sychareun (Vientiane); Malaysia: Wah Yun Low (Kuala Lumpur); Myanmar: Hla Hla Win (Yangon); Philippines: Alice Ferrer (Miagao); Singapore: Mee Lian Wong (Singapore); Thailand: Niruwan Turnbull (Maha Sarakham), Tawatchai Apidechkul (Chiang Rai); Vietnam: Thang Nguyen Huu (Hanoi).