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Messages of the Newly Proposed Malaysian Dietary Guidelines (MDG): Do Adults in Kuala Lumpur Understand Them?

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ABSTRACT

The Malaysian Dietary Guidelines (MDG) with eight key messages were first published in 1999. An updated version consisting of 14 key messages is being developed. The objective of this study was to evaluate the understanding of five key messages of the updated MDG among adults aged 18-59 years in Kuala Lumpur. A total of 773 adults comprising 330 Malays, 364 Chinese and 79 Indians were included in the study. A self-administrated questionnaire was used to obtain demographic data and to determine the level of understanding of key words and messages to be included in the new MDG. The results showed that 63% of the subjects were not aware of the existence of the MDG published in 1999. Overall, the understanding of the five messages in the updated MDG was moderate with a mean score of 60.0 ± 16.5. Between 52% to 93% of the subjects did not understand such key words as serving size, sedentary habits, blended vegetable oil and shortenings. The mean scores of understanding were significantly higher ($p< 0.05$) among the Chinese subjects (61.3 ± 17.8) than Malays (58.6 ± 14.2) and Indians (60.0 ± 18.9). The younger subjects (61.2 ± 16.0) scored significantly ($p< 0.05$) higher than the older (58.7 ± 17.0) counterparts. There was also a significant association between the level of understanding of MDG with education level ($p<0.001$) and occupational status ($p<0.001$), respectively. This study suggests that some key words and messages in the updated MDG should be simplified to ensure that they are understood by Malaysians.

Keywords: Malaysian Dietary Guideline, adults, messages, understanding

INTRODUCTION

The Dietary Guidelines (DG) are statements from authoritative scientific bodies translating nutritional recommendations into practical advice to consumers (Lee & Nieman, 2003). It is aimed at ensuring sufficient food intake and reducing incidence of nutrition-related diseases such as heart disease, cancer, hypertension and diabetes through healthy dietary habits (Lee & Nieman, 2003). In the government and private sectors, policy makers use dietary guideline to plan nutritional programmes (US Dept of Health and Human Services, 2005) while nutritionists and health

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educators use it as a dietary planning frame for particular population groups as well as prevention of chronic diseases. On the other hand, food manufacturers utilise it to develop and improve food products as well as planning marketing strategies (McMurry, 2003). Among consumers, the MDG can be used as a guide to choose foods wisely.

The Malaysian Dietary Guideline (MDG) was first published as part of the Ministry of Health's programmes to promote health and prevent disease through education (NCCFN, 1999). The dietary guideline is applicable for healthy Malaysians over the age of two years. It is currently being used by health professionals and those involved in nutrition as a basis for developing appropriate diets for particular groups such as infants, children, pregnant, lactating women and those with special needs including the elderly population.

In most countries, the food intake of the population does not comply with the recommendation in the dietary guideline (Hearty *et al*., 2007). According to the Malaysian Adult Nutrition Survey, the adults in Malaysia conform to some recommendations of the dietary guidelines particularly in meeting requirements of the cereal group, fruits and vegetables groups; however the meat group was consumed excessively, while the recommendation for milk and dairy products was not achieved (Norimah *et al*., 2008).

The updated MDG took into account the changes in the trend of food intake and eating habits and the increasing health problems among Malaysians (Norimah *et al*., 2008; NHMS III, 2008). The updated MDG consists of 14 messages; however only 5 messages will be evaluated among adults on their understanding of these key messages. Keenan *et al* .(2002) reported that research on the understanding of dietary guidelines is limited. In general consumers had difficulty in interpreting the guidelines and wanted more practical and usable information (Keenan *et al.*,2002). Presently, no research has been carried out in Malaysia to assess public understanding of the MDG. Therefore, the objective of this study is to determine public understanding of the five key messages and key words in the newly updated MDG. The results will help the relevant authorities to improve the dietary messages so that the messages could be effectively communicated to the public.

METHODOLOGY

Selection of subjects

Men and women of the main ethnic groups, Malays, Chinese and Indians aged 18 to 59 years old were invited to participate in the study. The subjects were classified by age into younger adults (18 to 29 years) and older adults (30 to 59 years). Using a cluster random sampling method, 773 subjects were recruited from government and private sectors after permission to carry out the study was approved by the respective sectors and informed consent was given. These sectors were selected from six zones in Kuala Lumpur namely central city, Bukit Jalil-Seputeh, Wangsa Maju-Maluri, Sentul-Menjalara, Bandar Tun Razak-Sungai Besi and Damansara-Pencala. Subjects who did not understand either Bahasa Malaysia or English were excluded from the study. Ethical approval was given by the Ethical Research Committee of Universiti Kebangsaan Malaysia.

Data collection

This was a cross-sectional study carried out between September 2008 to January 2009. The questionnaire was developed by the Institute for Behavioral Health, Ministry of Health using the new updated MDG and was pre-tested among adults in Kuala Lumpur. The results from the pretest was used to modify and improve the questions on its face validity. The final set of questionnaire used comprise questions on socio-demography and 24 questions (15

closed-ended and 9 open-ended questions) on subjects understanding of the key words and key recommendations in five key messages of the MDG. The five key messages evaluated were (1) Eat a variety of foods within your recommended intake; (2) Maintain body weight in a healthy range; (3) Be physically active everyday; (4) Eat plenty of fruits and vegetables everyday; and (5) Limit intake of foods high in fats and oils in food preparation. The level of understanding for each key message was determined based on the subjects' cumulative scores, in which a score < 50 was classified as poor, 51 to 74 as moderate, and > 75 was good (Department of Nutrition and Dietetics, UKM 2004).

Data analysis

All statistical analyses were performed using SPSS version 16.0. Descriptive statistics such as frequencies, means, medians and standard deviation were used to describe the data. Kolmogorov-sminov test was used to determine the normality of data. This statistical test showed that the data was not normally distributed so the non-parametric test was used in this study. Kruskal-wallis test was used to determine the difference in the level of understanding among the three ethnic groups. The difference in understanding between younger and older adults was tested using Mann-Whitney test. Chi-square test was used to determine the association of level of understanding with socio-economic factors.

RESULTS

Most of the subjects (93%) completed the self-administered questionnaire while the remaining 7% were excluded as the questionnaire returned was incomplete. The distribution of subjects according to demographic background is presented in Table 1. There was an equal distribution of men and women with the mean age of 34.1±12.3 years, ranging from 18 to 59 years. About 42.7% subjects were Malays, 47.1% Chinese and 10.2% Indians. Classification by age and marital status revealed almost similar percentages of younger adults and older adults and those who were either single or married. More than half of the subjects (65.2%) were educated up to tertiary level, 32% had secondary education and only 2.8% had primary education. By occupational status, the majority of subjects were non-professionals (51.7%) (clerks, security guards, drivers and businessman), with less than a fifth being associate professionals or technicians (17.2%) (traditional medicine practitioner, surveyor and sports executive). The subjects were either moderate household income earners (41.8%) or high income earners (40%), while the remaining 18.2% were from low household income group.

Understanding of the Malaysian Dietary Guidelines (MDG)

In terms of awareness, 63% of subjects were not aware of the existence of the Malaysian Dietary Guideline (1999). By ethnic group, more Malay subjects (53.6%) were familiar with the MDG compared to the Chinese (23.6%) or Indians (30.4%). Women (44%) were also more knowledgeable than men (30%). When asked about the content of the MDG, subjects were more familiar with the Food Pyramid of Malaysia compared with the messages incorporated into the MDG.

Of the five key messages tested, 93% of subjects did not understand the key words 'serving size' and 'shortenings'. Other key words which were not well understood were 'sedentary habits' (52%) and 'blended vegetable oil' (60%). Key recommendation statements that had many subjects confused include 'avoid gradual weight gain over time' (71%), 'accumulate 30 minutes per day of moderate intensity physical activity, preferably daily' (92%) and 'limit the intake of saturated fats to less than 10% of total daily calorie intake' (52%).

Table 1. Socio-demographic background of subjects

Socio-demographic background	*N=773*	
	n	*%*
Zone		
City Central	266	34.4
Wangsa Maju	176	22.8
Bukit Jalil	111	14.4
Bandar Tun Razak	49	6.3
Sentul	67	8.7
Damansara	104	13.5
Sex		
Men	390	49.5
Women	383	50.5
Age groups		
Younger adults (18-29 years old)	386	49.9
Older adults (30-59 years old)	387	50.1
Ethnic group		
Malay	330	42.7
Chinese	364	47.1
Indian	79	10.2
Marital status		
Single	376	48.6
Married	376	48.6
Divorce	7	0.9
Widower/ widow	4	1.8
Education level		
Primary	22	2.8
Secondary	247	32.0
Tertiary	504	65.2
Occupational status		
Professional	81	10.5
Associate professional and technician*	133	17.2
Non-professionals	460	51.7
Student	101	13.1
Others (retired or housewife)	58	7.5
Household income		
Low (<RM1500)	309	40.0
Moderate (RM1500-RM3500)	323	41.8
High (>RM3500)	141	18.2

*Includes traditional medicine practitioner, sports officer and surveyor

Table 2. Responses towards the key words and key recommendations in the five key messages evaluated

No.	*Key words/Key recommendations*	*(N=773)*	
		Correct (%)	*Incorrect (%)*
1	Combination of food	81	19
2	5 food groups	77	23
3	Serving size*	5	95
4	Healthy range	73	27
5	Light clothes	76	24
6	Without shoes	85	15
7	At the same time	67	33
8	Manually	79	21
9	Gardening	69	31
10	Vigorous physical activity	72	28
11	Sedentary habits*	48	52
12	Physical inactivity	85	15
13	Several times a week	97	3
14	Animal fat	77	23
15	Unsaturated fats	51	49
16	Blended vegetable oil*	40	60
17	Shortenings*	7	93
18	Deep fat frying	60	40
19	Maintain body weight by a balancing calorie intake with physical activity	59	41
20	Eat according to recommended calorie intake base on age, gender and physical activity level	57	43
21	Avoid gradual weight gain over time*	29	71
22	Be physically active everyday	82	18
23	Accumulative 30 minutes per day of moderate intensity physical activity, preferably daily*	8	92
24	Limit the intake of saturated fats to less than 10% of total daily calorie intake*	48	52

*Key words and key recommendations misunderstood by more than 50% of subjects in this study.

Table 3. The mean ± standard deviation of subjects by socio-demographics

Socio-demographics		*Mean score ± SD*	*p-value*
Gender			
Men	390	61.2±16	
Women	383	58.7±17	NS [b]
Age group			
Younger adults (18-29 years old)	386	61.2±16	
Older adults (30-59 years old)	387	58.7±17	0.02[b]
Ethnic group			
Malay	330	58.6±14.2	
Chinese	364	61.3±17.8	0.007[a]
Indian	79	60.0±18.9	
Marital status			
Single	397	60.9±16	NS [b]
Married	376	59.1±17	

[a] Significant *P*-value using Kruskal Wallis test
[b] Significant *P*-value using Mann Whitney test
[c] Singnificant *P*-value using Chi-square test
NS= not significant

The study also found that 95% of the subjects could not explain the meaning of serving size correctly while 42% did not understand serving size at all. Among the incorrect answers given for serving size were 'a portion' or 'quantity' (26%), while others responded that serving size as having a complete meal with rice, vegetables and fruits (8%), frequency of eating (6%) and nutrient composition in foods (5%). Most subjects (93%) also did not know what shortenings was, with 76% not understanding the word, while others provided answers such as animal fat, butter, cholesterol or fattening fat (12%).

When subjects were asked to explain the meaning of avoid gradual weight gain over time, 74% of the subjects misunderstood the message of this key recommendation. The most common answer given was that they had to go on a diet and exercise to lose weight (24%) while other responses were to avoid weight gain with age (12%), a person who is overweight and has to reduce weight gradually (5%). Similarly, 92% of the subjects misunderstood the recommendation to accumulate 30 minutes per day of moderate intensity physical activity, preferably daily. A total of 43% did not understand the message while others interpreted this recommendation as to do exercise at least 30 minutes in a day (31%) , followed by to do light exercise at least 30 minutes everyday (15%)and others said they were to do exercise everyday or have to do warming up, exercise and cooling down within 30 minutes (9%).

Overall, the adults in Kuala Lumpur have a moderate level of understanding of the five key messages, with a mean score of 60 ± 16.5. The mean score of subjects by sex, ethnic group, age group and marital status are presented in Table 3. There was no significant difference in the mean score between the sexes. Younger adults obtained a significantly (p=0.02, p<0.05) higher mean score than older adults. The mean scores were significantly different (p=0.007, p<0.05) among the ethnic groups with the Chinese achieving the highest followed by Indians and Malays. There was no significant difference between mean scores by marital status.

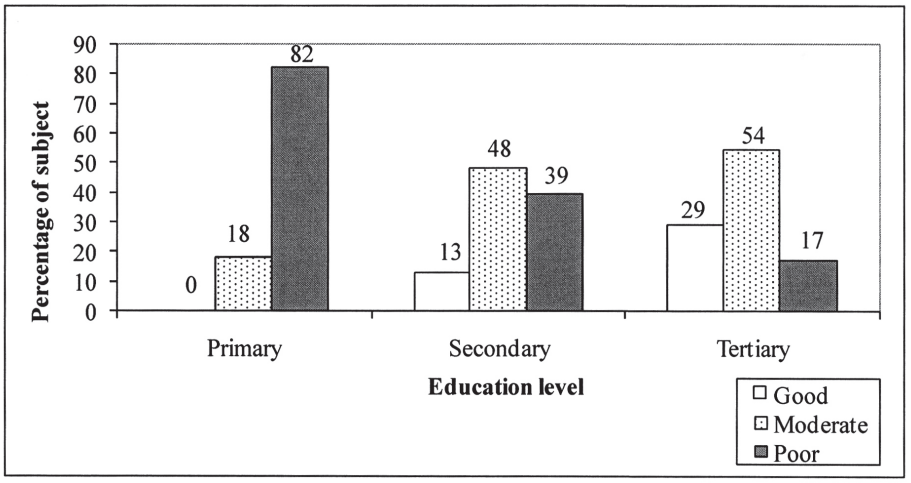

Figure 1. Level of understanding and education level $\chi^2 = 69.511^{**}$. Chi-square test showed the level of understanding was significantly related to education level ($p<0.001$)

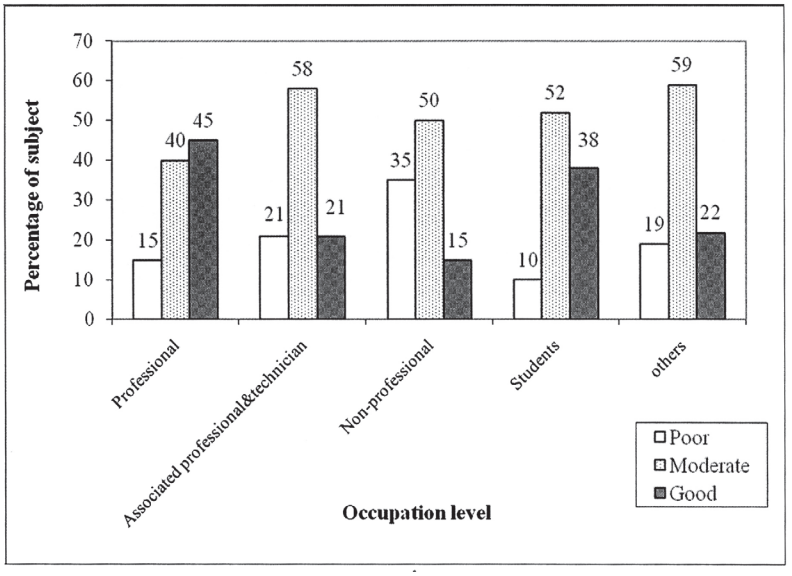

Figure 2. Level of understanding and occupation level $\chi^2 = 84.891^{**}$. Chi-square test showed that the level of understanding was significantly related to occupation level ($p<0.001$).

Level of understanding of MDG according to socio-demography indicies

Figure 1 shows the association between the level of understanding of the messages and the educational level of the subjects. There was a higher percentage of adults with primary school qualification categorised as having a poor level of understanding, while those with tertiary education showed a good level of understanding ($p<0.001$). A similar pattern was shown for occupational status (Figure 2) with more professionals categorised with a good level of understanding, while more non-professionals showed a poor level of understanding

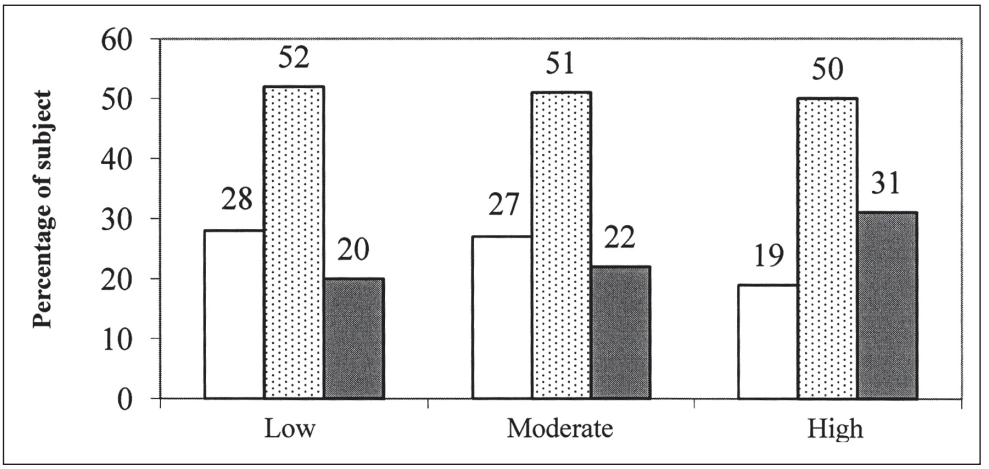

Figure 3. Level of understanding and economic level $\chi^2 = 8.071$. Chi-square test showed that the level of understanding was not significantly related to education status (p=0.089).

(p<0.001). However, there was no significant association between adults' understanding and economic status (p>0.05) (Figure 3).

DISCUSSION

Although the first Malaysian Dietary Guidelines was published 10 years ago, 63% of the subjects in this study were not aware of the existence of the 1999 MDG. The majority of the subjects had difficulty understanding the key words and the key messages. Similar results were reported by studies in United States whereby two-thirds of Americans did not know the existence of their Dietary Guidelines (Derby & Levy, 1996; Keenan *et al.*, 2002). According to Loughrey *et al.* (2001), to have a successful nutrition education strategy, for example, disseminating dietary messages, an abstract nutrition concept should be changed to a practical and doable action so that the messages can be identified with by the community. For individuals who would like to initiate practising a healthy lifestyle, simple, positive and practical messages would interest them to change. Besides being simple and practical, both media and interpersonal communications are important in disseminating health messages in a community. Hence, to ensure that the key messages get across to the community effectively, the relevant authorities need to make the messages simple, short and food based (Stuart & Achterberg, 1997; Abu Sabha,1998). The findings from this study also indicated that more women than men knew the existence of MDG. This result was in agreement with Girois *et al.* (2001) which showed that women were more aware of health and nutritional issues and were ready to change their unhealthy dietary habits compared to men. There was also evidence to show that men were less curious about health and nutritional issues (Food Marketing Institute, 1990; Nayga, 1997).

In this study, serving size was the key word that the majority of the subjects could not understand. A possible explanation might be that the term 'serving size' is a term which has no standard definition yet in the Malaysian context and not commonly used in the community. A serving size is a measuring unit for the total recommended amount of foods from every food group in the Food Pyramid (Hogbi *et al.*, 2001). The measuring unit used in household measures for foods and drinks, for example,

is cup, plate, tablespoon and teaspoon. A serving size defined in the food pyramid may not equal to a serving size defined in a food label. Thus it is not surprising that majority of the subjects were confused with this term. On the other hand key recommendations such as 'accumulate 30 minutes per day of moderate intensity physical activity, preferably daily' could be too long and complicated. Studies have shown that the community find it hard to understand messages in the dietary guideline, in particular those in relation to physical activity (Levy *et al*., 1993;Plous *et al.*, 1995). While some understand the messages, many failed to translate them into action (Waandel & Fager, 1999).

The younger age group in this study understood the key messages better than the older age group. This may be due to the younger subjects being tertiary educated than the older age group who were mostly secondary or primary educated. However, the variation in knowledge with age was less clear-cut. Different studies have found different patterns, but it was often the middle-aged group (35-64 years old) who understood the best. Low scores among the younger individuals might be indicative of a lack of interest in health care issues. One would expect that as individuals approach middle age, they become increasingly aware of diseases related to diet. This increased nutrition knowledge might also be associated with having children and seeking out dietary information to ensure that their children were eating healthily (Parmenter, Waller & Wardle, 2000).

In this study, Chinese subjects had better understanding of the key messages than Malays and Indians, which could be due to the majority of the Chinese subjects achieving tertiary education as compared to the other two ethnic groups. Higher educated individuals demonstrated superior knowledge of nutrition as education was positively related to knowledge. This would suggest that educated individuals were more likely to be better informed and to think that their understanding of nutrition was higher (Azucena, Maria & Nayga, 2007). This was probably true in the present study, with more educated subjects demonstrating significantly better understanding of the key messages. Similar results were shown in England with regard to the demographic variation in nutrition knowledge (Parmenter *et al.*, 2000). Individuals who were better educated may be better in making use of written material like newspaper articles and pamphlets, to gain information and implement it in their lifestyles (Geargiou *et al*., 1997). Lennernas *et al.* (2007) found that eating healthily was regarded as a priority by individuals with tertiary education, whereas food price was more important for those with only primary education.

The level of understanding was also associated with occupational status. In the present study, the non-professional group comprised a higher number of secondary and primary educated people who could be assumed to be less educated individuals. This made some sources of nutrition information completely inaccessible due to lack of background knowledge and inability to deal with the new information such as nutrition knowledge. Thus though many newspaper articles, television programmes and other forms of popular journalism assume a certain level of knowledge which, though common to most individuals, appear not to reach everyone (Parmenter *et al.*, 2000).

CONCLUSION

This study demonstrated that an unacceptably large number of individuals are unaware of the Malaysian Dietary Guideline. The majority have a moderate level of understanding of the five key messages tested. This has implications for public education campaigns if we are to ensure that consumers are exposed to the most recent and accurate health and dietary

recommendations. The subjects also have difficulty in understanding some key words and long key messages. Thus, health or nutrition messages need to be presented in simple, short and food based messages to ensure that the population at large will have a better understanding of the newly updated MDG. The current study may have its inherent limitations hence more research needs to be conducted to get a clearer understanding of nutrition knowledge of MDG amongst Malaysians especially those with low educational qualifications.

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REFERENCES

Abu Sabha R (1998). Effective nutrition education for behavior change(2nd ed). Wolf Rinke Associates Inc., Clarksville, Maryland, USA

Azucena GA, Maria LB & Nayga RMJ (2007). Do consumers perceive benefits from the implementation of a EU mandatory nutritional labeling program? *Food Policy* 32: 160–174.

Derby B & Levy A (1996). Consumer and market impacts of nutrition labeling and education act. paper presented at Marketing and Public Policy Conference, 17 May 1996.

Department of Nutrition and Dietetics (2004). Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia. Kuala Lumpur.

Georgiou C, Betts N, Hoerr S & Keim K(1997). Among young adults, college students and graduates practiced more healthful habits and made more healthful food choices than did non-students. *J Am Diet Assoc* 97(7): 754–759.

Food Marketing Institute. (1990). Trends: Consumer Attitude and the Supermarket. Washington, DC.

Girois SB, Kumanykia SK, Morabia A & Mauger E. (2001). A comparison of knowledge and attitude about diet and health among 35-75 years old adults in the United States and Geneva, Switzerland. *Am J Pub Health*. 91: 418–424.

Hearty AP, McCarthy SN, Kearney JM & Gibney MJ (2007). Relationship between attitudes towards healthy eating and dietary behavior, lifestyle and demographic factors in a reprensentative sample of Irish adults. *Appetite* 48: 1–11.

Hogbi M, Shaw A & Anand RS (2001). Insight11: Food portions and servings:How do they differ? *Family Ec & Nutr Rev* 3(1): 92–94.

Keenan DP, Rayane A & Natalie GR (2002). Consumer's understanding of the dietary guidelines for Americans : Insights into the future. *Hlth Edu & Beh* 29 (1): 124–135.

Lee RD & Nieman DC (eds) (2003). Nutritional assessment. Ed. Ke-3. Mc Graw- Hill Higher Education, United State of America.

Lennernas M, Fjellstrom C, Beacker W, Giachetti I, Schmitt A, Remaut de Winter AM & Keraney M (1997). Influences on food choice perceived to be important by nationally-representative samples of

adults in European Union. *European J Clin Nutr*. 51: 8–15.

Levy AS, Fein SB & Stephenson M (1993). Nutrition knowledge levels about dietary fats and cholesterol. *J Nutr Edu* 25:60–66.

Loughrey KP, Peter B, Claire Z &, Julia MD (2001). Promotion profiles of selected target audiences: promoting the Dietary Guidelines for Americans. *Family Ec & Nutr Rev* 3(1): 3–13.

McMurry KY (2003). Setting dietary guidelines: The US process. *J Am Diet Assoc.* 103: 10–16.

Nayga RM (1997). Impact of sosio-demographic factors on perceived importance of nutrition in food shopping. *J Consumer Aff* 31(1): 1–9.

National Health and Morbidity Survey (2008). The Third National Health and Morbidity Survey III. Institute of Public Health, Kuala Lumpur.

NCCFN (1999). National Coordinating Committe on Food and Nutrition. Panduan Diet Malaysia 1999. Kementerian Kesihatan Malaysia, Kuala Lumpur.

Norimah A.Karim, Safiah Mohd Yusof, Zuhaida Harun, Rohida saleh Hudin, Siti Haslinda Mohd Din & Siti Norazlin Mohd Ngadikin(2008). Habitual food intake of adults aged 18 to 59 years. Malaysian Adult Nutrition Survey (MANS) 2003. Vol 7. Ministry of Health Putrajaya, 77pp.

Parmenter K, Waller J & Wardle J. 2000. Demographic variation in nutrition knowledge in England. *Hlth Edu Res* 15(2): 163–174.

Plous S, Chesne RB & McMahon AV (1995). Nutrition knowledge and attitudes of cardiac patients. *J Am Diet Assoc* 95(4):442–446.

Stuart TH, Achterberg C (1997). Education and communication strategies for different groups and settings. *FAO Food & Nutr Papers* 62: 71–107.

U.S. Department of Human Services (2005). Dietary guidelines for Americans. Washington DC, United State of America.

Wandel M & Fager R (1999). Norwegians' opinion of a healthy diet in different stages of life. *J Nutr Edu* 31: 339-346