

Adverse Effects of “CAM” in Developing Countries

Teren Chui

School of Food Science and Technology
Universiti Malaysia Terengganu
21030 Kuala Terengganu
Malaysia

ABSTRACT

Treatment for illnesses was the main purpose for CAM use and musculoskeletal problems were the main health complaints. Fewer side effects were also cited as the main reason for patient use of CAM. In addition, average scores for nutritional knowledge (52%) and practices (65.8%) among CAM users were at nominally satisfactory levels while nutrition attitudes scored higher (73.9%). Women showed greater nutritional knowledge, attitudes and practices and thus, scored higher than men: ($p < 0.001$). However, we discovered no significant relationship between nutritional knowledge and socio-economic characteristics ($p > 0.05$). There does, however, appear to be positive correlations between nutritional knowledge and attitudes ($r = 0.496$, $p < 0.001$), as well as practices ($r = 0.427$, $p < 0.001$).

Keywords: *nutritional knowledge, attitude, practices, complementary alternative medicine (CAM).*

Introduction

Traditional and complementary medicines play very important roles and are becoming wide spread approaches to healing disease and health care (Traditional and Complementary Medicine Division 2011). Furthermore, the demand for CAM has been increasing for years in almost every country. The National Center for Complementary and Alternative Medicine has defined CAM as a group of diverse medical and health care systems, practices and products that are not presently considered part of conventional medicine (NCAAM 2011). NCCAM further classified CAM into five major domains: (i) alternative medical systems; (ii) mind body interventions; (iii) biologically based therapies; (iv) manipulative and body based therapies; (v) energy therapies. In Malaysia, the Ministry of Health established a Traditional and Complementary Medicine Division (TCMD) in 2004 and classified traditional and complementary medicine (TCM) into six major types: (i) Traditional Malay Medicine (TMM); (ii) Traditional Chinese Medicine (TCM); (iii) Traditional Indian Medicine (TIM); (iv) Complementary Medicine (CM); (v) Homeopathic Medicine (HM); (vi) Islamic Medical Practice (IMP) (Traditional and Complementary Medicine Division 2012). However, categorizing and defining CAM is difficult due to its broad set of concepts and scope, as well as constant changes in definition.

Studies from several countries show increasing demand for CAM. For example, in the United States, (38%) of adults and (12%) of children attended CAM centers in 2007 (NCCAM 2012). This trend for higher demand also has been seen in the United Kingdom as well as in Canada and Japan (Zhang 2006). In Malaysia, it was recently reported that approximately (69.4%) of Malaysians used TCM (Siti et al. 2009). Coincidentally, expenditures for CAM related practices have also been reported as high, not only in Malaysia but also in western countries (NCCAM 2012; Xue et al. 2008). Bearing in mind that the Malaysian Ministry of Health has recognized the use of CAM and has also established regulations and policies to integrate CAM within the main stream medical system, this research paper therefore bears possible as a baseline data set for health professionals. Based on previous studies, most patients seek CAM as complementary therapy along with conventional therapies for several diseases. However, the dearth of informed health professionals makes it difficult to assist patients with side effects due to the combination of both CAM and conventional Western medical practices. Hence also, limited information regarding several aspects of previous studies has driven the need for the present effort. This study's results, therefore, may provide indicators that will identify additional areas of future research which will aid government agencies to establish research priorities and protocols in the field of nutrition. Furthermore, such demographic data on the prevalence of CAM utilization can provide relevant governmental departments with a comprehensive purview regarding the types of CAM used by the public majority. This will better facilitate course work design for professional practitioners in training in order to meet the growing demand for popular CAM therapies.

Materials and Methods

This is a report of a community-based cross-sectional survey that was carried out in different venues which included shopping centers, night markets and other high visibility areas. One hundred and twenty respondents including sixty men and sixty women ranging in from 18 – 59 years were randomly recruited in the towns of Kluang and Batu Pahat from June through August of 2012. The data was collected by using a standard questionnaire that addressed socio-demographic details, the prevalence of CAM use, as well as nutritional knowledge, attitudes and practices. The prevalence of CAM use was assayed with ten questions covering the approximate amount of money spent on CAM per year and reasons for visiting a TCM center. The nutritional knowledge assay consisted of three components in an attempt to measure relationships between levels of nutritional knowledge that affected the prevalence of nutritional attitudes and practices. The reliability of the standard questionnaire was tested with the test-retest reliability survey instrument. Tests scoring high inter-item reliability (> 0.7) indicated that individual test items measured similar concepts or characteristic (Labble 2011).

The SPSS program (Statistical Package for the Social Sciences, version 16.0), was used for this study. Normality was assessed with the Kolmogorov-Smirnov ($n > 50$) and Shapiro-Wilk ($n < 50$) tests. Normally distributed is presented as a mean (standard deviation) accompanied by a median range (inter-quartile) for non-normally distributed

data. Descriptive statistics were used to obtain the frequency and percentage of demographic data, as well as the prevalence of CAM usage and nutritional knowledge, attitudes and practices. The independent t-test (Mann-Whitney) was performed to compare means and medians for nutritional knowledge, nutritional attitudes and gender related practices. The one-way ANOVA and Kruskal-Wallis tests were used to compare mean and median scores for nutritional knowledge with educational levels. The cross-tabulated (Chi-Square test) was used to assess the relationship between nutritional knowledge and demographic characteristics, and the correlation tests (Spearman Rank Order Correlation and Pearson Correlation) were performed to determine relationships between knowledge, attitudes, and practices. For all analytic results, $p < 0.05$ was taken to indicate significance.

Results

Demographic Characteristics

Nearly half of the respondents (49.1%) were between the ages eighteen and twenty-five years. Malay and Muslim respondents constituted the highest proportion (55.8%, 55%), respectively. Demographic characteristics are shown in Table 1.

Table 1: Demographic Characteristics of the Respondents

Characteristic	(n=120)	
	n	%
Gender		
Male	60	50.0
Female	60	50.0
Race		
Malay	67	55.8
Chinese	47	39.2
Indian	5	4.2
Others	1	0.8
Religion		
Islam	66	55.0
Buddha	40	33.3
Christian	5	4.2
Hindu	3	2.5
Free thinkers	5	4.2
Others	1	0.8
Age		
18-20	25	20.8
21-25	34	28.3
26-39	33	27.5
40-59	28	23.3

Education

PMR/ SPM or lower	50	41.7
STPM/ Matriculation/ Diploma	43	35.8
Degree/ Master/ PhD	23	19.2
Others	4	3.3

Income

Less than RM 1499	71	59.2
RM 1500 - RM 2999	21	17.5
RM 3000 - RM 3999	13	10.8
RM 4000 - RM 4999	6	5
RM 5000 – RM 5999	5	4.2
More than RM 6000	4	3.3

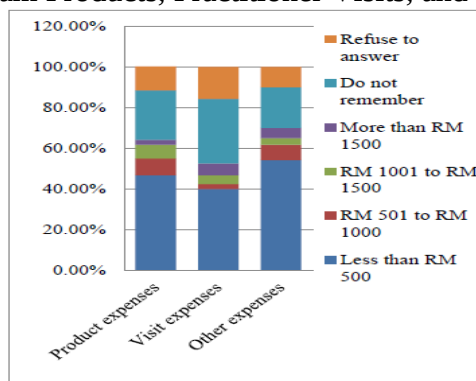
Note: RM = Ringgit Malaysia

Thirty-six percent of respondents had a family medical history of diabetes and hypertension. Other family illnesses included asthma (5.8%), heart disease (3.3%), cancer (1.7%), and kidney disease (1.7%). Nearly twenty-one percent of our respondents noted past personal histories of illnesses, with asthma and diabetes holding the highest positions at (7.5%) and (5.8%), respectively. Only (16.7%) of respondents reported current personal medical problems, including diabetes (5.8%), asthma (4.2%), hypertension (4.2%), and other diseases (4.2%).

Prevalence use and Expenditure on CAM

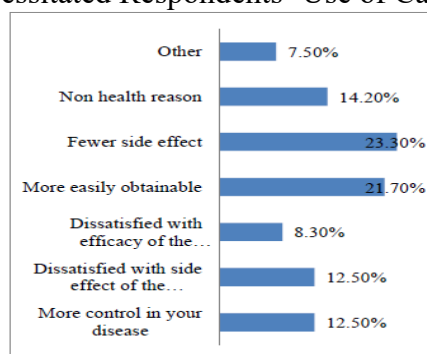
Massage was the most commonly used therapy reported (54.2%), followed by Chinese herbs (33.3%), Malay herbs (25%), nutritional therapy (24.2%), Islamic medical practices (21.7%), spa therapy (20.8%), reflexology (16.7%), yoga (13.3%), qigong (8.3%), tuina (a branch of traditional Chinese medicine, 6.7%), and acupuncture (6.7%). As for expenditure on CAM products, most respondents (46.7%) had spent less than RM 500 over the prior 12 months. About 40% of respondents spent less than RM 500 on visits to practitioners and most respondents (54.2%) incurred no expenses for other items. Expenses for CAM products, visits to CAM practitioners, and related expenses are presented in Figure 1.

Figure 1: Expenses for Cam Products, Practitioner Visits, and Other Expenses



Note: RM = Ringgit Malaysia

Figure 2: Reasons that Necessitated Respondents' Use of Cam



Rationale for the Use of CAM

Approximately (30.8%) of respondents used CAM to treat illnesses and about (28.3%) used CAM to prevent illness. (27.5%) of respondents used CAM to promote health and (13.3%) of respondents used CAM for other reasons. Among the (30.8%) who used CAM to treat illnesses, musculoskeletal problems were the most common complaints (17.5%). This was followed by more serious illnesses (5.8%), including cancer, diabetes, and other illnesses (7.5%). We found that most respondents chose CAM therapies due to fewer side effects (23.3%) and greater accessibility (21.7%). Respondents' reasons for the use of CAM as a necessity are presented in

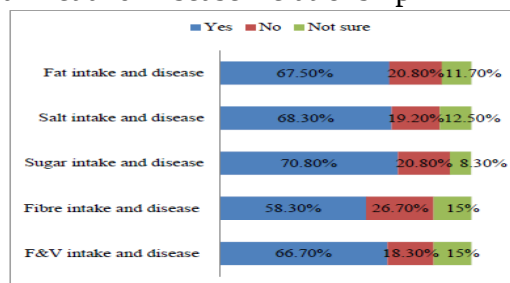
Main Sources of CAM Information

Friends and family were found to be major sources of CAM information (43.3%). This was followed by the internet (19.2%); the media (17.5%); health care providers (5.8%); other CAM users (5%); CAM practitioners (3.3%); and self-referral (0.8%).

Nutritional Knowledge, Attitude and Practices

The mean score for overall nutritional knowledge was (52.0%), indicating a satisfactory level of knowledge. About (17.5%) of respondents scored above the satisfactory level and (40%) obtained scored than satisfactory for nutritional knowledge. As for the awareness of any diet-disease relationship: the mean percentage score for respondents was satisfactory at (65%). Scoring for the general awareness of a diet and disease' relationship is shown in Figure 3.

Figure 3: Awareness of a Diet and Disease Relationship



Note: F & V = Fruits and vegetables

The “how-to-knowledge” section also achieved a satisfactory level with an overall median score. Nevertheless, only (41.7%) of respondents were able to identify the added sugar content in bananas; (41.7%) of respondents answered correctly for the added fat content in nuts; and (34.2%) of respondents answered correctly for the added salt content in pasta. The lowest median percentage score for the nutritional knowledge section was knowledge of nutritional principles (35.0%). The lowest correct rated questions included: “effect of trans-fatty acid” (29.2%); “fats to reduce” (29.2%); “fats most likely to raise cholesterol levels” (17.5%); “fats higher in calories” (10.8%); “those who had heard about the 14 key messages” (7.5%); and “those who had heard about the physical activity pyramid” (15.8%). When nutritional knowledge was compared with education levels, significant results were found. Based on the post-hoc Tukey HSD range test, those with higher educational levels (degree and above) scored a higher nutritional knowledge mean. Comparisons between nutritional knowledge and educational levels are shown in Table 2.

Table 2: Comparison between Nutritional Knowledge and Educational Levels

Variables	n	Mean (SD)	F-statistic ^a (df)	P value [*]
PMR/SPM or lower	50	48.64 (18.87)	6.026 (3, 119)	<0.001 ^b
STPM / Diploma / Matriculation	43	49.70 (16.66)		
Degree/ Master/ PhD	23	65.45 (11.67)		
Others	4	43.25 (23.34)		

a. One way ANOVA test.

b. The mean knowledge score between those with “PMR/SPM or lower qualifications” and “Degree/ Master/ PhD” and “STPM/ Diploma/ Matriculation and Degree/ Master/ PhD” holders, was significantly different as per the post-hoc Tukey HSD analysis.

As for nutritional attitudes, (64.2%) scored above the satisfactory level (score > 70) and (35%) of respondents obtained a satisfactory (score of 51–70). Most respondents (61.7%) had a strong belief in the following statement: “good eating habits are important to maintain my health,” when compared with the statement: “healthy food sold in the market is higher in nutritional value than regular foods,” with which only (8.3%) of respondents strongly agreed. When asked about factors considered when purchasing foods, ‘product safety’ was rated as “very important” (57.5%), rather than nutrition (49.2%). Survey ratings of “very important” for each factor queried are presented in Figure 4. In addition,(40%) of respondents rated “choose a diet with plenty of fruit and vegetables” as very important, while “eat at least two servings of dairy products daily” (20%) scored the lowest rating. Most respondents had good nutritional practices as reflected by scores of ‘above satisfactory’ (40.8%) while (35%) of respondents obtained satisfactory levels. When asked which statement best described their nutritional practices, (30%) strongly agreed with: “having a healthy diet is important to me and I think my diet is already as healthy as I can make it”; while: “mostly I just eat food I like and I don’t worry whether it is healthy or not,” (10.8%) obtained the lowest response. Nevertheless, only 7.5% of respondents claimed that they put a great deal of effort towards healthy eating. Efforts towards healthy eating are presented in Figure 5.

Figure 4: Ratings of "Very Important" for Each Factor Queried

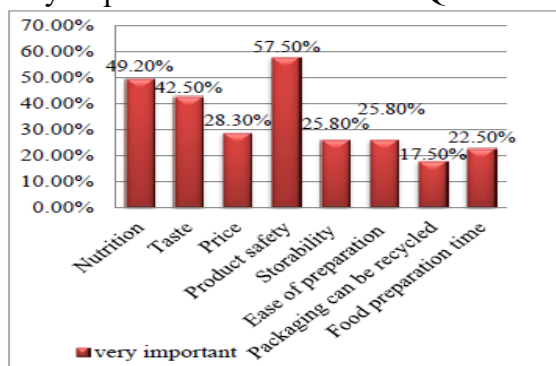
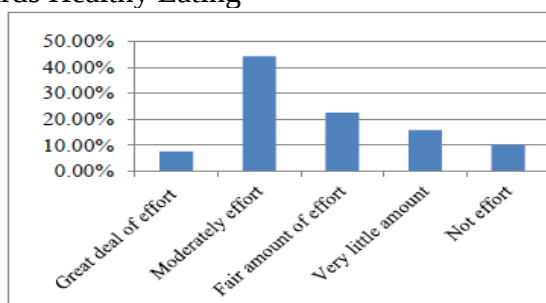


Figure 5: Efforts towards Healthy Eating



A majority of respondents also claimed: "I eat more fruits and vegetables" (65.8%). In addition, a significant difference was found between the genders regarding knowledge and attitudes: females had higher nutritional knowledge and better nutritional practice scores than their male counterparts, as shown in Table 3.

Table 3: Gender Differences in Nutritional Knowledge, Attitudes and Practices

VAR	Male (n=60) Mean (SD)	Female (n=60) Mean (SD)	Mean diff. (95% CI)	t-statistic (df)	P value *
K	48.37 (18.55)	55.76 (17.00)	-7.39 (-13.82, -0.96)	-2.274 (118)	0.025
A	71.27 (10.24)	76.52 (7.90)	-5.25 (-8.56, -1.94)	-3.142 (118)	0.002
P	65.10 (10.30)	66.53 (11.28)	-1.433 (-5.34, 2.47)	-0.727 (118)	0.469

Note: VAR; Variables, K; Knowledge, A; Attitude, P; Practice. *p < 0.05 indicates significant difference (Independent t test).

This survey also found significant relationships between income and attitude, education and knowledge, and age and practices; shown in Table 4. There also appeared to be a positive and significant correlation for nutritional knowledge, attitudes and practices and CAM users; the Pearson Correlation coefficients (r) for nutritional knowledge, attitudes, and practices as shown in Table 5. A majority of respondents

claimed that irregular working hours were a main barrier to healthy eating (47.5%). “I don’t want to change my eating habits”, rated second as a major obstacle for CAM users (26.7%), followed by “not interested in healthy eating”, (10%), and “healthy eating is boring”, (10%). As for motivational factors that gave cause for respondents to eat healthy foods, these included the following: to stay healthy (35.8%); media and advertising (22.5%); personal ill health (20.8%); and weight loss (19.2%).

Table 4: Relationships for Nutritional Knowledge, Attitudes and Practices with Socio-Demographic Characteristics

Independent variables	Dependent variables	r value
Income	Knowledge	0.244
	Attitude	0.007*
	Practices	0.219
Education	Knowledge	0.000*
	Attitude	0.907
	Practices	0.455
Age	Knowledge	0.217
	Attitude	0.232
	Practices	0.007*
Race	Knowledge	0.197
	Attitude	0.055
	Practices	0.197
Religion	Knowledge	0.256
	Attitude	0.075
	Practices	0.526

*p < 0.05 indicates significant difference (Pearson Chi-Square).

Table 5: Relationships between Nutritional Knowledge, Attitudes And Practices For Cam Users

	R value	Sig. (2 tailed)
Knowledge and attitudes	0.496**	0.000
Knowledge and practices	0.312**	0.001
Practices and attitudes	0.427**	0.000

** Correlation is significant at the 0.01 level (2-tailed) by Pearson.

Discussion

This study reports that the most commonly used CAM treatments were massage (54.2%), Malay herbs (25%), and Chinese herbs (33.3%). In Malaysia, similar results were previously shown in a survey for understanding, perceptions and self-use of CAM among Malaysian pharmacy students, in addition to another baseline study involving the use of Traditional and Complementary Medicine (Hasan et al. 2011; Siti et al. 2009), respectively. Our present results are also similar to those in Stockholm where massage was the most frequently used CAM therapy (57%) (Hansen et al. 2005). The high percentage CAM utilization was also strongly related to health factors, with the most

common complaints being musculoskeletal problems. According to a 2008 review of thirteen clinical trials, sufficient evidence revealed that chronic low back pain may be alleviated by using massage (NCCAM 2012q). In addition, prior findings also concluded that benefits from massage include a reduced “state of anxiety” (a reaction to a particular situation), as well as reduced blood pressure and heart rate, and that multiple sessions also reduced “trait anxiety” (general anxiety-proneness, in addition to depression and pain (NCCAM 2012q). These clinical trial findings further served to boost the confidence of CAM users who chose massage to overcome health problems rather than conventional treatments. Furthermore, massage therapy was noted as ‘readily accessible’ by most respondents since it is available in a variety of venues.

In addition, ‘fewer side effects’ was also listed by respondents as a factor for CAM use. This finding is similar to that of a Singapore study where the majority population found CAM more readily obtainable with fewer side effects (Lim et al. 2006). Friends and family were noted as a main source of CAM information by this study, which finding supports that of a South Korean study (Ock et al. 2008). We found that general knowledge of the ‘diet-disease relationship’ and ‘how-to-knowledge’ was satisfactory for the survey’s groups. However, results revealed that most respondents lacked principles of nutritional knowledge regarding food composition, fats and cholesterol, daily serving recommendations, and food guides. The lowest correct answer rates for basic nutrition regarded fats and cholesterol and food guide questions. This finding was similar to that of a Taiwanese study where the “relationship between diet and disease” had the highest correct answer rates (74.7%), followed by “comparison of foods in terms of specific nutrients” (69.2%) (Lin et al. 2011).

In addition, those with higher educational levels (degree holders and above) had higher mean scores than did diploma or lower certificate holders, which indicates that educational level may affect the nutritional knowledge score. A study conducted among Belgian middle aged women also found a significant relationship between nutritional knowledge and educational level (Vriendt 2009). The present study further suggests that women have greater nutritional knowledge than men, which endorses findings from previous studies that found women were more likely to be informed about nutrition than men (Lin et al. 2011; Dallongeville et al. 2000). Respondents with higher educational levels also had higher mean scores in nutritional knowledge. These results were similar to those from a study in Northern France (Dallongeville et al. 2000) and among Belgian middle aged women (Vriendt 2009).

Nevertheless, this may also be due to an educated person’s ability to better comprehend survey questions. Furthermore, materials such as newspaper articles and leaflets were also better utilized by highly educated people to gain information and implement changes in lifestyle (Parmenter et al. 2000). Educated people may also have a greater awareness and understanding of information conveyed by the government, which is sometimes perceived as ‘too complex’ by a lesser educated general public (e.g. the diet-disease relationship). Additionally, higher educated respondents, generally speaking, have greater means with which to modify their diet and incorporate nutritional knowledge

in their daily lifestyle. Regarding attitudes towards nutrition, respondents' were relatively positive. Most, (61.7%), had a strong belief in the statement: "good eating habits are important to maintain my health", reflecting their realization of the importance of nutrition. This finding is similar to a study by Lin et al. (2011), which showed that an attitude "recognizing the importance of nutrition" was more positive. However, when asked about factors considered when purchasing food products, 'product safety' rated as very important (57.5%), as opposed to nutritional value (49.2%). These findings may suggest a lack of public awareness of the importance of nutrition, even though they have some nutritional knowledge.

In addition, women had more positive attitudes towards nutrition than did men in accord with studies cited above—and which further suggests that women are more knowledgeable about some aspects of healthy eating (Thompson 2007). About (40%) of our respondents thought choosing a diet with plenty of fruit and vegetables was very important, which also supports a prior study (Guthrie et al. 1999). Thus, we confidently submit that a majority of CAM users realize the importance of fruit and vegetables in disease prevention. As for nutritional practices, (30%) of respondents agreed that healthy eating was important to maintain good health. This percentage was higher than a previous study of nutritional knowledge, attitudes and practices conducted in Bahrain where the percentage of respondents who agreed was (< 25%) (Al-Madani et al. 2004). Most respondents also claimed that they ate more fruits and vegetables and reduced fatty foods, which is also similar to the Al-Madani's results. These results indicate that a higher awareness of the benefits of fruit and vegetables, as well as the negative effects of fats, may encourage the consumption of fruits, vegetables and low-fat foods.

We found that irregular working hours presented a major difficulty for healthy eating habits, as also supported by Al-Madani et al. (2004). Respondents reported that barriers for healthy eating habits included irregular working hours as well as the perception that healthy eating is boring. This was in addition to a 'refusal to change' or 'not being interested' to change (Al-Madani et al. 2004). Furthermore, most respondents in the present study were from lower income levels whose working hours were normally longer, a factor that likely obstructs the practice of healthy eating. Our results also showed a significant gender relationship in that women generally had more nutritional knowledge than males. Previous studies indicated similar results in Geneva and Taiwan (Lin et al. 2011; Girois et al. 2011), and another where women were found more likely to be better informed about nutrition than were men (Dallongeville et al. 2000). Additionally, a nutritional survey conducted by Barzegari et al. (2011) found that men were less concerned than were women regarding issues involving nutrition and health (Barzegari et al. 2011). Moreover, women generally hold a major responsibility for buying and preparing household food for the family unit, thus giving good cause for them to be more knowledgeable (Thompson 2007). The awareness of beneficial fruits and vegetables has also been found higher in women than in men, even though they are not likely to identify correct portion sizes (Thompson 2007). Thompson's study also suggested that more women were more willing to change their diet within the coming year if they did not perceive their diet as 'healthy', and more women than men perceived their diet as very healthy (Thompson 2007).

In our study, a significant relationship between nutritional knowledge and attitude was shown ($r=0.496$, $p<0.001$). Prior findings reported a significantly positive correlation between knowledge and attitude for both genders (females: $r=0.40$, $p<0.001$; males: $r=0.30$; $p<0.05$) (Azizi et al. 2011; Barzegari et al. 2011). A study by Wong et al. (1999) also found a positive correlation between nutritional knowledge and attitude ($r=0.33$, $p<0.05$), in addition to a positive correlation between nutritional attitudes and practices ($r=0.427$, $p<0.001$). Others have also reported finding a positive and significant correlation between nutritional attitudes and practices ($r=0.18$, $p<0.001$) (Azizi et al. 2011). However, a stronger correlation coefficient was found for this association by the present study, which may be due to a variation in our survey's pattern of questions. Nevertheless, nutritional knowledge and practices showed a weak relationship ($r=0.312$, $p<0.001$) than did nutritional knowledge and attitude. A prior study suggested that nutritional knowledge was an insufficient factor to bring about changes in consumer food behavior (Worsley 2002). Hence, simply providing facts appears not to lead to major behavioral changes, although knowledge did prove needful (Ryan 2009).

Conclusion

This research survey reveals a relatively high use of massage therapy (54.2%) compared to other CAM approaches. The expenditure on CAM products and practitioner visits was less than RM 500 over the preceding twelve months. Treating illness was a major motivator for the use of CAM, and musculoskeletal problems were the main health factor cited. Fewer side effects also contributed to reasons for CAM use. In addition, the mean score for nutritional knowledge and practices among CAM users proved satisfactory and greater than satisfactory with regards to nutritional attitudes. Women had better nutritional knowledge, attitude and practice scores than did men, and there appears to be significant relationship between education levels and nutritional knowledge. We also found a positive correlation between nutritional knowledge, attitudes and practices.

References

- Al-Madani, K.M., Landman, L., Musaiger, A.O. (2004). Nutrition Knowledge Attitudes and Practices: A Comparison Between Medical Practitioners And Medical Students in Bahrain. *Health Education*, Vol.104, Issue: 2, pp. 90–99. Print.
- Azizi, M., Aghaee, N., Ebrahimi, M., Ranjbar, K. (2011). Nutrition Knowledge, the Attitudes and Practices of College Students. *Physical Education and Sport*, Vol.9, No. 3, pp 349–357, 2011. Print.
- Background (2012). Traditional and Complementary Medicine Division, <http://tcm.moh.gov.my/v4/modules/mastop_publish/?tac=2> (Accessed 30 March 2012)
- Barnes, P.M., Bloom, B., Nahin, R.L. (2007). Complementary Alternative Medicine Use among Adults and Children: United States. *National Health Statistics Reports*, No. 12, 2007. Print.

- Bishop, F.L. & Lewith, G.T. (2008). Who Uses CAM? A Narrative Review of Demographic Characteristics and Health Factors Associated with CAM Use. *eCAM*,; 7 (1), pp11–28, 2010. Print.
- Dallongville, J., Marecaux, N., Bingham, A., Amouyel, P. (2000). Association between Nutrition Knowledge and Nutritional Intake in Middle Aged Men from Northern France. *Public Health Nutrition*, Vol. 4, No. 1, pp 27–33, 2000. Print.
- Guthrie, J.F., Derby, B.M., Levy, A.S. (1999). What People Know and Do Not Know About Nutrition. U.S. Department of Agricultural and Economic Research Service, pp 250-251, 1999. Print.
- Hasan, S.S., Chew, S.Y., Babar, M.G., Naing, C.M., Hameed, A., Baig, M.R., Iqbal, S.M., Kairuz, T. (2011). Understanding, Perceptions and Self Use of Complementary Alternative Medicine (CAM) among Malaysian Pharmacy Students. *BMC Complementary and Alternative Medicine*, 11: 95, 2011. Print.
- Lim, J., Wong, M., Chan, M.Y., Tan, A.M., Rajalingam, V., Lim, P.N., Lou, J., Tan, C.L. (2006). Use of Complementary Alternative Medicine in Paediatric Oncology Patients in Singapore. *Annals: Academy of Medicine, Singapore*, Vol. 35, No.11, pp 1–6, 2006. Print. 10.
- Lin, W., Chi, M.H., Hsiao, C.Y., Hung, M.H. (2005-2008). Nutrition and Health Survey in Taiwan: The Nutrition Knowledge, Attitude And Behavior of 19-64 Years Old Adults. *Asia Pacific Journal Clinical Nutrition*, 20 (2): 309–318. 2011. Print.
- Ock, S.M., Choi, J.Y., Cha, Y.S., Lee, J.B., Chun, M.S., Chang, H.H., Lee, S.Y., Lee, S.J. (2008). The Use of Complementary and Alternative Medicine in a General Population in South Korea: Result From A National Survey in 2006. *The Korean Academy of Medical Sciences*, Vol. 24, pp 1–6, 2009. Print.
- Siti, Z.M., Tahir, A., Farah, A.I., Fazlin, S.M.A., Sondi, S., Azmanb, A.H., Maimunah, Haniza, A.H., Siti, H., Zulkarnain A.K., Zakiah, I., Zaleha, W.C.W. (2009). Use of Traditional and Complementary Medicine in Malaysia: A Baseline Study. *Complementary Therapies in Medicine*, 17, pp 292–299, 2009. Print.
- Thomas, K.J., Nicholl, J.P., Coleman, P. (2001). Use and Expenditure on Complementary Medicine in England: A Population Based Survey. *Complementary Therapies in Medicine*, No.9, pp 2–11. 2001. Print.
- Thompson, J. (2007). Healthy lifestyles: Knowledge, Attitudes and Behavior. NHS Information Centre. 2007.
- Vreindt, T.D., Matthys, C., Verbeke, W., Pynaert, I., Henauw, S.D. (2009). Determination of Nutrition Knowledge in Young and Middle-Aged Belgian Women and the Association with Theory Dietary Behavior. *Journal of Appetite*. Vol. 52, pp 788–792. 2009. Print.

- Xue, C.C.L., Zhang, A.L., Lin, V., Myers, R., Polus, B, David, F.S. (2008). Acupuncture, Chiropractic and Osteopathy Use in Australia: A National Population Survey. BMC Public Health. Vol. 8, No. 156, pp 1–8. 2008. Print.
- Zhang A.L. (2006). Complementary and Alternative Medicine Use in Australia: A National Population-Based Study, PhD Thesis, School of Health Science, RMIT University. 2006.