

ORIGINAL ARTICLE

Practices Contributing to Healthy Longevity among Elderly Population in Ipoh, Perak.

Durratul Hannah Hanaz Ismadi, Nur Farah Atikah Rosman, Nur Naili Nadiah Mohamad Shaiedi, Siti Nur Aisyah Zulkifly, Qistina Adilah Redzuan and Osman Ali*.

Department of Community based, Royal College of Medicine Perak, Universiti Kuala Lumpur. Ipoh, Perak, Malaysia.

Corresponding Author

Osman Ali

Department of Community based, Royal College of Medicine Perak

Universiti Kuala Lumpur, Ipoh, Perak, Malaysia.

Email: osmanali@unikl.edu.my

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Abstract

Background: Healthy longevity refers to living a long life while maintaining good health, influenced by genetics, lifestyles, and overall well-being.

Aim: This study examines lifestyle, social, and spiritual practices contributing to longevity among elderly individuals aged 80 years and above in Perak.

Materials and method: A mixed method study was conducted, involving interviews of 5 elderly individuals aged 85 and above, for the qualitative component, and 55 elderly individuals were subjected to a self-administered questionnaire for the quantitative component. The questionnaires aimed to obtain information on sociodemographic and health information, along with details on lifestyle, social, and spiritual practices.

Results: The study found that healthy aging and longevity were associated with proper diet, active living and adequate sleep. Early healthcare interventions helped reduce disease-related morbidity. Social interactions improved mental health, and high spirituality, including feelings of gratitude played a crucial role in well-being. Quantitative data showed 56.4% of respondents () had a normal body mass index (BMI), 61.8% were physically active. Most consumed rice regularly (78.2%), along with meat (89.1%), seafood (92.7%), dairy products (83.7%), vegetables (63.6%). and fruits (>80%). Majority never smoke (70.9%) or drink alcohol (76.4%). However, almost 90% had comorbidities, especially hypertension (78.2%), diabetes mellitus (56.4%) and dyslipidemia (54.5%), with 87.3% on medication and 76.4% showing good disease control. Most respondents had good relationships with relatives and friends (60%) and had moderate to high social engagements (more than 60%). High spirituality was practiced by 72%. Those under 85 had significantly higher social engagements ($p<0.03$), while higher education was significantly associated with high spirituality.

Conclusion: Proper diet, active lifestyles, social interactions, spiritual well-being, no smoking, and non-excessive alcohol consumption contribute to healthy aging and longevity.

Keywords: *elderly, lifestyles, longevity, social interactions, spiritual well-being.*

Introduction

The world is currently experiencing a significant increase in the aging population and Malaysia follows a similar trend. Between 2000 and 2050, the proportion of people over 60 is expected to double from 11% to 22%, increasing from 605 million to 2 billion people [1]. In Malaysia, the elderly population (aged 60 and above) is projected to increase from 7.1% in 2020 to 14.5% in 2040 [2]. This growth is driven by increased life expectancy, declining birth rates, and improved healthcare services.

The aging population in Malaysia presents challenges, particularly for the healthcare system, which needs to adapt to cater for the needs of the elderly. Comprehensive policies and programs are required to ensure their well-being. However, the aging process and longevity are not uniform across all populations and are associated with genetics, lifestyle, and overall health. Healthy longevity refers to living in good physical, cognitive and social health throughout the biological life span. To achieve these goals, requires maintaining physical and mental health, following a nutritious diet, avoiding smoking as well as excessive alcohol usage, and staying mentally active to prevent undesired outcomes of ageing [3].

Numerous studies have explored factors influencing health in the elderly and their correlation with longevity. There is evidence suggesting that longevity is influenced largely by genetic and familial background [4] of which certain genes are associated with advanced age [5]. Some studies have found that physical activities were strongly associated with longevity. For example, a study done in Northeastern Thailand found that elderly individuals aged 80 to 105 had normal body mass index (BMI), practiced daily physical activities such as walking for 2 to 3 kilometers per day, arm swinging, Tai Chi, bar slope dancing, gardening, etc. Other lifestyle factors such as a proper diet, good nutrition, cigarette smoking avoidance, controlled alcohol consumption, adequate sleep and rest as well as compliance with medication also play an important role in longevity [6]. Good emotional,

familial, and financial support is vital in leading a stress-free life thus leading to an enhanced life span [7].

Despite growing interest in elderly care there is limited research on their specific needs in Malaysia. Thus, this study aims to study practices among the elderly aged 80 years and above in Perak, that contribute to healthy longevity.

Materials and methods

This mixed-method study involves interviews for the qualitative, and a self-administered questionnaire for the quantitative component, aimed at identifying practices that contribute to healthy longevity among elderly individuals in Perak. The target population includes Malaysian elderly people aged 80 and above, living in Ipoh and appear healthy. The age cut-off of 80 years was based on Malaysia's life expectancy of approximately 76 years. For the qualitative study, 5 respondents were selected via snowballing method. The quantitative sample size of 55 respondents was calculated based on the expected proportion of 8% of elderly individuals above 80 years old in Kinta District, with a 95% confidence interval. Convenient sampling and snowballing technique were used to recruit participants with referrals from those participants until the targeted sample size was reached.

For the qualitative interviews, eligible respondents provided signed informed consent and the conversations were recorded. The interviews focused on individual practices of respondents contributing to longevity and coping strategies for current living. For the quantitative component, all consented respondents completed a self-filled questionnaire. Variables measured included sociodemographic and health status such as age, gender, race, religion, education, previous occupation, co-morbidities, treatment and compliance with medication, smoking habits and alcohol consumption. Practices such as lifestyles, dietary intake, social and spiritual beliefs were also assessed. The content validity of the questionnaires was evaluated by 2 senior lecturers

in the Royal College of Medicine Perak and pretested with 10 people in the community.

Plan for Data Analysis

The qualitative data from the interviews were transcribed for analysis. All collected data were read several times by the researchers. Constant comparison and verification were done, comparing answers within the same interview and across different interviews of all the participants. The themes were searched, mapped, and interrelated so that the meaning of the themes obtained from the interview could be interpreted. For the quantitative data, the data collected were cleaned and analyzed using SPSS version 26. The social engagements were measured using six questions and were scored (None=0, one=1, two = 2, three to four = 3, five to eight = 4 and nine or more = 5). Score of 0-10 was considered low, 11-20 as moderate and 21-30 as high engagements. The spiritual belief levels were measured using eleven questions and were scored (Never = 0, seldom =1, often = 2, regularly= 3). A score of 0-10 was considered low spirituality, 1-20 as moderate and 21-33 as high spirituality. The frequency and normality tests were performed. The Chi-square test was used to determine the association between some practices and sociodemographic variables. A $p < 0.05$ was considered significant.

Ethical Consideration

Ethical approval was obtained from the Ethics Committee of Universiti Kuala Lumpur, Royal College of Medicine Perak before conducting this study.

Results

Qualitative data from interview

Three women and 2 men, aged between 80 and 87 years were interviewed. Four were Malays and one was Chinese. Most had primary education.

Lifestyle practices

It was found that all respondents had quite similar lifestyles, with their beliefs being the most

important factor in achieving a long and healthy life. One of the respondents, an 85-year-old woman, believed that a good diet and physical activity helped her for a long healthy life.

“For me the most important things are diet and physical activity. For diet, we can eat everything but need to make sure we take it in small amounts such as sugar and fat. Other than that, physical activity is also important to me. I will do gardening, sweeping and walking to my neighbors’ house. I sweat a lot when I do this kind of activity and makes me feel more energetic. I also do exercise help me to feel stronger to do other things.”

This study showed that the inclusion of religious and spiritual practices, alongside other health factors, influences longevity. Some of the responses,

“I believed that maintaining a good lifestyle was the main key factor in keeping longevity such as exercising everyday by involving themselves in certain activities like brisk walk, tai chi and gardening. Next, for the dietary habit, I will control my carbohydrate portion, reduce sweetened food or drinks and avoid junk food. Furthermore, having enough sleep also improve longevity.”

“To me, eating habits are the most important. I always ensure adequate plain water consumption and consume fruits and vegetables every day. I also avoid salty foods like ‘budu’ or salted fish. However, I do like eating sweet snacks like ‘kuih’ daily, and I compensate and control the sugar intake by using stevia for my drinks such as tea or coffee. Other than that, I do morning exercise daily by brisk walk about 20 minutes. I also ensure I have good sleep and enough rest every day.

One of the women stated that physical activity and cautious eating habits could help someone stay healthy as they get older. Additionally, she

mentioned that the most important thing in achieving a long and healthy life is compliance with treatment.

“People who are physically activity seem to be able to stay healthy when they get older. A lot of people around me who do office work or live sedentary life tend to be less independent when they get older. Some of my old friends who are younger than me can’t even walk by themselves now, but those who worked as cleaner like me or exercise every day mostly are still able to be independent with their daily activities.”

“My parents both have multiple diseases, and they were not compliant with the treatment and lifestyle changes. So, I learn from it and be cautious with eating habits. After I was diagnosed with diabetes mellitus and hypertension, I avoided eating store-bought food and cooked my own meal. I ate less carbohydrates and ate a lot of vegetables. I believe that is why my sugar level is always controlled even though it’s been over 30 years since I have diabetes mellitus. But I rarely do exercise before because I already do a lot of physical work during working hours. Now that I have already retired, I just take a walk every morning (10 – 15 minutes a day) or walk to the store to buy groceries. But the most important thing is compliant to treatment. For me, the medication is like a daily food already, and the health checkup also has become a routine.”

One of the 86-year-old man gave some useful advice,

“Please stop eating unhealthy foods like fast foods and try to eat more vegetables, fruits and always control your meal portions.”

“I will usually do some gardening and house chores like mopping and sweeping. Sometimes I would take a walk around the neighborhood. In my opinion, it is important to move around and do an activity because it will help your brain to keep

functioning and prevent your body from getting muscles aches.”

Social practices

Strong social support from family and friends can help people to have long and healthy life. One of the female respondents mentioned that she always received support from family and friends to cope with life’s stresses and help reduced her risk of developing serious diseases.

“We need to have friends so we can have someone to talk to. For example, I will call them or go out together if I have free time. So, I can share my problems with my friends. Sometimes we also need to ask them if they have any problems. We need to share our problems with others. If we just hold it without sharing it, it can make us more stressed and can have a bad impact on our health. That’s why it is important to share the problems with friends or family members.”

Another respondent believed that they felt happier and more motivated to work when they had good interactions with others. She also participated in activities with other people to tighten their relationships.

“It is very important to have people around us. When we have people to talk to, we are happier, we would have the spirit to do work, but when we are alone, we won’t even have an appetite to eat. After my husband passed away 10 years ago, my son asked me to live with him so he can take care of me. I still meet and talk with my old friends from school who live nearby, and we still talk and chatting about everything like when we were in school.”

“I love cooking and watching cooking videos on television and internet. I don’t know if it is related to longevity, but it gives me joy to have something interesting to do every day. I learn a lot of recipes and cook with my family. So, it became our family activity. Luckily, they also like to cook, so we can

talk while spending time together, because I think it has become harder for old people like me to talk and chat with the younger generation nowadays. Maybe due to different interest and commitment, but we must find a way so that we can maintain our close relationship,”

The respondents also believed that maintaining good relationships with people was essential for having a good support system. Keeping closer relationships with family members seemed to be an important recipe for long life. Some of their responses,

“Personally, I think it’s important that we keep good social relationships with others, as we need good support systems.”

“By interacting with family members and relative, give advice and opinion to one closer in order to maintain good relationship.”

“I currently don’t have a lot of friends left as they have all passed away. Only a few of them left and I rarely meet them but sometimes I meet them at the mosque after performing our prayers. In terms of family, my child and grandchildren always come and visit me. If they do not have the time to do that, they will at least call and asked if I am doing okay, and we will just talk about our life updates. One of my children has passed away but the others are still healthy, and they visit me regularly. They just came and visit me during ‘raya’ celebration. So, I think that having someone to talk to is very important so that you would not feel lonely, and you have someone to count on especially your children. For me, I still have my wife, so I do have someone to talk to everyday. I can share all my worries to my wife and children.”

Spiritual practices

All respondents have the same belief that spirituality could influence longevity. Frequent prayers to God helped them find comfort, hope,

and inner peace. A positive and helpful attitude about life and illness could lead to better health outcomes. Some of their quotes,

“Not easily stressed due to my belief of accepting everything wholeheartedly and feeling of great gratitude would support healthy aging,”

“I always participate in tazkirah or religious lecture at mosque. I always performed prayer and fasting to improve my health and improve my self-realization. Furthermore, I will make sure that I will keep good relationships with family members and relative to improve mental wellbeing.”

“I believe that the most important thing is to always perform your prayers and do lots of ‘doa’ so that we are blessed with good health and live longer. Life and death are something that we could not plan as it is according to God’s will. I am very thankful for all the fortunes that I currently have right now, and I am still given a chance to be alive with my spouse.”

“I am rarely going to church, but I do believe that each of us has purpose in life. Since I was young, I prayed everyday so that my life will become better. Now, even though I am not rich, I am satisfied and content with my life. I believe I finally got what I worked hard and prayed for.”

Quantitative Data from Questionnaire

Sociodemographic data

In this study, out of 55 respondents, the majority were elderly individuals aged 80-84 years (74.5%), female (58.2%), Malay (50.9%), had a primary school education (40%) and were retired government employees (60%) (Table 1)

Health status

Most respondents were either of normal weight (56.4%) or overweight (23.6%). Almost 90% of the respondents reported having co-morbidities, especially hypertension (78.2%), diabetes mellitus (56.4%), and dyslipidemia (54.5%).

Most of them took medication for their illnesses (87.3%) and have good compliance (76.4%). However, half of them had a disability that limited their activities (Table 2).

Lifestyle practices

Most of them practiced frequent physical activity (61.8%), especially brisk walking (60%). Very few were current smokers (5.5%), with most being either former smokers or never having smoked. Among smokers and former smokers, most smoke less than 10 cigarettes or less daily. Most of them did not consume alcohol. More than 70% of respondents slept between 5 to 8 hours daily (Table 3).

Dietary intake practices

In terms of food intake, most respondents consumed rice (78.2%) and vegetables (63.6%) regularly, and more than often taking flatbread (68.1%), meat (89.1%), fish and sea foods (92.7%), dairy products (83.7%), legumes (54.5%) and fruits (more than 80%). Although 63.7% of respondents seldom or never took salty food, sweet foods seemed to be a choice by more than 60% of them, especially beverages (70.9%) (Table 4).

Social relationship practices

The study found that most respondents have good relationships with their relatives and friends. About 60% were in regular contact with their relatives with at least 3 relatives per month, and around 90% felt at ease and received help from at least one relative. Most respondents continued to get moral support and help from friends. Fewer than 10% had no contact with friends, while more than 50% still had more than 5 friends to chat with. About 45% of respondents still had close friends who could offer help in times of difficulties (Table 5).

Social Engagements level of Respondents

The prevalence of low social engagement was 36.4%, moderate 34.5% and high 29.1%. For the association analysis, moderate and high social

engagement were combined. The age was reclassified into less than 85 and more than 85 years old, ethnic groups into Malays and non-Malays and education levels into informal/primary and above. It was found that age was significantly associated with social engagement ($p = 0.03$) of which younger participants seemed to be more socially engaged (70.7%) compared to the older participants (42.9%). Other sociodemographic factors showed no significant relationship with the level of social engagement.

Spiritual belief practices

A strong spiritual belief seemed to be very well related to healthy aging and longevity. The study showed that most respondents prayed regularly (63.6%), more often self-reflected on the purpose of life (71%), experienced self-realization (72.8%), helped others (68.2%), considered the needs of others (76.4%) and felt great gratitude (81.8%) (Table 7).

Spiritual belief levels of the respondents

The prevalence of low spirituality was 3.6%, moderate 30.9% and high 65.5%. For the association analysis, low and moderate spirituality was combined. The age was reclassified into less than 85 years and 85 years or more, ethnic groups into Malays and non-Malays, and education levels into informal/primary and above. It was found that spirituality and belief were not associated with age, gender or ethnic groups. However, the level of education was significantly associated with spirituality and belief. High spirituality and belief were common among elderly with secondary education and higher compared to those with informal or primary education (p -value < 0.05) (Table 8).

Discussion

Analysis of qualitative data showed insights into the perspectives of elderly individuals, aged 80 to 87, regarding factors contributing to longevity. The study further explores lifestyle, social, and

spiritual practices as crucial elements influencing health outcomes in the elderly population.

All respondents unanimously agreed that lifestyle factors such as diet, physical activity, and adherence to treatment regimens play a huge role in maintaining long-term health. The emphasis on dietary habits, including portion control, balanced nutrition, and hydration, underscores the significance of mindful eating practices in disease management and prevention. Additionally, engaging in regular physical activity, whether through structured exercise routines or daily chores, reflects a commitment to maintaining mobility and vitality in later life. These findings align with global research, where lifestyle modifications such as dietary habits and physical activity have been shown to extend life expectancy [8-9]. Notably, the incorporation of lifestyle modifications following health diagnoses highlights the adaptive capacity of individuals to proactively manage their well-being.

In terms of social, the significance of social connections emerges as a key theme in the narratives, with respondents attributing their well-being to the support received from family and friends. Interactions with peers serve as platforms for emotional release, stress management, and friendship, thereby bolstering mental resilience and overall satisfaction with life. The role of familial relationships, particularly in providing care and companionship, highlights the importance of maintaining social bonds in mitigating loneliness and fostering a sense of belonging in older adults. Moreover, the reciprocity of support within familial networks exemplifies the symbiotic nature of intergenerational relationships in promoting holistic health outcomes. This has been shown in a few studies that discuss the impact that social involvement plays in extending life expectancy in the elderly [10-11].

Spirituality plays a fundamental role in coping strategies and meaning making for the respondents. Religious rituals, prayer, and seeking solace in faith communities offer ways to

find inner peace, acceptance, and gratitude amidst life's challenges. The narratives demonstrate how spiritual beliefs serve as sources of resilience, influencing attitudes towards illness, mortality, and life satisfaction. Spirituality helps promote psychological well-being and adaptive coping mechanisms in the face of adversity by cultivating a sense of purpose and transcendence. While some may see the inclusion of religion alongside other health factors as unscientific, multiple studies conducted globally have shown that spiritual influences seem to increase with age [12]. The qualitative part of the study highlights the complex interactions between lifestyle choices, social support systems, and spiritual beliefs in shaping health outcomes among elderly. By recognizing and addressing the diverse needs and perspectives of older individuals, healthcare professionals can design comprehensive interventions that promote holistic well-being and facilitate successful aging. The quantitative components on the other hand, provide the magnitude and extent of the factors perceived or felt by the respondents. It was found that almost 90% of the study respondents had already established the state of disease, especially hypertension, diabetes mellitus, and dyslipidemia. Most of them have been in treatment for many years, strictly complied with the regime, and had a well-controlled disease status. It is well known that mortality is increased by increasing age largely due to ischemic heart disease [13-14].

In this study, most respondents have a normal BMI (56.4%). This corresponds to the high frequency of physical exercise (61.8%) among them. The study showed that most of the respondents were actively involved in physical activity like gardening (40%), jogging (14.5%) and aerobics (12.7%). Most of them never smoke cigarettes (70.9%) or drink alcohol 76.4%). It is widely recognized that regular physical activity can enhance physical and mental functions, as well as reverse the effects of chronic diseases, which can help keep older individuals mobile and independent [15]. Regular physical activity also is safe for healthy and frail older people. It may

reduce the risks of developing cardiovascular diseases or its complications, obesity, muscular weakness (sarcopenia) and falls, depressive disorder, dementia etc. However, many studies showed that participation in physical activities at this age remains low, especially after they retire from work. People aged >80 years are over 50 % less likely than those in their early 50s to engage in sports or to want to increase their activity levels. The level will further decline as the person ages [16].

The dietary habits among respondents seem to be related to their long lifespan. Most of the respondents in the study consume a good and balanced diet. Their intake of carbohydrates, proteins, fats, vegetables, and fruits was according to the recommended portion that has been suggested by the doctors with little to no added sugar, saturated fats, and salt. Portion control is very crucial to prevent overeating and weight gain as the metabolic rate will decrease as age increases. Older people need a lower energy intake, higher protein content to preserve muscle mass, and a greater supply of vitamins and minerals to maintain good bone health. A cross-sectional study among people above 60 years old residing in the Spanish Mediterranean using a food frequency questionnaire found that the compliance to a recommended dietary intake (RDI) was low. However, among those people with higher degree of compliance to the recommended intakes, they have better control of their blood pressure, cholesterol, and glucose levels [17]. Poor compliance with RDI in elderly seemed to be related to decreased appetite, swallowing, and mastication difficulties, which reduce their motivation to eat [18]. A diet that is specifically formulated and textured for the elderly can enhance their quality of life and longevity.

Regarding the social aspects, most respondents frequently met or were in contact with nine or more of their relatives in a month (27.3%). It is well known that family bonding is very important for a sense of purpose and belonging in life. It offers an opportunity for the elderly to connect

with others, especially family members and relatives, that have similar interests and values. They also feel at ease talking about private matters and even ask for help when needed. They believed that maintaining good relationships with close companions would help them with emotional support, reduce the feelings of loneliness, and promote overall well-being [19]. However, a study showed that their social engagement with the community was low. This is probably due to the inability of elderly individuals to use gadgets for connecting with friends and the community. Strong social support has been proven to be one of the main components that can help people stay healthy and have long life. Persistent social interaction can help the elderly to increase mental stimulation, emotional resilience and quality of life [20].

On spiritual and belief factors, most respondents privately pray regularly with 63.6% believing that engaging with religious belief can provide a sense of spiritual nourishment and coping mechanism during times of adversity [20]. They also work in the mind-body discipline, reflect upon the meaning of life, and get to realize the insight as this is one of the ways to maintain healthy longevity. Furthermore, most of them in this study regularly have feelings of great gratitude as having the opportunity to live longer than others (63.6%), similar to findings in another study [21]. A high level of spirituality among respondents (65.5%) in this study was also identified as a key factor in maintaining longevity and staying healthy [22].

The findings from this mixed study support the need for active lifestyle practices, proper dietary intakes and maintaining mental health through social engagements and high spirituality to achieve healthy longevity. However, the results of this study should be interpreted cautiously as it is a cross-sectional and descriptive study, using a self-administered questionnaire and a convenience sampling method. Nevertheless, the results may provide insights into common practices adopted by elderly people in Perak and possibly Malaysia in general to stay healthy in old

age. Larger study with a greater number of samples are highly recommended.

Conclusion

This study demonstrated that maintaining physical and mental health by practicing proper dietary intakes, active lifestyles, avoiding smoking and excessive alcohol usage, as well as by enhancing social and spiritual health can help to prevent the undesired outcome of ageing and preserve longevity.

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Conflict of interest

The authors verified that there were no financial or commercial ties that might be viewed as having a potential conflict of interest.

Authors contribution

The first five authors designed, managed, and wrote the paper as main contributors of this study. The sixth author provided intellectual, technical input and editing of the manuscript for publication purposes.

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Table 1. Sociodemographic data distribution among respondents (n = 55)

Variable		Frequency (N)	Percentage (%)
Age	80-84 years old	41	74.6
	85-90 years old	13	23.6
	91-95 years old	1	1.8
Gender	Male	23	41.8
	Female	32	58.2
Race	Malay	28	50.9
	Chinese	22	40
	Indian	4	7.3
	Punjabi	1	1.8
Religion	Islam	28	50.9
	Christian	13	23.6
	Buddhism	10	18.2
	Hinduism	3	5.5
	Sikh	1	1.8
Education level	No formal education	3	5.5
	Primary	22	40
	Secondary	15	27.3
	Tertiary	15	27.3
Previous occupation	Government	33	60
	Private	10	18.2
	Self-employed	1	1.8
	Housewife	11	20

Table 2. Health status and coping with illnesses of the respondents

Variable		Frequency (N)	Percentage (%)
Body Mass Index (BMI)	Underweight	7	12.7
	Normal	31	56.4
	Overweight	13	23.6
	Obese	4	7.3
Medical Illness	Diabetes Mellitus (DM)	31	56.4
	Hypertension (HPT)	43	78.2
	Ischemic Heart Disease (IHD)	5	9.1
	Hyperlipidemia (HLD)	30	54.5
	Gout	2	3.6
	Bronchial Asthma (BA)	1	1.8
	Parkinsonism (PD)	1	1.8
	Liver cirrhosis (LC)	1	1.8
	Glaucoma	1	1.8
	No co-morbidity	6	10.9
	Treatment of Illness	Yes	48
No		1	1.8
Not applicable		6	10.9
Compliance to Medication	Yes	42	76.4
	No	4	7.2
	Partially	3	5.5
	Not applicable	6	10.9
Limitation of Activities due to Illness	Yes	28	50.9
	No	21	38.2

Table 3. Lifestyles factors

Variable		Frequency (N)	Percentage (%)
Body Mass Index (BMI)	Underweight	7	12.7
	Normal	31	56.4
	Overweight	13	23.6
	Obese	4	7.3
Frequency of physical exercise	Frequent	34	61.8
	Rarely	18	32.7
	Never	3	5.5
Type of physical activity	Brisk walking	33	60
	Jogging	8	14.5
	Tai Chi	6	10.9
	Aerobics	7	12.7
	Gardening	22	40
	Cycling	1	1.8
	Physiotherapy	2	3.6
	House chores	4	7.3
	None	4	7.3
History of smoking	Currently	3	5.5
	In the past	13	23.6
	Never	39	70.9
Smoking habit	10 or less daily	10	18.1
	11-20 daily	4	7.3
	21-30 daily	1	1.8
	31 or more	1	1.8
	Not applicable	39	70.9
Alcohol consumption	Frequent	1	1.8
	Rarely	12	21.8
	Never	42	76.4
Sleep and rest	Less than 5 hours	9	16.4
	5-6 hours	19	34.5
	7-8 hours	21	38.2
	More than 8 hours	6	10.9

Table 4. Dietary intake.

Variable		Frequency (N)	Percentage (%)
Dietary habit: Rice and noodles	Regularly	43	78.2
	Often	9	16.4
	Seldomly	2	3.6
	Never	1	1.8
Dietary habit: Oats	Regularly	3	5.5
	Often	9	16.4
	Seldomly	11	20.0
	Never	32	58.2
Dietary habit: Flatbread	Regularly	7	12.7
	Often	31	56.4
	Seldomly	13	23.6
	Never	4	7.3
Dietary habit: Meats	Regularly	23	41.8
	Often	26	47.3
	Seldomly	2	3.6
	Never	4	7.3
Dietary habit: Fish and seafood	Regularly	18	32.7
	Often	33	60.0
	Seldomly	2	3.6
	Never	2	3.6
Dietary habit: Dairy	Regularly	14	25.5
	Often	32	58.2
	Seldomly	7	12.7
	Never	2	3.6
Dietary habit: Legumes	Regularly	8	14.5
	Often	22	40.0
	Seldomly	15	27.3
	Never	10	18.2
Dietary habit: Tropical fruits	Regularly	19	34.5
	Often	33	60.0
	Seldomly	3	5.5
	Never	0	0
Dietary habit: Fruits	Regularly	11	20.0
	Often	34	61.8
	Seldomly	10	18.2
	Never	0	0
Dietary habit: Vegetables	Regularly	35	63.6
	Often	18	32.7
	Seldomly	1	1.8
	Never	1	1.8
Dietary habit: Local snacks	Regularly	7	12.7
	Often	30	54.5
	Seldomly	11	20.0

	Never	7	12.7
Dietary habit: High salt foods	Regularly	1	1.8
	Often	19	34.5
	Seldomly	15	27.3
	Never	20	36.4
Dietary habit: Sweet foods	Regularly	3	5.5
	Often	34	61.8
	Seldomly	7	12.7
	Never	11	20.0
Dietary habit: Beverages	Regularly	10	18.2
	Often	29	52.7
	Seldomly	11	20.0
	Never	5	9.1

Table 5. Social engagement factors

Variable		Frequency (N)	Percentage (%)
How many of your relatives do you see or hear from at least once a month?	None	2	3.6
	One	10	18.2
	Two	10	18.2
	Three to four	8	14.5
	Five to eight	10	18.2
	Nine or more	15	27.3
How many relatives do you feel at ease with that you can talk about private matters?	None	6	10.9
	One	14	25.5
	Two	11	20.0
	Three to four	5	9.1
	Five to eight	13	23.6
	Nine or more	6	10.9
How many relatives do you feel close to such that you could call on them for help?	None	4	7.3
	One	8	14.5
	Two	15	27.3
	Three to four	7	12.7
	Five to eight	13	23.6
	Nine or more	8	14.5
How many of your friends do you see or hear from at least once a month?	None	5	9.1
	One	12	21.8
	Two	8	14.5
	Three to four	5	9.1
	Five to eight	11	20.0
	Nine or more	14	25.5
How many friends do you feel at ease with that you can talk about private matters?	None	15	27.3
	One	9	16.4
	Two	10	18.2
	Three to four	9	16.4
	Five to eight	5	9.1
	Nine or more	7	12.7
How many friends do you feel close to such that you could call on them for help?	None	11	20.0
	One	13	23.6
	Two	12	21.8
	Three to four	6	10.9
	Five to eight	4	7.3
	Nine or more	9	16.4

Table 6. Association between social engagements and sociodemographic factors.

Social Factors	category	n	Low Social Engagement	Moderate/high Social Engagement	P-value*
Age	<85	41	12 (29.3%)	29 (70.7%)	0.03
	≥85 (n=14)	14	8 (57.1%)	6 (42.9%)	
Gender	Male	23	11	12	0.13
	Female	32	9	23	
Ethnic group	Malays	28	8	20	0.22
	Non-Malays	27	12	15	
Education	Informal or primary	25	9	16	0.95
	Secondary and above	30	11	19	

P<0.05 is significant.

Table 7. Spiritual belief factors

Variable		Frequency (N)	Percentage (%)
I privately pray	Regularly	35	63.6
	Often	18	32.7
	Seldom	0	0
	Never	2	3.6
I go to mosque/ church / temples etc.	Regularly	15	27.3
	Often	13	23.6
	Seldom	21	38.2
	Never	6	10.9
I work on a mind-body discipline	Regularly	8	14.5
	Often	9	16.4
	Seldom	14	25.5
	Never	24	43.6
I reflect upon meaning and purpose of life	Regularly	14	25.5
	Often	25	45.5
	Seldom	15	27.3
	Never	1	1.8
I try to get insight or self-realization	Regularly	14	25.5
	Often	26	47.3
	Seldom	13	23.6
	Never	2	3.6
In my private area, religious symbols are important to me	Regularly	22	40.0
	Often	21	38.2
	Seldom	2	3.6
	Never	10	18.2
I participate in religious events	Regularly	15	27.3
	Often	9	16.4
	Seldom	19	34.5
	Never	12	21.8
I help others	Regularly	27	49.1
	Often	16	29.1
	Seldom	9	16.4
	Never	3	5.5
I consider the needs of others	Regularly	26	47.3
	Often	20	36.4
	Seldom	7	12.7
	Never	2	3.6
I have a feeling of great gratitude	Regularly	35	63.6
	Often	17	30.9
	Seldom	3	5.5
	Never	0	0
I still have learned to experience and value beauty	Regularly	29	52.7
	Often	16	29.1
	Seldom	9	16.4
	Never	1	1.8

Table 8. Association between spirituality and belief with socio-economic factors.

Spirituality Factors	category	n	Low/moderate spirituality	high spirituality	P-value*
Age	<85	41	14	27	0.92
	≥85	14	5	9	
Gender	Male	23	10	13	0.17
	Female	32	8	23	
Ethnic group	Malays	28	7	21	0.13
	Non- Malays	27	12	15	
Education	Informal or primary	25	17 (68.0%)	8 (32.0%)	0.00002 (S)
	Secondary and above	30	2 (6.7%)	28 (93.3%)	

P<0.05 is significant.

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