ORIGINAL ARTICLE

Successful Ageing and Its Associated Factors Among Elderly Association Members in Kuching

Loo Tze Yong[1], Cheah Whye Lian[2], Jeffrey anak Stephen[2]

[1] Masters in Public Health (MPH), Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia
[2] Department of Community Medicine & Public Health, Faculty of Medicine & Health Sciences, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

ABSTRACT

Background: Successful ageing has become vital in the growing elderly population. The current study aimed to determine the prevalence and factors linked with successful ageing among members of elderly associations in Kuching. **Materials and methods:** This study employed a structured questionnaire from the Successful Ageing Inventory (SAI) through a cross-sectional survey involving 172 respondents. Respondents were randomly sampled from elderly associations, and information were collected from January to April 2024. Subsequently, statistical package for social sciences (SPSS) 22.0 was utilised during data analysis, employing descriptive statistics, univariate analysis, and multiple linear regression. **Results:** A 66.28% successful ageing prevalence was recorded. The results also indicated positive associations with successful ageing with higher education (secondary education: Adj. b = .85, 95% CI: .04, 1.66; p = .040; tertiary education or higher: Adj. b = 0.97, 95% CI: .09, 1.85; p = .031), living arrangements (spouse: Adj. b = 1.24, 95% CI: 0.38, 2.10; p = .005; spouse and children: Adj. b = 1.10, 95% CI: 0.23, 1.97; p = .014), Similarly, respondents who had five or more close friends or neighbors (Adj. b = 1.41, 95% CI: 0.19, 2.62; p = .023), and better access to neighborhood facilities (Adj. b = 1.49, 95% CI: 0.19, 2.79; p =.025) demonstrated successful ageing. Conversely, heavy drinking negatively impacted successful ageing among the respondents (Adj. b = -1.44, 95% CI: -2.65, -0.22; p = .021). **Conclusion:** Based on the findings, primary parameters influencing successful ageing include drinking habits, education level, living arrangements, access to neighbourhood facilities and social support through participation in elderly association activities.
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Corresponding Author:
Loo Tze Yong, MPH
Email: drjasonlootzeyong@gmail.com
Tel: +017-2972944

INTRODUCTION

The overall health of individuals, communities, and healthcare systems are profoundly affected by the global phenomenon of a consistently increasing ageing population. According to the World Population Prospects (1), the worldwide population aged 65 and above is expected to rise from 10% in 2022 to 16% by 2050, achieving twice the population of children under five years old. According to the Malaysian Department of Statistics (DOSM) (2), 10.7% of the Malaysian population was 60 years old and above in 2022.

Ageing is an unavoidable gradual event that leads to several cognitive, physical, psychological, hormonal, and social alterations (3). The process also result in a decline in physiological functions associated with ageing, potentially presenting obstacles in performing everyday life tasks and diminishing overall well-being (4). Consequently, understanding the factors and determinants related to Successful Ageing is critical to promote positive adaptation in ageing (5).

Successful ageing is not a recent or novel concept and has been the subject of numerous studies. Rowe and Kahn (6) introduced the concept of successful ageing in 1987. Based on the concept, ageing was described as maintaining active engagement with life and considerable physical and cognitive functioning in old age without major diseases and psychological issues (7). Nevertheless, the concept has evolved to incorporate physical, functional, psychological and social factors (8). Currently, comprehension of successful ageing significantly varies (9) with widely differing conceptualisations and definitions (10,11). The inadequate standardised interpretations have led to challenges in identifying consistent determining factors for successful ageing. For instance, some researchers define successful ageing primarily by the absence of cognitive disability and diseases and good physical health maintenance. Meanwhile, other studies

emphasised life satisfaction and well-being through social engagement (12). Nevertheless, a comprehensive and promising description of successful ageing should incorporate multiple domains, such as maintaining health, daily functioning, a sense of control, physical and cognitive abilities, social participation, and positive emotional well-being (13).

Successful ageing is a multi-dimensional concept, hence, the factors associated with the event are diverse and complex. Consequently, focusing on individual parameters during successful ageing studies can introduce bias, neglecting the broader context and limiting the understanding of the concept. A comprehensive successful ageing report should encompass all the factors surrounding individuals, including sociodemographic and psychological characteristics, social relationships, and environment alterations, to enhance successful ageing (14).

Elderly individuals should be encouraged and motivated to participate in social activities to maintain their health and well-being. Social participation is crucial in achieving successful ageing, considering its correlations with health benefits, cognitive functioning, healthy behaviours, subjective health status, and reduced mental illnesses, disabilities, and mortality risks (15,16). Consequently, this study involved elderly individuals who have engaged in social participation through elderly associations.

The primary objective of Malaysian elderly associations is to create a platform to promote social engagement and establish a socially healthy environment for the elderly population, aligning with successful ageing principles (17). Elderly individuals have reported notable advantages of joining in the activities and services offered by elderly associations (18). They also recommended constructing more similar centres to support and engage the community. In the associations, the elderly can partake socially through six methods: hobby groups, sports teams, volunteer organisations, neighbourhood associations, and senior clubs (19). Forming social connections with families, meeting new friends, engaging in community activities, and participating in volunteer work are also included.

Studies on the social benefits gained by elderly individuals from participating in elderly associations are rarely performed in Malaysia. Studies on the factors influencing successful ageing in the country is also limited. Consequently, the current study can offer valuable data for the well-being of the elderly population by demonstrating the role of social participation in promoting successful ageing among members of elderly associations. This study also addressed a knowledge gap by offering targeted insights into the benefits of social engagement within elderly associations, as existing studies tends to focus on the general elderly population or broader community groups. Furthermore, these insights can offer baseline information for future studies, contributing to understanding how social activeness aids successful ageing and the associated factors.

MATERIALS AND METHODS

The present cross-sectional study involved selected elderly respondents from the Sarawak Gerontology and Geriatric Society (SGGS) and Pusat Aktiviti Warga Emas (PAWE) Sri Satok, Kuching, Sarawak. The respondents were randomly chosen from the complete list provided by the secretaries of the associations. Data collection was performed from January 2024 to April 2024. Informed consent was obtained from respondents before data collection.

This study only involved the elderly actively participating in the activities offered by the elderly associations. The elderly must also possess the ability to understand and consent to this study voluntarily. Permission and consent to conduct this study were also procured from the presidents and committee members of the selected associations. Elderly individuals who could not cooperate or were critically ill were excluded.

The single-proportion formula (20) was employed to determine the required sample size for the current study. Based on a 95% confidence interval, the prevalence of successful ageing among elderly adults in Malaysia was 13.8% (21) with a (d)= .05 precision. Subsequently, the sample size was increased by 10% to account for potential non-response bias, resulting in a minimum of 201 respondents.

In this study, data was collected through individual face-to-face interviews. For ease of communication, English and Bahasa Malaysia were employed interchangeably based on the respondents' preferred language. Sociodemographic information procured from the respondents included age, gender, ethnicity, highest education level, marital status, and household income. Lifestyle and health behaviours were also assessed based on smoking and alcohol consumption habits, exercise, subjective health status, and annual health screenings. Meanwhile, social support parameters were established according to living arrangements, satisfaction with spousal relationships, frequency of contact with family, siblings, and relatives within a month, and the number and frequency of interactions with close friends and neighbours in a month. This study defined living environment as accessibility to neighbourhood facilities, satisfaction with the environment, feelings of security in one's neighbourhood, and interactions with neighbours. The present study utilised the Successful Ageing Inventory (SAI) to measure successful ageing. The instrument is a multidimensional tool developed by Troutman et al. (22). The inventory consists of 20 items with a dichotomous response of "Yes" and "No" to

yield a total score of 20. This study also established a successful ageing classification with a cut-off score (SA score≥19) determined based on the median score obtained from the total score (22).

The SAI demonstrated excellent reliability, documenting Cronbach's alpha (r) values of 0.82 and 0.91 (McCarthy, 2009; Cozort, 2008) (23). In this study, one translator translated the original SAI into Malay via the back-to-back translation method. An independent translator then back-translated the Malay version to English. Finally, another independent translator compared both English versions. Any discrepancies were discussed to attain a consensus on the final translated version.

This study subjected the translated SAI to a pilot study to ensure cultural relevance. The internal consistency of the instrument was also assessed with Cronbach's alpha. Subsequently, modifications were made based on pilot results and respondents' feedback. A reliability assessment was then conducted involving 47 eligible respondents who met the inclusion criteria and were not included in the main study, resulting in a .82 Cronbach's alpha. Furthermore, expert validation was performed by two experts in the relevant field.

The data collected in this study was analysed with descriptive statistics according to the frequency and percentage of the respondents. Univariate evaluations, including independent t-tests and one-way ANOVA, were also performed to compare variable means with successful ageing. Finally, post-hoc assessments enabled group differences identification. Variables with p-values under 0.2 from the univariate and simple linear regression were included in the multiple linear regression to avoid overlooking potentially predictive parameters (24). This study analysed all data obtained utilising IBM statistical package for social sciences software (SPSS) version 22.0.

ETHICAL CLEARANCE

The current study obtained ethical approval from the Medical Research Ethics Committee (MREC), University Malaysia Sarawak (UNIMAS), under the ethics reference number FME/24/76.

RESULTS

A total of 172 respondents were involved in the present study, and an 85.6% response rate was obtained. Most respondents were female (75.0%) and between 60 and 85 years old. According to the ethnicity, 43.6% and 47.7% of the respondents were Malay and Chinese, respectively. A majority of the elderly were also married (74.4%), attained tertiary education or higher (42.4%), and belonged to the B40 income category (68.0%). Regarding lifestyle behaviours, 68.6% of respondents exercise regularly, while 87.2% reported going for annual health screenings.

Although 5.2% of the elderly individuals interviewed in this study were heavy alcohol consumers, and 6.4% were smokers, 51.7% considered their subjective health status as good. Regarding living arrangements, 34.3% of the respondents lived with their spouses and children, and 54.1% expressed satisfaction with their spousal relationships. A total of 44.8% of the elderly interviewed had contact with relatives five times or more a month, 52.9% interacted with close friends or neighbours at least five times monthly, and 54.7% had five or more close friends. The data also indicated that less than half (35.5%) of the elderly regarded their local neighbourhood facilities as very accessible. Nonetheless, 55.8% of respondents reported being satisfied with their living environment, 54.7% expressed feeling safe in their neighbourhoods, and 47.7% described their interactions with neighbours as pleasant (see Table I).

Table I : Descriptive Characteristics of the Sociodemographic, Lifestyle, Health Behaviors, Social Support, and Living Environment of Study Participants. (N= 172)

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	43	25.0
Female	129	75.0
Age group		
60-69 years old	109	63.4
70-79 years old	52	30.2
80 years old and above	11	6.4
Ethnicity		
Malay	75	43.6
Chinese	82	47.7
Others (Bidayuh, Iban, Pakistan)	15	8.7
Marital Status		
Married	128	74.4
Widowed/Divorced	28	16.3
Single	16	9.3
Highest Education Level		
No formal education	3	1.7
Primary School	21	12.2
Secondary School	75	43.6
Tertiary Education or higher	73	42.4
Monthly household income range		
T20 (≥Rm11820)	15	8.7
M40 (Rm5251-Rm11819)	40	23.3
B40 (≤Rm5250)	117	68.0
Heavy drinking		
Yes	9	5.2
No	163	94.8

CONTINUE

Characteristics	Frequency (n)	Percentage (%)
Smoking		
Yes	11	6.4
No	161	93.6
Exercise		
Yes	118	68.6
No	54	31.4
Subjective Health Status		
Good	89	51.7
Fair	75	43.6
Poor	8	4.7
Annual Health Screening		
Yes	150	87.2
No	22	12.8
Living Arrangement		
Alone	23	13.4
With Spouse	55	32.0
With Children	35	20.4
With Spouse and Children	59	34.3
Satisfaction with the Spouse		
Satisfaction	93	54.1
Usual	59	34.3
Dissatisfaction	4	2.3
Contact with Family/Siblings/ Relatives		
<1	28	16.3
1-4	67	39.0
5 or more	77	44.8
Contact with Close Friends or neighbours		
<1	23	13.4
1-4	58	33.7
5 or more	91	52.9
Number of close friends/ neighbours		
1	9	5.2
2-4	69	40.1
5 or more	94	54.7
Accessibility to Neighbourhood Facilities		
Very easy	61	35.5
Somewhat easy	50	29.1
Neutral	53	30.8
Somewhat difficult	7	4.1
Difficult	1	0.6
Satisfaction with the Living Environment		
Very Satisfied	37	21.5
Satisfied	96	55.8
Neutral	36	20.9
Dissatisfied	2	1.2
Very Dissatisfied	1	0.6
Feeling Secure in Own Neighbourhood		
Very Safe	36	20.9
Fairly Safe	94	54.7
Neutral	40	23.3
Unsafe	2	1.2
Interaction with Neighbours in the Area		
Very Pleasant	30	17.4
Pleasant	82	47.7
Neutral	58	33.7
Unpleasant	2	1.2

CONTINUE

Table II summaries the overview statistics for the successful ageing scoring. Based on the results, the mean SAI score was 18.47±1.88. The data also revealed that a significant majority, 114 participants (66.28%), achieved a score of 19 or higher, hence categorised as experiencing successful ageing. According to the univariate analysis, age (p=.005), ethnicity (p = .002), highest educational level (p < .001), household income range group (p=.063), heavy drinking (p = .139), living arrangements (p = .009), contact with family, relatives and siblings (p = .013), number of friends and neighbours (p = .001) and accessibility to neighbourhood facilities (p = .021) were significant variables that influenced successful ageing among the respondents.

Table II : Overview of Successful Ageing Scoring (N=172)

Category	Statistic	Value
Successful Ageing Scale Statistics	Mean (SD)	18.47 (1.884)
	Median	19.00
	Variance	3.548
	Number of items	20
Successful Ageing Classification	Category	Frequency (%)
	Successful Ageing (Score ≥19)	114 (66.28)
	Usual Ageing (Score <19)	58 (33.72)

In this study, parameters documenting p < .20 were considered exceptional and were included in the simple and multiple linear regression analysis (see Table III). A p<.05 statistical significance level was applied for multiple linear regression (see Table IV). The multiple linear regression results indicated that the highest education level, heavy drinking, living arrangement, number of close friends and neighbours, and accessibility to neighbourhood facilities were statistically significant (p < .05). Respondents with higher education levels [secondary school (p = .040) and tertiary education or higher (p = .031)] and did not engage in heavy drinking (p = .021), lived with a spouse (p = .005) or with spouse and children (p = .014), had five or more close friends and neighbours (p = .023), and rated their accessibility to neighbourhood facilities as neutral (p = .025) predominantly had superior successful ageing scores.

Table III : Univariate Analysis of the Relationship between Observed Variables and Successful Ageing (N=172)

Characteristics	Successful Ageing Adjusted Mean (95% CI)	p value
Gender[1]		
Male	18.47 (17.91,19.02)	1.00
Female	18.47 (18.13,18.80)	
Age Group[2]		
60-69 years old	18.79 (18.50-19.08)	.005[a]
70-79 years old	18.04 (17.43-18.65)	
80 years and above	17.27 (15.47-19.08)	
Ethnicity[2]		
Malay	18.87 (18.52-19.21)	.002[b]
Chinese	17.95 (17.48-18.43)	
Others (Bidayuh, Iban, Pakistan)	19.27 (18.66-19.88)	
Marital Status[2]		
Married	18.53 (18.21, 18.85)	.733
Widowed/ Divorced	18.25 (17.40, 19.10)	
Single	18.31 (17.41, 19.22)	
Highest Educational Level[2]		
No formal education, Primary School	17.08 (15.97, 18.20)	<.001[c]
Secondary School	18.55 (18.14, 18.95)	
Tertiary Education or higher	18.84 (18.49, 19.18)	
Household Income Range Group[2]		
T20 (≥Rm11820)	18.60 (17.72, 19.48)	.063*
M40 (Rm5251-Rm11819)	19.05 (18.70, 19.40)	
B40 (≤Rm5250)	18.25 (17.87, 18.63)	
Heavy Drinking[1]		
Yes	16.89 (14.57, 19.21)	.139
No	18.55 (18.28, 18.83)	
Smoking[1]		
Yes	18.45 (16.83,20.08)	.985
No	18.47 (18.18, 18.75)	
Exercise[1]		
Yes	18.55 (18.20,18.90)	.379
No	18.28 (17.79,18.76)	
Subjective Health Status[2]		
Good	18.66 (18.29, 19.03)	.357
Fair	18.27 (17.80, 18.74)	
Poor	18.13 (16.75, 19.50)	
Annual Health Screening[1]		
Yes	18.52 (18.22,18.82)	.320
No	18.09 (17.14, 19.04)	
Living Arrangement[2]		
Alone	17.43 (16.53,18.34)	.009[d]
With Spouse	18.75 (18.29,19.20)	
With Children	18.11 (17.31,18.92)	
With Spouse and Children	18.81 (18.42,19.21)	
Satisfaction with Spouse[1]		
Satisfaction	18.48 (18.12,18.85)	.837
Usual/ Dissatisfaction	18.55 (18.01,19.08)	
Contact with Family/ Siblings/ Relatives[2]		

CONTINUE

Characteristics	Successful Ageing Adjusted Mean (95% CI)	p value
<1	17.79 (17.00,18.57)	.013[e]
1-4	18.25 (17.75,18.75)	
5 or more	18.90 (18.54,19.25)	
Contact with Close Friends or Neighbours[2]		
<1	18.04 (17.08,19.01)	.431
1-4	18.41 (17.96,18.87)	
5 or more	18.60 (18.21,19.00)	
Number of Friends and Neighbours[2]		
1	16.78 (15.20,18.35)	.001[f]
2-4	18.14 (17.62,18.67)	
5 or more	18.86 (18.56,19.16)	
Accessibility Neighbourhood Facilities[2]		
Very Easy	18.56 (18.12,19.00)	.021[g]
Somewhat Easy	18.12 (17.45,18.79)	
Neutral	18.91 (18.51,19.30)	
Somewhat Difficult/ Very Difficult	17.00 (15.66,18.34)	
Feeling Secure in Own Neighbourhood[2]		
Very Safe	18.67 (18.12,19.22)	.914
Fairly Safe	18.41 (18.02,18.81)	
Neutral	18.40 (17.73,19.07)	
Unsafe	18.50 (12.15,24.85)	
Interaction with Neighbours in the Area[2]		
Very Pleasant	18.60 (17.90,19.30)	.678
Pleasant	18.57 (18.17,18.98)	
Neutral	18.22 (17.70,18.75)	
Unpleasant	19.00 (19.00,19.00)	

CONTINUE

[1] Independent t-test, [2] One-way ANOVA

Post-hoc results (not tabulated): [a]60-69 years old vs 70-79 years old, p=.049, 60 years old vs 80 years old and above, p=.030, [b]Malay vs Chinese, p=.006, Chinese vs Others(Bidayuh, Iban, Pakistan), p=.034, [c]No formal education / Primary School vs Secondary School, p=.002, No formal education/ Primary School vs Tertiary Education or Higher, p=<.001, [d]Alone vs With spouse, p=.027, Alone vs With spouse and children, p=.016, [e]<1 vs 5 or more, p=.021, [f]1 vs 5, p=.004, 2-4 vs 5, p=.042, [g]Neutral vs Somewhat difficult/ Very difficult, p=.043.

*** Significance values have been adjusted for multiple comparisons using the Bonferroni correction. After adjustment, none of the comparisons remained statistically significant (all adjusted p values > .05), indicating that the observed differences may be due to random variation.**

Table IV : Regression analysis for factors associated with Successful Ageing (N=172)

Variables	Simple Linear Regression			Multiple Linear Regression			
	B	95% CI	p value	Adj. b	95% CI	t-statistic	p value
Highest Education Level[a]							
Secondary School	1.46	.62, 2.29	<.001	.85	.04, 1.66	2.07	.040
Tertiary Education or Higher	1.75	.91, 2.59	<.001	.97	.09, 1.85	2.18	.031
Heavy Drinking[b]							
No	1.66	.41,2.92	.010	1.44	.22, 2.65	2.34	.021
Living Arrangement[c]							
With spouse	1.31	.41, 2.21	.005	1.24	.38, 2.10	2.86	.005
With children	.68	-.29, 1.65	.170	.78	-.16,1.73	1.64	.104
With spouse and children	1.37	.48,2.27	.003	1.10	.23, 1.97	2.49	.014

CONTINUE

Variables	Simple Linear Regression			Multiple Linear Regression			
	B	95% CI	p value	Adj. b	95% CI	t-statistic	p value
Accessibility to neighbourhood facilities[e]							
Very easy	1.55	.18, 2.92	.026	1.12	-.17, 2.40	1.72	.088
Somewhat easy	1.12	-.26, 2.50	.113	.72	-.56, 2.01	1.11	.268
Neutral	1.90	.52, 3.28	.007	1.49	.19, 2.79	2.26	.025

The model fits reasonably well with an adjusted R^2 of .241. Model assumptions were met. There is no severe multicollinearity issues as indicated by the VIF values, all of which are below 10.

[a]"No formal education/Primary School" as reference, [b]"Heavy Drinking Yes" as reference, [c]"Alone" as reference, [d]"1 number of close friends/ neighbours" as reference, [e]"Somewhat difficult/ very difficult" as reference.

DISCUSSION

Based on the results, the prevalence of successful ageing among members of the elderly associations in Kuching was 66.28%, which was relatively more notable than several other reports (21,25,26). For instance, Hamid et al. (21) reported a 13.8% prevalence of successful ageing among the Malaysian community-dwelling elderly population, considerably lower than the figure in this study. Two other studies in Korea (25) and India (26) reported similar findings, where 13.3% and 27.2% of the respondents exhibited successful ageing, respectively.
Several factors contribute to this discrepancy between this study and prior studies. Firstly, the respondents in this study were specifically selected from the members of elderly associations, potentially providing members better access to social support, resources, and activities promoting successful ageing than their general population counterparts. Moreover, members of elderly associations typically have superior social engagement and proactive behaviours towards health and overall well-being. Elderly associations also frequently offer various activities, such as social gatherings, educational programs, physical exercise sessions, cultural events, religious reading sessions, and interest-based groups, including gardening or crafting workshops (27). Consequently, members of the associations remain socially, mentally, and physically active, which is essential for successful ageing.

Several studies have demonstrated that physical activity and social participation in daycare centres or elderly associations enhanced social, psychological and physical well-being considerably, improving quality of life and promoting successful ageing compared to the general elderly population (28,29). Chen et al. (30) reported similar findings among elderly community volunteers actively participating in voluntary services and activities at community care centres in Taiwan. The report noted that 54% of the elderly in the study perceived good health and achieved successful ageing. Individuals with continuous participation motivation and behaviour in activities also reported better health status rates and positive associations with successful ageing than those less socially active.

Makhtar et al. (31) employed an identical measurement tool utilised in this study and reported an exceptionally significant prevalence of successful ageing (98.5%) and social support level (75%) among the community-dwelling elderly population in Pahang. The findings suggested that most of the elderly respondents in the report benefited from strong social support, a factor consistently emphasised in literature as critical for successful ageing (29). Nonetheless, the current study yielded different results despite members of elderly associations being generally expected to provide higher levels of social support through social engagement during association activities. Similar studies targeting elderly associations (30,32) revealed a lower prevalence of successful ageing (between 54% and 66.28%) among elderly association members than the notably higher figure of 98.5% reported by Makhtar et al (31). The discrepancy might arise from the specific characteristics of community-dwelling individuals in their studies compared to those in elderly associations. Consequently, further studies are necessary to understand the underlying factors contributing to the outcomes. The study also involved univariate analyses and convenience sampling. In contrast, the current study implemented multivariate assessment, presenting a deeper understanding of the contributing factors and enhancing the robustness of this study's findings.

Successful ageing rates vary across studies, primarily due to differences in defining and measuring the concept. Diverse tools have different sensitivity and predictive values, leading to discrepancies in prevalence rates and definitions. Moreover, some studies focus on physical health and cognitive functioning, while others emphasise social engagement and emotional well-being. Numerous reports also adopted the Rowe and Kahn model, which defines successful ageing through three components: absence of disease and disability, notable physical and cognitive functioning, and active social engagement (21,33). Nevertheless, studies have

highlighted the importance of objective (e.g., cognitive function) and subjective (e.g., psychological well-being) criteria in achieving successful ageing (34).

This study employed SAI, a comprehensive tool that integrates multiple domains assessing physical and psychological well-being, social engagement, and functional ability. The instrument also combines objective (such as physical and cognitive functioning) with subjective measures (such as life satisfaction, emotional resilience, and coping mechanisms) (22). This holistic approach renders the SAI an accurate and effective tool for establishing successful ageing outcomes compared to other instruments.

Receiving a higher education level often equips individuals with better knowledge about health, enabling them to adopt healthier lifestyles and make informed health decisions. The multivariate results indicated that educational level is correlated to successful ageing, supporting other reports that emphasised the positive correlation between education level and successful ageing (35,36). Respondents with secondary education or higher reported significantly better overall successful ageing scores. Kubzansky et al. (37) also documented the association between education level and biological and psychological factors. The study revealed that individuals with lower education levels had poor psychological functioning and increased vulnerability to adverse biological conditions, presenting obstacles to achieving successful ageing.

Living with a spouse or spouse and children is healthier than living alone. Specific living arrangements, particularly living with children and a spouse, positively affect health outcomes by fulfilling social requirements and preventing mental-related issues (38–40). This study and multiple other reports also documented similar findings, indicating the significant correlation between living arrangements and successful ageing. Living arrangements offer a form of social support, as those residing with family frequently experience enhanced emotional and social support, potentially positively influencing their mental health and coping mechanisms. Moreover, Lin et al. (29) found that living arrangements positively influenced social support, which might improve life satisfaction and psychological well-being.
The data in the current study revealed that the number of close friends and neighbours significantly contributes to successful ageing, considering the importance of social support and interactions in promoting successful ageing among elderly individuals. Furthermore, Kang (41) revealed a positive association between the number of close friends and life satisfaction, which could lead to successful ageing. The findings also corresponded to the hypothesis that individuals with larger social networks or more close friends or neighbours tend to exhibit better overall well-being.

Easy access to neighbourhood facilities enhances various aspects of an elderly individual's life, leading to successful ageing. This study found that accessibility to neighbourhood facilities contributed considerably to successful ageing. Several other reports indicated that providing accessible neighbourhood facilities can sustain and improve the overall quality of life and societal well-being of elderly individuals by promoting healthy lifestyles, contributing to successful ageing (42,43). Moreover, well-designed neighbourhood facilities offer social engagement opportunities and can significantly affect the mental health of the elderly.

Based on the findings, heavy drinking was negatively associated with successful ageing. In this study, respondents who had consumed six or more standard alcoholic beverages weekly or more frequently were categorised as heavy drinkers. The parameter has been employed as the threshold for the classification (44). In another study, Jang (25) noted that respondents who abstained from heavy drinking reported a notably higher possibility of achieving successful ageing. Several reports have also consistently demonstrated that heavy drinking is linked to various adverse health outcomes, including increased risk of chronic diseases, mental health issues, and cognitive functioning decline, which can hinder successful ageing (45). Nonetheless, some studies found that individuals maintaining low to moderate alcohol consumption had better physical health, cognitive functioning, and emotional stability, improving their ageing outcomes (46,47). The data does not contradict the results of this study, considering the focus was heavy drinking, which poses significant risks. Distinguishing between heavy and low to moderate drinking underscores the importance of understanding the severity of alcohol consumption in assessing its impact on successful ageing.

This study had several limitations. Firstly, the findings from this study may not be generalisable to socially isolated elderly individuals or those not part of associations. Nevertheless, the data offer valuable insights to future studies on successful ageing and its associated factors among elderly individuals. Specifically, the information provides a baseline for evaluating the benefits of elderly associations in subsequent studies. This study was also restricted by its cross-sectional design, which involved collecting data simultaneously for independent and dependent variables. Although the method allowed correlation identification, it does not permit inferencing causalities (48).

According to the results, several factors were associated with successful ageing, however, none was confirmed as a factor for determining the level of successful ageing and its domains. Determining the direction between independent and dependent variables (successful ageing) was challenging in this study, even though

multivariate regression was employed to analyse the associations between variables. The 0.241 adjusted R^2 value obtained in this study indicated that only 24% of the variation in successful ageing was explained by the model applied, presenting another limitation. The data suggested that a considerable proportion of the variability was influenced by other unexplained indicators not included in this study, as successful ageing is a complex and multifaceted phenomenon. Consequently, future studies could adopt a qualitative (in-depth interview) or longitudinal approach to establish the causality direction and other possible factors and intangible domains of successful ageing.

CONCLUSION

Exceptional social networks, including close friends, neighbours, and family-based living arrangements, are crucial for successful ageing. Nevertheless, modifiable indicators, including alcohol consumption, educational opportunities to improve health knowledge, and supportive living environments with better access to neighbourhood facilities, are also vital.

The present study identified education level, living arrangement, number of close friends and neighbours, accessibility to neighbourhood facilities, and alcohol consumption as significant parameters associated with successful ageing. Living with a spouse or a spouse and children exhibited the highest positive predictive value. Conversely, heavy drinking habits presented the most negative influence. These findings highlighted the importance of individual behaviours, social support, and environmental factors in promoting successful ageing.

Promoting active participation in social activities through elderly associations is essential in enhancing the well-being of the elderly population. Consequently, initiatives should prioritise increasing social participation in elderly associations, developing comprehensive intervention programmes that cater to ageing population requirements, and ensuring their overall well-being. Social engagement opportunities, such as support services, recreational activities, hobby clubs, and peer support groups in healthcare and community settings, while promoting healthy lifestyles to reduce harmful behaviours like heavy drinking, might also significantly contribute to successful ageing. This holistic approach would assist in creating supportive environments, ensuring the sustainability of elderly associations and improving the well-being of the ageing population.

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REFERENCES

1. United Nations. Ageing [Internet]. United Nations; 2024 [cited 2024 Sep 17]. Available from: https://www.un.org/en/global-issues/ageing.
2. Zaid NNM, Ahmad NA, Rauf MFA, Zainal A, Razak FHA, Shahdan TST, et al. Strategies to Help Elderly Learning Technology in Malaysia: A Focus Group Study. International Journal of Academic Research in Progressive Education and Development. 2022;11(4). doi:10.6007/ijarped/v11-i4/16078
3. Monteiro-Junior RS, Rodrigues VD, Campos C, Paes F, Murillo-Rodriguez E, Maranhro-Neto GA, et al. The Role of Physical Activity on Mood State and Functional Skills of Elderly Women. Clinical Practice Epidemiology Mental Health. 2017;13(1):125. doi: 10.2174/1745017901713010125
4. Lee HW, Rhyu HS. Antiaging strategy considering physiological characteristics. Journal of Exercise Rehabilitation. 2019;15(3):346. doi: 10.12965/jer.1938196.126
5. Araьjo L, Ribeiro O, Teixeira L, Paьl C. Successful aging at 100 years: the relevance of subjectivity and psychological resources. Int Psychogeriatrics. 2016;28(2):179–88. doi: 10.1017/S1041610215001350
6. Rowe JW, Kahn RL. Human aging: Usual and Successful Science. 1987;237(4811):143–9
7. Urtamo A, Jyvдkorpi SK, Strandberg TE. Definitions of successful ageing: A brief review of a multidimensional concept. Acta Biomed. 2019;90(2):359-363. doi: 10.23750/abm.v90i2.8376
8. Rowe JW, Kahn RL. Successful aging. The Gerontologist. 1997;37(4):433–40. doi: 10.1093/geront/37.4.433
9. Kok AAL, Aartsen MJ, Deeg DJH, Huisman M. Capturing the diversity of successful aging: an operational definition based on 16-year trajectories of functioning. The Gerontologist. 2017;57(2):240-51. doi: 10.1093/geront/gnv127
10. Bьlow MH, Sцderqvist T. Successful ageing: A historical overview and critical analysis of a successful concept. J Aging Stud. 2014;31:139-149. doi: 10.1016/j.jaging.2014.08.009
11. Katz S, Calasanti T. Critical perspectives on successful aging: Does it "appeal more than it illuminates"?. Gerontologist. 2015;55(1):26-33. doi: 10.1093/geront/gnu027
12. Wong RY. A New Strategic Approach to Successful Aging and Healthy Aging. Geriatrics (Basel). 2018;3(4):86. doi: 10.3390/geriatrics3040086.
13. Fernбndez-Ballesteros, R., Garcна, L. F., Abarca, D., Blanc, L., Efklides, A., Kornfeld, R., Lerma, A. J., Mendoza-Nucez, V. M., Mendoza-Ruvalcaba, N. M., Orosa, T., Paьl, C., & Patricia, S. (2008). Lay concept of aging well: cross-cultural comparisons. Journal of the American Geriatrics Society.

2008;56(5), 950–952. https://doi.org/10.1111/j.1532-5415.2008.01654.x
14. Shin AJ, IN K, Yun-Jeong K. Development of successful aging measurement for Korean mid to later adults. Journal of Family Relations. 2009;13(4):225-45
15. Carver LF, Beamish R, Phillips SP, Villeneuve M. A scoping review: social participation as a cornerstone of successful aging in place among rural older adults. Geriatrics (Switzerland). 2018;3(4). doi: 10.3390/geriatrics3040067
16. Ho M, Pullenayegum E, Fuller-Thomson E. Is social participation associated with successful aging among older Canadians? Findings from the Canadian Longitudinal Study on Aging (CLSA). International Journal of Environmental Research and Public Health. 2023;20(12):6058. doi: 10.3390/ijerph20126058
17. Ibrahim N, Mat Saad Z, Ahmad Ramly FZ. Keberkesanan Pusat Aktiviti Warga Emas (PAWE) di bawah Dasar Warga Emas Negara. Jurnal Pembangunan Sosial. 2016;19. doi: 10.32890/jps.19.2016.11531
18. BERNAMA. RM17 juta tubuh pusat aktiviti warga emas. Sinar Harian; 2019. Available from: https://www.sinarharian.com.my/article/24749/BERITA/Nasional/RM17-juta-tubuh-pusat-aktiviti-warga-emas
19. Tomioka, K., Kurumatani, N. & Hosoi, H. Association Between Social Participation and Instrumental Activities of Daily Living Among Community-Dwelling Older Adults. Journal of epidemiology.2016;26(10), 553–561. https://doi.org/10.2188/jea.JE20150253
20. Charan J, Biswas T. How to calculate sample size for different study designs in medical research?. Indian Journal of Psychological Medicine. 2013;35(2):121-6. doi: 10.4103/0253-7176.116232
21. Hamid TA, Momtaz YA, Ibrahim R. Predictors and prevalence of successful aging among older Malaysians. Gerontology. 2012;58(4):366-70. doi: 10.1159/000334671
22. Troutman M, Nies MA, Small S, Bates A. The development and testing of an instrument to measure successful aging. Research in Gerontological Nursing. 2011;4(3):221-32. doi: 10.3928/19404921-20110106-02
23. Ji H, Ling J, McCarthy VL. Successful aging in the United States and China: a theoretical basis to guide nursing research, practice, and policy. Journal of Transcultural Nursing. 2015;26(2):129-36. doi: 10.1177/1043659614526257
24. Heinze, G., & Dunkler, D. Five myths about variable selection. Transplant international : official journal of the European Society for Organ Transplantation. 2017;30(1), 6–10. https://doi.org/10.1111/tri.12895
25. Jang HY. Factors associated with successful aging among community-dwelling older adults based on ecological system model. International Journal of Environmental Research and Public Health. 2020;17(9). doi: 10.3390/ijerph17093139
26. Pengpid S, Peltzer K. Successful ageing among a national community-dwelling sample of older adults in India in 2017–2018. Scientific Reports. 2021;11:22186. doi: 10.1038/s41598-021-00739-z
27. Zainuddin FH, Hamidi M, Wahab HA. The challenges of social support towards successful ageing among elderly in Pusat Aktiviti Warga Emas Malaysia. The Malaysian Journal of Social Administration. 2022;16:43-63. doi: 10.22452/16/43.6328.
28. Araya AX, Herrera MS, Iriarte E, Rioja R. Changes in social psychological and functional variables among older people attending a day care center. Revista Mйdica de Chile. 2018;146(8):864-71. doi: 10.4067/s0034-98872018000800864
29. Lin Y, Xiao H, Lan X, et al. Living arrangements and life satisfaction: mediation by social support and meaning in life. BMC Geriatrics. 2020;20:136. doi: 10.1186/s12877-020-01541-8
30. Chen CC, Lan YL, Yan YH. Empirical study on the factors influencing the successful aging of middle-aged and older adult community volunteers. Frontiers in Public Health. 2023;11:1140965. doi: 10.3389/fpubh.2023.1140965
31. Makhtar A, Mansor NA, Tohpa H. Successful ageing and social support among older people living in the community. International Journal of Care Scholars. 2024;7(1):16-27. doi: 10.31436/ijcs.v7i1.333
32. Douglas H, Georgiou A, Westbrook J. Social participation as an indicator of successful aging: an overview of concepts and their associations with health. Australian Health Review. 2017;41:455-62. doi: 10.1071/AH16038
33. Crowther MR, Parker MW, Achenbaum WA, Larimore WL, Koenig HG. Rowe and Kahn's model of successful aging revisited: positive spirituality—the forgotten factor. The Gerontologist. 2002;42(5):613-20. doi: 10.1093/geront/42.5.613
34. Requena C, Rebok GW. Evaluating successful aging in older people who participated in computerized or paper-and-pencil memory training: the Memoria Mejor program. International Journal of Environmental Research and Public Health. 2019;16(2):191. doi: 10.3390/ijerph16020191
35. Lucas HM, Lozano CJ, Valdez LP, Manzarate R, Lumawag FAJ. A grounded theory of successful aging among select incarcerated older Filipino women. Archives of Gerontology and Geriatrics. 2018;77:96-102. doi: 10.1016/j.archger.2018.04.010
36. Cao P, Luo H, Li J, et al. Education as a moderator in the effect of successful aging on mortality risk in elderly Chinese: a national longitudinal study (2011-2016). Research Square. 2020; doi:

10.21203/rs.3.rs-49041/v1
37. Kubzansky LD, Berkman LF, Glass TA, Seeman TE. Is educational attainment associated with shared determinants of health in the elderly? Findings from the MacArthur Studies of Successful Aging. Psychosomatic Medicine. 1998;60(5):578-85. doi: 10.1097/00006842-199809000-00012
38. Hughes ME, Waite LJ. Health in household context: living arrangements and health in late middle age. Journal of Health and Social Behavior. 2002;43(1):1-21
39. De Jong Gierveld J, Dykstra PA, Schenk N. Living arrangements, intergenerational support types and older adult loneliness in Eastern and Western Europe. Demographic Research. 2012;27:167-200.
40. Teerawichitchainan B, Pothisiri W, Thanh Long G. How do living arrangements and intergenerational support matter for psychological health of elderly parents? Evidence from Myanmar, Vietnam, and Thailand. Social Science & Medicine. 2015;136–137:106-116. doi: 10.1016/j.socscimed.2015.05.019
41. Kang W. Understanding the associations between the number of close friends and life satisfaction: Considering age differences. Frontiers in Psychology. 2023;14:1105771. doi: 10.3389/fpsyg.2023.1105771
42. Yi H, Ng ST, Chang CM, Low CXE, Tan CS. Effects of neighborhood features on healthy aging in place: the composition and context of urban parks and traditional local coffeeshops in Singapore. BMC Geriatrics. 2022;22(1):969. doi: 10.1186/s12877-022-03679-z
43. Wong PH, Kourtit K, Nijkamp P. The ideal neighbourhoods of successful ageing: A machine learning approach. Health & Place. 2021;72:102704. doi: 10.1016/j.healthplace.2021.102704
44. Robert Lourdes TG, Abd Hamid HA, Riyadzi MR, Rodzlan Hasani WS, Abdul Mutalip MH, Abdul Jabbar N, Mat Rifin H, Saminathan TA, Ismail H, Mohd Yusoff MF. Findings from a nationwide study on alcohol consumption patterns in an upper middle-income country. International Journal of Environmental Research and Public Health. 2022;19(14):8851. doi: 10.3390/ijerph19148851
45. Rehm J. The risks associated with alcohol use and alcoholism. Alcohol Research & Health. 2011;34(2):135-43
46. Sun Q, Townsend MK, Okereke OI, Rimm EB, Hu FB, Stampfer MJ, Grodstein F. Alcohol consumption at midlife and successful ageing in women: a prospective cohort analysis in the nurses' health study. PLoS Med. 2011;8(9):e1001090. doi: 10.1371/journal.pmed.1001090
47. Evans DA, Bienias JL. Alcohol consumption and cognition. New England Journal of Medicine. 2005;352(3):289-90. doi: 10.1056/NEJMe048315
48. Wang X, Cheng Z. Cross-Sectional Studies: Strengths, Weaknesses, and Recommendations. Chest. 2020;158(1S). doi: 10.1016/j.chest.2020.03.012