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Original Article

Health Needs Assessment of Older People in an Agricultural Plantation☆

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SUMMARY

Background: Federal Land Development Authority (FELDA) is a unique palm oil and rubber plantation settlement in the rural areas of Malaysia occupied by the land settlers who are now in their old age. Their health needs may be different from other agricultural workers in the world. The aim of the study was to conduct health needs assessment to identify health priorities of the older people in FELDA, based on the National Institute for Health and Clinical Excellence guidelines.

Methods: A sample of 162 older Malays aged 60–80 years from FELDA settlement volunteered to participate in the study. Data include information on health, cognitive, psychosocial, nutrition, and food intake using standard questionnaires. Cognitive tests were administered, and measurement of body composition and food intake were taken.

Results: The results showed that the main factors influencing health functioning of the older people of FELDA according to the priorities were as follows: (1) psychological factors, (2) nutritional factors, (3) social factors, (4) health conditions, (5) access to health services and functional status, (6) lifestyles factors, (7) biological factors, (8) socioeconomic factors, and (9) cognitive factors.

Conclusion: Psychological factors had the main influence on health functioning of the older people of FELDA. Physical health needs of the older people in FELDA were determined mainly by psychological, nutritional, and lifestyle factors, whereas mental health needs were determined mainly by psychological, socioeconomic, and social factors. FELDA has vast resources to utilize for the running and maintaining of health programs for their older people as well as for evaluating and monitoring the effectiveness of health programs.

1. Introduction

Health functioning among farmers and agriculture workers varies depending on their socioeconomic, cultural, and environmental factors. Agricultural work is hazardous to the health of workers as they were exposed to the danger of pesticides and accidents associated with the use of machineries. The majority of occupational risks related to agricultural work include poisoning, work-related cancer, reproductive impairment, and death.

Federal Land Development Authority (FELDA) is a unique palm oil and rubber plantation settlement situated in the rural areas of Malaysia occupied by the land settlers who had been selected by the government. The majority of the first and second generation of FELDA settlers are now in their old age. Their health needs may be different from other agricultural population in the world. According to the National Institute for Health and Clinical Excellence (NICE) guidelines[1], health needs assessment (HNA) is a systematic method for reviewing the health issues faced by a population, leading to agreed priorities and resource allocation that will improve health and reduce inequalities. HNA involves five steps: (1) getting started; (2) identifying health priorities; (3) assessing a health priority for action; (4) planning for change; and finally, (5) moving on or reviewing.

A nationwide research on health determinants among Malaysian older adult population[2] showed that their health determinants were exercise, regular medical checkups, and having health problems. Sazlina et al[3] reported that the predictors of the physical components of health-related quality of life (HRQoL) in older

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people with noncommunicable diseases were aged ≥65 years, single, presence of comorbid conditions, and poorer social support. Predictors for the mental health component of HRQoL were women, Indian ethnicity, and poorer social support. No interactions existed between these predictors.

Other than biological factors, demographic, social, and environmental factors as well as physical activity and dietary habits play major roles in health and functioning of older adults.[4,5] A survey by Wan Omar et al[6] among a sample of local residents in Kuala Lumpur, Malaysia, found that 65.1% did not achieve the recommended standards for walking to gain any health benefits, 27.4% did not walk at all, and only 1% engaged regularly in neighborhood walking. A survey on healthy lifestyle practices and effect of ageing on physical functions among members of Golden Age Club of Shah Alam, Selangor, Malaysia, revealed that arthritis seems to be the most debilitating illness that prevents or limits physical activities among the older adults compared to other chronic diseases. Females have poorer physical function than males[7]. Siop (Siop SJ. Disability and quality of life of non-institutionalized older Malaysians. Unpublished PhD Thesis, Universiti Putra Malaysia; 2008) examined the effects of physical functioning on quality of life in Sabah, Malaysia. The predictors of good quality of life among men were ethnicity, education, income, urban/rural residence, physical activity, and self-rated health. Among the predictors for women, ethnicity, self-rated health, and functional limitation predicted perceived a good quality of life. Compared to the Malays, being of Indian and Chinese ethnicity was associated with reduced perceived good quality of life for both men and women, whereas being of Bumiputera and other ethnicity increased the odds of a perceived good quality of life among men. Very poor self-rated health, compared with excellent self-rated health, was associated with lower perceived good quality of life in both men and women.

The purpose of this study is to determine the health needs of older people in Felda Sungai Tengi, Malaysia. Based on the uniqueness of the FELDA settlement itself, it is hypothesized that health functioning of the older FELDA settlers is evaluated mainly based on their health conditions, physical functioning, and psychosocial factors. The findings from this research will better inform the FELDA organization and the Malaysian government in planning and monitoring of health promotion programs.

2. Materials and methods

2.1. Recruitment of participants

This cross-sectional survey study was conducted among older people in Felda Sungai Tengi, Selangor, Malaysia. The participants were selected purposively, with an enrolment of 162 participants from Sabak Bernam district, Malaysia. The selection of Felda Sungai Tengi was determined by the FELDA headquarters, and the list of participants was provided by the local FELDA office in Sungai Tengi. Invitation letters and consent forms were sent to those who meet the selection criteria. Those who agreed to participate attended the FELDA Community Hall for health status screening. Questionnaires on health status, cognitive status, dietary intake, and nutritional status were administered to the older people who participated in the study. Sociodemographic profiles of the older people of FELDA are shown in Table 1.

2.2. Inclusion and exclusion criteria

All older persons who were Malays; aged 60–80 years; able to read, write, and communicate; and had no mental or critical illness were invited to participate in the screening process. Those who had severe chronic illness, were not ambulatory, were aphasic, or had mental or critical illness were excluded from the study.

Table 1
Sociodemographic and health profiles of elderly FELDA people.

		n (%)
Sex	Male	59 (36.4)
	Female	103 (63.6)
Marital status	Married	119 (73.5)
	Divorce	2 (1.2)
	Widower	41 (25.3)
Education level	Illiterate	25 (15.4)
	Religious school	10 (6.2)
	Primary school	111 (68.5)
	Secondary school	12 (7.4)
	Others	4 (2.5)
Occupation	Not working	31 (19.1)
	Housewife	70 (43.2)
	Retired	33 (20.4)
	Working	28 (17.3)
Age (mean ± SD)		64.98 (3.9)
Years of education (mean ± SD)		4.22 (2.6)
Total household monthly income (RM) (mean ± SD)		1656.89 (814.0)

FELDA = Federal Land Development Authority; SD = standard deviation.

2.3. Location

The sample in this study consisted of the older people of FELDA who resided in Sungai Tengi, Kuala Kubu Baru, Selangor, Malaysia. They represent the FELDA population all over Malaysia, as FELDA plantations and housing establishments were built in a homogeneous manner.

2.4. Project team and resources

The research team comprised clinical psychologists, dieticians, psychogeriatricians, nurses, toxicologists, and FELDA representatives. The research group secured a university-community research grant to run the study, as well as assistance from FELDA staff and head of blocks of the FELDA community. An appropriate setting was required for interviewing and assessing the older adults in FELDA, and manpower for assisting in the data collection.

2.5. Demographic characteristics

Demographic data included information on age, sex, marital status, levels of education, number of household occupants, household income, monthly salary, and other sources of income.

2.6. Health status

Health status of the older FELDA people was assessed using the Subjective Global Assessment[8].

2.7. Functional status

Functional status was assessed using the Instrumental Activities of Daily Living[9] for physical capacity, Elderly Mobility Scale for mobility[10], the International Physical Activity Questionnaire for physical activities[11], and handgrip dynamometer test for handgrip strength (GRIP 5401 Handgrip Dynamometer, London, UK)[12]. Instrumental Activities of Daily Living has been validated for multiethnic group in Asia[13,14,15]. Internal consistency among 38 elderly people in Kota Bharu Kelantan was 0.73[13], and ranged from 0.91 to 0.92 in the study of 1072 older adults aged ≥60 years in Singapore[14].

2.8. Cognitive status

Cognitive status was screened using the Malay version of the Mini Mental State Examination[16] and the Montreal Cognitive Assessment Bahasa Malaysia.

2.9. Psychosocial status

The study assesses coping strategies of the older people in FELDA using the Malay version of the Brief Cope Scale[17], psychological well-being using the Short-Form 12[18], life satisfaction using the Malay version of the Satisfaction with Life Scale[19,20], depressive symptoms using the Malay Geriatric Depression Scale[21,22], loneliness using the De Jong Gierveld Loneliness Scale[23], and social support using the MOS Social Support Survey[24].

2.10. Anthropometry

Anthropometric measurements were carried out using the standard anthropometric technique[25], which include weight and height for body mass index[26], arm span, waist circumference, mid-upper arm circumference, and calves circumference. Body composition was also assessed indirectly using the bioelectric impedance analysis.

2.11. Nutritional status

Nutritional status of the older people in FELDA was assessed using the validated Dietary History Questionnaire[27], which includes dietary intake, dietary habit, and behavior. Nutritional status is also associated with appetite, which was assessed using the Short Nutritional Appetite Questionnaire[28,29]. The presence of any malnutrition problems among the elderly was screened using the Malnutrition Risk Screening Tool for Community[30] and Mini Nutritional Assessment Short Form[31].

2.12. Statistical analysis

Data were analyzed using SPSS Version 16 (SPSS Inc., Chicago, IL, USA) for *t* test and analysis of variance for mean comparison between two- and three-level groups, as well as bivariate correlation and multiple linear regression to determine the contribution of each factor on health functioning of the elderly of FELDA.

2.13. Ethical approval

Permission to conduct the study was given by the FELDA Community Development and Communication Division, and ethical approval was obtained from the Ethical Committee of Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia. All respondents gave their consent.

3. Results

3.1. Sociodemographic and health profiles of respondents

The majority of respondents who participated in the study were women (63.6%), married (73.5%), attended primary school (68.5%), housewives (43.2%), with a mean age of 64.98 years and a total monthly income of above RM1500.00 (Table 1). The main health problems suffered were visual problems (77.78%), followed by hypertension (48.77%; Table 2).

Table 2
Health conditions of the elderly in FELDA.

	n (%)
Diabetes	40 (24.7)
Chronic heart disease	13 (8.0)
Hypertension	79 (48.8)
Gout/arthritis	23 (14.2)
Renal problems	5 (3.1)
Respiratory problems	13 (8.0)
Anemia	1 (0.6)
Gastrointestinal problems	5 (3.1)
Other diseases	77 (44.4)
Visual problems	126 (77.8)
Hearing problems	42 (25.9)
Chewing problems	59 (36.4)

FELDA = Federal Land Development Authority.

3.2. Health determinants of older people in FELDA

Health determinants were categorized as follows: (1) biological factors (i.e., age, sex, height, and weight); (2) access to health services (i.e., clinic/hospital, access to medication, use of herbs, and use of Chinese herbs); (3) lifestyle factors that include smoking, diet, and physical activity; (4) social factors (i.e., living arrangement, number of household occupants, social support, and isolation/loneliness); (5) socioeconomic factors such as education level, occupation, sources of income, and household monthly income; (6) cognitive factors assessed by the Mini Mental State Examination and Montreal Cognitive Assessment; (7) psychosocial factors, including emotional status, coping strategies, and satisfaction with life; (8) nutritional factors as measured by the body mass index, appetite, nutrition status, malnutrition, diet recall, and frequency of food intake; and (9) functional status assessed by the Instrumental Activities of Daily Living, Elderly Mobility Scale (EMS), and handgrip strength measurement (Table 3).

3.3. Impact of health conditions and determinant factors on health functioning of older people in FELDA according to the NICE guidelines for HNA

Factors that significantly affect health functioning (measured by Short Form 12 (SF-12)) were considered as health priorities to be changed. The HNA was based on the NICE guidelines for HNA; however, priorities were determined using multiple regression. The main factors influencing health functioning of the elderly in FELDA according to the priorities were as follows: (1) psychological factors that significantly affect all domains of SF-12; (2) nutritional factors that affect all domains of SF-12, except mental and emotional functioning; (3) social factors that affect all domains of health functioning except for physical and social functioning; (4) lifestyles factors that significantly influence physical health, physical functioning, role of physical functioning, pain, mental functioning, and emotional functioning domains of SF-12; (5) health conditions that have significant impact on physical health, physical functioning, pain, general health, mental functioning, and vitality; (6) access to health services, which significantly affects physical health, physical functioning, general health, social health, and mental and emotional functioning; (7) functional status that significantly influences physical functioning, role of physical functioning, general health, social functioning, and vitality; (8) biological factors that have significant influence on physical health, general health, social functioning, and vitality; (9) socioeconomic factors that significantly influence mental health, pain, and social functioning; and (10) cognitive factors that significantly influence social functioning and vitality (Table 4).

Table 3
Health determinants of participants.

			n (%)	Mean (SD)
Biological factors	Sex	Men	59 (36.4)	
		Women	103 (63.6)	
	Age			64.98 (3.85)
	Weight			63.86 (14.07)
	Height			152.76 (10.34)
Access to health care	Attending clinic/hospital	Yes, always	79 (48.8)	
		Yes, sometimes	34 (21.0)	
		Rarely/never	47 (29.0)	
		Do not know	2 (1.2)	
	Access to medication	Yes, always	8 (4.9)	
		Yes, sometimes	20 (12.4)	
		Rarely/never	122 (75.3)	
		Do not know	12 (7.4)	
	Use of herbs	Yes, always	9 (5.6)	
		Yes, sometimes	38 (23.5)	
		Rarely/never	106 (65.4)	
		Do not know	9 (5.6)	
	Use of Chinese herbs	Yes, always	1 (0.6)	
		Yes, sometimes	7 (4.3)	
		Rarely/never	139 (85.8)	
		Do not know	15 (9.26)	
Lifestyle factors	Smoking	Smokers	23 (14.2)	
		Ex-smokers	23 (14.2)	
		Nonsmokers	116 (71.6)	
	Diet	Energy		1413.30 (306.73)
		Carbohydrate		200.19 (96.37)
		Fat		44.25 (13.55)
		Protein		61.95 (15.12)
		Calcium		447.19 (178.11)
		Ferrum		11.95 (4.01)
		Vitamin A		755.54 (511.87)
		Thiamine		0.61 (0.23)
		Riboflavin		1.17 (0.52)
		Niacin		8.90 (3.67)
		Folate		83.33 (80.03)
	Metabolic equivalent task	MET heavy physical activities		678.27 (1897.99)
		MET moderate physical activities		897.28 (1107.85)
		MET walking		576.35 (666.74)
		Total MET		2151.90 (2334.49)
Social factors	Marital status	Married	119 (79.3)	
		Divorced	2 (1.2)	
		Widower	41 (25.3)	
	Living arrangement	Live with others	149 (92.0)	
	Household occupants	Less than 3	121 (74.7)	
	Loneliness	Emotional loneliness		1.02 (1.15)
		Social loneliness		2.89 (1.47)
		Total loneliness		3.91 (1.88)
	Social support	Emotional Informational Scale		51.93 (25.05)
		Tangible Support Scale		78.55 (23.54)
		Affectionate Support Scale		78.50 (26.03)
		Possible Social Interaction Scale		68.93 (27.60)
Socioeconomic factors	Level of education	No education	25 (15.4)	
		Religious school	10 (6.2)	
		Primary school	111 (68.5)	
		Secondary school	12 (7.4)	
		Others	4 (2.5)	
	Total years of education			4.22 (2.65)
	Occupation	Not working	31 (19.1)	
		Housewife	70 (43.2)	
		Pensioner	33 (20.4)	
		Working	28 (17.3)	
	Monthly income			1656.89 (813.97)
Cognitive factors	MMSE			25.22 (3.81)
	MoCA			18.78 (4.89)
Psychosocial factors	GDS	No depression	120 (74.1)	
		Mild depression	38 (23.5)	
		Severe depression	4 (2.5)	
	SWLS			28.91 (4.15)
	Brief COPE	Self-distraction		5.22 (1.64)
		Active coping		6.04 (1.46)
		Denial		3.60 (1.61)

(*continued on next page*)

Table 3 (*continued*)

			n (%)	Mean (SD)
		Substance use		2.01 (0.16)
		Use of emotional support		5.10 (1.67)
		Use of instrument support		5.22 (1.75)
		Behavioral disengagement		2.58 (1.08)
		Venting		4.23 (1.81)
		Positive reframing		5.57 (1.60)
		Planning		6.11 (1.52)
		Humor		3.70 (1.92)
		Acceptance		6.17 (1.41)
		Religion		7.67 (0.79)
		Self-blame		3.52 (1.75)
Nutritional factors	BMI			26.90 (4.51)
	Malnutrition risk	No malnutrition risk	136 (84)	
	SNAQ			14.04 (2.07)
	MNA-SF	MNA-SF2 weight reduction		2.18 (0.93)
		MNA-SF3 mobility		1.99 (0.11)
		MNA-SF4 psychological stress		1.42 (1.42)
		MNA-SF5 neuropsychology		1.55 (0.55)
		MNA-SF6 BMI		2.76 (0.62)
		Total MNA-SF		11.50 (1.73)
	Waist circumference			91.85 (14.32)
	Mid-upper arm circumference			28.61 (5.00)
	Calf circumference			34.35 (3.75)
	Fat			32.00 (9.38)
	Free fat mass			68.16 (9.41)
Functional status	Mobility			18.58 (1.82)
	IADL			10.98 (2.35)
	Muscle strength			21.84 (7.35)

BMI = body mass index; COPE = Brief Cope Scale; GDS = Geriatric Depression Scale; IADL = Instrumental Activities of Daily Living; MMSE = Mini Mental State Examination; MNA-SF = Mini Nutritional Assessment Short Form; MoCA = Montreal Cognitive Assessment; SD = standard deviation; SNAQ = Short Nutritional Appetite Questionnaire; SWLS = Satisfaction with Life Scale.

4. Discussion

The process of HNA should follow all five steps stated in the NICE guidelines; however, it is flexible. Population profiling is required in conducting HNA, but health profiling alone is not HNA. The results showed that physical health of the older people in FELDA was influenced mainly by psychological factors, followed by nutritional factors and lifestyle factors, with cognitive factors having the least effect. By contrast, mental health of the older FELDA people was influenced by psychological factors, followed by socioeconomic factors and social factors; cognitive factors had the least effect.

Psychosocial factors are the main factors influencing both physical and mental functioning of the older people in FELDA. The majority of older people in FELDA in this study were not depressed (only 2.5%), and they were satisfied with their life. Stepwise regression analysis showed smoking and active coping as significant predictors of mental functioning. The prevalence of depression among the older people in FELDA is lower compared to the prevalence in the rural areas of Malaysia, which range from 10%[32] to 48.8%[33,34,35]. Using General Health Questionnaire 12 (GHQ-12), Latifah et al[13] found that the prevalence of emotional disorders among the elderly was 18%. The factors found to have significant association with the psychological well-being were district classification and demographic factors (i.e., sex, ethnic group, marital status, number of years of education, and current working status).

The second most important factors influencing health functioning in the older FELDA people were nutritional factors, with greater impact on physical functioning (14.8%) compared to mental functioning (8.2%). Among the nutritional factors, only waist circumference was significantly associated with physical health functioning, and only weight reduction significantly influenced

Table 4
Factors influencing health functioning of the elderly in FELDA.

	PH	MH	PF	RPF	Pain	GH	SF	MF	EF	Vitality
Health conditions	8.2[a]	3.3	15.3[a]	5.4	5.5[a]	14.3[a]	4.8	9.4[a]	3.5	8.3[a]
Biological factor	2.0[a]	3.6	5.3	1.1	2.4	3.6[a]	7.9[a]	3.4	0.5	4.3[a]
Lifestyle factors	9.8[a]	8.1	12.8[a]	11.4[a]	8.4[a]	3.7	4.5	10.1[a]	12.3[a]	8.3
Access to health services	3.5[a]	3.5	8.2[a]	3.9	0.6	5.9[a]	3.3[a]	2.8[a]	3.9[a]	1
Social factors	2.9	2.7[a]	5.7[a]	9.6[a]	8.6[a]	22.9[a]	5.6	10.4[a]	6.6[a]	7.7[a]
Socioeconomic factors	2.3	3.5[a]	6.5	5.5	5.2[a]	3.4	9.4*	6.4	7.4	7.1
Cognitive factors	0.4	2.2	0.7	0.9	0.6	0.5	2.3[a]	1.9	1.7	3.2[a]
Psychological factors	15.2[a]	21.2[a]	18.4[a]	19.3[a]	10.8[a]	20.4[a]	16.3[a]	22.5[a]	13.3[a]	22[a]
Nutritional factors	14.8[a]	8.3	26.2[a]	15.5[a]	19.1[a]	15.3[a]	12.8[a]	14.4[a]	3.4	13.3[a]
Functional status	2.7	2.8	10.1[a]	4.5[a]	1.9	4.2[a]	4.6[a]	3.5	0.2	4.6[a]

Data are presented as %.
EF = emotional functioning; FELDA = Federal Land Development Authority; GH = general health; MF = mental functioning; MH = mental health; PH = physical health; PF = physical functioning; RPF = role of physical functioning; SF = social functioning.
[a] Significant predictors using R^2.

mental health functioning. Nutrition and diet have not been a part of mainstream research on quality of life and were not among the key quality of life domains. Quality of life measurements or health functioning tools do not explicitly tap nutritional dimensions. The relationship between nutrition and health functions is usually associated with aging such as the sense of smell and taste, ability to chew and swallow, as well as gastrointestinal and bowel functions, and these in turn may influence quality of life. Most of the older people in Felda Sungai Tengi are obese, which affects their physical activity. Based on the Satisfaction with Life Scale (SWLS) score, it can be concluded that the older people in FELDA lead a good life, which is highly related to good food and nutrition. They are active in social gathering such as wedding ceremonies or religious classes that involve eating with others. Excessive dietary intake and insufficient physical activity may lead to health and mental health problems, especially when they lead to obesity.

Health functioning depends on health awareness, knowledge, and level of education. Previous studies in rural[36] and urban[37] areas reported that the nutritional knowledge was unsatisfactory among Malay and Chinese elderly[38]. Older people with good nutritional knowledge and education were those who changed their diet for health reasons[39]. Understanding of health information and education depends on the level of education of the elderly. Those with a lower education level have poor understanding of health education, and were often found to have unsatisfactory health status compared to those with higher education[40].

Social factors also play an important role in enhancing quality of life in older adults. However, in this study, social factors such as marital status, living arrangement, household occupants, loneliness, and social support did not significantly affect physical or mental health functioning. This is in contrast to a study by Mohamed Shaffril et al[41] on community satisfaction toward the quality of life among the Pahang River community, which indicates that the satisfaction of this community toward the quality of life was moderate. They were highly satisfied with their social involvement and relationship, safety of their living areas, home condition, and education. This is of no surprise because the Pahang River community were well provided for by the Prime Minister, who is the Member of Parliament for that area. The same applies to the FELDA community, which is under the monitoring of the Prime Minister of Malaysia.

Lifestyle factors account for 9.8% of the variance in physical functioning of SF-12 and 8.1% toward mental functioning. Three lifestyle factors investigated, namely diet, smoking habits, and physical activities, have minimal effect on health functioning or quality of life. In a study among older adults in Europe, it was found that the unhealthy lifestyle habits such as smoking, having a low-quality diet, and being physically inactive were singly related to an increased mortality risk (hazard ratios ranged from 1.2 to 2.1). In addition, inactive and smoking persons had an increased risk for a decline in health status as compared with active and nonsmoking people[42]. In Taiwan, 10% elders were functionally dependent, and the unmet needs of activities of daily living were highly related to climbing stairs[43].

As found in this study, the health condition that affects physical functioning among the elderly in FELDA is gout/arthritis. Research on the effect of health conditions on health functioning of the elderly is scarce. One research showed that urinary incontinence in the older adults was associated with poor quality of life[44]. Abdullah and Jamal[45] evaluated HRQoL among 150 elderly respondents from the Terengganu State of Malaysia and ranked the eight indicators of HRQoL using fuzzy numbers. The result showed that the indicator of emotion has recorded the lowest problematic level, while the indicator of bodily pain recorded the highest problematic level experienced by elderly people[45].

Other factors in the study had minimal effects on health functioning. Attendance at a clinic or hospital was associated with better physical health functioning. Utilization of health care services was quite high among the older people in FELDA (70%). Access to health services was found to be highly related to physical, social, mental, and emotional functioning of the older FELDA people. Malaysia has a good network of health care services, with 97% of the citizens having access to health services within a 3-km radius of their residence[46]. Utilization of health care services depends on a variety of factors, such as the presence of chronic illness, followed by gynecological problems, psychological problems, and age $\geq$50 years[47].

Based on the health priorities, the next step is to create a list for a possible plan of action. Evaluation of how effective those actions are across all levels of prevention was carried out by assessing what has been done in Malaysia. A review of the relevant national policies was carried out to determine which actions were recommended and what the national priorities were on certain issues.

Effective actions can be targeted for a combination of health priorities. The following are possible effective actions that can improve health conditions and determinants among the older people in FELDA: (1) health promotion to increase awareness and knowledge of health; (2) weight management; (3) lifestyle modification or healthy lifestyles; and (4) mental health programs. All these programs have been launched previously by the government of Malaysia, and health campaigns were conducted all over the country. However, most of the activities were not closely monitored, and their effectiveness and acceptability were not assessed at regular intervals or in routine practice. Monitoring and evaluation of the health promotion and education program should be carried out with the assistance of the local FELDA staff, representative from the FELDA community, FELDA social workers, primary health clinic staff, and the research team.

Any health program is not without risks. The risk-management strategy will help the research team to evaluate and address possible risks, based on the project's chosen aims and objectives. We identified some of the potential risks based on the experience of conducting research projects and health promotion programs in FELDA. Older people in FELDA have easy access to the primary health clinic situated within FELDA. One constraint in seeking treatment at the clinic was a lack of transportation for the elderly who live alone, with no children or neighbors to help them attend the clinic. The clinic services were provided for basic problems; for more complex problems or some specific procedures the older people had to be referred to a hospital. The elderly had to pay out of their own pockets to travel to the hospital and for any medical procedures performed at the hospital.

Any health promotion programs should consider the level of health literacy of the targeted group. The illiteracy rate among the older people in FELDA was high. Many of them did not understand the purpose of the research project or programs. This affects their health understanding, health awareness, and participation. Because FELDA settlers were well provided for by the government, they were reluctant to participate in any health program if there were no tokens or benefits. Some of them also expect to get free medications, and every program must be well provided with meals to attract them to participate. Lack of participation was also due to a lack of transportation to the venue of the program. Some elderly did not participate because they did not understand the difference between this program and other health programs running at the same time in their locality. The lack of participation is what is considered as the discrepancy between knowledge and behavior. The understanding also depends on the materials prepared for the elderly. It should avoid too many words and too many medical jargons.

In summary, health functioning of the older people in FELDA was mainly determined by psychological factors compared to health conditions or physical functioning. FELDA older population can be an exemplar of successful aging in Malaysia as well as in other agricultural plantation areas in the world. They are satisfied with their life, have a low depression rate, and have a better socioeconomic status compared to other agricultural workers in the world. Physical health needs of the older people in FELDA were determined mainly by psychological, nutritional, and lifestyle factors, whereas their mental health needs were determined mainly by psychological, socioeconomic, and social factors. Cognitive function has minimal effects on both physical and mental health of the elderly in FELDA. FELDA has vast resources to utilize for running and maintaining health programs for their elderly people, as well as for evaluating and monitoring the effectiveness of health programs. In planning for the future care of their elderly people, FELDA should consider adopting the Program of All-inclusive Care for the Elderly, which is an innovative long-term care model for elderly in a community setting based on the model for the Chinese American community developed in the early 1970s[43].

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