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Original/*Otros*

The understanding, attitude and use of nutrition label among consumers (China)

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Abstract

Objective: **the aim of this study was to investigate the understanding, attitude and use of nutrition label among consumers in china.**

Methods: **a cross-sectional survey with a self-structured questionnaire was conducted among 1153 consumers, who were recruited from different supermarkets during March to May 2014 in Wuhu city of china.**

Results: **the result shows that the subjective understanding of nutrition labels was moderate (62.8% of respondents) but the objective understanding was varied. The attitudes toward nutrition label was positive in participates who had a higher confidence and satisfaction of nutrition label. 59.2% of the respondents indicated 'sometimes' and 28.7% 'always' reading nutrition label. The most frequently reading of nutrition label food was milk (57.5%), followed by infant food (33.3%), and nutrient was protein 51.5%, vitamin (49.8%) and fat (29.4%). None of demographic characteristics was associated with the understanding, attitude and use of nutrition label except education.**

Conclusions: **participates of our study had a moderate understanding, positive attitude and higher frequent using nutrition label. Although the code of nutrition label became mandatory, more additional strategies for nutrition label are still needed, so as to improve consumers' the cognition of nutrition label.**

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Key words: *Nutrition label. Understanding. Attitude. Use.*

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EL CONOCIMIENTO, LA ACTITUD Y EL USO DE LA ETIQUETA NUTRICIONAL ENTRE LOS CONSUMIDORES (CHINA)

Resumen

Objetivo: **el objetivo de este estudio fue investigar el conocimiento, la actitud y el uso de la etiqueta nutricional entre los consumidores en China.**

Métodos: **estudio transversal con un cuestionario estructurado que fue realizada entre 1.153 consumidores, que fueron reclutados a partir de diferentes supermercados durante marzo a mayo de 2014 en la ciudad de Wuhu de China.**

Resultados: **el resultado muestra que la comprensión subjetiva de las etiquetas nutricionales fue moderada (el 62,8% de los encuestados), pero el objetivo entendimiento fue variado. Las actitudes hacia la etiqueta nutricional fueron positivas en aquellos participantes con mayor confianza y satisfacción en las mismas. Respecto a la lectura de las etiquetas, el 59,2 % de los encuestados contestó que "a veces" y el 28,7 % que "siempre". La lectura de la etiqueta nutricional de alimentos que con mayor frecuencia se realizó fue la de la leche (57,5%), seguida por la alimentación infantil (33,3%), proteínas y nutrientes (51,5%), vitaminas (49,8%) y grasas (29,4%). Ninguna de las características demográficas se asoció con el conocimiento, la actitud y el uso de la etiqueta nutricional, excepto la educación.**

Conclusiones: **Las personas que participaron en nuestro estudio tenían una comprensión moderada, mostrando una actitud más positiva aquellos que la utilizan con más frecuencia. Aunque la etiqueta nutricional se convirtió en obligatoria, aún son necesarias estrategias adicionales, así como fomentar su conocimiento por parte de los consumidores.**

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Palabras clave: *Etiqueta nutricional. La actitud de comprensión.*

Introduction

Recent years, because of the growing prevalence of diet-related diseases such as obesity, diabetes and cardiovascular disease, the prevention and management of these diseases has become an important public health issue in China. In order to reduce the incidence rate of diet-related diseases, the governments and food manufacturers promote nutritional labels to help consumers making healthier food choices. Globally, many countries have introduced policies nutrition label to improve food purchase behavior of the public[1]. However, previous studies shown that understanding and using of nutrition label among consumers is not optimistic. Few consumers can fully understand nutrition label although they always reading nutrition label when purchasing food[2,3]. The first Chinese Food Nutrition Labeling Regulation was published in 2008 (MOH, 2008). In 2011 China's Ministry of Health released the National Food Safety Standard for Nutrition Labeling of Pre-packaged Foods (GB 28050-2011). From 1st of January 2013 this national standard for mandatory nutrition labeling went into force[4]. The government expects that consumer would be benefited from the legislation, which may protect their right and make a health diets. Few study reported that weather consumers' understanding, attitude and use of nutrition label was changed after the standard of nutrition label became mandatory. This study access the status of consumer towards nutrition label in order to promote nutrition education and reduce prevalence of diet-related diseases.

Methods

Participants

According to the administrative zone, participants were selected from 3 different areas based on convenience sampling. The Medical College of Research Ethics Committee granted approval for the research and prior consent was obtained from all participants. Before investigation, all participants were identified volunteers and aged 18 years or more. Eligible participants were recruited from different supermarkets in the area. Of the 1153 subjects, who had different age, income, education and occupation were included. Detailed general socio-demographic characteristics of respondents are provided in table I.

Questionnaire

With the previous references[5-7], a self-structured questionnaire was conducted. The first section of questionnaire was socio-demographic characteristics of respondents, such as age and sex. The second section aimed to assess understanding of food nutritional labels of participants by using the following 2 methods: a subjective measure that used a question that asked participants: do you know the nutritional labels? A 3-point Likert scale (1=poor, 2=somewhat, 3=a great deal) was used to evaluate the answer; an objective measure that used a model of nutritional labels, participants are required to choose what he considered. The answers include nutritional facts table, the nutritional claim, functional claim, and ingredient list, all content and unclear. Then, a 3-point Likert scale (1=poor, 2=sometimes, 3=always) was used to assess the attitude of participants toward the nutritional labels by the following questions: 1) whether the nutritional information on food package affects your decision to purchase? 2) Do you trust the nutritional information on the food package? 3) Are you satisfied with the food nutrition label? Finally, the purchasing intention of participants was measured by the following 2 questions; 1) How often do you read nutritional information on a food package when you purchase food? A 3-point Likert scale (1=poor, 2=sometimes, 3=always) was used to assess the frequency. 2) What kind of food do you read nutritional information carefully when you purchase, with answering possibilities drinks, milk, beans, biscuits, bread, meat, infant food, fortified food and others. 3) What nutrients are you concerned when you read the list of ingredient? Nutrients include energy, protein, fat, cholesterol, carbohydrate, dietary fiber, vitamin, sodium, calcium and others. The respondents were allowed to choose more than one answer for the second and third questions. Reliability of the questionnaire was furthermore ensured and improved by discussions and revision after pre-testing.

Data collection

According to previous study[8], a cross-sectional survey was conducted during March to May in 2014. Sample was selected by stratified randomly. Firstly, 3 district was selected as the sampling area, based on the administrative division of Wuhu, and then, 5 supermarkets in each district for the investigation were randomly selected, finally, 80 consumers of one supermarket were selected randomly as object. A trained investigator conducted interviews to collect the data at three periods of shopping time (9:30-11:30, 14:30-17:00, and 18:30-20:30) on weekend. In order to ensure the diversity of samples, sample was selected randomly at the exit of supermarket. The interview begins after informed consent was provided by every consumer.

Data analysis

The database was established by EpiData 3.1 software. The eligible data was analyzed by SPSS 20.0 software after checking. Descriptive analysis was conducted to analyze the general characteristics of the participants on nutrition label, include understanding, use, faith and satisfaction by percentages. The chi-square test was conducted to test the differences of understan-

Table I
Socio-demographic Characteristics of the respondents with the understanding of Nutrition Labels based on a subjective questions (n, %)

Variable	*Socio-demographic characteristics*	*Do you know the nutritional labels?*			*P*
		poor	*somewhat*	*a great deal*	
Gender					
Male	528(45.8)	119(22.5)	327(61.9)	82(15.5)	0.223
Female	625(54.2)	117(18.7)	397(63.5)	111(17.8	
Area					
City	547(47.4)	104(19.0)	350(64.0)	93(17.0)	0.508
Countryside	606(52.6)	132(21.8)	374(61.7)	100(16.5)	
Educational level					
Elementary school	360(31.2)	84(23.3)	203(56.4)	73(20.3)	0.000
Middle school	368(32.0)	68(18.5)	257(69.8)	43(11.7)	
College	344(29.8)	74(21.5)	193(56.1)	77(22.4)	
Advanced degree	81(7.0)	10(12.3)	71(87.7)	0(0.0)	
Age (years)					
18~	257(22.3)	46(17.9)	160(62.3)	51(19.8)	0.323
30~	444(38.5)	87(19.6)	288(64.9)	69(15.5)	
50~	452(38.2)	103(22.8)	276(61.1)	73(16.2)	
Occupation					
Employed	610(52.9)	132(21.6)	379(62.1)	99(16.2)	0.835
Unemployed	306(26.5)	56(18.3)	194(63.4)	56(18.3)	
Student	87(7.6)	19(21.8)	52(59.8)	16(18.4)	
Retired	150(13.0)	29(19.3)	99(66.0)	22(14.7)	
Frequency of shopping					
Never	201(17.4)	42(20.9)	120(59.7)	39(19.4)	0.335
Occasionally	206(17.9)	51(24.8)	123(59.7)	32(15.5)	
Frequently	246(21.3)	55(22.4)	153(62.2)	38(15.4)	
Always	500(43.4)	88(17.6)	328(65.6)	84(16.8)	

ding, use and attitudes of food nutrition label among socio-demographic groups. A p-value <0.05 was considered as significant.

Results

Participants

A total of 1153 valid questionnaires were recovered and analyzed. The based characteristics of the participants are shown in table I. The majority of respondents were women (54.2%) because of they were the main shopper in the household. The average age of subjective was 43.48±15.00. Among all participates, 64.7% of respondents said they always (43.4%) or often (21.3%) were responsible for purchasing in the household. Of all respondents, 32.9% of subjects reported that their family member or they were suffered from chronic diseases.

Understanding of Nutritional Labels

On the whole, more than half of respondents (62.8%) indicated that the level of understanding on nutritional labels was general. Only 16.7% respondents claimed 'unclear' and 20.5% respondents represented 'a great deal'. The understanding of nutritional labels was not significantly different by demographic characteristics (sex, area, age, occupation and frequency of shopping). However, it was significant differences was obtained between different education groups (P<0.05).

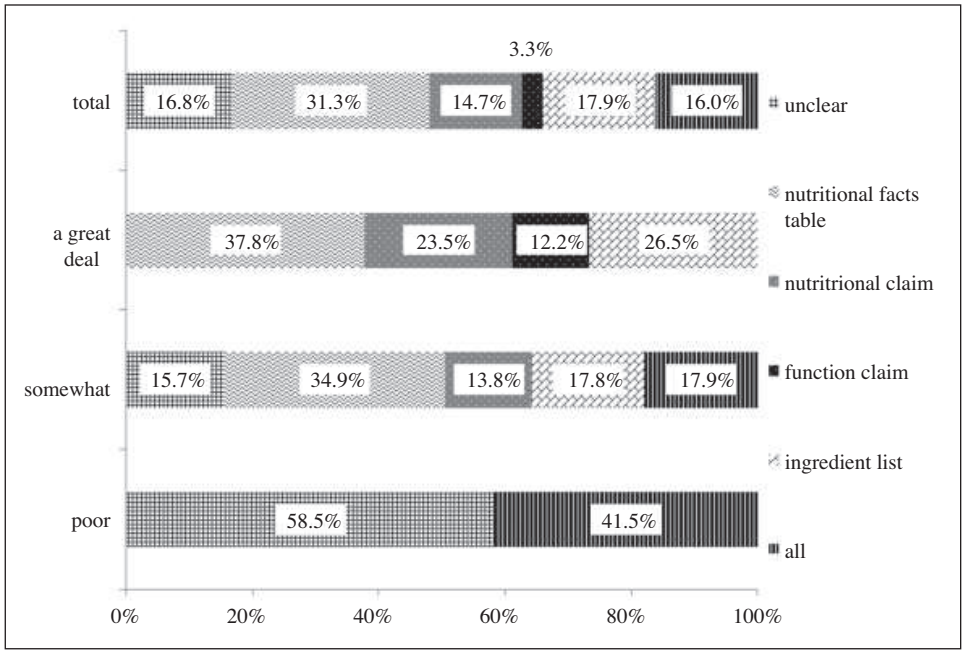

Fig. 1.—The percentages of objective understanding towards nutrition label. (The classification of variables was based on the above subjective measure. First, participates were asked that whether they knew nutrition label, then to point out which section was nutrition label they considered.)

As figure 1 show, a total of 16.8% of consumers indicated they weren't sure which section of food package are nutritional labels, so they were classified into unclear group. Most of these consumers (58.5%) reported that they know nutrition label little, and 41.5% of consumers chose the option 'all options on the package'. On the whole, 31.3% of respondents considered the nutrition label as nutritional facts table. It was the largest proportion of answers whether in 'somewhat group (34.9%)' or 'a great deal group (37.8%)'. The rate of nutritional claim and list of ingredients was 14.7% and 17.9%, respectively. 16.0% of respondents choose the option that includes all symbols on the food package. In the little and somewhat group, no one considered the function claim is one section of nutrition label. The percentage of function claim was the lowest, only 3.3% on the whole.

Attitudes towards Nutrition label

To assess attitude towards nutrition label by following questions (Table II), 42.4% of respondents indicated they were always influenced by nutritional information on food package when purchasing, and 28.1%of respondents indicated poor. Meanwhile, the confidence and satisfaction of nutrition label was optimistic, 44.6% of respondents reported always trust the nutritional information on the package, only 10.3% of respondents reported poor. On the satisfaction of nutrition label, the percentage of always was 50.5% and poor was 20.2%. Statistical differences of attitude towards nutrition label was only focus on education, it was insignificant on others socio-demographic characteristics of the respondents.

The frequency of reading toward nutrition label

The frequency of label reading was analyzed with the answer 'poor', 'sometimes' and 'always' read. As table III shows, 12.1% of the respondents indicated they 'poor'' read labels, whereas 59.2% of the respondents 'sometimes' read labels, with 28.7% of the respondents reported that they 'always' read nutritional information on food labels. The result on relationship between frequency of label reading and their demogra-

Table II
The Attitudes of Nutrition Labels among respondents (n, %)

	Poor	*Sometimes*	*Always*
Whether the nutritional information on food package affects your decision of purchasing?	150(28.1)	339(29.5)	340(42.4)
Do you trust the nutritional information on the food package?	514(10.3)	520(45.1)	119(44.6)
Are you satisfied with the food nutrition label?	582(20.2)	338(29.3)	233(50.5)

Table III
The Use of Nutrition Labels among respondents (n, %)

Variable	*How often do you read nutritional information on a food package when you purchase food?*			*P*
	Poor	*Sometimes*	*Always*	
Gender				
Male	58(11.0)	316(59.8)	154(29.2)	0.589
Female	81(13.0)	367(58.7)	177(28.3)	
Area				
City	71(13.0)	322(58.9)	154(28.2)	0.646
Countryside	68(11.2)	361(59.6)	177(29.2)	
Educational level				
Elementary school	46(12.8)	209(58.1)	105(29.2)	0.003
Middle school	60(16.3)	209(56.8)	99(26.9)	
College	30(8.7)	205(59.6)	109(31.7)	
Advanced degree	3(3.7)	60(74.1)	18(22.2)	
Age (years)				
18~	29(11.3)	149(58.0)	79(30.7)	0.896
30~	57(12.8)	265(59.7)	122(27.5)	
50~	53(11.7)	269(59.5)	130(28.8)	
Occupation				
Employed	70(11.5)	362(59.3)	178(29.2)	0.899
Unemployed	40(13.1)	179(58.5)	87(28.4)	
Student	11(12.6)	56(64.4)	20(23.0)	
Retired	18(12.0)	86(57.3)	46(30.7)	
Frequency of shopping				
Never	68(13.6)	289(57.8)	143(28.6)	0.754
Occasionally	25(10.2)	153(62.2)	68(27.6)	
Frequently	25(12.1)	124(60.2)	57(27.7)	
Always	21(10.4)	117(58.2)	63(31.3)	

phic characteristics shows that only educational level was statistical significance (P=0.003). It implies that the respondent's frequency of label reading was increased with the level of respondent's education.

The frequency of reading toward different food

As figure 2 shows, the percentage of reading nutritional information was great difference among different food. Most of consumers (57.5%) would read nutritional information carefully when they purchase milk, followed by infant food (the rate of reading was 33.3%) and biscuits or bread (the rate of reading was 32.3%). The frequency of beans was 6.9% which was the lowest among all food. Significant demographic differences on the reading toward different food have been noted.

The frequency of reading toward different nutrients

As figure 3 shows that protein (stated by 51.5% of respondents), vitamin (stated by 49.8% of respondents) and fat (stated by 29.4% of respondents) were the most frequently reading nutrient among all nutrients. Only 5.8% of respondents indicated they read carefully the information of sodium when purchasing food. In addition, 30.1%of respondents reported they would read other nutrients such as iron, zinc and so on. The relationship between the respondents' demographic characteristics (sex, age and education) and

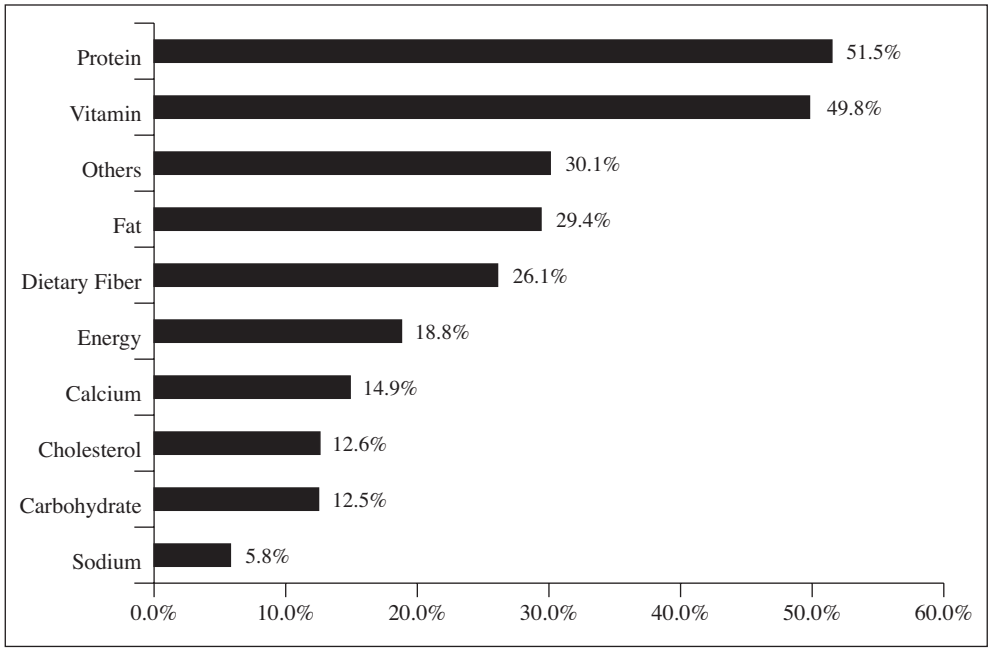

Fig. 2.—The percentage of reading nutritional information responses to the question: what kind of food do you read nutritional information carefully when you purchase?

frequency of reading on different food was significant. For example, the women's frequency of reading was higher than men when purchase milk, bread, biscuits and infant food. The similar result was found among nutrients' frequency of reading, also it was significant among sex, age, education and occupation.

Discussion

The nutrition label was standardized after the code of nutrition label became mandatory, and also, more and more people were aware of it's not importance attribute to purchase safely and health food. To study the understanding, attitude and use of nutrition label among consumers is helpful to promote healthy diet in the future. The result shows that the subjective understanding of nutrition labels is moderate (62.8% of respondents), however the objective understanding isn't optimistic. Only education of participates is related with the understanding of nutrition labels was found in our study. Also, participates' attitude towards nutrition labels is negative by the degree of impact on shopping behavior, trust and satisfaction of nutrition label.

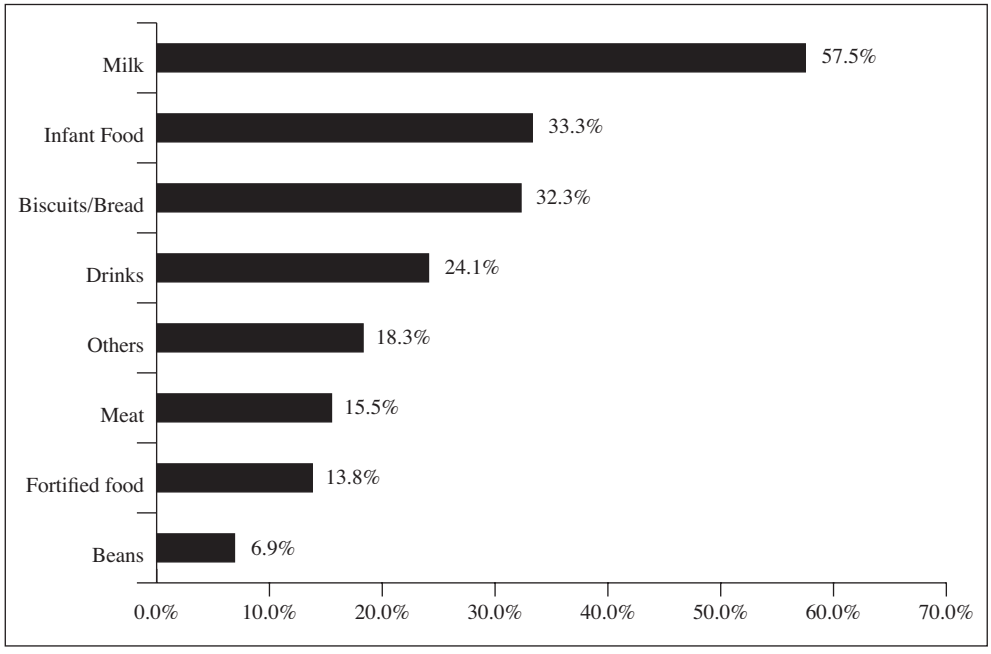

Fig. 3.—The percentage of nutrients responses to the question: what nutrients are you concerned when you read the list of ingredient?

Fortunately, the frequency of reading nutrition label wasn't very low, 59.2% of the respondents indicated 'sometimes' and 28.7% of the respondents indicated 'always'. Similarly, the attitude and use of nutrition labels didn't depended on the different demographic characteristics except education. The focus of consumer about food and nutrients was variable among different people when they read nutrition label.

The result shown that participates' understanding of nutrition label was in accordance with the findings of Liu et al[4], who reported that participates had a moderate level of subjective understanding of the nutrient terms presented on nutrition labels. Compared with other studies[9], the degree of understanding was higher, but it was lower than the others[7,10,11]. It was explained that each of study was great different by method, participates, time, scene and so on, also there may have some degree of selection bias in our study. The objective understanding of nutritional claim and functional claim was difficult to understand for the words are professional, only 3.3% of respondents correctly indicated the functional claim. It was in line with Jacobs's study that difficult terminology, small font size and inability to understand nutritional labels are the major problems encountered by the consumers[12].

On the other hand, individual characteristics and nutritional knowledge of participates maybe affect the understanding and usage of nutrition label, as shown in previous studies[9,10,13]. Only education was positively associated with subjective understanding of nutrition labels in our study, which was different from most of studies whose results shown age[4,10], sex[2,5,10], occupation[10,14] and household income[2,14] were main effect factors. The answer of subjective understanding was categorized into three groups (little, somewhat and a great deal) may cause the results was inconsistent, so the relationship between the demographic characteristics and understanding of nutrition label was needed to be analyzed further more. Based on the results, participates have a positive attitude towards nutrition label that was similar to other studies[11,15]. Most of customers indicated they were always influenced when purchasing, and had a high level of trust and satisfaction about nutrition label. According to previous studies, the attitude of nutrition label was associated with demographic characteristics [2,16] and label formats[5,17,18], et al.

However, a higher percentage of consumers who indicated reading nutrition label, which was similar to previous studies[7,11], significantly greater than result of Zeng in 2011(40.4%)[19]. It might be explained by the subjective and self-reported measures may lead to over reporting[6,20]. In spite of this, consumers may don't not fully understand the content of nutrition label. Because individual characteristics, nutritional knowledge, understanding and the attitude towards nutrition label maybe both affect the use of nutrition label[2,4,16], so the usage of nutrition label should be combined with other factors. In addition, the form and content of nutrition label also determines behavior of consumers, that implied the standard and easy to understand of label maybe improve the utilization, as was confirmed in previous studies[6,18,21,22].

The result shows that the degree of nutrition labels' concern was variable when consumers purchase food. The nutrition label of milk was the most read frequently following by infant food, biscuits/bread, and other. Also it was different on the attention of nutrients by socio-demographic, vitamin was the highest concerned. The reason may be that consumer's purchase different food for varied considerations, so they would focus on the food or nutrients which was they needed. For example, the consumer may be focused on sodium on the package of food when purchasing if he or families had blood pressure disease. As result shown, the milk and protein was the most concerned may because it was the most commonly eaten and familiar, which was similarly to the studies of Tang[7], Zhang[15] and Hong[8]. According to previous studies[1,23], the purpose of purchasing can affect the usage of nutrition label, also did the individual character such as age, sex and education of participates. Because of each person's liking and needs for food was different, they always focus on the most familiar foods or nutrients and failed to others. As previous results shown[1,24], the incidence of metabolic diseases can be obviously reduced if consumers can often read and correctly understanding nutrition labels. However, a few of people can correctly use nutrition label to make a healthy choices for purchasing because of poor understanding. Thus, influencing factors of understanding, attitude and use of nutrition label should be further studied.

Our study has some limitations. First, some demographics were not investigated such as families and marriage of participates which were related with understanding attitude and use of nutrition label. Second, the questionnaire are mainly subjective and results were self-reported may lead to bias. Finally, although our study had a larger of sample, it may still limit the representative of people. Despite these limitations, the results of this study are worth for the education of nutrition label, as it reported the understanding, attitude and use of nutrition label among Chinese consumers. In future studies, more influencing factors would be considered such as nutritional knowledge, and also objectively measures would be used.

Conclusions

The code of Nutrition Labeling of Pre-packaged Foods became mandatory in china which was not only the need of food safety, as an important measure for reducing chronic disease risk of peoples. More and more people begin to pay attention to the safety and nutrition of food as the concept of diet is changing and proportion of pre-packaged food is increasing. This study accessed the understanding, attitude and use of nutrition label. The results showed that participates had

a moderate understanding, positive attitude and over self-reported use of nutrition label. Only education affected understanding and attitude towards nutrition label in this study, other factors should be further studied. The study towards nutrition label is important for future education and policies of nutrition label. Since consumers can benefit from reading nutrition label, i.e. reduce prevalence of diet-related diseases, more additional strategies that enhance to spread knowledge of nutrition label.

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Author disclosure statement

The authors declare no conflicts of interest.

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