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Abstract

Background: Cancer knowledge, attitude, and practice (KAP) levels of communities are essential to be assessed to enhance cancer educational programs. This study aimed to determine the KAP level of the Kuantan community on the effects of monosaccharides on cancer. The association between the sociodemographic data and KAP level of the community has also been evaluated. **Methods:** A cross-sectional survey was performed among residents living in the Kuantan community. Only 303 of 380 responses were included in the data analysis using the chi-square test. **Results:** The knowledge and practice levels were moderate, whereas the attitude was at a positive level. Moreover, the association of sociodemographic factors (sex and education level) showed significant difference with the knowledge level ($p \leq 0.05$). Additionally, only the age factor showed significant difference toward the practice level of the Kuantan community, with $p < 0.05$. **Conclusion:** In conclusion, although the attitude score is positive, educational programs still need to be conducted as the knowledge and practice levels of the community have moderate scores.

Keywords: attitude, cancer, knowledge, monosaccharide, practice, sex

Introduction

Cancer is a multifactorial disease that is affected by various factors including diet, lifestyle, environment, and chemicals. However, the primary cause of cancer is gene mutations that lead to production of abnormal or damaged cells. In normal conditions, the cells are repaired, or the replication process is stopped by inducing cell death by either apoptosis or necrosis. Apoptosis is defined as the process of cell shrinkage, DNA fragmentation, and phagocytosis by macrophages or neighboring cells.¹ Meanwhile, necrosis is a mode of cell death that results from loss of plasma membrane integrity and breakdown of organelles with release of proteolytic enzymes, which subsequently initiate surrounding cell destruction and promote inflammation.²

It has been reported that diet increases glycemic response, which is involved in the etiology of colon cancer.^{3,4} As high sugar consumption is associated with colon cancer, consumption of low glycemic diet could be a possible intervention to reduce colon cancer risk.⁴ However, there is little evidence showing that high glycemic diet is associated with liver cancer.⁵ Among

premenopausal women who consume a high fiber diet, fat and carbohydrate could increase the insulin-like growth factor (IGF)-1 and IGF binding protein (BP)-3 levels.⁶ The increase of these IGF-I and IGFBP-3 factors is associated with lung cancer.⁷ Consuming sugar does not automatically increase blood sugar levels, but if consumed in large amount, it can increase the risk of certain cancers.⁸ Nevertheless, sugars can indirectly be related to cancer cells as obesity is associated with many cancer types.⁹ Reactive oxygen species (ROS) are also inducers of cancer cells as they can cause DNA damage. It was reported that fructose is associated with cancer progression by increasing ROS production or inducing directly DNA damage.¹⁰

Education is crucial and cost effective in minimizing the incidence and prevalence rates of cancers. Several methods could be used as a medium to disseminate knowledge to communities, such as school, college, university, and hospital lectures, campaigns, and social media. Currently, it is a challenge for the educational system to spread awareness because of the rapid dissemination of fake information in communities. For instance, the source of misinformation about cancer

might come from those who are selling nonevidence-based alternative therapies for cancer. The overclaim products could jeopardize the vulnerable life of people in the community including cancer patients. It is worrisome if cancer patients trust misleading promotions and marketing of ineffective products with false information. False information misleads the direction of the community toward authentic knowledge, which can subsequently increase the incidence and prevalence rates of cancer. It has been reported that fake, misleading, and overinterpreted health news is a potential threat for public health.¹¹ One study in China emphasized the paramount importance of correcting the falsehoods of preventive mechanisms for gynecologic cancers on social media.¹² Many knowledge, attitude, and practice (KAP) studies on the effect of nutrition on cancer have been conducted. Previously, it has been reported that nutritional KAP on breast cancer prevention factors was influenced by age, familial breast cancer history, and residency status.¹³ The KAP study on the association between cancer and monosaccharides is limited. Hence, this study aimed to assess the KAP level of the Kuantan community on the effects of monosaccharides on cancer. The association between the KAP score level and sociodemographic data will also be investigated.

Methods

Ethical considerations. The ethical approval was obtained from the Kulliyah of Nursing Postgraduate Research Centre and International Islamic University Malaysia Research Ethics Committee. Several ethical principles were considered for this study. First, data were collected after obtaining the approval letter from the ethical committees. Then, the participants were informed about the overview and objective of this study. Participants who were willing to participate signed an informed consent to indicate an agreement of joining this study without any coercion. Meanwhile, participants solely have the right to withdraw from the study at any time. All personal information was considered private and confidential matters.

A quantitative, cross-sectional design was used in this study to evaluate the KAP level of the Kuantan community concerning the relationship between sugar and cancer. Kuantan is a district in Pahang Darul Makmur, Malaysia, and is located at the east coast of Peninsular Malaysia. Questionnaires were distributed in public areas in Kuantan, including Taman Tasik Bandar, Taman Gelora, and the International Islamic University Malaysia Kuantan Campus.

Study population and sampling. The respondents were selected based on convenience sampling. The sample size was calculated using the Raosoft formula with a confidence interval of 95% and margin of error 5%. The Raosoft is a website that allows researchers to calculate

the sample size for a population. Therefore, the estimated sample size was 377 people. The sampling started from December 20, 2020, to March 14, 2020, with 380 respondents. Only 303 (79.7%) responses were included for data analysis based on the inclusion and exclusion criteria.

Only individuals from the Kuantan community were eligible to participate in this study. No sex restriction was considered to participate. Most importantly, the respondents should understand the Malay or English language, which was used in the questionnaires. However, kids or teenagers aged > 18 years were restricted to be a part of this study. Furthermore, duplicate and incomplete responses were excluded from analysis.

The dependent variable in this study is the KAP level of the Kuantan community on the relationship between sugar and cancer. The independent variables are sociodemographic factors (age, sex, education level, and marital status).

Data collection and instrument. The questionnaire was adapted and modified from Gilani *et al.*,¹³ and content experts evaluated the modifications. After corrections were made according to the experts' comments, the set of questionnaires was translated into the Malay language by an authorized translator. Then, a pilot study among 20 respondents was conducted to ensure understandability of the language that was used in the questionnaire. The Cronbach alpha and Kuder Richardson 20 values were 0.91 and 0.87, respectively. The data were collected by distributing the combination of close-ended and open-ended questionnaires. The study participants were selected based on the study criteria. The participants were given a set of questionnaires examining their KAP on the relationship between sugar and cancer. The questionnaires were available in bilingual versions (Malay and English). There was no time limit to complete the questionnaire. Once the participants had finished, the questionnaire was submitted to the enumerator. Questionnaires with incomplete answers were excluded from data analysis. The scoring level of KAP is presented in Table 1.

The questionnaire was divided into the following four parts: (a) Sociodemographic data including age, sex, and education level; (b) Knowledge of the community on the relationship between sugar and cancer (16 items); (c) Attitude of the Kuantan community on the relationship between sugar and cancer (13 items); (d) Practice of the Kuantan community on the relationship between sugar and cancer (10 items).

Data analysis. Data were analyzed using the Statistical Package for the Social Sciences software. The statistical analysis was divided into two: descriptive and inferential statistics. Descriptive analysis included the frequency

Table 1. Scoring category of knowledge, attitude, and practice

Category	Score
Knowledge	
High	29–40
Moderate	15–28
Low	1–14
Attitude	
High	45–65
Moderate	13–44
Low	1–22
Practice	
High	15–21
Moderate	8–14
Low	1–7

and percentage of sociodemographic data. Meanwhile, in the inferential analysis, the chi-square test was conducted to compare categorical groups including sociodemographic data (age, sex, marital status, and education level) and KAP level of the Kuantan community on the effect of monosaccharides on cancer.

Results

Table 2 presents the frequency and percentage of the respondents' sociodemographic data. Overall, only 303 responses were included for data analysis. Four sociodemographic data were collected including age, sex, marital status, and education level. The majority of the respondents were early adults (22–34 years old; n = 186). In terms of sex, there were more female respondents (63.4%) than male ones (36.6%). Furthermore, of 303 respondents, 243 responses came from single respondents (80.2%), followed by 58 from married ones (19.1%) and 2 from divorcees (0.7%). For the educational level, most respondents (88.8%) finished tertiary level.

Table 2 also shows the score of KAP level on the effect monosaccharides on cancer. The knowledge level of the respondents was categorized into three (low, moderate, and high). Most of the respondents (50.8%) have moderate knowledge level on the effect of monosaccharides on cancer. In addition, the majority of respondents achieved a high attitude level (87.8%) and moderate practice level score (78.9%).

Table 3 shows the association between sociodemographic factor and knowledge level of the Kuantan community on the effects of monosaccharides on cancer. Sex and education level were the only factors that showed significant association, with *p* at 0.016 and < 0.001, respectively. Meanwhile, the age and marital status factors had no significant association (*p* > 0.05).

Table 3 also depicts the association of sociodemographic factors with attitude level of the Kuantan community. None of the sociodemographic factors had significant association toward the attitude level. The significant values for age, sex, marital status, and educational level were 0.916, 0.445, 0.849, and 0.968, respectively. All the values were > 0.05 and thus considered not significant.

The association of sociodemographic data with the practice level of the Kuantan community was depicted on Table 3. All of the sociodemographic factors, except age, showed significant values at > 0.05. The age factor showed significant association with practice level on the effect of monosaccharides on cancer. The *p* was 0.011, which is lower than 0.05.

Table 2. Sociodemographic data and the level of knowledge, attitude, and practice of the respondents (N = 303)

Variables	Frequency (N = 303)	Percentage (%)
Age		
Late adolescent	90	29.7
Early adult	186	61.4
Early middle age	21	6.9
Late middle age	6	2.0
Sex		
Male	111	36.6
Female	192	63.4
Marital status		
Single	243	80.2
Married	58	19.1
Divorce	2	0.7
Level of education		
Primary school	1	0.3
Secondary school	33	10.9
Tertiary school	269	88.8
Level of knowledge		
Low	7	2.3
Moderate	154	50.8
High	142	46.9
Level of attitude		
Low	1	0.3
Moderate	36	11.9
High	266	87.8
Level of practice		
Low	1	0.3
Moderate	239	78.9
High	63	20.8

Table 3. Association between sociodemographic data with the knowledge level, attitude level, and practice level of the Kuantan community

Category	Level of knowledge on monosaccharides and cancer			<i>p</i>	Level of attitude on monosaccharides and cancer			<i>p</i>	Level of practice on monosaccharides and cancer			<i>p</i>
	Low	Moderate	High		Low	Moderate	High		Low	Moderate	High	
Age				0.180				0.916				0.011
Late adolescent	3	51	36		0	10	80		1	70	19	
Early adult	2	90	94		1	24	161		0	155	31	
Early middle age	2	10	9		0	1	20		0	11	10	
Late middle age	0	3	3		0	1	5		0	3	3	
Sex				0.016				0.445				0.171
Male	5	64	42		0	16	95		0	82	29	
Female	2	90	100		1	20	171		1	157	34	
Marital status				0.972				0.849				0.770
Single	5	123	115		1	27	215		1	194	48	
Married	2	30	26		0	9	49		0	44	14	
Divorce	0	1	1		0	0	2		0	1	1	
Level of education				<0.001				0.968				0.089
Primary school	1	0	0		0	0	1		0	1	0	
Secondary school	0	24	9		0	3	30		0	20	13	
Tertiary school	6	130	133		1	33	235		1	218	50	

Discussion

Based on the results, most of the respondents have moderate knowledge level. It is inferred that the Kuantan community has a general idea about cancer. However, the community's understanding of the effect of monosaccharides on cancer still needs to be enhanced. A previous study reported that recognition of symptom and risk factors for cancers was relatively low in Malaysia.¹⁴ It has been reported that majority of Malaysian female university students had insufficient knowledge on several breast cancer risk factors.¹⁵ Another study on Iranian adult women also showed that respondents possessed low awareness of breast cancer risk factors.¹⁶ The Kuantan community showed positive attitude toward the association of monosaccharides with cancer. One study reported that respondents have positive attitude even though they lack knowledge.¹⁷ Concerning positive attitude, one research revealed that Malaysian medical students have positive knowledge and attitude toward breast cancer.¹⁸ Meanwhile, the practice level of the community is moderate, showing that good attitude does not necessarily mean good practice.

The association of sociodemographic factors with knowledge level is crucial to be studied. Educational programs could be organized for target groups that showed low or moderate knowledge levels. For instance, in this study, there was significant association between sex and education level with knowledge level. It indicates that sex and education level influenced the knowledge level of the Kuantan community on the

association of monosaccharides with cancer. The score in women was higher than in men, except for the low-level score. However, the knowledge scores of female respondents were better than that of male respondents. Another study reported that women more likely have better knowledge on cancer signs and symptoms.¹⁹ Meanwhile, in terms of educational status, it shows that a higher education level would increase knowledge level. Respondents who finished tertiary education level were better than those who finished secondary level. Similarly, one study reported that majority of respondents have a higher education level, with a high knowledge level on prostate cancer.²⁰ Moreover, another study revealed that a higher education level was positively associated with breast self-examination performance.²¹ Additionally, the highly educated respondents scored notably better than those who never went to school or finished primary school only.²²

Then, all of the sociodemographic factors have no significant association with the community's attitude level. It indicates that sociodemographic factors do not influence the attitude level of the respondents. However, the attitude level of the respondents is still considered high. The sociodemographic factors have no association with practice level except for the age factor. There is an association between age and practice. From the results, the early adult group had the highest score in the moderate practice level. Age is an important factor in influencing practice level. In comparison, the late adolescent (18–21 years old) and early adulthood (22–34 years old) groups showed low

scores in terms of practice level. This could be postulated that age transition from late adolescent to early adulthood could influence practice level. However, the transition from early adulthood to early (35–44 years old) and late middle (45–64 years old) ages showed an improvement in the practice level. Age is one of the biggest risk factors of cancer. It has been reported that aging may increase the incidence of cancer because of accumulated mutations that initiate cancer and through compromised body control of premalignant lesions development into cancer.²⁴ However, it does not necessarily mean that youngsters are restricted from getting cancer. It has been reported that the incidence of cancer among adolescents and young adults (15–39 years old) increased in the most recent decade (2007–2016).²⁵ Therefore, good practice on sweet product consumption need to be promoted in all age groups. Good practice will eventually prevent or minimize cancer incidence.

Based on the recent findings, educational programs about cancer and its risk factors need to be organized periodically by healthcare providers. It has been reported that a short-term cancer prevention educational program was proven effective in improving cancer knowledge and attitude toward cancer prevention.²⁶ It also has been reported that it is necessary to conduct public or professional programs that are intended to increase cancer awareness.¹⁷ Because of poor knowledge on cancer signs and symptoms, a study reported that urgent strategies are necessary to improve public awareness of the signs and symptoms of cancer.²⁷ However, enhancement programs on good practice need to be done as well. It is futile if communities have good knowledge but moderate practice levels. The dissemination of knowledge and encouragement from various media such as school and university lectures and social media would benefit the community to better understand cancer. Still, surveillance on social media need to be considered since the number of fake or misleading information is paramount. For instance, there is increasing concern among healthcare communities about misinformation of using cannabis as cancer treatment.²⁸ Cannabis, also known as marijuana, is the most frequently used illegal psychoactive substance in the world.²⁹ Various studies have reported about the relationship between cannabis use and different detrimental effects including cardiovascular, cerebrovascular, and neurological complications among different age groups.³⁰ Several studies have also reported the benefits of cannabis on cancer treatments. One research revealed that cannabis can reduce neuropathic pain and treat nausea and vomiting due to chemotherapy.³¹ However, it is too early to claim or use marijuana as a treatment for cancer. Furthermore, this study has some limitations. For instance, the number of male respondents was lower than that of female respondents, which may affect the homogeneity

of the population of the present results. Moreover, most respondents came from the early adult age group, have single marital status, and finished tertiary education level. Therefore, further research should be equally conducted based on the sociodemographic factors.

Conclusion

It could be concluded that the knowledge and practice levels of the Kuantan community are moderate. Meanwhile, the Kuantan community has a positive attitude, as majority of them possessed high scores. Although the attitude score is considered positive, education programs need to be conducted to enhance the knowledge and practice levels of the community. Furthermore, the association between sociodemographic factors (sex and education level) showed significant difference with knowledge and practice levels

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Conflict of Interest Statement

The authors declare no conflict of interest.

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