

## AN ACTION RESEARCH ON PROMOTION OF HEALTHY AGEING AND RISK REDUCTION OF CHRONIC DISEASE: A NEED ASSESSMENT STUDY AMONG RURAL ELDERLY MALAYS, CARE GIVERS AND HEALTH PROFESSIONALS

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**Abstract:** *Objective:* Prior to the development of a healthy ageing and risk reduction of chronic diseases intervention package for older people in Malaysia, a need assessment study was conducted to identify nutritional knowledge status and information needs, as part of an action research process. *Design:* A cross sectional study was conducted among 267 elderly people, 54 care givers and 66 health professionals in two rural areas of Peninsular of Malaysia (i.e Sabak Bernam, Selangor and Kuala Pilah, Negeri Sembilan). Information on nutritional knowledge was obtained from an interview based questionnaire for older subjects and caregiver and through self administered questionnaire from the health professionals. Anthropometric and functional measurements were also conducted among elderly subjects. *Results:* It was found that the elderly subjects had poor nutritional knowledge with 43.8% of them classified as having unsatisfactory nutritional knowledge, followed by moderately satisfactory (33.7%), very unsatisfactory (15.7%) and good (6.7%). Talks, counselling sessions with health professionals and electronic media such as television and radio were the most preferred nutrition education sources among elderly subjects and their care givers. The majority of health professionals studied (98.5%) had good nutritional knowledge. Although most of them (93.6%) were involved in management of the elderly, only 45.5% incorporated nutritional information component in this activity. Most of the health professionals used the guidelines for management of elderly patients (63.6%). However, nutritional knowledge was very minimal in these guidelines. Multiple regression analysis indicated that 'level education', involvement in 'social activities', presence of 'hearing problems', the Instrumental Activities of Daily Living (IADL) score, having previous 'nutritional information' and 'participation in healthy eating programme' were the major predictors of nutritional knowledge score among elderly subjects. *Conclusion:* Based on the above findings it is thus, imperative that an appropriate nutritional intervention package and programme be developed so as to help improve nutritional knowledge and subsequently the nutritional status of the rural elderly Malays.

**Key words:** Nutrition education, nutritional knowledge, elderly, care giver, health professional, Malaysia.

### Introduction

The world proportion of people over 60 years old increased from 8% in 1950 to 10% in 2000. By 2050, the proportion of this population will have more than doubled, to 22% (1). In Malaysia, as a result of the decline in birth rate and mortality rate, reduction in infectious diseases and improvement in health care system (2), there is a two-fold increase in the ageing population within 25 years, from 685 thousand in year 1975 to 1,463.4 thousand in year 2000 (1). The ageing population is at risk of malnutrition for a variety of reasons including lack of nutritional education, financial constraints, declining physical and psychological functional abilities, social isolation and side effects of treatments for multiple concomitant disorders or diseases (3). Apparently, weight status studies among rural elderly Malays reported that 24.6% to 37.7% of them are underweight (BMI < 18.5 kg/m<sup>2</sup>) and 12.3% to 38.4% are overweight (BMI > 24.9 kg/m<sup>2</sup>) (4-9). In addition, hypertension

and cardiovascular diseases were found as the most commonly reported chronic diseases among elderly people in Malaysia (8, 9, 10). Predictors of dietary inadequacy among rural elderly Malays have been identified as 'unable to take public transport', 'loss of appetite', 'chewing difficulty', 'no regular fruit intake' and 'regularly taking less than three meals per day' (11). However, the nutritional knowledge was not assessed in this study. Other studies reported that the nutritional knowledge was unsatisfactory among Malays (12, 13) and Chinese elderly (14). There was a consistent association between the level of nutritional knowledge, dietary quality and an intention to make positive dietary changes (15). It has also been reported that subjects who had changed their diet for health reasons had good nutritional knowledge and older people were found to be more receptive to nutrition education particularly if the programme focused on issues which affected them directly (16). Nutritional education, therefore, has an important role in encouraging older people to make dietary changes (17). Hence, development of a

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nutritional education intervention programme for promotion of healthy ageing and risk reduction of chronic diseases should include increased knowledge about good eating behaviour and healthy lifestyle. Prior to this, a need assessment study, which was a planned process that identified the needs of an individual or group (18), had to be carried out. Therefore, a need assessment study was conducted among rural elderly Malays, their care givers and health professionals to identify the nutritional knowledge status and information needs that are essential and appropriate for planning, development and implementation of nutritional intervention programme. This study has chosen rural location because it was reported that The National Health and Morbidity Survey (NHMS) II showed that the rural population had a higher prevalence of recent illness and physical disability (19).

**Study Design and Methods**

A need assessment study was carried out among elderly Malays, their care givers and health professionals in health clinic involved with healthy ageing programme in rural areas of Kuala Pilah, Negeri Sembilan and Sabak Bernam, Selangor. The study was approved by the Medical Research & Ethics Committee of Ministry of Health Malaysia. The elderly subjects were selected from those who had participated in an earlier study on nutritional and health status of older people (IRPA 06-02-02-0099) (20). The inclusion criteria for elderly subjects were Malays, aged 60 and above, with no mental or critical illness and residents for at least one year at the selected rural areas. The care givers were those who were responsible for care of the elderly subjects, either their spouses, children, grandchildren or relatives. Health professionals who were involved in health management of elderly persons such as medical officer, medical assistant officer, public health nurse, staff nurse, community nurse, pharmacist (assistant) and laboratory officer from 13 health clinics were also recruited for this study. In addition to the elderly subjects, the study also involved the care givers and health professionals as they were

recognised as important partner in optimising the nutritional status and the nutritional education intervention package to be developed will be used by them as well. The selected variables and methodology for this study are summarized in Table 1. The study involved quantitative approaches including assessment of nutritional knowledge status, anthropometry and functional status. All the subjects were assessed for their nutritional knowledge status using Ministry of Health Questionnaire (21), which consisted understanding of 10 nutritional terms and 15 statements on nutrition. The format of the questionnaire included true-false and multiple-choices. Inter-item reliabilities (Cronbach alpha coefficient) of the scales was good (alpha > 0.7) (22). The elderly subjects were also measured for their nutritional status using body mass index (BMI) and waist circumference. The height was derived from arm span measurement (23). Waist circumference was measured to identify the elderly who had high risk for getting cardiovascular disease using WHO, IOTF & IASO classifications (24). In addition, functional status was also assessed using Instrumental Activities of Daily Living (IADL) (25) to obtain information about their ability to perform daily activities and cognitive performance was tested using Hodkinson Abbreviated Mental Test (26). Besides, an observation was also conducted at the 13 health clinics from both areas to evaluate the availability of facilities and equipment for the intervention programme.

**Statistical analysis**

The Statistical Package for Social Sciences (SPSS) software version 12.0.1 was used to analyse the data. Descriptive statistics, Student’s independent t-test, Chi-square test, Mann-Whitney test and stepwise multiple linear regression analysis were used. Multiple linear regression analysis was done to identify the best predictors (independent variables) of nutritional knowledge score.

**Table 1**

Subjects	Variables	Methods
Elderly people	Socio-demography and health data	Household visit using an interview-based questionnaire
	Information needs of nutrition intervention	
	Nutritional knowledge status (Knowledge, Practice and Attitude-KAP)	
	Anthropometry : weight; height, arm span, waist circumference	
Care givers	Functional status	Ministry of Health’s questionnaire with modifications Standard anthropometric measurements Instrumental Activities of Daily Living (IADL) (24), Hodkinson Abbreviated Mental Test (25)
	Socio-demographic data	
	Nutritional knowledge status (Knowledge, Practice and Attitude-KAP)	
Health professionals	Information needs of nutritional intervention	Household visit using an interview-based questionnaire Self administered questionnaire Ministry of Health’s questionnaire with modifications Self administered questionnaire Observation in health clinics
	Socio-demographic data	
	Nutritional knowledge status (Knowledge, Practice and Attitude-KAP)	
	Information needs of nutritional intervention	
	Nutritional and health practice	

**Results**

**Demographic, socioeconomic and health characteristics**

A total of 267 elderly Malays (55.4% men and 44.6% women), mean ± SD age of 70.6 ± 5.9 years, 54 care givers (11.1% men and 88.9% women), mean ± SD age of 43.0 ± 10.7 years and 66 health professionals (24.2% men and 75.8% women), mean ± SD age of 36.3 ± 9.9 years participated in the study. Health professionals involved were doctors (14%), medical assistants (15%), nurses (65%) and others (4%) including two assistant pharmacists, one assistant nurse and one assistant laboratory technician. Table 2 shows that majority of the elderly subjects (74.2%) and care givers (88.9%) were married and unemployed (70.0% and 75.9%, respectively). Most of the elderly subjects stayed with family members (89.9%). Only 55.8% of the elderly received formal education compared to the care givers (79.6%). Almost half of elderly depended on family members for economic resources. Majority of the elderly women were widowed, received informal education, were unemployed with no pension, depended more on others for financial resources and were more likely to be living alone compared to their spouses (p<0.0001 for all parameters). Similar trends were noted in other study among rural elderly Malays (8, 9). Almost half of the elderly subjects (45.9%) had a normal body mass index (BMI) with 14.5% of elderly subjects underweight and 39.6% classified as overweight. Functional status revealed that only half of elderly subjects (50.2%) were fully independent in performing daily tasks such as housekeeping, shopping, using public transport, ability to walk and manage money. The results also indicated that elderly men had a significantly higher score for Instrumental Activities of Daily Living (IADL) and cognitive test compared to women (p<0.0001). A total of 45.7% of elderly subjects, particularly women (56.3%) (p<0.010) were at high risk of getting cardiovascular disease as assessed using waist circumference.

**Nutritional knowledge status**

Results revealed that the mean of percentage of total nutritional knowledge score of caregivers (73.1 ± 19.7%) was better than the score of elderly subjects (46.1 ± 18.8%) (p<0.0001). As expected, health professionals had a much higher nutritional knowledge status (93.1 ± 6.5%) compared to the caregivers and elderly subjects, with 98.5% having a good nutritional knowledge. Elderly men had a higher mean percentage of nutritional knowledge score (50.4 ± 19.3%) than their females counterparts (40.7 ± 16.8%) (p<0.0001). A total of 43.8% of elderly were classified as having unsatisfactory nutritional knowledge status, followed by moderate nutritional knowledge score (33.7%), very unsatisfactory (15.7%) and good knowledge (6.7%) (Figure 1). Meanwhile, majority of the care givers (59.3%) had good nutritional knowledge status, followed by moderate (24.1%), unsatisfactory (14.8%) and very unsatisfactory (1.9%).

**Table 2**

Demographic, socioeconomic and health characteristics of the elderly subjects and their care givers [presented as number (%)]

Characteristics	Men (n=148)	Elderly Women (n=119)	Total n=267	Care giver (n=54)
<i>Marital status :</i>				
Single/divorced/widowed	11 (7.4)	58 (48.7) <sup>d</sup>	69 (25.8)	6 (11.1)
Married	137 (92.6)	61 (51.3)	198 (74.2)	48 (88.9)
<i>Education level :</i>				
Formal education	117 (79.1)	32 (26.9)	149 (55.8)	43 (79.6)
Informal education	31 (20.9)	87 (73.1) <sup>d</sup>	118 (44.2)	11 (20.4)
<i>Employment :</i>				
Unemployed/housewife/retired	84 (56.8)	103 (86.6) <sup>d</sup>	187 (70.0)	41 (75.9) <sup>f</sup>
Employed	64 (43.3)	16 (13.4)	80 (30.0)	13 (24.1)
<i>Dependent on others for financial resources</i>				
<i>Living arrangement :</i>				
Alone	6 (4.1)	21 (17.6) <sup>d</sup>	27 (10.1)	-
With family members	142 (95.9)	98 (82.4)	240 (89.9)	-
<i>Body mass index (BMI)<sup>a</sup></i>				
Underweight (BMI <18.5 kg/m <sup>2</sup> )	19 (13.4)	18 (15.9)	37 (14.5)	-
Normal (BMI 18.5-24.9 kg/m <sup>2</sup> )	71 (50.0)	46 (40.7)	117 (45.9)	-
Overweight (BMI > 30.0 kg/m <sup>2</sup> )	52 (36.6)	49 (43.4)	101 (39.6)	-
IADL score <sup>b</sup>	14 ± 1	12 ± 3 <sup>c</sup>	14 ± 2	-
Cognitive score <sup>b</sup>	9 ± 2	6 ± 3 <sup>c</sup>	8 ± 4	-
High CVD risk <sup>c</sup>	18 (12.3)	95 (81.9) <sup>d</sup>	113 (43.1)	-

a. N value were 255 (Men=142, Women=113); b. Presented as median ± range between quartile; c. Waist circumference ≥90 cm men, ≥80 cm women; d. p<0.0001, differences between sex, Chi-square test; e. p<0.0001, differences between sex, Mann-Whitney test; f. p<0.05, differences between sex, Chi-squared test

**Figure 1**

Nutritional knowledge of subjects (%)

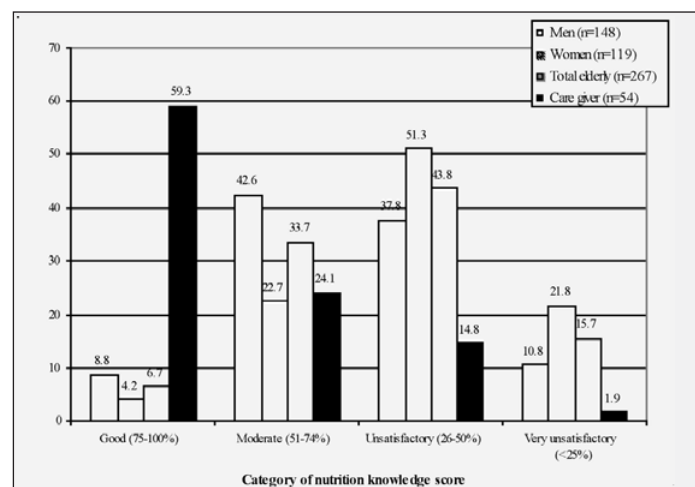


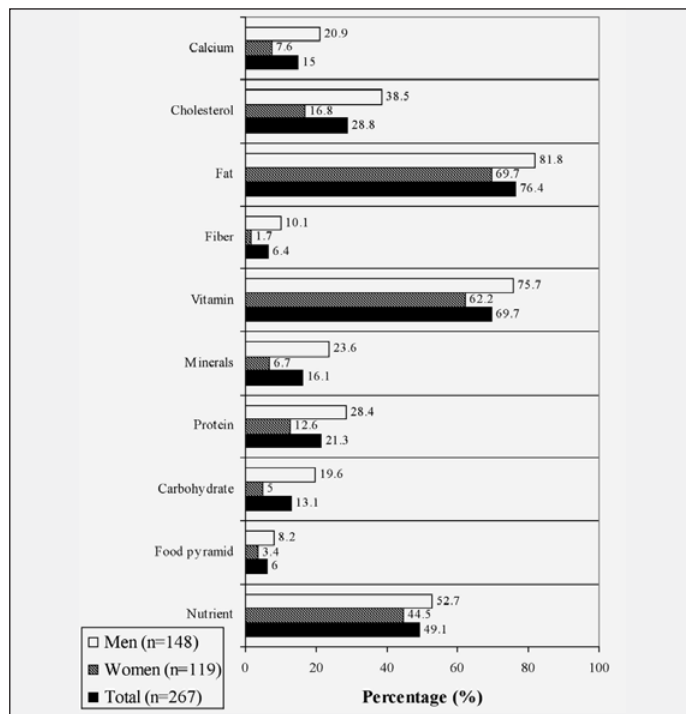
Figure 2 indicated that majority of the elderly subjects understood terminology of fats and vitamins (76.4% and 69.7%, respectively), however, they had poor knowledge of food pyramid, fibre, carbohydrate, protein, calcium and

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minerals. On the other hand, the majority of the caregivers understood almost all nutritional terminology except for food pyramid, minerals and calcium. Elderly men had a better knowledge in nutritional terminology than female subjects [carbohydrate, minerals and cholesterol ( $p < 0.0001$ ), protein, fibre and calcium ( $p < 0.01$ ), vitamin and fat ( $p < 0.05$ )].

**Figure 2**

Percentage of elderly subjects by sex who understood a specific nutritional terminology



**Information needs of nutritional intervention**

The main sources of nutritional information for elderly subjects were electronic media such as television and radio (70.3%), health professionals (64.3%) and offsprings, relatives or friends (56.8%). Only 22.7% of the elderly reported printed media to be their nutritional information source. A higher percentages of the elderly men reported that they had received nutritional information from printed media ( $p < 0.0001$ ) and health professional ( $p < 0.05$ ) as compared to the elderly women. Both the elderly and caregiver subjects showed preferences for nutritional education to be delivered via talks, counselling sessions with health professionals and electronic media such as television and radio.

Majority of the health professionals were involved in health counselling for older people (93.6%), but only 45.5% included nutrition in their activity. Approximately 70% of the health professionals assessed the nutritional status of their elderly patients. This assessment included regular clinical assessments (89.6%), followed by basic anthropometric assessments (weight and height) (83.3%), dietary intake (79.2%), biochemistry assessments (69.4%) and physical activity assessments (57.1%). However, the health professionals assessed dietary

intake of the elderly patients only briefly, without using any standardized method such as 24-hours diet recall, diet history, food frequency and food checklist. There was no dietitian or nutritionist at the health clinics being studied. A dietitian was placed in a hospital whereas a nutritionist was in the district health office. An assessment of waist circumference and body composition was not conducted. Half of the health professionals delivered nutritional education through talks and diet counselling for the elderly patients. Most of them used pamphlet (87.9%) as a teaching aid. Around 63.6% of them used the guidelines for management of elderly patients and majority of this group (71.4%) used the Ministry of Health's (MOH) module. However, nutritional component is hardly present in this module. Results from the observation exercise indicated that only nine out of 13 health clinics were involved specifically with the healthy ageing programme. The most popular activities were home visits (67%), individual counselling (56%) and rehabilitation programs (44%). Only five health clinics carried out exercise education for the elderly patients.

Results of multiple linear regression analysis indicated that there were six predictors of nutritional knowledge score (Table 3). The variables were education level ( $p < 0.0001$ ), social activities ( $p < 0.05$ ), hearing problem ( $p < 0.0001$ ), IADL score ( $p < 0.01$ ), having nutritional information ( $p < 0.0001$ ) and being involved in healthy eating programme ( $p < 0.0001$ ). The adjusted R squared value was 0.386 and it showed that 38.6% of the variance in nutritional knowledge score was explained by the model. According to Cohen 1988 (27), this is already a large effect.

**Table 3**

Simultaneous multiple linear regression analysis summary for predicting nutritional knowledge score (N=254)

Variables	Standardized Beta Coefficients ( )	Significant values
Age group	0.093	0.083
Education status	0.225	0.000
Diagnosed with diabetes mellitus	0.041	0.434
Diagnosed with hypertension	0.087	0.102
Participate in social activities	0.124	0.031
Had eye sight problem	0.058	0.282
Had hearing problem	-0.201	0.000
IADL score	0.164	0.009
Cognitive score	-0.022	0.658
Body Mass Index (BMI)	0.059	0.294
Received nutritional information	0.232	0.000
Had joined healthy eating program	0.232	0.000
Living arrangement	0.029	0.570

Multiple regression; Adjusted R2 = 0.386, SEM = 14.838; ANOVA test; F(13,240) = 13.261,  $p < 0.001$

**Discussions**

As reported in earlier studies among older people in Malaysia (12-14), the nutritional knowledge of the subjects



were unsatisfactory with almost 60% of them were classified as having poor nutritional knowledge status. Similar to other studies (28-32), this study found that low education level, not being involved in social activities, having hearing problem, low IADL score, not getting any nutritional information and not joining any health programme were predictors of low nutritional knowledge score. Social interaction is an important psychosocial factor influencing malnutrition and poor health among older people (33). Declining physiological condition such as hearing impairment is a biological consequence of ageing and may result in social isolation that increases risk of consuming inadequate diet and malnutrition (34-35).

Although it has been expected that the nutritional knowledge of older people in rural area is poor, this study has successfully identified which domain of knowledge needed to be emphasized in developing the nutrition education intervention package (i.e: food pyramid, fibre, protein, carbohydrate, calcium and minerals). The health professionals involved in the care of older people in this study had good nutritional knowledge, however, only approximately 45% included nutrition in their health intervention. There is a need to ensure that nutritional education materials are available for health intervention at health clinics.

The major sources of nutritional information reported by the subjects were electronic media such as television and radio, health professionals and offspring/relatives/friends. Similar findings were noted in another study (28). We also found that only 22.7% of the subjects reported printed media as their nutritional information source. This is because almost 40% of the elderly have no formal education and this may limit their access to written education materials. Thus, in developing a suitable nutritional education package for this subgroup of the population, special attention has to be given to the low literacy capability. Nutritional messages to be disseminated in a particular nutritional guidelines or intervention package for older people should be limited in number, simple, targeted, practical and reinforced (36). Furthermore, as low literacy rate was high in ageing population (37) and subjects with low literacy are more likely to report having poor health than those with adequate literacy (38-39), health professionals should use a suitable nutritional education package such as simply written educational materials, videotapes, and color-coded medication schedules (40).

Elderly subjects in this study showed preferences for nutritional education to be delivered via talks, counselling session with health professionals and electronic media. Nutrition counselling is the preferably mode for bringing a permanent and favourable solution to the problem of malnutrition (41). It is an effective tool for changing the food habits of the people without affecting their sentiments. Several studies have reported a positive influence of nutrition counselling on nutritional knowledge scores (15, 41-48). Age did not appear to be a limiting factor in increasing one's knowledge, as seen from positive knowledge gain in several intervention studies (35).

## Conclusion

The nutritional knowledge of the elderly subjects in this study was not satisfactory, particularly among females. There is a need to develop a nutritional intervention package emphasizing healthy eating concepts, minerals and fiber, preferably delivered via electronic media and counselling to improve the nutritional knowledge of the elderly subjects.

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