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Influence of Age and Education on Nutritional Knowledge and Dietary Choices among Chinese Consumers in Shenyang, China

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ABSTRACT

Introduction: Consumers seldom pay attention to the nutritional aspects of food during purchasing. The study examined the influence of age and level of education on the nutrition knowledge and dietary choices of a sample of Chinese consumers. **Methods:** Probability and non-probability sampling methods were used to select four supermarkets and subjects for this cross-sectional descriptive survey conducted in Shenyang, the capital city of Liaoning Province in China. A response rate of 95.9% was obtained after retrieving 400 questionnaires out of 417 distributed. **Results:** About two-thirds (61.5%) of the respondents rated their nutrition knowledge level as "fair". Independent *t*-test revealed a significant age difference in knowledge levels [t (398) = 5.467, $p < 0.01$ (two-tailed)] with 7.0% (eta square (η^2) = 0.070) of the variance in nutritional knowledge explained by age groups. Significant differences ($p < 0.01$) in knowledge level [F (2, 397) = 7.765, p = 0.00] were also observed among the three educational groups using one-way ANOVA, with nutritional knowledge accounting for 19.1% (eta square (η^2) = 0.191) of the variance. However, age and level of education did not present any significant influence on the respondents' food choices. The results suggest that nutrition knowledge increased with age and level of education, but did not sufficiently affect food choices. **Conclusion:** Supportive nutrition education on use of label information complemented with practical use of such information may augment nutrition knowledge and assist consumers to make healthy food choices.

Key words: Age, China, consumers, education, nutrition knowledge

INTRODUCTION

Healthy eating is deliberated as one of the most important deciding factors for the health of an individual. In that light, eating for health is considered a basis for preventing many common chronic non-communicable diseases (NCDs) confronting the world (WHO, 2011). Previous research suggests that the acquisition of information, and consequently food purchase behaviour, is influenced by various demographic factors such as age (Nayga, 2000) and level of education (Hu, Adamowicz &Veeman, 2006). However, the magnitude of influence wielded by these factors varies in relation to information acquisition and food purchase behaviour and this has been

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well noted. Therefore, scientific evidence on the subject remains inconclusive.

Some studies have demonstrated that food label use decreases with age (Nayga, 2000) while other authors have reported a significant positive relationship between age and label use (Coulson, 2000). Varied evidence has also been reported on the influence of formal education on label reading, though quite a number of studies have confirmed the hypothesis that highly educated individuals are more likely to read and use nutritional labels (Ahmadi *et al.*, 2013; Drichoutis, Lazaridis & Nagya, 2005; Nayga, 2000). Difficulty in understanding the different terms on labels by older and less educated consumers has also been indicated in some studies with lack of nutritional knowledge being mentioned as the contributing factor (Cowburn & Stockley, 2005).

While a consumer's nutritional knowledge is fundamental and a predictor of nutritional label use, food labelling is considered an essential tool for providing the needed nutritional information at the point of purchase, to guide consumers make healthy food choices and subsequently, espouse healthy dietary patterns (Cooke & Papadaki, 2014). Regardless of the inconsistencies in nutrition knowledge literature available, a review of studies on the use of food label by Miller & Cassady (2015) revealed that a majority of such studies found significant positive associations between subjective measures of nutrition knowledge and nutrition label use, and dietary choices. Nonetheless, nutritional knowledge and its influence on the use of health claims, food preferences and selection have been noted to be rather insignificant compared to nutrition facts labels.

Africa, Eastern Europe, and Asia are currently facing an alarming surge in chronic disease cases, way above that in high-income countries (World Bank Group, 2011). It has been predicted that current trends of chronic diseases in Asia may worsen and will increase from 51% in 2008 to 72 % of all deaths by 2030. China is an Asian country experiencing unprecedented rates of chronic NCDs. Xu *et al.* (2013) reported that the major causes of death in China currently are non-communicable chronic related diseases such as obesity, diabetes, cardiovascular diseases, hypertension and stroke.

Industrial growth and concomitant socio-economic changes have generally led to modifications in lifestyle towards the consumption of processed packaged foods, due to the convenience they offer. However, it has been observed that the Chinese public and food manufacturers, for instance, do not pay much attention to the impact of calories, fats, sugars, and sodium in packaged foods (Lv *et al.*, 2011). Moreover, the prevalence of NCDs in China has accordingly been blamed on the increased consumption of high-fat and high-salt diets (Kang *et al.*, 2012).

In response to the spiralling NCD prevalence and to help control this epidemic, and promote healthy eating, the Chinese government published its first Food Nutrition Labelling Regulation to communicate to Chinese consumers food and nutrition knowledge (Liu, Hoefkens & Verbeke, 2015). This great stride was to regularise nutrition labelling and at the same time play a role in influencing diets of Chinese consumers in the hope that it may eventually reduce the incidence of NCDs (Liu *et al.*, 2015). Generally, the prevalence of obesity and other nutritional health-related problems in most third world countries has been attributed to lack of nutrition knowledge, suggesting that unhealthy food choices may be due to lack of understanding of label information. Against the assumption that increasing consumer nutrition knowledge levels may improve nutrition communication through food labels, this paper examined the impact of age and level of formal education on nutritional knowledge and determined whether knowledge levels present any

significant differences in healthy dietary behaviours. Moreover, a paucity of data on age differences in the effects of knowledge in studies on the use of nutrition claims has been well noted (Miller & Cassady, 2015).

A review of empirical studies to examine the dynamics among the variables under investigation was carried out to better understand these concepts and variables. The results of some studies showed that there is a direct relationship between educational level and knowledge of Belgian women and Spanish consumers (Carrillo, Varela & Fiszman, 2012; De-Vriendt *et al.*, 2009). Furthermore, the study by Bonaccio *et al.* (2013) to ascertain the association between nutrition knowledge and adherence to a Mediterranean diet, which is noted for its healthiness, indicated that knowledge to a large extent is associated with adherence to healthy diet, and participants with higher nutrition knowledge present a lower prevalence of obesity. Sakhile, Masuku & Lan (2014) observed a significant positive correlation between nutritional knowledge and dietary practices ($r = 0.456$, $p = 0.001$) among pregnant and lactating women living with HIV in the Manzini region of Swaziland.

A model was developed to support the basis for the study with inspiration from Miller & Cassady (2015) as well as literature on nutrition label use (Figure 1). The model is founded on the premise that age and formal education determine level of nutrition knowledge and support the use of nutrition claims, which subsequently influence healthy dietary choices. As people grow older and knowledge level appreciates, individuals become increasingly aware of the relationship between diet and health and tend to invest in healthy eating (Jovičić's, 2015; Post *et al.*, 2010). It is also assumed that nutrition knowledge increases as individuals attain higher levels of education.

It is hoped that the outcome of the study will provide new and more current data on the impact of age and level of education on nutrition knowledge of Chinese consumers. It will also add to the scanty data on the influence of age and level of education on consumers' food purchasing behaviour with regard to calorie, fat, sugar and salt content. Such data are necessary to help identify public health recommendations and programs to enhance consumer behaviours towards

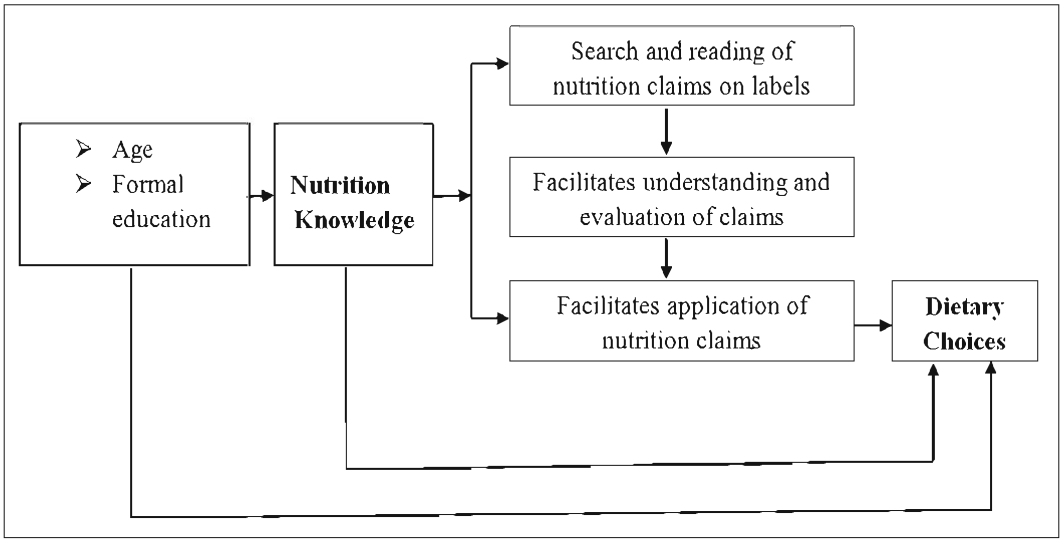

Figure 1. Determinants of nutrition knowledge and dietary choices

better use of the information on food labels. It is hoped that results of the study will contribute to filling the gap that needs attention in the nutritional knowledge literature to help develop appropriate educational messages to promote reading, understanding and use of nutrition labels.

METHODS

A descriptive survey design was used to draw consumers from Shenyang, the capital and the largest, multi-ethnic urban city of Liaoning Province, China.

Shopping centres were identified as appropriate sites for data collection. Consumers are exposed to food labels mainly while purchasing food products. A list of all international chain supermarkets and other popular shops that sell daily consumer goods in Shenyang, China was procured online. The shopping centres were first stratified according to type and location. The names of the shopping centres in each stratum were written on pieces of paper and placed in a bowl. A paper representing a shop was randomly selected from each stratum. Thus, different types of shops at different locations that represented 40% of the large shopping centres in Shenyang were selected.

Four hundred and seventeen customers who were more than 20 years old and involved in the purchasing of household food products were drawn from the selected supermarkets, department stores and shopping malls to participate in the study.

Instrument and data collection procedure

The questionnaire sought the following information: background characteristics (age and level of education), nutrition knowledge (subjective) and use of nutrition claims in dietary selection. Subjective knowledge is usually measured by asking participants to rate how much they think they know about an object (Park, Mothersbaugh & Feick, 1994). However, in this study respondents were not asked questions to evaluate their subjective knowledge but were required to rate their knowledge levels in nutrition on a 4-point discrete scale ranging from "fair" (1) to 'excellent' (4).

Respondents' food choices based on nutrition claims were measured by asking "How regularly they read nutrition labels to select low-calories, low-fat, low-sugar and low-salt packaged foods. Responses to the items were rated on a 5-point discrete scale (ranging from "never" (1) to "always" (5). Age and educational levels of respondents were measured using multiple items. The items were pooled together to form each major variable. The age group of respondents was assigned to two categories. Respondents who were between 20 and 45 years were categorised as young and those above 45 years as old. Similarly, the level of education of respondents was categorised into three: Group 1 comprised those who had attained a basic level of education; Group 2, those with secondary education; and Group 3 those with tertiary level education.

The self-administered questionnaire was first developed in English and carefully translated from English into Chinese by a native speaker with relevant research expertise and proficient in both languages. The translated questionnaire was then back-translated to English by another native speaker and again reviewed by a professor who is an expert in both languages, to ensure that there was no deviation from the original text and the information in both languages conveyed the same message. Differences between both translations were discussed and adapted when appropriate.

Before administering the questionnaires, respondents were informed fully about the aim of the study for their informed verbal consent. In addition, respondents were assured of anonymity and confidentiality of the information divulged. During the data gathering

process, the researcher was assisted by a Chinese-speaking PhD student, who explained the questions to respondents who needed further clarification on some of the questionnaire items. For those who could not readily comprehend, the questionnaire was administered to them as an interview schedule. At the end of data collection, 400 completed questionnaires were retrieved, representing a 95.9 % response rate.

Data processing and analysis

The quantitative data were processed and analysed using the Predictive Analytic Software (PASW) Version 19.0. Answered questionnaires obtained were serially numbered to reflect the number of respondents. Responses to items were scored according to the order in which they appeared. Respondents who selected less than 40 years as an option were scored one (1) while those in the 40 years and above category were scored 2. Similarly, responses to the level of education were coded as basic "1", secondary "2" and tertiary "3". The dependent variables considered were Chinese consumers' level of nutrition knowledge and their food choice.

In a normal distribution, the mean and the median score should be approximately the same, and also the skewness values must have a threshold of -0.5 to 0.5 and mean and standard deviation coefficients are used when the distribution is normal. A test of normality on the data showed that the skewness values of the distribution were closer to each other and were within an acceptable threshold of a normal distribution (that is, within a range of -0.096 – 0.275). The standard deviations were also moderate and closer to each other, indicating non-dispersion in a widely-spread distribution. The moderateness of the standard deviations of the distribution shows that the views of the respondents were coming from a moderate homogeneous group that is, a group with similar characteristics. This meant that respondents' view on the influence of nutritional information on food purchase is an approximation to a normal distribution.

Independent sample *t*-test was applied to the first and second hypotheses, to evaluate the impact of age on Chinese consumers' nutritional knowledge level and food choice based on calorie, low-sugar, low-fat and low-salt. The third and fourth hypotheses were analysed with One-way ANOVA F-tests and post-hoc Tukey HSD comparison of means to determine the differences in the nutrition knowledge and dietary choices of the three education groups. In order to quantify the margin of differences, eta square (η^2) values were calculated for differences if any, and Cohen (1988)'s guidelines were used for interpreting eta square values.

Ethical approval

The study was approved by the College of Food Science, Shenyang Agricultural University, China.

RESULTS

About two-thirds (61.5%) of respondents reported a "fair" level of nutritional knowledge while 21.5% and 11.5% rated their knowledge levels "good" and "very good" respectively (Table 1). Only 5.5% perceived their knowledge level to be "excellent". These results suggest that generally, respondents had an average subjective knowledge.

Results of the independent *t*-test with level of nutrition knowledge and food choice as the dependent variables are presented in Table 2. There was a statistically significant age effect on respondents' nutritional knowledge. Younger respondents reported lower (Mean = 3.374, SD = 0.505) nutritional knowledge than the older respondents (Mean = 4.222, SD = 0.645), t (398) = 5.467, $p < 0.01$ (two-tailed). The mean increase in nutritional knowledge levels with regard to age difference of Chinese participants

Table 1. Consumers' self-reported level of nutrition knowledge (N=400)

Responses	*How do you rate your nutrition knowledge?*	
	Frequency	%
Fair	246	61.5
Good	86	21.5
Very good	46	11.5
Excellent	22	5.5
Total	400	100

Table 2. Influence of age on consumers' nutrition knowledge and dietary choices (N=400)

Variable	*Age group*	*N*	*Mean*	*SD*	*t-value*	*Sig.*	*η2*
Nutritional knowledge	Young	234	3.374	0.505	5.467**	0.001	0.070
	Old	166	4.222	0.645			
Food choice based on:							
Calorie	Young	234	2926	1.239	1.499	0.214	
	Old	166	3.032	1.288			
Low-sugar	Young	234	3.032	1.047	1.305	0.271	
	Old	166	3.329	1.289			
Low-fat	Young	234	3.097	1.034	0.794	0.409	
	Old	166	3.387	1.050			
Low-salt	Young	234	2.536	1.031	0.746	0.525	
	Old	166	2.739	1.052			

N = Sample Size and SD = Standard Deviation
Young: 20-40 years
Old: Above 40 years

was 0.848 with a 99.0% confidence level. Based on Cohen (1988)'s guidelines on the interpretation of the eta square, the magnitude of the age group difference in the means with regard to respondents' nutritional knowledge level is moderate (eta square (η^2) = 0.070), with 7.0% of the variances in Chinese respondents' nutritional knowledge levels explained by age group. The results further showed that there was no statistically significant age group difference with regard to food choices based on the level of nutrient (calorie, sugar, fat, and salt) content of foods.

Results of the one-way ANOVA with nutritional knowledge and food choices as the dependent variables are presented in Table 3. There was statistically significant difference at the $p < 0.01$ level in nutrition knowledge level for the three groups [F (2, 397) = 7.765, p = 0.00]. The actual difference in mean scores among the groups was large. The effect size calculated using eta square, was 0.191, meaning 19.1% of the variances in Chinese respondents' nutritional knowledge could be explained by level of education. Post-hoc comparisons using the Turkey HSD test indicated that the mean score for respondents whose highest level of education was at the basic level (Mean = 3.208, Std. Dev. = 0.503) was significantly different from those with secondary level (Mean = 3.160, Std. Dev. = 0.611) and tertiary level (Mean = 4.248, Std. Dev. = 0.525) education.

The descriptive statistics further showed that respondents whose highest level of education was at the tertiary level had a higher level of nutrition knowledge than those with secondary and basic level of education. This means that the higher the level of education of respondents, the higher his/her nutritional knowledge.

Table 3. Influence of level of education on consumers' nutrition knowledge and dietary choices

Dependent variables	*Levels of education*	*N*	*Mean*	*SD*	*Sig.*	*F*	*η2*
Nutrition knowledge	Basic	51	3.208	0.503	0.00	7.765**	0.191
	Secondary	100	3.160	0.611	0.00		
	Tertiary	249	4.248	0.525	0.00		
Food purchasing choice based on:							
Calorie	Basic	51	3.090	1.272	0.989	1.51	
	Secondary	100	3.080	1.238	0.750		
	Tertiary	249	3.007	1.228	0.988		
Low-sugar	Basic	51	3.196	1.081	0.843	0.76	
	Secondary	100	3.189	1.033	0.989		
	Tertiary	249	3.197	1.047	0.899		
Low-fat	Basic	51	3.304	1.021	0.729	0.55	
	Secondary	100	3.146	1.095	0.750		
	Tertiary	249	3.217	1.050	0.899		
Low-salt	Basic	51	4.541	1.024	0.863	1.71	
	Secondary	100	4.627	1.124	0.843		
	Tertiary	249	4.650	1.046	0.988		

**$p < 0.01$; *$p < 0.05$ (N = 400)
N = Sample size, MD = Mean difference and SD = Standard deviation
Basic education: Junior high school
Secondary: Senior high school/Technical education
Tertiary : Diploma/University education

Nonetheless, food choices of the three groups did not present any statistically significant difference with regard to the nutrient (calorie, sugar, fat, and salt) content of food.

DISCUSSION

A total number of 400 Chinese consumers were captured for the survey. Similar to much of the research on the use of food labels, the study focused on respondents' self-reported knowledge and food choice behaviour. The emphasis of this paper was to look at the contribution of age and formal education on Chinese consumers' nutritional knowledge and whether knowledge levels influenced dietary choices based on the negative nutrition factors (calories, fats, sugars, and salt) that have health implications when over consumed. The aim was to expand on the understanding of how nutrition knowledge appreciates with age and formal education and whether this knowledge supports food label use. The study was exploratory and there are few documented similar studies in China.

Nutrition label information is meant to communicate the nutrition and health features of packaged food products to consumers at the point of sale to help them make healthy food choices. However, it has been argued that without prior knowledge, it may be difficult for prospective consumers to comprehend and apply label information effectively (Miller & Cassady, 2015). Thus, regardless of the fact that nutrition labels are a useful source of nutritional information through which individuals can shape their food choices, consumers need to have some level of knowledge to empower them make this happen.

This study found a positive age-dependent difference in nutrition knowledge of respondents (Table 2) suggesting that older respondents had comparatively better nutrition knowledge than the younger ones. Drichoutis *et al.* (2005) attributed the positive relationship

between nutritional knowledge and age of Athenian consumers to the fact that older people (over 40 years old) tend to have more restricted diets as a result of medical advice or related health problems, which compel them to use nutrition labels often. Older respondents in this study were over 40 years; thus, the health status is probably the same among respondents in this study as in the case of the Athens study (Drichoutis *et al.*, 2005).

The study by Miller & Cassady (2015) showed that older people performed better on varied tasks that required mental processes and demonstrated better retention of nutrition information. On the contrary, Liu, Hoefkens & Verbeke (2015) found a negative effect of age on both subjective and objective understanding of food nutrition labels, indicating that younger Chinese consumers seem to have a better understanding of nutrition labels. Jovičić's (2015) study on differences in gender and age on healthy eating habits among the Serbian population revealed that knowledge about healthy eating increased with age [$F(2,379) = 6.14$, $p = 0.002$] because of higher risk of diet-related chronic diseases, which increases with age (Post *et al.*, 2010).

Contrary to expectation, age-dependent significant differences in healthy food selection based on the negative nutrition factors were not evident. Current literature indicates that label users who have greater knowledge of diet-disease relationship tend to express worry about their diet and health and so exhibit a positive attitude towards achieving good health (Cowburn & Stockley 2005). It is therefore not surprising that older respondents reported comparatively healthier food choices than the younger ones since they were within the age range where health issues regularly begin to manifest. Although special dietary needs is a motivating factor for healthy food choices, it is important to encourage young consumers to engage in healthy eating as this may help facilitate wellness and help control the incidence of chronic NCDs.

The results of the present study concur with the findings of Carrilo, Varela & Fiszman (2012) and De-Vriendt *et al.* (2009) who reported a direct relationship between educational level and knowledge. Respondents with a tertiary level of formal education in this study recorded the highest level of nutritional knowledge. Sakhile, Masuku & Lan (2014) studied nutritional knowledge, attitude, and dietary practices among pregnant and lactating women living with HIV in the Manzini region of Swaziland and observed a significant positive correlation between nutritional knowledge and dietary practices ($r = 0.456$, $p = 0.001$). Although respondents' level of education was positively associated with their nutritional knowledge, the level of nutritional literacy in the study sample is probably not the same as in Spanish consumers (Carrilo *et al.*, 2012) as knowledge levels did not have a significant impact on dietary choices. Nayga (2000) opines the weak link between knowledge and purchase behaviour as the reason why nutritional knowledge does not have a significant effect on the use of nutrition label.

The results of the study by Liu *et al.* (2015) showed that Chinese consumers' subjective nutrition knowledge was an important and positive determinant of label use than objective nutrition knowledge. Other studies have reported that subjective knowledge more positively affects consumers' use of nutrition labels (Hess, Visschers & Siegrist, 2011), assists in consumer interpretation of nutrition messages (van Trijp, 2009) and is crucial in shaping the acceptability of different nutrition label formats (Mejean *et al.*, 2013). However, the majority of respondents in the present study reported a "fair" subjective nutrition knowledge, which also supports the findings of a qualitative study conducted by the Asian Food Information Centre (AFIC) in 2006 in China and

Malaysia (Wills *et al.*, 2009) suggesting that the participants in the study perceived their nutrition knowledge levels to be low. Consequently, they preferred label claims that describe the effect of a particular nutrient on body function over simple nutrient content claims; the study further noted, probably due to lack of understanding of the latter. Effective use of label information may be facilitated where academic knowledge is complemented by practical utilisation of such knowledge (Miller & Cassady, 2015).

Current literature indicates that higher educated and consumers with high nutritional knowledge were more likely to use nutrition information on sugar and other ingredients than less educated, when shopping (Drichoutis *et al.*, 2005). This was confirmed in this study where the older consumers, who presented relatively higher nutritional knowledge, used label information on calorie, sugar, fat and salt more frequently than younger respondents. An irregular pattern was, however, observed with regard to the use of such information by respondents of the three education categories. Nutrition claims on calories and fat were often used by respondents with a basic level education who presented a relatively low level of nutrition knowledge. On the contrary, Spanish consumers with low nutritional knowledge in the study by Carrilo et *al.* (2012) indicated that they never or rarely looked at nutrition claims to ascertain whether it had low-fat or not, because "they considered the information too technical". Respondents in the tertiary category who presented higher nutrition knowledge usually considered sugar and salt content of food in making their choices. It has been reported that highly educated individuals are normally mindful of the quality of their diet and also have a less sedentary lifestyle since they do not spend much time watching television (Macino, Lin & Ballenge, 2004). This could be the basis for less use of nutrition information on calories and fat by tertiary consumers in the present study.

In their study to determine the effect of reading food label information on Americans' dietary behaviour, Ollberding, Wolf & Contento (2010) observed a significantly healthier consumption level with regard to total calories, total fat, saturated fat, cholesterol, sodium, dietary fibre and sugar of label users than non-users. Furthermore, knowledge to a large extent is associated with adherence to healthy diet while higher nutrition knowledge is associated with lower prevalence of obesity (Bonaccio *et al.*, 2013). Even though there were no significant differences in the dietary choices based on knowledge levels, older and consumers with tertiary level education were more mindful of their choices based on the negative factors in food.

Recent data suggest that misconceptions about what constitutes healthy eating could be an underlying factor for consumers' confusion over the concept regardless of the fact that consumers have become increasingly aware of the nutrition-health link and rely on nutrition information sometimes to base their food choice decisions. Various studies showed that the respondents often associated healthy foods with those that reflect their health perspectives (Wills *et al.*, 2009). In the case of Chinese and Malaysians, it was found that consumers focused on short-term health effects of dietary choices while knowledge on the long-term impact of eating behaviour on health was poor, a behaviour which was attributed to the 2,000-year-old Asian tradition of consuming specific foods to influence a particular health/disease state (Wills *et al.*, 2009). Nutrition education may therefore have to deliberate other forces at play in food choices for more effective use of nutrition information.

Although this study highlights significant knowledge level differences among age and education strata, no significant difference were observed in

knowledge and dietary behaviour with regard to the negative nutrition factors. Nonetheless, older respondents with perceived higher nutrition knowledge were more mindful of their choices with regard to all negative ingredients in food. On the other hand, use of such information by respondents on the basis of their level of education did not follow any regular pattern suggesting that level of education does not really influence food choices. It is possible that the level of applicability of theoretical knowledge to guide older respondents in making healthy food choices was better based on the practical expert advice given by professionals than theoretical knowledge through formal education. Formal education may have to consider a combination of theoretical and practical application of nutrition knowledge in making choices. Consequently, future research may focus on how conceptual knowledge may be applied in evaluating the quality of food products to provide conclusive evidence on the associations between the two forms of knowledge and nutrition label use.

CONCLUSIONS

The findings indicate that nutrition knowledge often increases with age and formal education, although it may not always significantly impact on food choices. Furthermore, the results suggest that conceptual knowledge alone may not be adequate to assist consumers in evaluating the quality of food products. While continuous nutrition education may be necessary, it should provide consumers the needed skills to facilitate the application of such knowledge in judging the healthiness of food products. Future studies may need to employ more objective methods for conclusive evidence on the issue.

LIMITATIONS OF THE STUDY

Generalisation of the findings to the whole Chinese population must be done with caution as the results represent self-reported knowledge and dietary behaviour of consumers in Shenyang, China. Secondly, the present study, like most research in this field, focused on self-reported behaviour. That notwithstanding, the results provide a valuable information on the contribution of age and formal education to subjective knowledge and dietary behaviour with regard to the negative nutrition factors among the population's subgroups and has important implications for future educational campaigns or policies to promote nutrition education and label use.

Conflict of interest

The authors report no conflict of interest in this work

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