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Short Communication

Diet and colorectal cancer: knowledge assessment among Malaysian university students

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ABSTRACT

The aim of this study was to assess the level of knowledge of dietary habits related to colorectal cancer (CRC) in a university students' population. A questionnaire-based survey was conducted among students from different schools and grades of studies at Universiti Sains Malaysia (USM) ($n = 385$), regarding knowledge of CRC and dietary habits. Only (34.8%) of students could correctly define CRC as cancer of colon and rectum and (55.3%) of them could not define diet as a risk factor for CRC. The overall score of knowledge was low ($Mean \pm SD = -4.27 \pm 0.4$). Majority of students showed lack of knowledge (71.9%). Inferential analysis revealed significant association and difference in knowledge among different sociodemographic subgroups.

Keywords: Colorectal cancer (CRC); Dietary habits; Knowledge assessment

INTRODUCTION

The colorectal cancer (CRC) is defined as a malignant tumor arising from the inner wall of the large intestine (the colon) or the rectum (the end of colon). CRC is one of the most insidious cancers and it was the second most commonly diagnosed cancer in both sexes in developed countries (Sessa *et al.*, 2008). According to the Malaysian National Cancer Council (MAKNA), CRC was the second most common cancer after breast cancer in Malaysia in 2007. In Malaysia a total of 2,246 cases of CRC were registered with National Cancer Registry (mNCR) in 2007, which represented 12.33 % of the total registered cases (MAKNA, 2007; mNCR, 2007). It was the second most cancer among males and females in Malaysia, and it is incidence increased with age, slightly higher among males compared to females, the highest among Chinese population and the lowest among Malays (mNCR, 2007). There are a lot of factors that would be considered risk factors for CRC; among which is diet. The correlation between dietary habits and cancer had been extensively studied, but no clear cut had been revealed from studies in order to prove the actual effect of diet and its risky or beneficial impact on cancer because of the potential for confounding factors (Key *et al.*, 2002). However, compelling experimental and epidemiological evidences indicated that diet and nutrition were key factors in the modulation of CRC (Lipkin *et al.*, 1999). Among the dietary fac-

tors, some were considered dietary risk and others were considered dietary protective factors for the development of CRC. Epidemiological data from various populations had suggested positive relationships between the incidence of CRC and the consumption of meat and fat (Jenkins *et al.*, 1986). Cooking meats at very high temperatures yielded chemicals that might contribute to the CRC. It had been confirmed that high intake of red meats and processed meats was positively associated with the risk of CRC (Carlos *et al.*, 2006). In the contrary; increased fish intake might have a preventive effect on CRC (Jedrychowski *et al.*, 2008). Finnish men who consumed the highest amounts of dairy products showed the least CRC incidence, while Danish men who consumed lower amounts of dairy products ranked high in CRC incidence (Jain *et al.*, 1998). Increasing plant foods intake e.g., vegetables, fruits and cereals was effective in decreasing risk of CRC (Kushi *et al.*, 2002; McKeivith *et al.*, 2004).

It has been revealed from studies that there was an obvious lack of knowledge about diet as a risk for CRC. Understanding the dietary habits effects on CRC are vital aims for community education, public awareness and risk reduction (Wang *et al.*, 2010). Although many studies assessed the knowledge of diet in relation to cancer (in general); only few studies have investigated human knowledge about diet that is related to CRC risk reduction. There is no published data on the knowledge assessment of dietary habits related to CRC risk reduction in Malaysia; thus the aim of this study was to investigate knowledge of dietary habits related to CRC. The data provided by this study will help the concerned bodies in Malaysia in planning interventional strategies and in developing educational programs to maximize the knowledge of dietary habits related to CRC risk reduction.

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MATERIALS AND METHODS

Questionnaire development

The questionnaire used in this study was developed after screening the literature for studies that assessed the correlation between diet and CRC. Content validation was carried out by three doctors of Clinical Pharmacy department, School of Pharmaceutics, USM. Face to face validation with 10 participants was done by the researcher as well. A pilot study of 30 participants was performed to estimate reliability. The cronbach's alpha value yielded was 0.641; Hair *et al.* (1998) proposed that a Cronbach's alpha value of 0.6 is considered to be the lowest acceptable value.

Study population

A sample of 385 participants was collected from students of varied schools from both the undergraduate and postgraduate studies at USM. Exclusion Criteria: students who had CRC while the study was being held or those who had had CRC, students whose any of their close family members had CRC, or students who could not read and write in English.

Data analysis

Negative scoring system was applied in scoring knowledge i.e. false answer was recorded as -1 point. The maximum achievable score of knowledge was 19. Depending on the total achievable score; knowledge was categorized into different levels as shown in table (1). SPSS (version 16) was used to analyze data. Descriptive statistics, differential statistics and Chi-square test with Fischer exact test were all performed for the inferential data analysis. Statistical significance was considered at $p < 0.05$.

Table 1: Different levels of knowledge based on score points

Level	Points
Lack of	< 0
Poor	1 - 8
Moderate	9 - 13
Good	14 - 19

RESULTS AND DISCUSSION

A total of 385 students participated in this study. Mean age of students \pm SD = 21.9 ± 4.7 . Results of the sociodemographic characteristics are shown in table (2).

Only one hundred thirty four (34.8%) of students could correctly define CRC as cancer of colon and rectum. More than half of them (55.3%) could not define diet as a risk factor for CRC. About two hundred and forty (63%) stated that they know that some foods are risk factors and others are protective factors; however, about half of those could not define legumes and cereals (55.7%), dairy products (50.4%) and fish (49.6%) as protective factors, and cooking meat at high temperature (42.9%) as a risk factor. The statistical analysis showed that majority of students were lacking of

knowledge (71.9%), (20.8%) had poor knowledge, small amount had moderate knowledge (7%) and only (0.3%) showed good knowledge. The mean knowledge score \pm SD = -4.27 ± 0.4 .

Table 2: Sociodemographic characteristics of students participated in the study (n = 385)

Variable	%	(n)
Gender	Male	35.6 (137)
	Female	64.4 (248)
Students' grade	Undergraduate	84.4 (325)
	Postgraduate	15.6 (60)
Type of school	Science	68.6 (264)
	Non science	31.4 (121)
Race	Malay	62.1 (239)
	Indian	4.2 (16)
	Chinese	23.4 (90)
	Others	10.5 (40)
Weight as described by students	Overweight	18.2 (70)
	Normal	68.1 (262)
	Underweight	13.8 (53)
Marital status	Single	93.5 (360)
	Married	6.5 (25)

This is the first study that links knowledge of dietary habits to CRC in Malaysia. The findings confirmed that very few of students are knowledgeable about diet related to CRC with the majority lacking of knowledge. Majority of students incorrectly defined CRC, some of them (17 students) claimed that they know what CRC is; however, they defined it as cancer of intestine or stomach. In addition, more than half of them could not define diet as a risk factor for CRC, this is to some extent similar to a study by Sessa *et al.* (2008), which revealed that majority of participants among Italian population lack of knowledge about one modifiable risk factor (high caloric intake from fat). What confirms that they lack of knowledge about dietary habits related to CRC risk reduction is that the majority of them claimed that they know some foods are risk factors and others are protective factors; however, about half of those could not define cooking meat at high temperature as a risk factor, and legumes, cereals, dairy products and fish as protective factors. This is consonant with Loss *et al.* (2005) study, which found that majority of the participants claimed that healthy diet is a potential protective factor for CRC; however, 45.5% of them could not define dietary protective factors.

Differential statistics were performed to analyze knowledge of students among varied sociodemographic subgroups. There was no statistically significant difference in knowledge between males and females or between undergraduates and postgraduates. There was statistically significant difference in knowledge scores between the science and the non science schools students ($p = 0.027$). There was statistically significant difference among various ethnic populations and among different groups of weight of students (i.e., weight as described by them) ($p = 0.003$ and $p < 0.001$;

Table 3: The difference in knowledge among sociodemographic groups as revealed by statistical analysis

Variable		Significance (<i>p</i> value)	Effect size (<i>eta</i>)	Mean ± SD
Gender	Male	NS	NS	-5.4 ± 0.6
	Female			-3.7 ± 0.5
Students' grade	Undergraduate	NS	NS	-4.6 ± 0.4
	Postgraduate			-2.6 ± 1
Type of school	Science	<i>p</i> = 0.027	<i>eta</i> = 0.01	-3.2 ± 0.5
	Non-science			-6.7 ± 0.6
Race	Malay	Significance was found to be between Malay and Chinese, <i>p</i> = 0.001	<i>eta</i> = 0.036	-5.2 ± 0.5
	Indian			-1.32 ± 0.9
	Chinese			-1.6 ± 0.9
	Others			-0.29 ± 1
Weight as described by the student	Overweight	Significance was found to be between overweight and underweight, <i>p</i> = 0.035	<i>eta</i> = 0.016	-4.3 ± 0.9
	Normal			-3.8 ± 0.5
	Underweight			-6.7 ± 1.1
Marital status	Single	NS	NS	-4.5 ± 0.4
	Married			-1.6 ± 1.6

* NS: Not Significant

respectively). No statistically significant difference in knowledge between single students and married students. The results are summarized in table (3).

Knowledge was found to differ in accordance with sociodemographic characteristics. Science schools students reported higher score of knowledge. Malays among various ethnic groups showed significantly the least knowledge score, and students that define their weight as being underweight also showed significantly the least knowledge score. These findings are somewhat consistent with Al-Naggar et al. (2011) findings in a Malaysian population, which reported difference in knowledge about cancer in general among various sociodemographic groups. Our findings suggest that educational programs need to be targeted to those with lower knowledge scores.

Statistical Analyses revealed statistically significant association between knowledge and race ($X^2 = 21.8$, $p = 0.005$) and between knowledge and type of schools ie, science and non science ($X^2 = 21.5$, $p < 0.001$). No statistically significant association between knowledge and each of gender, marital status, weight (as described by student) and students' grade (undergraduates and postgraduates).

As knowledge measurement in general is challenging and the scope within which assessment of actual knowledge is difficult to establish (McCaffery et al., 2003); future measurement of knowledge more deeply by means of qualitative methods to investigate the reported findings and to be targeted to explore diverse population subgroups is recommended.

CONCLUSION

University students displayed lack of knowledge about CRC and dietary habits related to it. As knowledge was varied among different sociodemographic subgroups and associated with certain subgroups; targeted edu-

cational programs are favored to these subgroups, and of course without negligence of other subgroups.

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