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The National Conference on Ageing

Guest Editors
Puvaneswaran Kunasekaran, Rahimah Ibrahim, and Chan Yoke Mun



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Preface

The National Conference on Ageing (NCA) is a research conference for scholars, experts, and professionals to present, discuss, and exchange ideas, findings, and developments in the field of gerontology - the multidisciplinary study of ageing and the processes associated with it, encompassing the biological, social, psychological, and environmental aspects. These presentations are now transformed into scholarly papers in the Proceedings of NCA 2024, under the esteemed *Pertanika Journals*, UPM Press Centre.

The conference theme reflects the growing recognition that ageing populations present both opportunities and challenges, and that creative, innovative, and inclusive approaches are essential to ensure quality of life and social well-being for older adults. With this in mind, the conference was organised to provide a scholarly platform for researchers, practitioners, and stakeholders to convene, share perspectives, and amalgamate knowledge constructively, while gaining visibility through publication in an outstanding academic outlet.

Research titles such as “Technology Acceptance among Older Adults for Healthcare Monitoring”, “Intergenerational Learning and Social Cohesion”, “Age-friendly Housing and Urban Planning”, and “Elderly Caregiving Burdens and Policy Responses” are some of the topics that reflect the conference theme as we navigate the realities of an ageing society in an increasingly complex and interconnected world. On this note, this proceeding aspires to inspire scholars, researchers, and practitioners to delve deeper into potential research areas that can be explored and extended further in the quest to enrich our understanding of social gerontology from both the theoretical and practical perspectives.

We extend our gratitude to UPM Press Centre and the Pertanika team for supporting this academic endeavour and enabling the publication of these papers. We also express our heartfelt appreciation to our industry and academic partners, collaborators, participants, and scientific committee members of NCA 2024, who have worked tirelessly to ensure that the conference and publication of the proceedings were efficiently managed and successfully realised. The NCA 2024 proceedings are a testament to the collective effort and dedication of all involved.

Guest Editors

Puvaneswaran Kunasekaran (Dr.)

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Chan Yoke Mun (Prof. Dr.)

Medication Adherence among Older People with Chronic Diseases in a Suburban District in Malaysia's East Coast

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ABSTRACT

Older adults are vulnerable to multiple chronic conditions and polypharmacy, increasing the risk of medication non-adherence. This study evaluates medication adherence among older patients with chronic diseases in a suburban district in Malaysia. The study also investigates the association between adherence with age, gender, and quantity of medication prescribed. A cross-sectional study was conducted in January 2023, involving older patients aged ≥ 60 years in nine villages in the Dun Hulu Besut, Terengganu. Medication adherence was assessed using the Malaysia Medication Adherence Assessment Tool (MyMAAT), and statistical analysis included descriptive statistics and Fisher's Exact Test for associations. Of 40 participants, 15% showed good adherence (MyMAAT score ≥ 54), while 85% had moderate/poor adherence. Age, gender, and medication number were not significantly associated with adherence. Low medication adherence was prevalent, indicating the need for interventions by healthcare professionals, particularly community pharmacists, to improve adherence and treatment outcomes for older patients.

Keywords: Chronic diseases, elderly, community pharmacists, medication adherence, polypharmacy

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INTRODUCTION

The aging population is a global and national phenomenon. By 2030, the number of people aged 60 years or older is projected to exceed 2 billion globally (He et al., 2020). In Malaysia, this demographic is rapidly growing, representing 10.4% of the population in 2022 (mampu.gov.my). Older individuals are more likely to experience

non-communicable diseases (NCDs), which account for 71% of deaths worldwide, primarily in low- and middle-income countries (Chobe et al., 2022). Managing multimorbidity often results in polypharmacy, increasing the risk of medication non-adherence (Woodford & George, 2007). Community pharmacists play a crucial role in improving adherence through medication reviews and personalized interventions (Ministry of Health Malaysia, 2023). This study aims to assess medication adherence in elderly patients and evaluate its association with demographic and clinical factors.

METHODS

This cross-sectional study was conducted in January 2023 in nine villages within Dun Hulu Besut, Malaysia. This study was approved by the Universiti Sultan Zainal Abidin Human Research Ethics Committee (UniSZA/UHREC/2023/491). The study targeted elderly patients aged ≥ 60 years with at least one chronic condition. A convenient sampling method was used, with 40 participants recruited from a list provided by village authorities based on inclusion criteria. Informed consent was obtained, and face-to-face interviews were conducted using the MyMAAT questionnaire through the pharmacist-led home medication review. The pharmacists involved have been trained before the data collection. Responses were scored on a 5-point Likert scale, with adherence classified as good (score ≥ 54) or moderate/poor (score < 54) (Hatah et al., 2020). Data were analyzed using IBM SPSS version 25, employing Fisher’s Exact Test to evaluate associations between adherence and variables such as age, gender, and number of medications prescribed.

RESULTS

Demographic Characteristics

The study included 40 participants (60% female, 40% male), with a mean age of 70.6 years (SD = 7.2). More than half of the participants (57.5%) were aged ≥ 70 years. Table 1 summarizes the demographic data.

Table 1
Demographic characteristics of participants (N=40)

Variable	Mean (SD)	Frequency (Percentage, %)
Age (years old)	70.6 (7.2)	
60-69		17 (42.5)
≥ 70		23 (57.5)
Gender		
Male		24(60)
Female		16(40)
Education Level		
Primary School		40 (100)
Secondary School		0 (0)
Degree		0 (0)
Master		0 (0)
PhD		0 (0)
Current diagnosis		
Diabetes Mellitus		18
HPT		16
Hyperlipidemia		15
IHD		6
Gout		3
Gastric		2
Seizure		2
COPD		2
Chronic kidney disease		1

Clinical Characteristics

Participants were prescribed an average of 4.23 medications (SD = 2.42), with the number of medications ranging from 1 to 9 (Table 2).

Table 2
Number of medications prescribed

Variable	Mean (SD)	Min.	Max.
Number of Medications	4.23 (2.42)	1	9

Note. Min. = minimum; Max. = maximum

Medication Adherence

Overall, 85% of participants exhibited moderate/poor adherence, while only 15% showed good adherence (Table 3). Table 4 presents adherence scores across various MyMAAT constructs, indicating barriers to adherence related to medication-taking behavior, perceived utility, and self-efficacy.

Table 3
Percentage level of medication adherence

Level of Medication Adherence	Percentage (%)
Good	15.00
Moderate/Poor	85.00

Table 4
MyMAAT construct scores

Domain	Score (M±SD)
Patients’ medication-taking behavior	13.45±4.5
Other	3.08±1.4
Perceived utility of the medications—benefits, costs, and efficacy	3.28±1.4
Perceived barriers to medication adherence	6.85±2.3
Perceived self-efficacy and social support	12±4.7

Association between Variables and Adherence

There was no significant association between adherence and age (p = 0.489), gender (p = 0.16), or the number of medications (p = 0.197) (Table 5).

Table 5
Association between adherence by age, gender, and number of medications

Variable	Level of Medication Adherence n (%)		P value *
	Good	Moderate to Poor	
Age (years old)			0.49
60-69	2 (33.3)	15 (44.1)	
≥70	4 (66.7)	19 (55.9)	
Gender			0.16
Female	2 (33.3)	22 (20.4)	
Male	4 (66.7)	12 (35.3)	
Number of medications			0.20
1-4	3 (33.3)	21 (61.8)	
≥5	4 (66.7)	13 (38.2)	

*Fisher’s Exact Test

DISCUSSION

This study found that only 15% of elderly participants exhibited good medication adherence, with the majority showing moderate or poor adherence. This rate is lower than the adherence levels reported in similar studies, which range from 26% to 59% (Eijken et al., 2003). Factors such as cognitive decline and the complexity of medication regimens may contribute to non-adherence, particularly in rural settings (Woodham et al., 2018). Although age, gender, and the number of medications were not significantly associated with adherence, higher adherence was noted among participants prescribed five or more medications. This finding aligns with studies indicating that increased medical oversight may improve adherence (Kim et al., 2019).

CONCLUSION

The study reveals low adherence rates among elderly patients, underscoring the need for targeted interventions to improve medication compliance. Community pharmacists, through home medication reviews, can play a vital role in enhancing adherence and ensuring better therapeutic outcomes for elderly patients with chronic conditions. The use of convenience sampling in the study design represents a major limitation. Future research should consider more robust sampling methods to strengthen the generalizability of the results.

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Characterisation of Relative Muscle Power and Physical Function Status among Community-dwelling Older Persons

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ABSTRACT

Muscle power has been demonstrated to decline earlier and more quickly than muscle strength with advancing age. Studies revealed that muscle power is a critical determinant of physical functioning in older persons. Thus, this study is designed to examine muscle power and physical function status among community-dwelling older persons. This study was a cross-sectional study conducted among 50 community-dwelling older persons in Selangor. Sit-to-stand (STS) test, Frailty Index, 4.5 meters walking time, gait speed, hand grip, and Body Mass Index (BMI) were measured. Muscle power performance was estimated by the STS test. Overall, the mean age of the respondents was 65.0 ± 5 years. More than half (60.0%) of the respondents were female. The mean muscle power was 1.52 ± 0.36 W/(kg $\times$ m). There were no significant differences of muscle power between the sociodemographic parameters and smoking status. Among the respondents, 36% were categorized in low muscle power group (1.19 ± 0.14 W/(kg $\times$ m)), 30% in medium muscle power group (1.48 ± 0.08 W/(kg $\times$ m)), and 34% in high muscle power group (1.92 ± 0.26 W/(kg $\times$ m)). Significant

differences among groups of muscle power were revealed in terms of frailty index. Those with a higher frailty index have lower muscle power compared to those with lower frailty index ($p < 0.05$). Although other physical functional parameters reported a non-significant p -value, calculation of effect size using eta squared exhibited a medium effect size for walking time, gait speed, and BMI. In conclusion, more than one-third of the respondents have low muscle power. Those with a higher frailty index exhibited lower muscle power compared to those with a lower frailty index. The findings provide beneficial information in developing muscle

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power training interventions to prevent frailty and retain functional ability, and independence in old age.

Keywords: Frailty, muscle power, older person, physical activity, physical function

INTRODUCTION

Ageing is associated with significant declines in the neuromuscular system including muscle function and muscle structure (Aagaard et al., 2010). Despite the establishment of the role of muscle strength in determining functional limitations, muscle power has been demonstrated to decline earlier and more quickly than muscle strength with advancing age (Reid & Fielding, 2012). Studies revealed that muscle power is a critical determinant of physical functioning in older persons (Simpkins & Yang, 2022). Thus, this study is designed to examine relative muscle power and physical function status among community-dwelling older persons.

METHODS

This study was a cross-sectional study conducted among 50 community-dwelling elderly in Selangor. The Frailty Index was assessed according to the criteria established by Fried et al. (2001). Sit-to-stand (STS) was measured as the respondents stood up and sat down as quickly as possible on a firm, padded, armless chair for five cycles. Walking time was measured as participants walked 4.5 meters, and gait speed was derived from the time of walking and the distance. Jamar dynamometer was used to assess hand grip strength while body mass index (BMI) was calculated from the weight and height of the respondents. Relative muscle power was determined using the equation provided by Simpkins and Yang (2022):

$$\text{Relative STS mean power} = \frac{0.9 \times g \times [\text{body height} \times 0.5 - \text{chair height}]}{\text{five STS time} \times 0.1 \times \text{body height}}$$

g = the acceleration due to gravity (9.81 m/s²).

Descriptive statistics were shown as mean (standard deviation) for continuous variables and frequency for categorical variables. An independent t-test was applied to compare research variables between two groups, while one-way Analysis of Variance (ANOVA) was utilised for comparisons involving more than two groups.

RESULTS AND DISCUSSION

Overall, the average age of the responders was 65.0 ± 5 years. More than half (60.0%) of the participants were female. The mean relative muscular power was 1.52 ± 0.36 W/(kg $\times$ m). The relative muscle power was not significantly different between male (1.56 ± 0.40 W/kg) and female (1.50 ± 0.33 W/(kg $\times$ m)), and between age group 50-60 years (1.50 ± 0.40 W/(kg $\times$ m)), 61-70 years (1.50 ± 0.30 W/(kg $\times$ m)) and 71 years and above (1.68 ± 0.51 W/(kg $\times$ m)). There were no significant differences of relative muscle power between other sociodemographic parameters and smoking status as shown in Table 1. Among the respondents, 36% were categorized in low muscle power group

Table 1
Mean comparison of relative muscle power for sociodemographic characteristics and the relative muscle power group

	n (%)	Relative Muscle Power (mean)	(SD)	p-value
Age (years old)				
50-60	10 (20)	1.50	0.40	0.43
61-70	32 (64)	1.50	0.30	
71-80	8 (16)	1.68	0.51	
Gender				
Male	20 (40)	1.56	0.40	0.58
Female	30 (60)	1.50	0.33	
Marital status				
Single	3 (6)	1.97	0.42	0.07
Married	42 (84)	1.51	0.35	
Divorced/widowed	5 (10)	1.40	0.29	
Educational level				
College/university	18 (36)	1.58	0.35	0.63
Secondary education	20 (40)	1.47	0.29	
Primary education	12 (24)	1.53	0.47	
Working status				
Retiree	35 (70)	1.56	0.38	0.57
Pensioner	9 (18)	1.40	0.34	
Still working	2 (4)	1.66	0.30	
Unemployed/housewife	4 (8)	1.42	0.14	
Smoking status				
Current smokers	1 (2)	1.22		0.67
Never smoked	40 (80)	1.54	0.33	
Stopped	9 (18)	1.50	0.49	
Relative muscle power group				
Low	18 (36)	1.19	0.14	<0.001
Medium	15 (30)	1.48	0.08	
High	17 (34)	1.92	0.26	

Abbreviation: n = frequency, SD = standard deviation

($1.19 \pm 0.14 \text{ W}/(\text{kg} \times \text{m})$), 30% in medium muscle power group ($1.48 \pm 0.08 \text{ W}/(\text{kg} \times \text{m})$), and 34% in high muscle power group ($1.92 \pm 0.26 \text{ W}/(\text{kg} \times \text{m})$). Table 2 shows significant differences in relative muscle power among groups based on the frailty score. Those with a higher frailty index have lower muscle power compared to those with a lower frailty index ($p < 0.05$). Although other physical functional parameters reported a non-significant p -value, calculation of effect size using eta squared exhibited medium effect size for walking time, gait speed, and BMI.

Table 2
Mean comparison of physical functional parameters according to the relative muscle power group

	Relative Muscle Power Group (mean±SD)			<i>p</i> -value	ES
	Low	Medium	High		
Frailty index	1.50*±0.63	1.13±0.74	0.81*±0.75	0.03	0.15
Walking time (seconds)	5.04±1.30	4.46±1.06	4.31±0.87	0.15	0.08
Gait speed (m/s)	0.95±0.26	1.06±0.25	1.08±0.21	0.27	0.06
Hand grip (kilogram)	20.93±7.33	20.68±7.37	22.13±5.55	0.82	0.01
BMI	28.94±5.02	27.11±3.90	25.61±3.26	0.08	0.11

Abbreviation: SD = standard deviation; ES = eta squared effect size; BMI = body mass index

CONCLUSION

In conclusion, more than one-third of the respondents have low relative muscle power. Those with a higher frailty index exhibit lower muscle power compared to those with a lower frailty index. The findings provide beneficial information in developing muscle power training interventions to prevent frailty and retain functional ability and independence in old age.

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Comparative Study of Antioxidant and Anticholinesterase Activities in *Moringa oleifera* Leaves across Different Growth Stages

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ABSTRACT

Alzheimer's disease (AD) treatment often targets increasing acetylcholine levels in the brain by inhibiting acetylcholinesterase (AChE) using AChE inhibitors (AChEIs). *Moringa oleifera* leaves (MOL) possess neuroprotective, antioxidant and anticholinesterase activities. However, the variation in bioactivity of MOL at different growth stages is unclear. This study aims to compare the antioxidant and anticholinesterase activities of MOL harvested at 30, 45, and 60 days. The DPPH assay was used to measure antioxidant activity and the acetylcholinesterase assay assessed AChE

inhibition. MOL were harvested at the specified stages, processed, and extracted with ethanol for the DPPH assay, while acetylcholinesterase activity was measured using lysate from homogenized MOL. Results showed that MOL harvested at 60 days exhibited the highest antioxidant activity compared to those harvested at 45 days ($p < 0.05$) and 30 days ($p < 0.001$). However, MOL harvested at 30 days demonstrated the most significant inhibition of acetylcholinesterase activity compared to the other stages ($p < 0.001$). These findings reveal the varying bioactivities of MOL at different growth stages and highlight the importance of timing in harvesting for therapeutic purposes.

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This study provides valuable insights into the potential use of MOL in AD treatment, emphasizing stage-specific bioactivity.

Keywords: Anticholinesterase, Alzheimer's disease, antioxidant, *Moringa oleifera*, neuroprotective

INTRODUCTION

The aging population is rapidly increasing in Malaysia with the country projected to become an aged society by 2050 (Department of Statistics, Malaysia). This demographic shift is expected to contribute significantly to the escalating prevalence of Alzheimer's disease (AD), a neurodegenerative disorder that affects millions of people globally each year and is known for its significant impairment of sufferers' cognition and behaviour. The neuropathological hallmark of AD includes the abnormal accumulation of misfolded protein (Ashraf et al., 2014), which disrupts neuronal function and contributes to a decline in acetylcholine. One of the main approaches to AD treatment has been to increase the level of acetylcholine (ACh) in central synapses by inhibiting acetylcholinesterase via the use of AChE inhibitors (AChEIs). The USFDA has approved many AChE inhibitors for the treatment of mild-to-moderate AD patients, including galantamine, donepezil and rivastigmine. However, these drugs have several side effects, including gastrointestinal disorders and depression (Yiannopoulou et al., 2020). Natural AChEIs are gaining attention as alternative treatments for AD due to their efficacy and fewer side effects. The World Health Organization (WHO; 2013) stated that herbal medicines serve the health needs of approximately 80 percent of the world's population, particularly in rural areas. *Moringa oleifera*, known as the 'miracle tree' has various pharmacological properties such as antioxidant, anti-inflammatory, immunomodulatory, and anticancer (Dubey et al., 2013). *Moringa oleifera* leaves (MOL) also exhibit a neuroprotective effect, a vital role as antioxidants and anticholinesterases (Omodanisi et al., 2017). However, the different growth stages of MOL that possess different potent bioactivities remain unclear. This study aimed to compare the antioxidant and anticholinesterase activities of MOL harvested at 30-, 45-, and 60-days using DPPH and acetylcholinesterase assays respectively.

METHODS

Moringa oleifera leaves were provided by MR Moringa Sdn. Bhd. and harvested on days 30, 45, and 60. The antioxidant activity of MOL was assessed using the DPPH assay while the inhibition of acetylcholinesterase activity of MOL was assessed using acetylcholinesterase assay. In the DPPH assay, MOL extracts were prepared using ethanol at a solid-to-liquid ratio of 1:10. Next, DPPH solutions were added to the MOL extracts followed by incubation in the dark at room temperature for 30 minutes. Absorbance readings were taken at 515 nm with ascorbic acid serving as the positive control. For

the acetylcholinesterase assay, MOL lysates were obtained through homogenization in a lysis buffer. Next, acetylthiocholine-reaction mixtures were added to MOL lysates, followed by incubation in the dark at room temperature for 30 minutes. Absorbance measurements were conducted at 410 nm, using donepezil as a positive control. The experiments were carried out in triplicate, and data were analysed with ANOVA followed by Tukey’s post-hoc test using SPSS software (version 28).

RESULTS

From the DPPH assay, we found MOL harvested at day 60 exhibited significantly higher antioxidant activity compared to those harvested at day 45 ($p < 0.05$) and day 30 ($p < 0.001$) (Figure 1). The IC₅₀ values for MOL harvested at day 30, 45, and 60 were 611.4 µg/ml, 535.2 µg/ml, and 256.6 µg/ml, respectively. In contrast, based on the acetylcholinesterase assay, the inhibition of acetylcholinesterase activity was highest in MOL harvested at day 30, followed by those harvested at day 45 and day 60 ($p < 0.001$) (Figure 2).

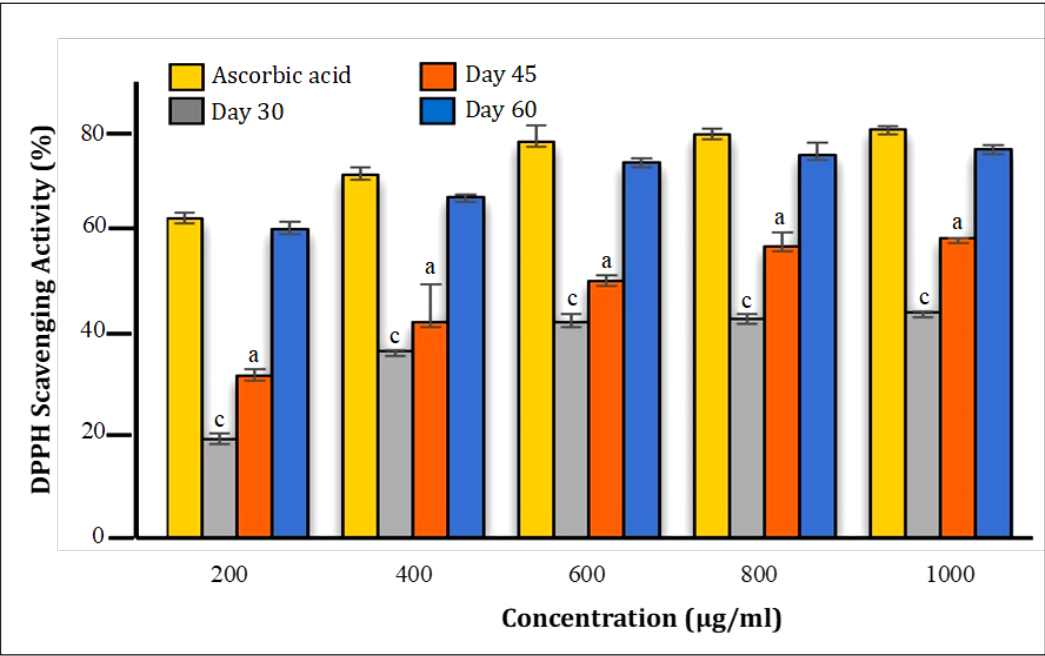


Figure 1. Antioxidant activity of MOL. Data is shown as mean ± SD (n=3). a: $p < 0.05$; b: $p < 0.01$; c: $p < 0.001$ compared to Day 60

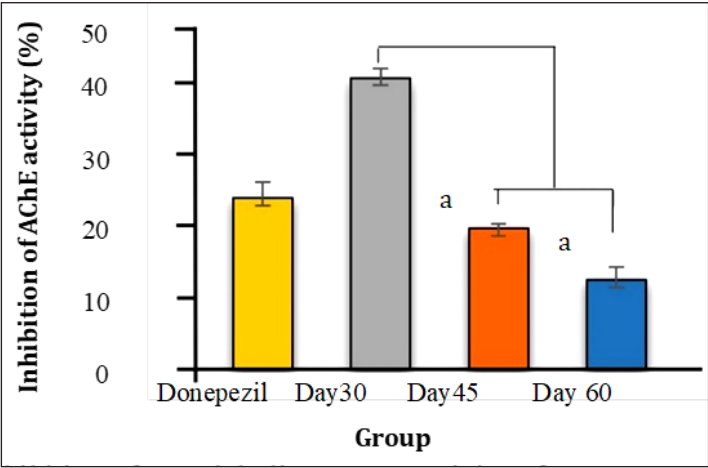


Figure 2. Inhibition of acetylcholinesterase activity of MOL. Data is shown as mean $\pm$ SD (n=3).
a: $p < 0.001$ compared to Day 30

DISCUSSION

Moringa oleifera leaves (MOL) contain approximately 35 important phytochemical constituents, among which tannin, saponin, carotenoids, alkaloids, flavonoids and phenols play significant roles in antioxidant and anticholinesterase activity. We hypothesized that *Moringa oleifera* leaves (MOL) harvested at different growth stages may exhibit variations in their phytochemical constituents, contributing to their pharmacological properties. Our findings indicate that MOL harvested at day 60 exhibited the highest antioxidant activity, while those harvested at day 30 showed the most significant inhibition of acetylcholinesterase activity. Previous research has highlighted the antioxidant properties of MOL, attributing these effects to their rich content of polyphenols and flavonoids. Nwidu et al. (2018) reported an inverse correlation between acetylcholinesterase inhibition activity and the total phenolic and flavonoid contents, further supporting the notion that the bioactive compounds present in MOL may vary significantly with growth stage and influence their pharmacological potential.

CONCLUSION

Our data reveal that MOL harvested at different growth stages exhibit varying bioactivities. This study provides a valuable reference for future research in related fields, emphasizing the importance of identifying and correlating specific phytochemical constituents across the various growth stages of *Moringa oleifera*, particularly in the context of Alzheimer’s disease. By elucidating these phytochemicals and their associated bioactivities, targeted approaches can be developed, potentially advancing treatment strategies for Alzheimer’s

disease. Further investigations are warranted to fully realize the therapeutic potential of *Moringa oleifera* in combating this condition.

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Perhatian in Practice: Dementia Care in Kuantan, Pahang

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ABSTRACT

As the world's population ages, social and cultural aspects of dementia care must be considered. This ethnographic study explores perceptions of dementia care among Malay and Chinese Malaysians living in Kuantan, Pahang. Two years of field work, 18 semi-formal and informal interviews, and archival research led to the results of this study. Areas for participant observation included visits to qigong courts, religious centres, and community organizations. Cultural values, familial responsibilities, and community dynamics impact the care of people experiencing dementia and influence the effectiveness of interventions. "Perhatian" (attention) is a key theme found in the community's perception of dementia care. This theme points to the importance of a community-wide desire for attention, compassion, and pampering in formal and informal care. Cultural awareness is essential in dementia care, and initiatives should be developed to support people experiencing dementia and their caregivers. Medical professionals should collaborate with communities to ensure that dementia is understood. "Perhatian" found in the community of qigong practitioners, demonstrates cultural values combined with caring for each other and the body. Community engagement must come from locals caring for people in Kuantan, Pahang. Medical professionals must advocate, educate, and equip patients and families using community-based tools.

Keywords: Caregiving, dementia, ethnography, informal care, Malaysia, religious aspects, social aspects

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INTRODUCTION

Communities worldwide are increasingly challenged by the ageing population and the rising prevalence of dementia and Alzheimer's disease. Dementia, often

identified by progressive memory loss, behavioural disturbances, and communication difficulties (Emmady et al., 2024), demands not only medical, but also social responses to support patients and caregivers. Kuantan, Pahang, is missing key support structures to care for people experiencing dementia. Johor, Penang, Ipoh, Taiping, Malacca, and Kuala Lumpur, all have vibrant societies that provide support, but Kuantan, Pahang, is far behind. This ethnographic study attempts to understand how the community in Kuantan, Pahang, cares for individuals experiencing dementia.

METHODS

This study explored the perceptions of dementia within the community of Malay and Chinese Malaysians in Kuantan, Pahang. Eighteen caregivers were recruited through community outreach and advocacy programs. Data was collected through semi-structured interviews and informal conversations based on caregiving experiences. Reflexive thematic analysis was used on over 200 hours of fieldwork.

RESULTS

Informal care in Kuantan is vital due to limited formal care services for people experiencing dementia. The care provided is influenced by social, cultural, and religious factors. Families are the primary caregivers but are always struggling with the complexities of dementia such as emotional outbursts, aggression, or wandering off. In Kuantan, Pahang, informal care networks have developed, where care responsibilities are shared among a wider community rather than being shouldered solely by families. This “care innovativeness” allows families to delegate care responsibilities, differing from the Philippines, where family members are judged for not providing direct care (Yeo et al., 2019). The theory of care convoys, which describes fluid networks of caregivers and those needing care throughout life, can be applied to the community dynamic in Kuantan, Pahang (Plath, 1980). Insights from caregivers strengthen this theme as they emphasize the importance of “perhatian”, or paying attention, in caring for their loved ones. Care in Kuantan, Pahang, then looks like a collective, attentive approach rather than the establishment of a hierarchical formal system.

DISCUSSION

Key themes to explore to improve care for people experiencing dementia and reduction of caregiver burnout are to improve community education programs. Advocacy event attendance is already strong, but the support group participation remains non-existent. The Bougainvillea City Dementia Café in Ipoh is a successful model for a positive and culturally informed structure. Medical community involvement is also a key to the success of health initiatives. Without clear guidance or referrals, people in Kuantan are lost, feeling

uncertain about the next steps to take. The cultural contrast between Western individualistic care systems and the Asian collectivist system was also made apparent during the research project as the tools and care strategies brought in from the West must be culturally adapted and informed.

CONCLUSION

The research highlights the importance of community involvement, education, and sensitivity in dementia care in Kuantan, Pahang.

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Navigating the Path: The Recruitment Process for Gardening Research with Cancer Patients in the Klang Valley

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ABSTRACT

The need for customised approaches to engage older cancer patients and the insight garnered from patient-centred care pathways and exercise intervention trials have been beneficial in understanding effective recruiting techniques. This document offers a succinct summary of the obstacles and complications that are linked to the recruitment of elderly individuals who have been diagnosed with cancer. Our methodology is founded on a model that explicitly addresses the challenges and opportunities associated with recruiting individuals from the research community and the special population. At the outset of the investigation, potential enablers and barriers in prior research are identified. Participants recruitment was recorded in a logbook detailing contacts with parties who are related to cancer patients and senior adults, which was subjected to content analysis to examine recruitment barriers and facilitators. The finding shows that successful recruitment transpires when the objectives of certain populations coincide with those of the scientific community. Recruiting cancer patients necessitates considerable time and effort; nonetheless, retention remains high, despite some individuals declining interviews due to fear. Trust is essential, given the persistent stigma

surrounding cancer. Overcoming obstacles, including gatekeepers' interests and participants' availability, is essential for effective recruitment techniques.

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Keywords: Cancer, gardening, methodology, older persons, recruitment

INTRODUCTION

Participating in research is difficult for elderly cancer patients. Chronic diseases can complicate aged cancer treatment (Ploeg et al., 2019; Sien et al., 2024). Transportation obstacles, psychological issues including fear and trial procedure misunderstanding, and feelings of alienation from care decisions can all hamper enrolment (Hestevik et al., 2020; Wright, 2017). Low health literacy, lack of awareness of supportive care options, and misconceptions regarding clinical trials and their benefits can lead to unmet treatment needs (Puts et al., 2012). These issues require new communication and recruitment strategies. This paper discusses the challenges of recruiting elderly cancer patients into horticultural programs and suggests solutions.

METHODS

The study used a combination of purposive and snowball sampling to recruit older cancer patients aged 60 and above in Selangor, Kuala Lumpur, and Putrajaya. The purposive sampling targeted individuals aged 60 or older, diagnosed with cancer within five years, and engaged in gardening activities. Snowball sampling involved referring eligible individuals from their social or support networks. A detailed logbook was maintained to manage appointments, ensuring regular follow-up and confirmation. This strategy enhanced the study's reliability and comprehensiveness.

RESULTS AND DISCUSSION

This study found that linking personal goals with scientific community aims and fostering trust boosts engagement among older adult cancer patients. Participants often wish to contribute to the research that reflects their experiences and goals, highlighting the goal alignment. These findings support previous research indicating societal advantages and institutional prestige may drive a health research engagement (Goodman et al., 2019). Cancer's stigma and death might also inhibit frank dialogues. In contrast, trust reduces anxiety and increases participation, creating a good research atmosphere.

Gatekeepers' personal interests, participants' research knowledge, and their individual and medical availability were the main hurdles to participation. The gatekeepers who lead recruitment efforts may have competing interests, limiting participation. Potential volunteers must understand the research to avoid uncertainty and mistrust (Nueces et al., 2012). Many cancer patients may face personal and medical challenges that limit their availability (Abshire et al., 2017).

Well-coordinated research teams can improve participant retention despite recruitment delays. This study found that participants appreciated the experience, highlighting its potential advantages. Anxiety can prevent some people from attending interviews (Wang et

al., 2023). Despite these challenges, this study's participants enjoyed gardening, suggesting that therapeutic activities might offer joy and normalcy to cancer treatment.

CONCLUSION

Personal alignment with research goals and trust motivates particular populations to participate in cancer research. Gatekeeper interests and participant availability must be addressed to improve recruitment and retention. The findings emphasize the necessity of recognizing elderly cancer patients' unique issues and the possibility of therapeutic activities to encourage research participation. Recruiting older cancer patients for research is challenging due to physical and emotional barriers. Policies should promote accessible activities like gardening to support their well-being and research participation.

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Perceived Income Adequacy: A Comparative Analysis of Young and Mature Malaysian Government Employees

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ABSTRACT

Perceived Income Adequacy (PIA) reflects individuals' subjective assessment of their financial capacity, serving as a key indicator of economic well-being and financial security. This study examines age-related differences in PIA among Malaysian government employees, using data from 6,096 Malaysian government employees. Respondents were categorized as young (below 40 years) and mature (40 years and above). PIA was measured using a five-point Likert scale, and a Chi-square test was conducted to assess the relationship between age and PIA. Results show that mature employees perceive higher levels of income adequacy compared to younger employees. However, 14% of mature employees still report inadequate income. The significant association between age and PIA highlights the need for tailored interventions. These findings highlight the importance of addressing age-specific financial needs to promote economic security and quality of life across career stages.

Keywords: Malaysian government employees, perceived income adequacy, retirement

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INTRODUCTION

Perceived income adequacy (PIA) is a crucial component of economic well-being at any age, particularly as it serves as an indicator of financial capacity in old age. It reflects individuals' subjective assessment of their financial situation and their ability to meet current and future expenses. Some authors (e.g., Bagwell, 2000; Hayhoe,

1990) suggest that an individual's subjective perception of their income adequacy may be a stronger predictor of their overall quality of life than objective financial measures. Furthermore, objective indirect measures are often not comprehensive in reflecting people's experiences (Helliwell et al., 2017; Kwan et al., 2018).

PIA is a pivotal element of economic well-being, especially in later years, as it affects overall life satisfaction, financial security, and retirement planning. This study aims to compare PIA among young and mature Malaysian government employees to understand age-related differences by cross-tabulating age groups and PIA. Data were obtained from an online survey on the "Views and Aspirations of Government Employees" conducted in 2023.

The Public Service Department (JPA) reported that the number of government employees in 2023 was over 1.5 million, including federal and state government employees, as well as employees of statutory bodies and local authorities. This large workforce draws attention to the importance of assessing income adequacy to ensure sustainable retirement outcomes for current and future retirees.

METHODS

Data were collected through an online survey distributed to government employees using a convenience sampling approach. A total of 6,252 responses were initially gathered. Following data cleaning to remove entries with missing information, 6,096 responses were included in the final analysis. The respondents were categorized into two age groups: young (below 40 years) and mature (40 years and above).

PIA was measured using a single-item assessment where participants rated their current income adequacy (Gildner et al., 2019; Masud et al., 2006). They responded on a five-point Likert scale: 1 (inadequate), 2 (adequate for basic needs only), 3 (adequate for most things but not everything), 4 (adequate for everything), and 5 (adequate for everything and able to save).

Data were analysed by cross-tabulating PIA with age groups to examine patterns across the two groups. A Chi-square test was conducted to determine the statistical significance of the association between age and PIA, providing insights into whether differences in PIA were significantly related to age group.

RESULTS

Table 1 presents the demographic profile of the respondents, totalling 6,096 respondents. The average age is approximately 40.81 years, with 46.4% of respondents below 40 years and the remaining 53.6% aged 40 years and above. In terms of gender, females make up the majority at 55.0%, while males account for 45.0%. The distribution across job categories shows that 1.1% of respondents hold the top management category, 34.9% are

in the management and professional category, and the largest portion, 64.0%, are in the supportive category. This demographic overview provides insight into the age, gender, and job distribution within the respondent group.

Table 1
Profile of respondents (N=6,096)

Demographic Profile	Mean	Frequency	Percentage (%)
Age (years)	40.81		
Young	34.17	2829	46.4
Mature	46.55	3267	53.6
Sex			
Male		2746	45.0
Female		3350	55.0
Marital status			
Married		5039	82.7
Widowed/Separated/ Divorced		263	4.3
Never married		794	13.0
Household size	4.53		
Job Category			
Top management		69	1.1
Management & Professional		2128	34.9
Supportive		3899	64.0

The distribution of PIA between younger and mature employees is shown in Table 2. The findings indicate that mature government employees generally perceive a higher level of income adequacy. Young employees are more likely to report inadequate income, while mature employees often feel their income is sufficient to cover most or all expenses and allows for savings. This finding suggests that as individuals progress in their careers, they may experience greater financial stability and confidence in meeting their needs. Overall, mature employees exhibit a more positive perception of their income adequacy compared to their younger counterparts.

Table 2
Cross-tabulation of Perceived Income Adequacy (PIA) by age group

Perceived Income Adequacy	Young Employees (n=2,829)	Mature Employees (n=3,267)	Total (N=6,096)
Inadequate (1)	21.0%	14.0%	17.2%
Adequate for basic needs only (2)	32.0%	24.1%	27.7%
Adequate for most things (3)	31.9%	37.3%	34.8%
Adequate for everything (4)	7.2%	12.5%	10.1%
Adequate for everything and able to save (5)	8.0%	12.1%	10.2%
Total (%)	100%	100%	100%

A Chi-square test was conducted to assess the association between age groups and PIA (Table 2). The results indicate a significant relationship, indicating that age significantly influences government employees' PIA ($\chi^2 = 158.434$, $df = 4$, $p < .001$). Notably, mature employees report a higher level of income adequacy compared to their younger counterparts.

DISCUSSION

The association between age and PIA may be influenced by various factors at different life stages. Young adults often face significant financial challenges including the rising cost of living and unstable economies, which impact how they consume, manage, and save their monthly income to maintain their standard of living (Sabri et al., 2023). Additionally, young workers are often in the early stages of family formation, which may require higher expenditures to support their growing families. These challenges collectively contribute to their sense of income inadequacy. In contrast, older individuals typically report higher levels of PIA (Litwin & Sapir, 2009), likely due to more stable incomes, accumulated work experience, and potentially more effective financial planning over time.

However, the finding that 14% of mature employees still perceive their income as insufficient is unexpected and challenges common assumptions that financial adequacy consistently improves with age. Despite their career experience and likely higher income levels, a significant portion of mature workers may still struggle with financial challenges. This could stem from larger financial responsibilities, such as supporting dependents or covering healthcare costs, or from inadequate retirement planning, which may affect their financial situation in retirement. Such findings highlight that even with career longevity, financial adequacy may not be guaranteed, underscoring the need for targeted interventions to support mature employees in managing these ongoing challenges. These issues warrant further examination and should be the focus of upcoming discussions in Malaysia.

On the other hand, the capacity to save, reported by a higher percentage of mature employees than younger employees, stands as a key indicator of long-term financial resilience. Saving capacity not only reflects immediate financial security but also predicts readiness for retirement and economic stability in later life. This pattern highlights the importance of financial literacy programs tailored to younger employees to instil early savings habits, supporting them in building long-term financial security (Masud et al., 2012).

Finally, the statistically significant association between age and PIA reinforces the importance of addressing age-specific financial challenges. Younger employees could benefit from debt management, budgeting, and financial planning resources, while mature employees-despite reporting higher perceived adequacy-would benefit from retirement-focused planning to ensure sustained economic security.

CONCLUSION

Overall, this study emphasises significant age-related differences in PIA among Malaysian government employees, suggesting that financial well-being varies substantially across life stages. Mature employees generally report higher levels of income adequacy, possibly due to greater financial stability and savings capacity accumulated over their careers. However, the notable portion of mature employees who still perceive their income as inadequate implies that financial stability does not automatically increase with age, particularly when considering factors such as family responsibilities and healthcare costs.

These insights reveal the critical need for age-specific financial support interventions. Younger employees may benefit from programs focused on debt management, budgeting, and foundational financial literacy, aimed at building early financial resilience and savings habits. Conversely, mature employees would benefit from retirement-oriented financial planning to address ongoing financial challenges and secure their economic well-being post-retirement. By recognizing and addressing these distinct financial needs, policymakers and organizations can foster a workforce better prepared for both current financial demands and long-term economic security, ultimately enhancing the overall quality of life for government employees at different career stages.

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Public Transport Policy Enrichment in Improving Its Acceptance and Utilisation among the Ageing Population

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ABSTRACT

Population aging may pose a challenge to the public transport system. This study aimed to identify the travel behaviors, needs, and challenges of older adults living in the Klang Valley, Malaysia, when using public transport. A community survey was conducted with 497 older adults from all municipalities in the Klang Valley. Overall, the majority lacked adequate access to public transport facilities. Public transport was primarily used to access healthcare services. On average, respondents made four trips per week, typically in the morning. Many experienced more difficulties with the service itself than with the available infrastructure.

Keywords: Mobility, older adults, older public transport users, public transport, travel behaviour, trip characteristics

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INTRODUCTION

Mobility justice views equitable access to transport as a fundamental right, especially for vulnerable groups like the elderly (Sheller, 2020). From this perspective, the lack of reliable and safe transport options for older adults constitutes a form of social exclusion. Complementing this, the World Health Organization's age-friendly cities

framework advocates for inclusive urban environments that support active aging with accessible and affordable transport as a key component (World Health Organization, 2007). In Malaysia, public transport often overlooks older adults' needs, such as inadequate age-friendly pedestrian infrastructure, limited parking facilities, and insufficient security features (Zakaria et al., 2024). With the ageing population expected to place greater demand on public transportation, it is crucial to reassess and improve the current system to better serve older users (Ang et al., 2020). In light of this, this study explores public transport usage among older adults and identifies the key challenges they encounter when using it.

METHODOLOGY

The Consortium on Mobility and Transportation in an Ageing Society (CoMTAS) was established to look into older adults' mobility and transportation. A cross-sectional study was conducted with a survey administered to randomly selected older adults aged 55 years and above who reside in the Klang Valley through cluster sampling. Respondents completed a self-administered questionnaire that covered sociodemographic, socioeconomic, household characteristics, living environment, health and disability status, as well as travel modes, needs, patterns, and barriers. Descriptive statistics were used to describe the travel characteristics of respondents who use public transport. Additionally, multiple logistic regression analyses, conducted using the SPSS version 26, were performed to identify significant determinants influencing public transport use, while controlling for baseline characteristics.

RESULTS AND DISCUSSION

Of the 497 respondents, 39.4% reported regular use of public transport, with 26.8% by bus, 18.5% by train, 12.1% by taxi, and 10.3% by e-hailing services. Regular users were predominantly aged 80 and above (47.4%), female (43.7%), of Indian ethnicity (60.0%), and had no formal education (56.0%). Most were retirees (44.5%), from lower-income groups (39.0%), lived alone (77.8%), and reported having comorbidities (39.8%), functional impairments (39.9%), musculoskeletal pain (41.0%), or used a walking device (50.0%).

When examining travel behaviors, those who had stopped driving (52.5%) or had never driven (52.6%) were more likely to rely on public transportation to reach their destinations. Nearly half of them did not own a vehicle (47.2%). Most reported having access to a nearby taxi stand (46.3%), followed by a train station (44.1%), bus stop (42.1%), and bus station (38.5%). Nevertheless, only a small percentage used transport concessions for buses (24.9%), trains (18.7%), or transnational buses (9.9%). A larger proportion traveled in the morning (58.3%) and primarily for healthcare purposes (19.4%). Table 1 summarizes the travel characteristics of respondents who use public transport.

Table 1
Travel characteristics of respondents who use public transport

Variable description % per category	1	2	3	4
Driving status (1=still driving, 2=ceased driving, 3=never drive)	30.7	52.5	52.6	
Vehicle ownership (1=none, 2=has bicycle, 3=has motorcycle, 4=has car)	47.2	12.8	24.3	38.5
Facility near home (1=bus stop, 2=bus station, 3=train station, 4=taxi stand)	42.1	38.5	44.1	46.3
Use of concession card (1=RapidKL, 2=KTMB, 3=express bus)	24.9	18.7	9.9	
Perceived public transport affordability (1=affordable, 2=unaffordable, 3=undecided)	45.5	8.6	17.5	
The average number of trips per week 4.97 ± 3.54				
Travel time (1=morning, 2=afternoon, 3=evening/night)	58.3	57.8	33.5	
Common travel destination (1=healthcare facilities, 2= relative/ friends' house, 3=mall, 4=service center such as bank, post office, etc.)	19.4	11.7	11.2	10.2

Older adults living alone were less likely to use public transport (aOR: 0.860, $p=.001$). Conversely, those who had ceased driving (aOR: 1.262, $p<.001$) or had never driven (aOR: 1.025, $p<.001$) were more likely to rely on public transport. Additionally, bus concession users were nearly twice as likely to use public transport (aOR: 1.892, $p<.001$). However, train concession use was associated with slightly lower odds of public transport use (aOR: 0.926, $p<.05$).

Furthermore, a range of recurring obstacles was reported by the respondents. Among bus users, the most frequently cited issues were long waiting times (43.3%), lack of punctuality (39.4%), and limited parking at bus stations (39.4%). Train users experienced similar challenges, including limited parking (38.2%), long waits (34.8%), and unreliable schedules (33.7%). Taxi users most often pointed to inconsistent fares (32.0%), unclear fare displays (28.0%), and long waiting times (28.0%). For e-hailing services, the main concerns included high fees (41.3%), inconsistent pricing (28.3%), and limited availability during nights or weekends (28.3%). Figure 1 summarizes the obstacles they encountered when using public transport.

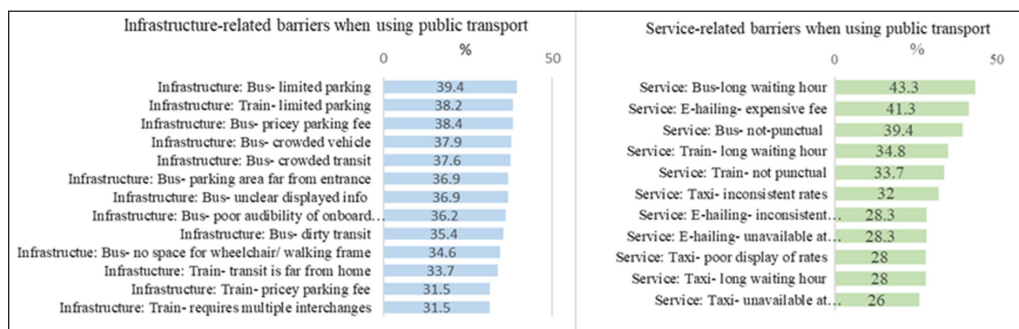


Figure 1. Summary of the obstacles older adults face when using public transport

Similar issues have been reported by Tang et al. (2022), Latiff and Mohd (2023), and Fatima and Moridpour (2019). To address the identified obstacles in public transport, several policy interventions can be proposed. To reduce long waiting times and improve punctuality, real-time tracking systems and increased service frequency should be implemented. For parking, dedicated age-friendly spaces near stations and park-and-ride schemes should be introduced. Inconsistent fare structures can be addressed by standardizing pricing across transport modes and offering clear, transparent fare systems with concessions for older adults. Finally, to improve e-hailing service availability, incentives for off-peak service provision and age-friendly taxi services should be established. These measures will contribute to a more inclusive and reliable public transport system for older users.

CONCLUSION

Public transport usage among older adults is low, with the presence of significant barriers to accessing services tailored to their needs, particularly for those with lower incomes or health challenges. Future transport policies should focus on improving accessibility, affordability, and engagement for older adults, while promoting concessionary travel and integrating transport with health and social care systems.

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A Bibliometric Analysis of Technology for Aging Populations: Trends and Future Directions

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ABSTRACT

This study presents a bibliometric analysis of research on technology for aging populations from 1997 to 2024. We analyzed 552 documents from Scopus, focusing on publication trends, key research areas, and emerging topics. The field saw minimal activity until 2013, followed by fluctuations from 2014 to 2016, and a dramatic surge from 2017 to 2022, with publications increasing nearly fivefold. A slight decline was observed in recent years. The top research areas were Medicine, Computer Science, and Engineering. The most influential paper, “A Survey on Ambient-assisted Living Tools for Older Adults” (2013), received 919 citations. The most productive author, Demiris, G., published 16 documents, with his highest-cited article “Older adults’ attitudes towards and perceptions of ‘smart home’ technologies: A pilot study” (2004) receiving 548 citations. This review highlights trends in technological developments for aging populations, summarizes main research areas, and identifies topics requiring further investigation. Our findings can guide researchers, funding agencies, and policymakers in addressing the technological needs of aging populations.

Keywords: Aging populations, bibliometric analysis, gerontechnology, research trends, technological solutions

INTRODUCTION

Problem Statement

The rapid expansion of research on technology for aging populations across multiple disciplines has led to a diverse but potentially uncoordinated body of knowledge. This situation may result in the oversaturation of certain research areas while others remain underexplored, creating

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inefficiencies and potential gaps in addressing the comprehensive needs of the aging population. A systematic bibliometric analysis is therefore warranted to map the current research landscape, identify potential redundancies and overlooked areas, and provide strategic guidance for future research priorities. This study aims to synthesise and evaluate the existing literature to facilitate a more synchronised and targeted approach to research in gerontechnology, ultimately enhancing the field's ability to address the multifaceted challenges of an aging society.

Research Questions

For this study, there are three main research questions to address.

1. What are the predominant trends in publication volume, subject areas, and geographic distribution of research on technology for aging populations over the period of 1997-2024?
2. How have the key research themes and focus areas in gerontechnology evolved over time, and what emerging topics or underexplored areas can be identified?
3. Based on citation patterns and emerging keywords, what are the potential high-impact research directions in technology for aging populations for the next 5-10 years?

MATERIALS AND METHODS

Data Collection

This bibliometric analysis utilised the Scopus database, one of the largest abstract and citation databases of peer-reviewed literature. The search was conducted on 12th August 2024 using the following string of keywords: Search string used are ("Aging technology" OR "ageing technology" OR "Gerontechnology" OR "Assistive technology" OR "Smart home" OR "Robotics" OR telemedicine OR "Wearable technology" OR "Digital health" OR "Ambient assisted living" OR "Environmental gerontology" OR "Universal design" OR "Mobility aids" OR "Cognitive assistive technology" OR "Senior living technology" OR "Aging in place" AND (elderly OR aging OR ageing OR older) AND adults). The search was limited to articles published between 1997 to 2024, spanning over a 27-year trend in the field. Only English-language articles were included in the analysis.

Data Analysis

The initial dataset was exported from Scopus in CSV format for further processing and analysis. We employed several software tools for data cleaning, analysis, and visualization which include Microsoft Excel: used for initial data cleaning, basic statistical analysis, VOSviewer (version 1.6.20): for creating and visualising bibliometric networks, including

co-authorship, co-citation, and keyword co-occurrence networks and finally Harzing’s Publish or Perish for additional citation analysis and to verify publication metrics.

Inclusion and Exclusion Criteria

Our analysis encompassed all documents retrieved from the Scopus database search, including articles, conference papers, reviews, book chapters, letters, notes, editorials, and books. We excluded non-English publications.

RESULTS

The field of technology for aging populations experienced minimal growth from 1997 to 2016, followed by a surge from 2017 to 2022, with publications increasing nearly fivefold to peak at around 90 documents annually. However, a slight decline is observed from 2023 to 2025 (Figure 1).

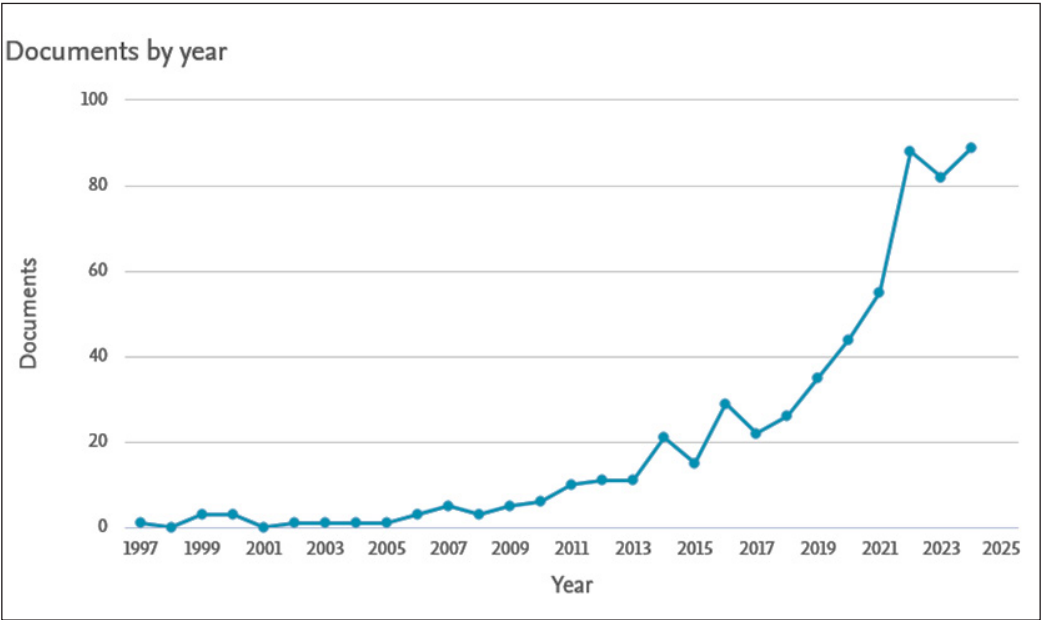


Figure 1. Annual publication trends in technology for aging populations (1997-2025)

Figure 2 shows the United States leads research output in technology for aging populations, followed by Canada and a diverse mix of European and Asia-Pacific countries, reflecting a global interest in this field with a concentration in developed nations.

Table 1 presents the top ten most cited publications in the field of technology for aging populations, with citation counts ranging from 922 to 153. The studies cover a diverse

range of topics including ambient-assisted living, smart homes, telemedicine, wearable technologies, and social networks for older adults, indicating the multifaceted nature of research in this field from 2004 to 2020.

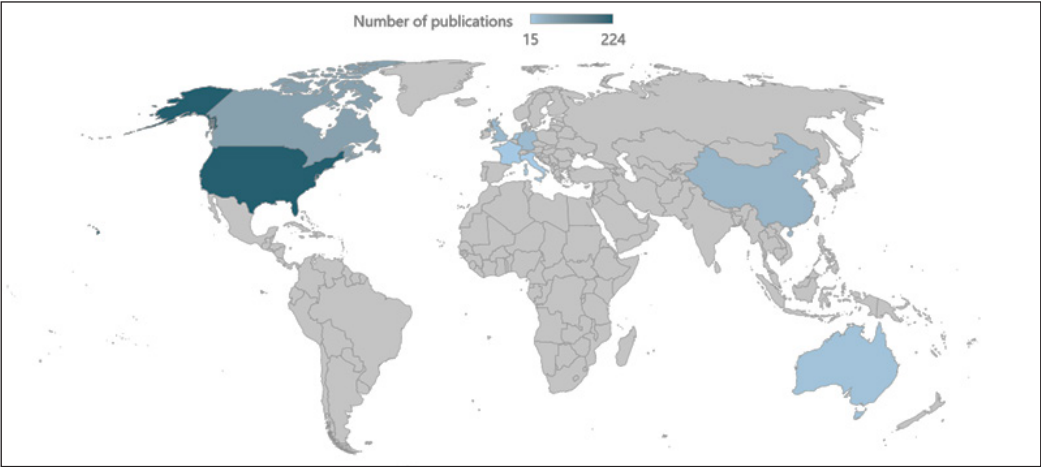


Figure 2. Top 10 countries/territories contributing to research on technology for aging populations

Table 1
Most cited publications on technology for ageing population

References	Title of the study	Year	Number of citations	Document type
Rashidi & Mihailidis (2012)	A survey on ambient-assisted living tools for older adults	2012	922	Article
Demiris et al. (2004)	Older adults' attitudes towards and perceptions of 'smart home' technologies: A pilot study	2004	552	Article
Liu et al. (2016)	Smart homes and home health monitoring technologies for older adults: A systematic review	2016	468	Review
Lam et al. (2020)	Assessing Telemedicine Unreadiness among Older Adults in the United States during the COVID-19 Pandemic	2020	433	Letter
Peek et al. (2016)	Older Adults' Reasons for Using Technology while Aging in Place	2016	347	Article
Gardner (2011)	Natural neighborhood networks - Important social networks in the lives of older adults aging in place	2011	295	Article
Li et al. (2019)	Health monitoring through wearable technologies for older adults: Smart wearables acceptance model	2019	279	Article
Looije (2010)	Persuasive robotic assistant for health self-management of older adults: Design and evaluation of social behaviors	2010	195	Article

Table 1 (continue)

References	Title of the study	Year	Number of citations	Document type
Wang et al. (2019)	Technology to support aging in place: older adults' perspectives	2019	185	Article
Courtney et al. (2008)	Needing smart home technologies: The perspectives of older adults in continuing care retirement communities	2008	153	Article

Figure 3 presents a network of interconnected keywords related to technology for aging populations from 2016 to 2022, with “human”, “older adults”, “aging”, and “quality of life” as the largest and most central terms. The map displays a color gradient from blue to

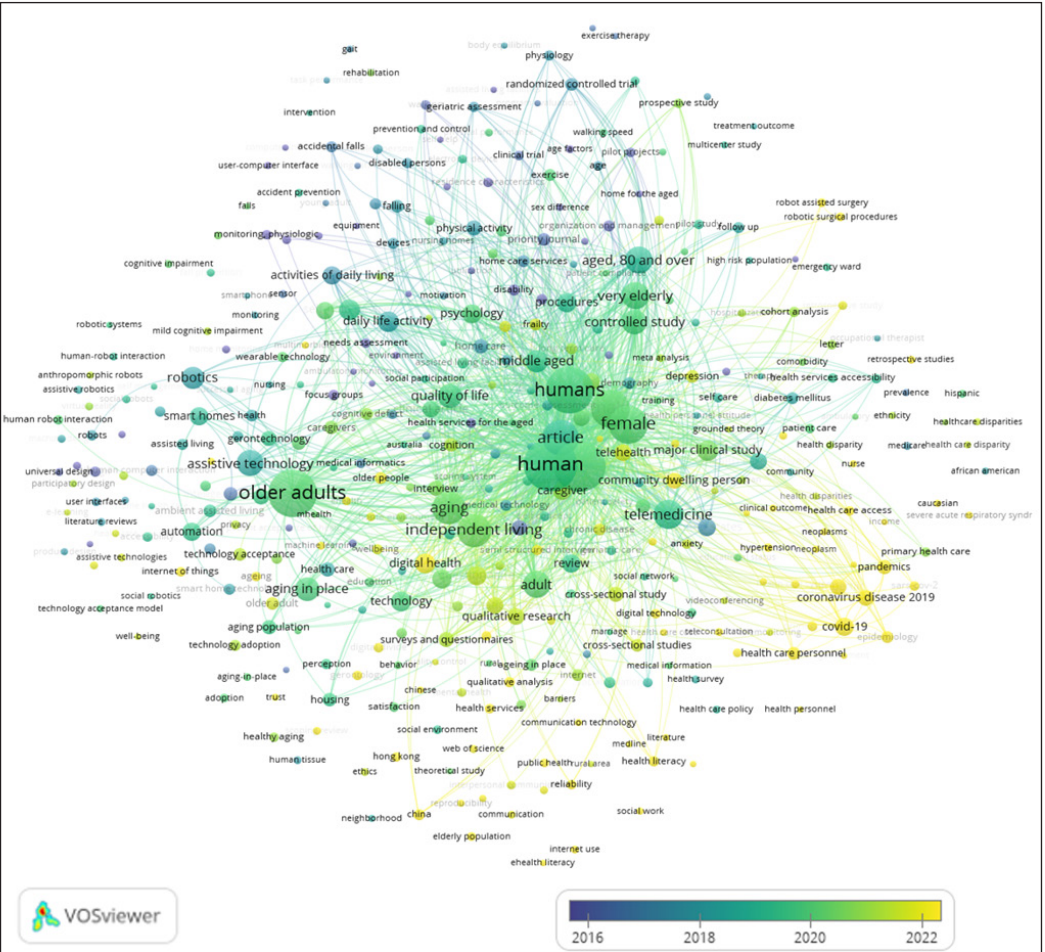


Figure 3. Overlay visualisation map of co-occurrence for all keywords on technology for aging population from 2016-2022

yellow, representing earlier to more recent years respectively, with terms like “covid-19”, “telemedicine”, and “digital health” appearing in yellow. The network shows distinct clusters of related topics, encompassing a diverse range of medical, technological, and social terms, with varying node sizes indicating different co-occurrence frequencies and interconnecting lines suggesting relationships between keywords.

DISCUSSION

The field of gerontechnology has an exponential growth since 2015, evolving from basic assistive technologies to encompassing cutting-edge concepts such as smart environments, digital health ecosystems, and AI-augmented care. This progression, accelerated by the COVID-19 pandemic, has led to high-impact research efforts in ambient-assisted living, advanced wearable technologies, and seamless AI integration in geriatric care. Current trends emphasize human-centric aging, quality of life, telemedicine, and digital health solutions, with key focus areas including assistive technologies, health monitoring, mental health support, and social connectivity for older adults. Future research is likely to prioritize AI integration, advanced telemedicine, personalized care technologies, and solutions addressing cognitive health, social connectedness, and sustainable aging in the context of global challenges like climate change.

CONCLUSION

Gerontechnology has rapidly evolved from basic assistive devices to sophisticated, AI-driven ecosystems, reflecting their growing importance in addressing the complex needs of aging populations worldwide. The field’s responsiveness to technological progress and societal changes, particularly accelerated by the COVID-19 pandemic, has led to expanding research in personalized care, cognitive health, and sustainable aging solutions. As gerontechnology advances, it is poised to revolutionize how societies support and empower their aging members while addressing broader healthcare system challenges.

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Accessible Multisensory Garden and Its Impact on Quality of Life among Elderly Residents of USJ6

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ABSTRACT

Designing a space with health considerations for individuals involves a holistic approach aimed at enhancing overall well-being. Multisensory gardens are specially designed to appeal to the senses of sight, smell, touch, taste, and hearing in order to provide an engaging and restorative environment for individuals with different capacities. An accessible multisensory garden's design prioritizes usability and accessibility for all individuals, including those with impairments. The features of accessible multisensory gardens can greatly influence the quality of life among the residents of a community, especially the elderly. In order to study the impact of the establishment of an accessible multisensory garden, a cross-sectional study was conducted to explore how people of USJ6, Selangor, Malaysia, are able to improve their quality of life. A total of 48 retired elderly people took part in the study. The findings show that quality of life has significant positive associations with usage accessibility ($r = 0.342$, $p = 0.017$), movement accessibility ($r = 0.361$, $p = 0.012$), multisensory experiences ($r = 0.460$, $p = 0.001$), and social engagement ($r = 0.366$, $p = 0.011$). Stepwise multiple linear regression identified multisensory experiences and usage accessibility as significant predictors of quality of life, explaining 26.3% of the variance. The findings underscore the importance of accessible multisensory gardens in enhancing the well-being of community residents. The study, which demonstrates the good influence of these gardens on physical, emotional, and social well-being, is useful for urban planners, healthcare practitioners, and community organisers.

It emphasises the potential of such gardens to promote inclusive, healthy, and dynamic communities, and advocates for their widespread implementation in both urban and suburban contexts.

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INTRODUCTION

Designing spaces that prioritise health involves creating environments that foster holistic and sensory-rich experiences, which is crucial for overall well-being. In many communities, public spaces such as parks and gardens play a vital role in promoting health by encouraging physical activity and providing opportunities for relaxation and socialization (Cohen et al., 2007). Among these, the multisensory gardens are a specialized environment designed to be particularly therapeutic and engaging. Research has consistently shown that access to natural environments is linked to reduced depression, anxiety, and stress, highlighting the therapeutic value of “nature therapy” in enhancing mental health (Bratman et al., 2015; Mitchell & Popham, 2008).

The concept of an accessible multisensory garden takes this further by prioritizing usability for everyone, including individuals with physical or sensory impairments. Among these natural settings, multisensory gardens are designed to engage all five senses: sight, smell, touch, taste, and hearing, creating a restorative environment that benefits individuals with varying abilities, particularly older adults (Souter-Brown et al., 2014). For elderly residents, such features can profoundly influence their quality of life by providing a safe and stimulating space that fosters physical, emotional, and social well-being. These gardens have been shown to improve quality of life and support independence in elderly populations (Souter-Brown et al., 2021). While the benefits of sensory gardens are recognized, particularly for specialized populations like those with dementia, it is essential to understand which specific design elements most effectively contribute to the well-being of the broader elderly population in a community setting.

Therefore, this study aims to address the issue by exploring the impact of an accessible multisensory garden on the quality of life of retired elderly residents in USJ6, Selangor, Malaysia. Using a cross-sectional research design, this study will not only assess the overall impact but also identify the key garden features such as accessibility, sensory experiences, and opportunities for social engagement that are most significant predictors of an enhanced quality of life.

METHODOLOGY

A cross-sectional research design is employed to investigate the relationship between the features of the accessible multisensory garden and quality of life. The study was conducted in the community of USJ6, Selangor, Malaysia. The sample consists of 48 retired elderly residents from USJ6 who participated in the community garden activities.

Data were gathered through a structured questionnaire administered to the participants. The instrument was designed to collect information on several key areas, including aspects of the garden’s usage and movement accessibility, multisensory experiences, structural and tool safety features, and social engagement.

The collected data were subject to several statistical procedures. First, a factor analysis using Principal Component Analysis (PCA) with a Varimax rotation was conducted to group questionnaire items with similar characteristics. The suitability of the data for factor analysis was confirmed through two tests: the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which was 0.752, and Bartlett’s test of sphericity, which was significant ($\chi^2 = 234.076$, $p < 0.001$).

Next, to assess the relationship between garden features and quality of life, Spearman’s correlation was used, as some variables were not normally distributed. Finally, a stepwise multiple linear regression was performed to identify the most significant predictors of quality of life among the variables studied.

RESULTS AND DISCUSSION

The statistical analysis yielded several key findings regarding the relationship between the accessible multisensory garden’s features and the residents’ quality of life.

Spearman correlation analysis revealed that quality of life had significant positive associations with most of the garden features studied. The results showed that the strongest correlation was with multisensory experiences ($r = 0.460$, $p = 0.001$), as shown in Table 1. Other significant positive correlations included social engagement ($r = 0.366$, $p = 0.011$), movement accessibility ($r = 0.361$, $p = 0.012$), usage accessibility ($r = 0.342$, $p = 0.017$), and structural safety ($r = 0.328$, $p = 0.023$). Tool system safety was the only variable that did not have a statistically significant association with quality of life.

Table 1
Spearman’s correlation coefficients

Variables		r	df	p-value
Quality of Life	Usage Accessibility	0.342	48	0.017
	Movement Accessibility	0.361	48	0.012
	Multisensory	0.460	48	0.001
	Structural Safety	0.328	48	0.023
	Tool System Safety	0.202	48	0.168
	Social Engagement	0.366	48	0.011

A stepwise multiple linear regression was performed to identify the most significant predictors of quality of life. The results for the predictive model are shown in Table 2. The analysis identified multisensory experiences and movement accessibility as key predictors of quality of life. This final model explained 26.3% of the variance in quality of life (adjusted $R^2=0.230$). The regression model met all key assumptions, including normality, linearity, and homoscedasticity.

Table 2
Significant predictors of quality of life from the stepwise regression model

Model	Adjusted R Squared	Variable	p-value
Stepwise	0.230	Multisensory	0.006
		Movement Accessibility	0.027

This study shows that the accessible multisensory garden at USJ6 positively affects the quality of life for its elderly residents. The main finding is that, although several features are important, multisensory experiences and movement accessibility are the most influential factors for well-being. This suggests that for seniors, the garden’s therapeutic benefits depend more on its ability to engage the senses and support safe, independent movement than on its physical design. The role of sensory engagement supports the idea that such activities boost cognitive and emotional health, while easy movement encourages physical activity and independence.

These findings hold practical significance for various professionals. Urban planners and community organizers can utilize this evidence to prioritise barrier-free pathways and develop lush, sensory-rich planting and design schemes, thus enhancing the health benefits of community green spaces. For healthcare providers, recommending time in these gardens provides a non-drug approach to improve the physical and emotional well-being of older adults.

It is important to recognise the limitations of this research. The cross-sectional approach offers a snapshot of associations but cannot prove cause-and-effect relationships. Additionally, with only 48 participants from a single location, the results’ applicability to broader populations is restricted. Future studies should consider longitudinal designs to observe changes in quality of life over time and include larger, more varied samples from various urban and suburban areas to confirm these findings. Nonetheless, despite these constraints, this research strongly supports the widespread adoption of accessible multisensory gardens as a means to foster inclusive, healthy, and vibrant communities.

CONCLUSION

This study examined how an accessible multisensory garden affects the quality of life among elderly residents of USJ6. The results show that the garden positively influenced their well-being, with multisensory experiences and ease of movement being the key factors driving this improvement. These findings emphasise the important role such gardens can play in creating inclusive, engaging, and health-promoting spaces, especially for seniors. Overall, the study strongly supports expanding the use of accessible multisensory gardens in urban and suburban areas as a practical way to boost community well-being.

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Beyond Caregiving: Unveiling the Relationship between Caregiving Dynamics and Psychological Well-being

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ABSTRACT

Informal caregivers play a crucial role in the care of older persons, providing essential support that significantly influences the well-being and functioning of this population. However, caregiver characteristics, such as mental health and adaptability to caregiving stress, can impact the quality of care provided. This study investigates the unique contributions of care willingness and competency on the psychological well-being of informal caregivers of older persons. A total of 228 caregivers (165 females, 63 males), mean age = 248.89, SD = 12.10, aged between 21 and up to 75 years participated in the study. The information regarding willingness to care, care competency and psychological distress using Depression, Anxiety and Stress (DASS-21) were examined. Participants were provided four response options: 0=never, 1=sometimes, 2=a lot of the time, 3=most or all the time. Total scores for each sub-scale are multiplied by two to interpret scores on the same scale as the DASS-41. Higher response values and higher scores indicate higher levels of experiencing the condition measured. Analysis using Spearman Rho correlation revealed that the willingness to care and perceived competency to care are negatively associated with psychological distress. In conclusion, this study highlights the complex interplay between caregiving competency, willingness to provide care, and psychological distress among informal caregivers. Supporting caregivers' skills and well-being is crucial for sustaining high-quality care for older adults. The findings suggest that

competency and willingness to provide care is a potential protective factors for the mental health of caregivers and should be a focal point for interventions aimed at improving the quality of care for older persons.

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Keywords: Care willingness, dementia, informal caregiver, older person, psychological well-being

INTRODUCTION

The aging population is rapidly increasing globally, leading to a growing demand for caregiving support for older adults. Informal caregivers, often family members or friends, play a pivotal role in providing this essential care. While caregiving can be a fulfilling experience, it often comes with significant challenges that can impact the caregiver's mental health and overall well-being. Understanding the dynamics between caregivers' willingness to provide care, their perceived competency in caregiving, and the psychological distress they may experience is crucial for developing effective support systems. Willingness to provide care encompasses a caregiver's motivation and readiness to engage in caregiving activities. As noted, willingness can be influenced by various factors, including personal values, emotional bonds, and the perceived demands of caregiving.

According to Meyer et al. (2022), care competency refers to a caregiver's confidence and ability to perform caregiving tasks effectively. High levels of perceived competency may enhance a caregiver's sense of control and self-efficacy, potentially mitigating feelings of distress (Bergstrom et al., 2023). Psychological distress among informal caregivers can manifest as anxiety, depression, and feelings of overwhelm, which can adversely affect both the caregiver's and the care recipient's quality of life (Engel et al., 2022). Research has shown that caregivers who feel less competent in their caregiving roles are more likely to experience higher levels of psychological distress. However, the relationship between willingness to provide care and care competency, and how these factors collectively influence psychological distress, remains underexplored.

This study aims to investigate the intricate relationships between the willingness to provide care, care competency, and psychological distress among informal caregivers of older adults. By examining these relationships, we hope to identify potential areas for intervention that can enhance caregiver well-being and improve the quality of care provided to older adults. Ultimately, fostering a supportive environment for informal caregivers is essential for addressing the challenges they face and ensuring the sustainability of informal caregiving in the context of an aging society.

A recent review indicates a complex interplay between willingness to provide care, perceived care competency, and psychological distress among informal caregivers (Zimami, & Darwish, 2024). As the demand for informal caregiving continues to grow, understanding these relationships is crucial for developing effective support systems that enhance caregiver resilience and improve the quality of care for older adults. Future research should explore targeted interventions that address the unique challenges faced by informal caregivers, ultimately fostering a healthier caregiving environment.

MATERIALS AND METHODS

A cross-sectional survey involved a sample of informal caregivers of older people. Caregiver burden and psychological manifestations were measured using previously

translated DASS-21 questionnaires. Two hundred thirty-seven samples were selected for analysis. The inclusion criteria for this study were (i) being the primary caregiver. The primary caregivers were individuals whom the patient felt most involved in the caregiving process, (ii) caregivers who are ≥ 18 years old, and (iii) able to understand English or Malay language. The exclusion criteria were (i) caregivers who were mentally challenged, which is associated with loss of a sense of reality (schizophrenia, bipolar disorder, acute psychosis or dementia), (ii) caregivers to patients who are institutionalized. The information regarding willingness to care, care competency and psychological distress using Depression, Anxiety and Stress (DASS-21) were examined. Participants were provided four response options: 0=never, 1=sometimes, 2=a lot of the time, 3=most or all the time (Lovibond & Lovibond, 1995).

RESULTS

A total of 228 caregivers (165 females, 63 males, mean age = 48.86, SD = 12.10) aged between 21 and 75 years participated in the study. As referred to Table 1, the majority of caregivers were women, Malays, mean age of 49 years old, still married, and had received secondary education, and with a mean monthly income of approximately MYR5300.

Table 1
Sociodemographic characteristics of the study participants (n=237)

Sociodemographic Characteristics	n (%)	Mean (SD)
Age in years		48.89 (12.1) †
Sex		
Male	63 (26.6)	
Female	174 (73.4)	
Race		
Malay	192 (81.0)	
Chinese	22 (9.3)	
Indian	17 (7.2)	
Others	6 (2.5)	
Marital status		
Single	44 (18.6)	
Married	171 (72.2)	
Widowed	72 (19.0)	
Divorced	9 (3.8)	
Education level		
Secondary school	55 (23.2)	
Tertiary	149 (39.4)	
Living at home with whom		
Living alone	55 (23.2)	
Living with others	182 (76.8)	

One third of caregivers perceive themselves as competent to take care of their care recipients. Present finding shows that the majority (more than 80%) of caregivers had normal scores for depression, anxiety and stress as shown in Table 2. Spearman Rho correlation analysis revealed that the willingness to care and perceived competency to care are negatively associated with psychological distress.

Table 2
Prevalence of depression, anxiety, and stress among study participants (n=237)

	Depression (%)	Anxiety (%)	Stress (%)
Normal	88.6	88.2%	95.4
Moderate	7.9	10.3	3.6
Severe	3.5	1.5	1.0

DISCUSSION AND CONCLUSION

Present findings show that the negative association between the willingness to care, perceived competency to care, and psychological distress has meaningful implications. The findings suggest that individuals who are more willing and feel more competent in providing care tend to experience lower levels of psychological distress. This inverse relationship highlights two key factors: emotional readiness and a sense of efficacy in caregiving. On the other hand, when caregivers are confident in their ability to manage care tasks, they may feel more empowered and less overwhelmed, reducing the mental and emotional strain (Dombestein et al., 2020; Pizzol et al., 2024). This perceived competency likely fosters resilience, helping caregivers better navigate challenges without experiencing severe distress. Price et al. (2020) examined the support needs of informal caregivers, particularly those caring for individuals with multimorbidity. The findings revealed that caregivers often experience high levels of psychological distress due to the complexities of managing multiple health conditions. Moreover, a higher willingness to care may be rooted in intrinsic motivation, which provides emotional fulfilment and a sense of purpose, further buffering against psychological challenges. Additionally, a high willingness to care might overshadow personal boundaries, causing caregivers to neglect their self-care needs, ultimately contributing to longer-term psychological or physical health issues.

In summary, the results suggest that strengthening caregivers’ willingness and competency can be protective against psychological distress. However, ensuring a balance between caregiving duties and self-care is essential to prevent potential negative outcomes such as burnout.

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Through Thick and Thin: Barriers to Volunteering among Malaysian Senior Volunteers

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ABSTRACT

Senior citizens represent an overlooked asset that holds the potential to meet society's needs by leveraging their extensive experience and skills instead of being the traditional receiver of care and service. Senior volunteerism is often regarded as one of many positive measures to promote productive ageing. To encourage participation as volunteers in later life, there is a need to understand the various limitations experienced by current volunteers, specific to this age group when carrying out their voluntary work. A qualitative research design is employed for this study where a total of 51 senior volunteers aged 60 years old and above participated in six focus group discussions to share their experience on the barriers faced by senior citizens while volunteering. The discussions were then recorded, transcribed verbatim and thematically analysed to extract themes encompassing barriers experienced by senior volunteers. The following themes were proposed upon analysis: (1) health issues, (2) time, (3) financial constraints, (4) stigma and perception, and (5) access to volunteering information. The challenges identified shed light on senior volunteers' resilience while providing valuable insights to policymakers and volunteer organisations for the retention and promotion of senior volunteerism in Malaysia.

Keywords: Barriers, productive ageing, qualitative, senior citizen, volunteer

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INTRODUCTION

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has reported that in 2024, 8.1 percent of Malaysia's population will be 65 years old and older (UNESCAP, 2024). By 2040, this figure is projected to be 14.5 percent, solidifying Malaysia's status as an aged nation (DOSM, 2024). As Malaysia

attains this demographic milestone, it is imperative to develop effective ageing measures to manage the challenges ahead.

Current older adults are derived from the generations of baby boomers with extensive education and experience. By engaging the older adults as contributors to the community by way of volunteerism, we can simultaneously address the challenges an ageing population poses in the long run. There is robust documented evidence of the positive impact of volunteering on the physical health, social, and mental wellness (Ling et al., 2023), enhanced quality of life (Lehane & Scarlett, 2024) and overall well-being of older adults (Nichol et al., 2024). However, most volunteering opportunities are sporadic with low participation rates by the elderly (Hansen & Slagsvold, 2020; Lai, 2024). Furthermore, although the culture of volunteerism is evident and widely practised in Malaysia, there is little documented evidence of volunteering efforts among older adults. There is a critical need to understand the barriers to volunteering among Malaysian seniors to enable stakeholders and organizations to provide senior-friendly volunteering opportunities and environments, thereby encouraging volunteers to invest time and resources towards productive ageing. Thus, this paper aims to identify the challenges experienced by senior volunteers when carrying out their voluntary work. From these challenges, recommendations are proposed to overcome these barriers and encourage volunteerism among senior citizens.

There are two pertinent theories that address the limitations experienced by older adults when they volunteer. From a sociological perspective, Role Strain Theory which was introduced by Goode (1960), refers to the stress faced by people when they are unable to meet the multiple demands or simultaneous roles demanded of them (Li et al., 2023). Eventually, they faced conflict when failing to fulfil the obligations expected by the role. For example, older adults with caregiving responsibilities or familial obligations may volunteer less than those without such commitments. On the other hand, Resource Theory (Foa, 1993) assumes that one's ability to volunteer is influenced by resources such as time, money and financial concerns that they possess. For instance, seniors plagued with health issues or with limited financial means would find it challenging to be continuously involved in volunteer work. Hence, these theories provide a key foundation for this study.

METHODOLOGY

Research Design

This study employs a qualitative method to understand barriers experienced by senior volunteers when carrying out their voluntary work.

Location

The focus group discussions (FGD) were held in Kuala Lumpur and Kuching, Sarawak. The locations were chosen based on the highest rate of elderly population aged 60 and above, according to DOSM (2024).

Sample Size/Sampling Criteria

Selection was made via purposive and snowball sampling to get various senior representations from non-governmental associations, government agencies, local communities, religious bodies and those volunteering in a personal capacity. Purposive sampling was used as the most appropriate sampling to answer the research question, whereas snowball sampling was employed to obtain a hard-to-reach population (Pasikowski, 2024). As a result, 51 informants (aged 60 years and above) who volunteered for at least 12 months were chosen to participate in six focus groups, in accordance with the point of saturation as recommended by Hennink and Kaiser (2021). From the total number, 35 informants were programme participants of *Bengkel Sukarelawan Jiwa Malaysia untuk Warga Emas* proposed by Malaysian Social Institute while the rest were obtained via volunteer recommendation and sourced through social media.

Data Collection

Groups were each assigned a moderator who led and moderated the FGD sessions with the aid of an interview protocol. Note-takers were also present for all groups to observe and take note of the various expressions, behaviours, and statements deemed necessary to contribute richer data to the study. The discussions were then audio-recorded to ensure that critical information was captured.

Data Analysis

The recordings were transcribed, thematically organized and analysed with the aid of Nvivo software to extract several themes encompassing barriers experienced by senior volunteers.

RESULTS AND DISCUSSION

Upon analysis, five themes (and six sub-themes) have emerged: (1) health issues, (2) time management (caregiving responsibilities and other commitments), (3) financial constraints (personal commitment and activity fund), (4) stigma and perception (family and community support), and (5) access to volunteering information. Consistent with the findings from the literature, health issues appear to be a critical challenge to senior volunteers (Hansen & Slagsvold, 2020). Despite cutting-edge health technologies, the modern lifestyle brings many health problems to older adults as they age. Older adults with good health will be more inclined to volunteer compared to those with poor health. Furthermore, senior citizens with decreased capacity/capability or cognitive impairment may pause or stop volunteering entirely. For instance, volunteering sessions may be deferred when senior citizens recuperate from health issues, as experienced by the following informant:

“I’m not going (to volunteer) because of my health...I fell, and I couldn’t come back because doctors say I must wait to do stitches and all that...” (Informant 4, FGD 2)

Secondly, volunteers often mentioned the constraint of time as a significant barrier to volunteering. Upon retirement, the elderly are no longer attached to work-related commitments and thus, should have the luxury of time to contribute to society (He et al., 2025). However, senior volunteers experienced the need to prioritize more crucial commitments such as caregiving and home responsibilities, as stated by the following informant:

“A lot of people say, what? Too busy, no time, no time. But yeah, this is the challenge. You see, like even in our small community, it’s very difficult to get people to come together to do a lot of charity.” (Informant 7, FGD 1)

Moreover, senior volunteers stated that available volunteering opportunities often emphasise inflexible time commitment, which does not necessarily accommodate older adults as highlighted by the following informant:

“Even though that’s something I’m passionate about, I think the organiser wanted someone like (to commit) every day, and I didn’t have that. So, I said, I probably couldn’t commit to that sort of timeline even though I wanted to.” (Informant 3, FGD4)

Third, financial constraints appear to hinder seniors from consistently volunteering. Among limitations related to financial constraints are money spent on travelling to reach volunteering locations, i.e., payment of tolls and gas, public transportation fees, and contributing financial support to causes or charities they believe in. On the other hand, senior volunteers also mentioned the need to prioritise paid work or caregiving responsibilities over unpaid work such as volunteering, and their statements correlated with the findings by Lu et al. (2021). This is mentioned by the following informant:

“Now volunteerism, so much so not paid again. You got to come out with your own money to volunteer. And time...time is money.” (Informant 1, FGD6)

Meanwhile, informants faced stigma and negative perceptions from their own family and relatives concerning their involvement in voluntary work. For senior volunteers, family or relatives’ support is crucial in their journey of continuous volunteering. However, the lack of support among family members, relatives or friends who do not understand their passion for volunteering, often leads to disagreements or conflicts as reflected by the following informant:

“My family, for example, are not very supportive. They will question why I would want to be involved in unpaid work and trouble myself at this age?” (Informant 3, FGD1)

Additionally, ageism has been highlighted as a negative perception that can diminish the participation rates of senior volunteers. Among the concerns highlighted are the unclear division of volunteer roles and scepticism from volunteer organisations on their capability to handle volunteering work at an old age, which is attuned to the findings of Nickrent et al. (2024). The informant highlighted this issue in the following statement:

“I was once involved in an ad-hoc volunteering programme for COVID-19. I suffered from a slipped disc, but I was doing fine. However, people kept on questioning my ability to volunteer by asking “Are you sure you can do it?”” (Informant 3, FGD3)

Finally, the lack of access to volunteering information and limited awareness of volunteering opportunities specially catered for this specific age group may also hinder seniors from volunteering. The elderly who are not well-versed in the latest technology or have limited access to social media may find it challenging to access the latest volunteering opportunities promoted online. Thus, current volunteering opportunities are usually sourced through word of mouth or from their network of close friends or the community.

The findings are summarised in Figure 1.

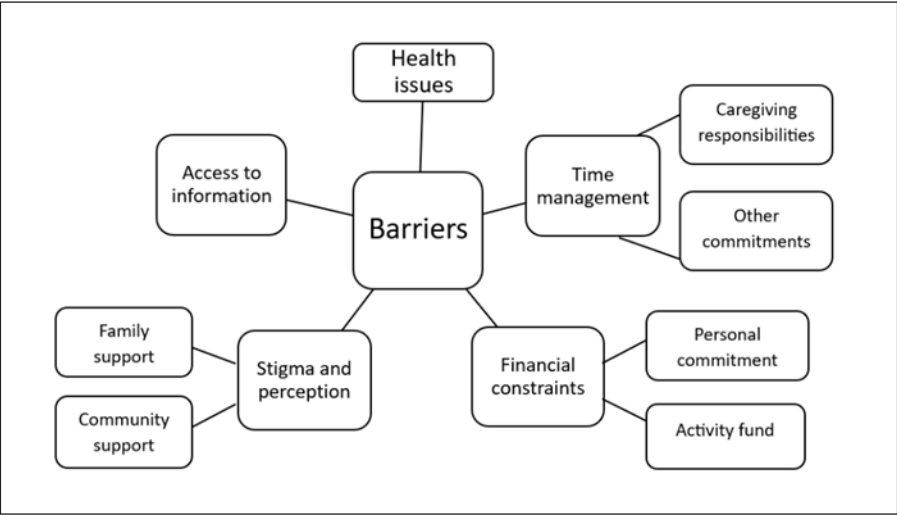


Figure 1. Barriers to volunteering
Source: Author’s work

CONCLUSION

This study calls for an understanding of the challenges experienced by senior volunteers when carrying out their voluntary work and how it impacts the volunteering scenario in Malaysia. Barriers such as health issues, time management, financial constraints, stigma and perception and access to volunteering information support the findings of previous literature. The barriers identified further lend credence to Role Strain Theory and Resource Theory and how they drive volunteer behaviour among Malaysian seniors. These barriers, if not addressed, may leave senior volunteers feeling unappreciated and eventually may reduce their frequency of volunteerism or they may stop altogether. To overcome these challenges, strategic volunteer recruitment and retention mechanisms should be carefully planned to improve their resilience and empower volunteering as one way to promote productive ageing. The government and decision-makers may consider incorporating senior-friendly volunteerism measures in current ageing policies and activities. Furthermore, local authorities and local leaders may encourage seniors to be more involved in volunteering by conducting and sponsoring volunteer outreach programmes as well as promoting volunteering opportunities in their area. Finally, volunteering entities may cater towards senior citizens' needs by considering their availability and flexibility to volunteer compared to their younger counterparts, expanding partnerships with other volunteering organisations as well as providing training and support to further develop their skills and talents.

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Activity Centres as Hubs of Social Interaction and Community Engagement for the Elderly

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ABSTRACT

The rapid growth of ageing populations globally necessitates age-friendly urban environments to enhance older adults' well-being. In Malaysia, the proportion of individuals aged 60 and above is projected to reach 15% by 2030. To address this, Taiping was selected as the first pilot project for age-friendly city development, reflecting Malaysia's commitment to the World Health Organization's (WHO) Age-Friendly Cities framework. This study investigates the role of activity centres, clubhouses, mosques, and community halls as hubs for social interaction and community engagement among older adults in Taiping. Using a qualitative approach, semi-structured interviews with 12 participants revealed that these centres promote physical, mental, and social well-being through diverse activities such as group exercises, religious gatherings, and cultural events. Findings highlight the critical role of activity centres in fostering social connections, reducing loneliness, and enhancing community support systems. Taiping's initiative aligns with global trends while addressing the unique cultural and demographic context of Southeast Asia. The study highlights the need for policymakers to prioritise funding and integrate activity centres into urban planning strategies. By ensuring accessibility, offering diverse programs, and promoting intergenerational engagement, activity centres can serve as vital components of resilient, age-friendly communities and contribute to achieving sustainable development goals.

Keywords: Activity centre, age-friendly environment, community engagement, elderly, social interaction

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INTRODUCTION

The global rise in ageing populations has raised concerns about how cities can better support older adults. In Malaysia, the proportion of individuals aged 60 and above is projected to reach 15% by 2030,

highlighting the urgent need for age-friendly environments (Ministry of Health Malaysia, 2022). The World Health Organization (WHO) promotes age-friendly cities, emphasising the importance of public spaces that enhance the well-being and social engagement of older adults. Activity centres, such as clubhouses, places of worship, and community halls, are integral to this framework, offering spaces for social interaction and combating isolation.

With Malaysia's shifting demographics, developing cities that accommodate older populations have become increasingly important. In 2018, 18.2% of individuals aged 51 and above lived in urban areas, underlining the need for liveable, supportive environments for the elderly (Ministry of Rural Development, 2018). To address this, Malaysia initiated its first age-friendly city pilot project in Taiping, Perak, in 2021. Known for its ageing population, rich history, and urban accessibility, Taiping serves as a model for addressing the specific needs of older adults while aligning with global efforts to create inclusive and supportive urban environments.

This study explores how activity centres, such as clubhouses, mosques and community halls, act as hubs for social connections and community engagement, contributing to the well-being of older adults. These centres play a critical role in promoting social interaction and enhancing the quality of life for Malaysia's ageing population.

SELECTION OF TAIPING

Taiping was selected due to its high percentage of older residents, well-preserved urban infrastructure, and history as one of Malaysia's earliest settlements. These factors make it uniquely positioned to pioneer age-friendly initiatives that emphasize ageing in place. Globally, similar projects have been implemented under the WHO Age-Friendly Cities framework, such as in Sweden, mobile care services have been introduced to address the needs of an ageing population by providing healthcare directly at patients' homes (Teske et al., 2023). Taiping's pilot project not only reflects Malaysia's commitment to these international standards but also offers a culturally specific model for addressing the needs of Southeast Asian ageing populations.

ROLE OF ACTIVITY CENTRES

Activity centres such as clubhouses, mosques, and community halls have become vital spaces for older adults to gather, socialise, and engage in meaningful activities. These centres act as community hubs, offering programmes that cater to various interests and abilities (Hutchinson & Gallant, 2016). They provide opportunities for older adults to take part in physical activities like exercise classes and social events, which help reduce loneliness and enhance mental well-being (Sánchez-Jurado et al., 2021).

Gripko and Joseph (2024), in their study of senior centres in North America, highlight the importance of the built environment in fostering older adults' engagement with their

communities. They argue that well-designed, multi-functional activity centres can improve social interaction by facilitating both formal and informal gatherings. The flexibility of these spaces enables older adults to participate in activities ranging from group exercises to religious events, contributing to their sense of belonging and purpose (Wu et al., 2020).

In Malaysia, places of worship, especially mosques, play a similar role as activity centres for older adults. These spaces not only offer religious services but also serve as social hubs where older adults can join in community events like religious talks and *gotong-royong*. Such participation fosters a sense of community and helps maintain social connections, which is crucial for mental and emotional well-being (Fadzil et al., 2021). Social networks built through these centres can also provide practical support during illness or financial difficulties (Tumin et al., 2022).

METHODOLOGY

The interviews were conducted with 12 older adults aged 60 and above who regularly participated in activities at clubhouses, mosques, or community halls in Taiping. Participants were purposefully selected based on their active engagement with these centres, ensuring they had relevant experiences to share. Each interview lasted approximately 45–60 minutes and was conducted in quiet and familiar settings, such as the participants' homes or the activity centres, to ensure comfort and privacy. The interviews were semi-structured and guided by a set of open-ended questions designed to elicit detailed responses about their experiences with the activity centres and their impact on well-being. All interviews were conducted face-to-face by the primary researcher, who took steps to build rapport and minimise bias.

Informed consent was obtained prior to each interview, and participants were assured of their confidentiality and anonymity. The interviews were conducted in Malay, the native language of most participants, and were audio-recorded with their consent. Transcriptions were subsequently prepared and securely stored to maintain data integrity. The researcher also took notes during the interviews to capture non-verbal cues and contextual details. These measures ensured a rigorous and culturally sensitive data collection process, allowing for an in-depth exploration of the participants' experiences.

FINDINGS AND DISCUSSION

In this study, clubhouses play an important role in fostering social interaction and physical well-being among older adults. For instance, Elderly 9 shared how he participates in group exercise sessions, which help him maintain physical fitness and manage chronic joint pain. His wife, on the other hand, engages in social games like mahjong, which she described as 'a fun way to connect with friends and stay mentally sharp.' Such clubhouses offer multi-purpose spaces where older adults participate in both physical and social activities,

promoting their overall well-being. These findings align with research highlighting how community-based physical activities can boost health and reduce loneliness in ageing populations (Suragarn et al., 2021).

The mosque serves as another critical activity centre where older adults engage in religious and social activities. These include daily prayers, religious talks, and gotong-royong (communal work), which Elderly 3 and Elderly 12 noted as ‘a meaningful way to stay spiritually grounded while building friendships.’ Such activities not only promote spiritual well-being but also provide a sense of purpose and social connectedness, which are important for mental health. According to Elderly 4, regular participation in mosque activities ensures that older adults are known and supported by the community, which reinforces social cohesion. This supports studies that emphasise how social participation, especially in religious settings, contributes to the well-being of older adults (Löfgren et al., 2021).

Community halls provide additional venues for social interaction, particularly through events like weddings and funerals. As mentioned by Elderly 4, it is a ‘joyful moment to reconnect with distant relatives.’ These informal settings create a conducive environment for socialisation, helping older people manage feelings of loneliness. The flexible nature of community halls, which can host various events, underscores their importance in promoting social interaction. Social gatherings like these have been shown to significantly impact life satisfaction and mental well-being among older adults (Park & Kang, 2023).

The findings of this study emphasize the important role of activity centres in fostering social and community engagement among older adults. Taiping’s initiative reflects broader global trends in age-friendly city development. For instance, while Singapore focuses on social inclusion through intergenerational programs (Moogoor et al., 2022), Taiping emphasizes cultural and religious engagement as core components of its model. Such context-specific approaches highlight the importance of tailoring age-friendly strategies to the unique demographic and cultural profiles of each city. Lessons from Taiping can inform similar initiatives in other developing nations seeking to address the challenges of an ageing population.

CONCLUSION

Taiping’s selection as Malaysia’s first age-friendly pilot project highlights its strategic role in promoting inclusive urban environments for older adults. The initiative aligns with global efforts under the WHO framework and offers valuable insights for addressing ageing-related challenges in developing countries. By tailoring programs to the unique cultural and demographic context of Taiping, Malaysia, demonstrates how local solutions can contribute to achieving global SDGs, particularly those focused on health, well-being, and sustainable urban development.

These findings highlight the need for policymakers to prioritise funding for activity centres as a key component of national strategies for healthy and engaged ageing. Practical measures, such as ensuring accessibility, designing multi-functional spaces, and locating centres near residential areas or public transport hubs, can significantly enhance their impact. Furthermore, incorporating diverse and inclusive programming, including intergenerational activities, can foster stronger community bonds and social integration. By integrating activity centres into urban planning initiatives and community development programs, policymakers and urban planners can create environments that not only address the needs of older adults but also build resilient, age-friendly communities.

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Anxiety and Loneliness in the Post COVID-19 Era: A Study on Elderly Retirees in Kelantan

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ABSTRACT

The COVID-19 pandemic has significantly impacted the mental health of older adults, exacerbating feelings of loneliness and anxiety. Post-pandemic, these issues have persisted and, in some cases, worsened due to ongoing social isolation and health concerns. This study intends to examine the prevalence of anxiety and loneliness among elderly retirees in Kelantan in the post-COVID-19 pandemic era and measure the factors associated with anxiety. A cross-sectional study was conducted from March 2022 until March 2023, involving 378 members of the Malaysian Government Pensioners Association (Kelantan branch) using online Google form questionnaires. The instruments consisted of a sociodemographic proforma, Malay Version of the De Jong Gierveld Loneliness Scale, and Malay Version of Generalized Anxiety Disorder-7 (GAD-7). Logistic regression analysis was conducted to examine factors associated with anxiety. From the findings, the mean (standard deviation) age of the 378 participants was 65.7 (3.60) years, with 61% being males. The prevalence of anxiety and loneliness was 10.8% and 16.1%, respectively. Analysis showed an increasing 1 year in age (95% CI 0.62 to 0.84, $P<0.001$), and those with perceived social support (95% CI 0.14

to 0.62, $P=0.001$) have 28% and 71% lower odds of developing anxiety, respectively. Male participants have 67% less odds of developing anxiety compared to females (95% CI 0.16 to 0.71, $P=0.004$), whereas those having chronic illnesses have more odds of 10.41 of developing anxiety (95% CI 2.93 to 36.99, $P<0.001$). The prevalence of anxiety among elderly retirees in Kelantan was relatively low post-COVID-19,

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while loneliness was comparable to other studies. Protective factors against anxiety include increasing age, being male, and perceived social support, whereas chronic illnesses increase anxiety risk. Effective chronic illness management and social support are essential for mental well-being, and integrating mental health services with chronic illness management is crucial for early assessments and interventions.

Keywords: Anxiety, COVID-19, elderly, loneliness, retirees

INTRODUCTION

The COVID-19 pandemic has posed unprecedented challenges to mental health globally, with older adults being particularly vulnerable due to increased health risks and imposed social restrictions (Palgi et al., 2020). Loneliness and anxiety have been identified as major concerns among this demographic. Loneliness is linked to numerous adverse health outcomes, including depression and anxiety, and the pandemic has exacerbated these feelings in older adults due to prolonged isolation (Armitage & Nellums, 2020). Anxiety, meanwhile, is precipitated by social isolation, fear of infection, and uncertainties about the future. Most global studies on the psychological impact of the COVID-19 pandemic have predominantly focused on the general population. Research about the psychological well-being of elderly retirees amidst the pandemic worldwide is scarce, as more research was conducted on retirement planning and financial preparedness among retirees (Lawton et al., 2024). This study focuses on retirees in Kelantan, a state with a unique cultural and social dynamic, where support systems may differ from those in urban areas. We aim to determine the prevalence of anxiety and loneliness among retirees and identify factors that influence anxiety levels in the post-COVID-19 era.

MATERIALS AND METHODS

A cross-sectional study was carried out between March 2022 and March 2023 involving 378 members of the Malaysian Government Pensioners Association (Kelantan branch). The chairman of the association was contacted and briefed about the study and helped to distribute the Google Forms questionnaire link in their organization's online platforms. Participants were then recruited through this online platform, where they completed the Google Forms questionnaires. The study's primary instruments included a sociodemographic proforma; capturing variables such as age, gender, education level, income, living arrangements, and chronic illness status, Malay version of the De Jong Gierveld Loneliness scale, which was a validated tool for assessing emotional and social loneliness, and Malay version of Generalized Anxiety Disorder-7 (GAD-7) which used to assess anxiety symptomatology. A logistic regression analysis was conducted to identify independent factors significantly associated with anxiety.

RESULTS

Table 1 shows that the mean age of the participants was 65.7 (SD 3.60) years. Most of the respondents were male (60.6%), Malays (97.1%), Muslim (97.1%), married (65.1%), and lived with others (81.2%).

The prevalence of anxiety was 10.8%, and loneliness was 16.1%, as shown in Table 2.

Table 1
Sociodemographic characteristics of the study participants (n=378)

Sociodemographic Characteristics	n (%)
Age in years	65.71 (3.60) †
Sex	
Male	229 (60.6)
Female	149 (39.4)
Monthly income (RM)	
B40 (< RM 3030)	310 (82.0)
M40 (RM 3030 – RM 6619)	58 (15.3)
T20 (> RM 6619)	10 (2.6)
Race	
Malay	367 (97.1)
Chinese	8 (2.1)
Indian	3 (0.8)
Religion	
Islam	367 (97.1)
Buddhist	7 (1.9)
Hindu	4 (1.1)
Marital status	
Single	14 (3.7)
Married	246 (65.1)
Widowed	72 (19.0)
Divorced	46 (12.2)
Education level	
Secondary school	229 (60.6)
Tertiary	149 (39.4)
Living at home with whom	
Living alone	71 (18.8)
Living with others	307 (81.2)
Received social support	
Yes	283 (74.9)
No	95 (25.1)
Having any chronic illness	
Yes	254 (67.2)
No	124 (32.8)

† Mean (SD)

Table 2
Prevalence of depression and loneliness among study participants (n=378)

Variables	Measurement Scoring	n (%)
Anxiety	Score ≥ 8	41 (10.8)
Loneliness	Score ≥ 3	61 (16.1)

Table 3 shows a logistic regression analysis, which identified four key factors influencing anxiety. With each additional year of age, the odds of anxiety decreased by 28% (95% CI 0.62 to 0.84, $p<0.001$). Participants reporting higher perceived social support were 71% less likely to develop anxiety (95% CI 0.14 to 0.62, $p=0.001$). Males were 67% less likely to experience anxiety compared to females (95% CI 0.16 to 0.71, $p=0.004$). Individuals with chronic illnesses had a significantly higher risk of anxiety, with a tenfold increase in odds (95% CI 2.93 to 36.99, $p<0.001$). Loneliness was a confounder of anxiety in this study.

Table 3
Association between sociodemographic profile and anxiety among study participants (n=378).

Variables	Simple Logistic Regression		Multiple Logistic Regression ^a	
	Crude OR [†] (95% CI [‡])	<i>p</i> -value	Adj OR (95% CI)	<i>p</i> -value
Age in years	0.78 (0.69, 0.89)	<0.001	0.72 (0.62, 0.84)	<0.001
Sex	1		1	
Female				
Male	0.29 (0.15, 0.58)	<0.001	0.33 (0.16, 0.71)	0.004
Living at home with whom	1			
Alone				
With other people	0.29 (0.15, 0.58)	<0.001		
Receiving social support	1		1	
No				
Yes	0.19 (0.10, 0.37)	<0.001	0.29 (0.14, 0.62)	0.001
Having chronic illness	1		1	
No				
Yes	7.10 (2.15, 23.47)	0.001	10.41 (2.93, 36.99)	<0.001
Loneliness	1			
Lonely				
Normal	0.31 (0.15, 0.64)	0.001		

DISCUSSION

The results indicate that the prevalence of anxiety among elderly retirees in Kelantan was lower compared to global estimates for older adults during the pandemic, which ranged from 12% to 26% (Korkmaz et al., 2021; Robb et al., 2020). However, loneliness remained a notable concern, comparable to findings from other studies (Groarke et al., 2020). Protective factors such as increasing age and male gender align with previous research, suggesting factors such as work, neurohormonal, and psychological aspects may mediate this gender disparity (Ciuffreda et al., 2021). Perceived social support is crucial in mitigating anxiety, particularly emotional support which has a more significant effect on promoting psychological health (Bai et al., 2020; Wang et al., 2020).

Conversely, chronic illness significantly increases anxiety risk, emphasizing the interconnected relationship between physical and mental health (Wang et al., 2020). Chronic disease management should include mental health assessments to identify anxiety at an early stage. In comparison, loneliness is a confounder of anxiety in this study.

CONCLUSION

The prevalence of anxiety among elderly retirees in Kelantan was relatively low post-COVID-19, while loneliness was comparable to other studies. Protective factors against anxiety include increasing age, being male, and perceived social support, whereas chronic illnesses increase anxiety risk. Loneliness was a confounder of anxiety. Effective chronic illness management and social support are essential for mental well-being, and integrating mental health services with chronic illness management is crucial for early assessments and interventions.

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Bibliometric Analysis of Poverty among the Elderly: A Global Perspective

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ABSTRACT

This paper will carry out a bibliometric review of the literature on poverty in old age, its trends of publication, the countries most active, as well as the core themes. The sources of data were the Scopus database from 1971 to 2024, which provided 216 valuable journal articles. Through the analysis, it is clear that research production has been on a gradual increase in the last five decades, especially in the developed world like China, United States, as well as the United Kingdom. The VOSviewer analysis of the keywords reveals the main themes, such as health, financial security, as well as the importance of social support, which explains the multidimensionality of elderly poverty. The findings also show that there is a considerable gap in developing world studies, which is why future research should be conducted to fill in these underrepresented areas.

Keywords: Bibliometric analysis, elderly, financial security, poverty, social support, sustainable development goals, VOSviewer

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INTRODUCTION

The question of elderly poverty has become an increasingly important topic around the world as the world is aging fast (Kang et al., 2022). The elimination of poverty, especially among such vulnerable populations as the elderly, is one of the pillars of the United Nations Sustainable Development Goals (SDGs), particularly Goal 1, to which the

elimination of poverty is to be achieved. This objective underlines the elimination of poverty in all its manifestations and the provision of all people, including the elderly, with sufficient resources as well as social security. Nonetheless, the coexistence of aging populations and poverty is one of the major barriers to this objective because older adults have a tendency to have special needs given their dependence on fixed incomes, health-related costs, as well as a lack of workforce in the labor market.

The socio-economic factors, health status, as well as sufficientness of social safety nets influence elderly poverty (Agblobi et al., 2020; Mohd et al., 2018; Quartey et al., 2016). The study highlights the role of pensions in alleviating poverty among the elderly, whereas health problems along with chronic diseases, are other factors that decrease the financial strength of the elderly due to medical costs as well as scarce resources within the context of other needs (Ma et al., 2022). This issue is especially acute in rural settings where healthcare access is low (Zhang et al., 2018).

In addition to that, other influential factors in reducing poverty in the elderly are the family structure as well as intergenerational support (Tan et al., 2023). The economic burdens can be relieved by the financial and emotional help of children, yet changes in society and urbanization are slowly undermining such traditional systems of support (Acharya, 2023). This problem is more critical in the countries that lack strong social security frameworks, wherein older people are less provided with resources to fall back on in retirement (Niimi & Horioka, 2021; Vu et al., 2021).

Although this topic is of global concern, the research on the subject is generally viewed in a one-dimensional, mono-faceted manner with no overall investigation available on this matter. In a bid to fill this gap, this paper has conducted a bibliometric analysis in order to investigate the trends in research, geographical contributions, as well as important thematic areas pertinent to the elderly poverty research. In particular, the research questions that the study discusses are the following:

RQ1. What is the current state of research on elderly poverty?

RQ2. Who are the key contributors to the elderly poverty literature?

RQ3. What are the emerging themes in this field?

METHODOLOGY

This research employs a bibliometric method of conducting a systematic analysis of the research trends as well as thematic patterns in the literature about poverty among the elderly. The Scopus database was analyzed as it is known to have good coverage of peer-reviewed academic literature and is also reputed to be one of the largest as well as the most credible sources of scholarly literature (Schotten et al., 2017; Sharif et al., 2020). The Scopus database has been chosen because of its comprehensive multidisciplinary database,

meaning that it is sure to include high-quality publications in various fields that will be pertinent to this research. It also has advanced search capabilities as well as standardized indexing, which make it especially useful to this study, providing an opportunity to conduct a powerful bibliometric analysis.

The search string employed was as follows: TITLE (“elderly” OR “older age” OR “old-age” OR “old age” OR “old people” OR “older people” OR “ag*ng population” OR “population ag*ng” OR “retiree” OR “retirement” AND “poverty”). The timeframe of the search was 1971 to 2024 to achieve a comprehensive overview of the direction of research over more than 50 years. On 6 September 2024, the search was done, and a preliminary search resulted in 323 documents. The final set of 216 articles was analyzed after filtering and eliminating 8 unrelated documents and English-language journal articles.

FINDINGS AND DISCUSSION

As illustrated in Figure 1, a review of the trends in publication indicates that the study on poverty among the elderly has slowly become more popular in the past 50 years. A notable increase in research output began in the 2000s, with a significant surge post-2010, reflecting growing awareness of the implications of aging populations in poverty. This trend aligns with the increasing global concern about the financial security of the elderly, especially considering the expanding aging population. The steady rise in research suggests that the issue of elderly poverty is being recognized as a critical socio-economic challenge worldwide, prompting a sustained academic focus.

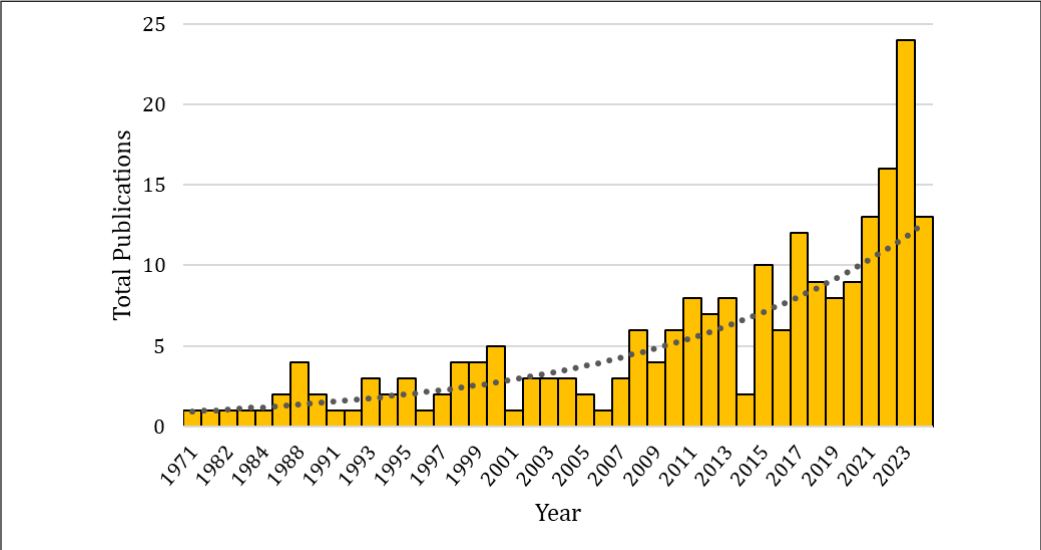


Figure 1. Publication trends
Source: Author’s work

Next, Figure 2 highlights the dominance of developed nations in this field, with the United States, China, and the United Kingdom leading in research output. Besides that, Australia, South Korea, and Germany also contribute significantly. These findings suggest that scholars from advanced economies are more actively engaged in this area. The prominence of researchers from the United States and the United Kingdom likely reflects their focus on welfare systems and social protection debates. China’s growing output likely corresponds to its shift towards an aging population and the related socio-economic challenges. However, the underrepresentation of research from developing countries, where elderly individuals may face greater vulnerability due to weaker social safety nets, underscores a critical gap in the literature.

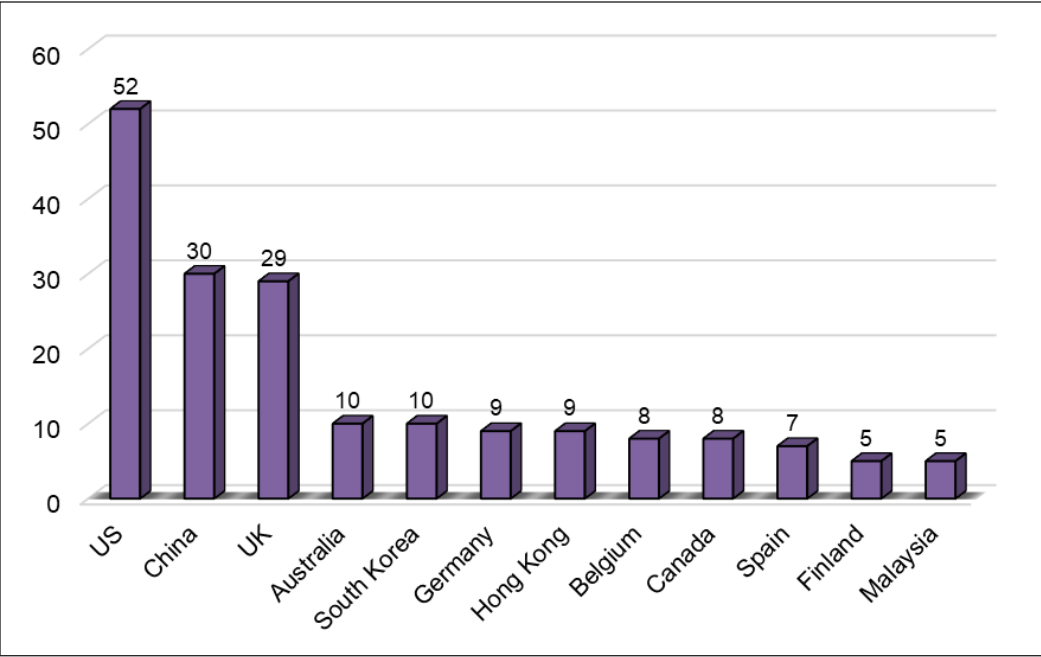


Figure 2. Most productive countries
Source: Author’s work

The visualization of the interrelated themes of research on elderly poverty is complete as represented by the keyword analysis using VOSviewer in Figure 3. The keywords that have the most significant presence in the center of the network are the words “elderly” and “poverty”, which demonstrate that they are essential in defining the research focus. These key terms are surrounded by groups of related themes which demonstrate the multi-dimensional aspect of the issue. Financial and social security have also become the most prevalent themes and the words “social security,” “pensions,” as well as “social pension,”

demonstrate the significance of institutional systems in reducing elderly poverty. These terms highlight the need to rely on the financial systems and welfare programs to take care of the ageing populations.

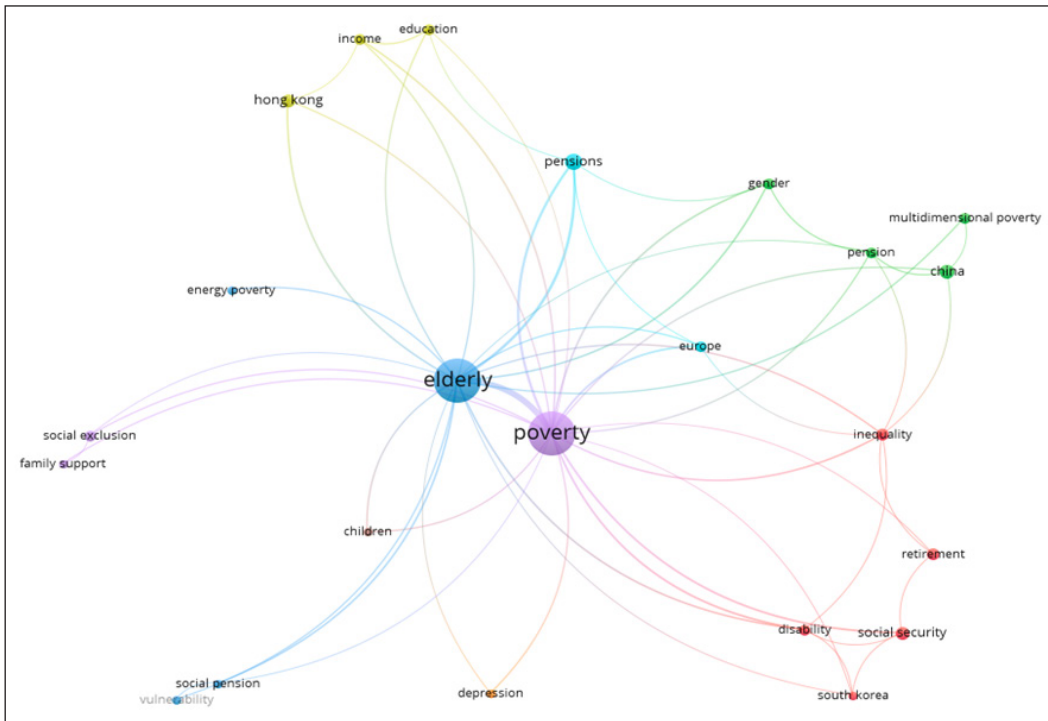


Figure 3. Keyword analysis using VOSViewer

Source: Author's work

The keywords such as “disability,” “depression” as well as “vulnerability” are also prominent themes in health and vulnerability, with the three keywords weakening the boundary between health problems and economic challenges amongst the elderly. Poor health not only leads to poverty but also enhances poverty by raising the medical costs and income-earning potential. Also, there are such words as inequality and multidimensional poverty, which refer to the greater socio-economic discrepancies of older adults, indicating that the researchers tend to think of poverty as multi-dimensional, not merely income-related.

Another matter of interest is social and family dynamics, which is demonstrated by such keywords as “social exclusion,” “family support,” as well as “children.” These words draw attention to the intergenerational relationship and the support of the community in reducing or increasing the risk of poverty in the elderly. The dependency on the family system is especially imperative in societies where institutional support is absent.

Lastly, it is seen that concentrations on the areas of interest are based on regions like “South Korea,” “China,” “Hong Kong,” and “Europe,” which display a focus on developed as well as emerging economies with large aging populations. This is in tandem with the results in Figure 2 that show the overrepresentation of developed country researchers. The geographical bias in literature shows that more research is required on elderly poverty in unexplored areas, especially in developing nations with a fast-aging population.

CONCLUSION

This paper presents a bibliometric review of the elderly poverty research, which will offer a perspective on trends and geographical contributions to this topic as well as the thematic emphasis. The analysis demonstrates a gradual increase in academic focus over the last 50 years, and a significant spike in publications since 2010, as a result of increased awareness of aging societies as well as their socio-economic issues on a global scale. The results indicate that the research is concentrated in developed nations, and especially in the United States, China and the United Kingdom. Thematic areas that are essential and have been identified by the keyword analysis comprise financial security, health and social support, which are vital in examining the intricacies of old age poverty. Nevertheless, the fact that fewer studies have been conducted on region-specific issues in the developing countries where weaker social safety nets compound the vulnerabilities indicates the need to conduct future research. By filling these gaps with extensive and varied research, one can gain a better insight into the issue of elderly poverty and can influence policies to guarantee aging population economic security as well as well-being across the world.

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Association between Heart Failure and Dementia among Elderly Patients in Hospital Kuala Lumpur

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ABSTRACT

Heart failure (HF) is a major noncommunicable disease that has been associated with significant morbidity and mortality. It has also been reported to be a risk factor for dementia, termed cardiogenic dementia, leading to further increase in functional disability and death in the elderly. Local studies are still lacking to prove this relationship. This research aimed to identify the association between HF and dementia. This cross-sectional retrospective analysis was conducted on elderly patients diagnosed with HF who were undergoing follow-up at the Geriatric Clinic, Hospital Kuala Lumpur (HKL), from January 2020 to January 2023. Convenience sampling method was used in patient selection. This study found that, among the 42 patients diagnosed with HF, 76.2% (N = 32) of them also had a diagnosis of dementia. A total of 7 comorbidities were found to be significantly associated with dementia ($p < 0.01$). In addition, major depressive disorder (MDD) and benign prostatic hyperplasia (BPH) were found to be significant predictors of dementia among elderly patients with HF. The study found a significant prevalence of dementia in specific subgroups. Early detection of risk factors may help prevent dementia in elderly HF patients, highlighting the need for further research on modifiable risk factors.

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Keywords: Dementia, elderly, heart failure, non-compliance, outcome

INTRODUCTION

Background

Heart failure (HF) remains a significant public health issue on a global scale, with

indications suggesting a potential rise in prevalence in the near future. A recent study showed that there are approximately 56.19 million individuals affected by HF worldwide, with numerous countries and regions exhibiting an increasing trend from 1990 to 2019, particularly in low-income nations (Yan et al., 2023). Malaysia had one of the highest incidence rates of HF in Southeast Asia, with 721 cases per 100,000 people in 2017, a growing 7.7% from 669 cases per 100,000 people in 1990 (Bragazzi et al., 2021).

Previous studies have shown that HF could increase the risk of recurrent cardiovascular events (Govender et al., 2022) and stroke (Adelborg et al., 2017). Recent literature has also identified dementia as a condition that can arise from HF, with reported overall prevalence of 19.79% (Yap et al., 2022). Specifically, HF has been identified as a significant contributor to cardiogenic dementia which is a form of dementia resulting from cardiac dysfunction (Roger, 2021). Dementia in HF patients could affect patient's ability to self-care (Lovell et al., 2019), further reduce medication adherence (Muñoz-Contreras et al., 2022) and can reduce patients' overall quality of life (Liu et al., 2024).

Problem Statement

The prevalence of HF is rising in Malaysia, particularly among the elderly population. Effective management of HF relies heavily on medication adherence and the patient's ability to self-care. However, emerging evidence suggests a potential link between HF and dementia, which could further compromise self-care abilities and treatment adherence. Understanding this relationship, especially the associated risk factors, is crucial for improving patient outcomes. Despite the frequent co-occurrence of these conditions, there remains a significant gap in knowledge regarding their interplay, particularly within the Malaysian context. Addressing this gap is essential for developing targeted interventions to support elderly patients with both HF and dementia.

Research Questions

1. What is the prevalence of dementia among elderly HF patients in HKL?
2. What are the associated factors of dementia in elderly HF patients in HKL?

Hypotheses

- H₁ : The prevalence of dementia among elderly HF patients at HKL is significantly high.
- H₂ : Certain demographic factors, such as age and smoking status, as well as clinical factors such as comorbidities, are significantly associated with the presence of dementia in elderly HF patients at HKL.

Study Objectives

1. The main aim of this study was to determine the association between HF and dementia among elderly patients. Specific objectives of this study include:
2. To determine the prevalence of dementia among elderly HF patients in HKL
3. To identify associated factors of dementia in elderly HF patients in HKL

METHODOLOGY

Study Design

This cross-sectional study was conducted via retrospective medical record review.

Study Site

The study was conducted at Geriatric Clinic, HKL. HKL was chosen as the study site because it is one of the largest Malaysia's public tertiary hospitals, managing a high volume of elderly patients with various conditions. Its role as a major referral centre with comprehensive geriatric care makes it an ideal setting to study the prevalence and associated factors of dementia in elderly HF patients. Additionally, HKL's extensive medical records and multidisciplinary care support robust data collection and analysis.

Sample Size

The sample size was calculated using the following formula adopted and adapted from Yap et al., (2022):

$$\text{Sample size, } n = \frac{Z^2 \times P(1 - P)}{e^2}$$

where;

Z= statistic for level of confidence,

P= prevalence of dementia in HF

e²= margin of error

Based on literature, the prevalence of dementia in HF patients was 19.79%.

$$\text{Sample size, } n = [(1.96)^2 \times 0.1979 \times (1 - 0.1979)] / 0.05^2$$

$$= 243.9$$

$$\approx 244 \text{ patients}$$

Correction to finite population:

$$\text{Adjusted sample size, } n' = n / [1 + [(n-1) / p^*]]$$

where;

n' = adjusted sample size (corrected for a smaller population) n = sample size

p^* = estimation number of dementia geriatric patients with HF visited HKL during the study period

Estimation number of HF patients visiting Geriatric Clinic, HKL between January 2020 to January 2023 is 50.

Adjusted sample size, $n' = 244 / [1 + [(244-1) / 50]]$

= 41.6

= **42 patients** (final target sample size)

Sampling and Patient Selection Criteria

This cross-sectional study was conducted on elderly patients diagnosed with HF who were undergoing follow-up at the Geriatric Clinic, HKL, from January 2020 to January 2023. Convenient sampling method was employed to identify potential patients because it allows efficient selection of eligible patients within a limited timeframe. The study included individuals aged 60 years and older with HF, with or without dementia, while excluding those with significant neurological disorders or incomplete medical records. Retrospective demographics and clinical data were collected from patients' medical records.

Statistical Analysis

Statistical analyses were performed using SPSS version 29. Demographic factors and prevalence of dementia were analysed descriptively using cross-tabulations and percentages. The association between demographic and clinical factors with dementia was analysed using simple binary logistic regression. A p-value of <0.25 was considered statistically significant. Subsequent analysis of significant factors was done using multiple binary logistic regression, where a p-value of < 0.05 was considered statistically significant.

Ethical Approval

This research has been approved by the Medical Research and Ethics Committee (MREC) [NMRR ID-23-02691-NSQ-(IIR)].

RESULTS

Medical records from a total of 60 patients were identified and screened. A total of 18 patients were excluded and 42 patients were included for final analyses. Majority of the patients were between 80-89 years of age, male, Malay, married, had primary education as highest education and non-smokers. Among the 42 patients diagnosed with HF, 32 of them also had a diagnosis of dementia, giving an overall prevalence of 76.2%. The detailed demographic data of all included patients is as shown in Table 1.

Logistic regression analysis found no statistically significant associations between demographic parameters and dementia ($p > 0.25$). However, 7 clinical parameters were significantly linked to dementia namely hypertension, type 2 diabetes mellitus (T2DM), dyslipidemia, stroke, benign prostatic hyperplasia (BPH), major depressive disorder (MDD), and atrial fibrillation (AF) (Table 2). Notably, MDD and BPH were found to be strong predictors of dementia in elderly HF patients, with odds ratios of 4.6 and 3.8, respectively (Table 3).

Table 1
Demographic data of included patients (N = 42)

Demographic Factors	Groups	Frequency (n)	Percentage (%)
Age (in years)	60 – 69	9	21.4
	70 – 79	13	30.9
	80 – 89	17	40.5
	90 - 99	3	7.1
Gender	Male	26	61.9
	Female	16	38.1
Ethnicity	Malay	18	42.9
	Chinese	14	33.3
	Indian	10	23.8
Marital Status	Single	9	21.4
	Married	33	78.6
Highest education level	Primary	18	42.9
	Secondary	15	35.7
	Tertiary	9	21.4
Smoking Status	Ex-smoker	7	16.7
	No	27	64.3
	Yes	8	19.0

Table 2
Demographic and clinical factors associated with HF (N = 42)

Factors	Groups	Crude OR [95% CI] ^a	p-value
Age		-0.988 [0.938,1.040]	0.636
Gender	Male	Ref	
	Female	-0.687 [0.317,1.489]	
Ethnic	Malay	Ref	0.970
	Chinese	1.114 [0.475,2.612]	0.805
	Indian	1.049 [0.387,2.843]	0.925
Marital status	Single	Ref	
	Married	1.206 [0.426,5.333]	0.525
Highest education level	None	Ref	0.595
	Primary	-0.000[0.000, -]	0.998
	Secondary	-0.825[0.301,2.263]	0.709
	Tertiary	1.524[0.535,4.340]	0.430
Smoking status	No	Ref	0.345
	Ex-Smoker	-0.459 [0.131,1.611]	0.224
	Yes	1.486 [0.452,4.887]	0.515
Hypertension	No	Ref	
	Yes	-0.257 [0.041,1.604]	0.146*
Type 2 diabetes mellitus (T2DM)	No	Ref	
	Yes	-0.257 [0.043,1.504]	0.156*
Dyslipidemia	No	Ref	
	Yes	-0.257 [0.041,1.604]	0.146*
Stroke	No	Ref	
	Yes	-0.461[0.168,1.264]	0.132*
Ischemic Heart Disease (IHD)	No	Ref	
	Yes	1.506 [0.426, 5.333]	0.525
Benign Prostatic Hyperplasia (BPH)	No	Ref	
	Yes	3.280 [1.206,8.917]	0.020*
Major Depressive Disorder (MDD)	No	Ref	
	Yes	3.447 [1.083,11.162]	0.036*
Atrial Fibrillation (AF)	No	Ref	
	Yes	2.169 [0.723, 6.512]	0.167*

^aSimple Binary Logistic Regression
*p-value <0.25 was considered statistically significant

Table 3
Factors associated with dementia in HF patients (N = 32)

Factors	Group	Adjusted OR [95% CI] ^b	p- value*
Major Depressive Disorder (MDD)	No	Ref	0.014*
	Yes	4.579 [1.361,15.401]	
Benign Prostatic Hyperplasia (BPH)	No	Ref	0.014*
	Yes	3.759 [1.307, 10.814]	

^bMultiple Binary Logistics Regression
*p-value <0.05 was considered statistically significant

DISCUSSION

This study found a high overall prevalence of dementia in elderly HF patients (76.2%). This finding is supported by the study by Adelborg et al., (2017) that showed higher risk of dementia in HF patients [HR: 1.21, 95% confidence interval (CI), 1.18-1.24]. Although the exact mechanism linking these two conditions is yet to be fully understood, reduced cerebral blood flow is one of the proposed mechanisms for the development of dementia in HF (Goh et al., 2022). The prevalence of dementia in this study was also noted to be higher in male patients, contrasting with a population-based cohort study in China by Ren et al. (2023), which reported higher rates in females. This difference could be attributed to a vast difference in sample sizes (N = 202,12).

With regards to risk factors, this study found no statistically significant demographic factors linked to dementia. However, a higher incidence of dementia was noted among patients aged 80 to 89, consistent with previous studies suggesting HF increases dementia risk in those 65 and older (Arslan et al., 2024; Jensen et al., 2023) and 75 years and older (Ren et al., 2023). MDD and BPH were identified as significant predictors of dementia in elderly HF patients. Previous research has linked depression history to increased dementia risk in HF patients (Adelborg et al., 2016). Additionally, men with BPH are at higher risk for Alzheimer’s and dementia (Nørgaard et al., 2021), and BPH medications may also elevate dementia risk (Tae et al., 2019). The limitations of this study include its retrospective design, which relies on existing medical records and may be subject to incomplete or missing data. Additionally, the small sample size may limit the statistical power to detect significant associations between HF and dementia. Furthermore, as a single-centre study conducted at HKL, the findings may not be fully generalizable to other healthcare settings or the broader Malaysian population. Differences in patient demographics, healthcare access, and clinical management across regions could influence the observed associations.

CONCLUSION

This research found a higher incidence of dementia in elderly HF patients aged 80 to 89 years, males, Malays, married individuals, those with only primary education, and non-

smokers. Significant correlations were identified between dementia and comorbidities such as hypertension, T2DM, stroke, dyslipidemia, BPH, MDD, and AF, with MDD and BPH being notable predictors of dementia. The study highlights the need for integrated care strategies addressing both cardiovascular and cognitive health in Malaysia. By identifying the modifiable risk factors, healthcare professionals can develop tailored preventative and management plans to improve outcomes and quality of life of HF patients. Further research is needed to explore the mechanisms linking HF and dementia and the impact of comorbidities on cognitive health.

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Optimising Cognitive Assessment: Key Variable Identification for Efficiency using Ensemble Learning

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ABSTRACT

Mild Cognitive Impairment (MCI) signifies an abnormal cognitive decline that surpasses the natural deterioration associated with aging. The Montreal Cognitive Assessment (MoCA) is a leading tool for MCI detection, evaluating twelve variables to diagnose various cognitive domains. This study aims to optimize the MoCA by identifying the most critical variables, thus simplifying the test while maintaining diagnostic accuracy. Using an Ensemble model comprising Gradient Boosting and Random Forest techniques, eight key variables were identified, enhancing the MoCA's efficiency without compromising its effectiveness.

Keywords: Cognitive impairment (CI), feature selection, frailty, machine learning, MCI, MOCA

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INTRODUCTION

Mild Cognitive Impairment (MCI) stands as an early, decisive warning sign of possible cognitive decline, frequently preceding more severe neurodegenerative conditions such as Alzheimer's disease (AD) (Boettcher et al., 2020). It occupies a transitional cognitive state between typical age-related decline and more debilitating conditions like dementia, where individuals may exhibit measurable cognitive deficits—particularly in memory, attention, and

executive function—yet retain a degree of independence. Approximately 15% of individuals with MCI progress to AD annually (Liu et al., 2020; Quek et al., 2023). This alarming statistic highlights the urgent need for precise and timely diagnostic instruments that enable healthcare professionals to act quickly and prevent progression. Various tools, including the Mini Mental State Examination (MMSE) and Clinical Dementia Rating (CDR), have been identified in multiple literatures for assessing neurocognitive disorders (Boettcher et al., 2020; Ghoraani et al., 2021; Idris & Badruddin, 2021; Kumar et al., 2021; Louka et al., 2022; Mantovani et al., 2020; Zhou et al., 2022). The Montreal Cognitive Assessment (MoCA) has been widely acknowledged as a better tool for detecting MCI. The MoCA test, involving a 30-point assessment over 15 minutes, is highly regarded for evaluating cognitive abilities across multiple domains (Corral et al., 2024). In comparison with MMSE, researchers adjudged MoCA to be significantly better, more sensitive and more effective in detecting MCI (Roeck et al., 2019; Tan et al., 2021). Recent adaptations, like the MoCA-Blind, cater to vision-impaired individuals by excluding visual components (Effendi-Tenang et al., 2020; Wittich et al., 2010).

The Montreal Cognitive Assessment is widely recognised as an effective tool for detecting MCI by assessing multiple cognitive domains through twelve variables. Although MoCA has demonstrated value, its twelve parameters covering various cognitive areas add to its complexity, making it difficult to administer in fast-paced clinical settings. The mental effort required can cause fatigue and errors in older adults, highlighting the need for alternative approaches that balance simplicity with diagnostic accuracy. (Roeck et al., 2019; Tan et al., 2021). The challenge is to identify the most important variables in MoCA that can accurately predict cognitive impairment while minimizing the time and complexity of the assessment. The key question is; how can the MoCA be improved by pinpointing the most critical variables that preserve its diagnostic accuracy for cognitive impairment, thereby reducing the overall length and difficulty of the evaluation? This research aims to address this issue by creating a more concise version of the MoCA using an ensemble model that employs Gradient Boosting and Random Forest techniques to identify essential variables without sacrificing the tool's effectiveness and accuracy. To our knowledge, this is the first time a machine learning model has been used to develop a short-form MoCA.

MATERIALS AND METHODS

The study utilized data from the Transforming Cognitive Frailty into Self-Sufficiency (AGELESS) and Malaysian Elders Longitudinal Research (MELOR) studies (Aravindhan et al., 2022; Asmuje et al., 2023). The dataset included 2177 participants after excluding those diagnosed with dementia. Data preprocessing involved eliminating cases with excessive null values; participants with missing values greater than 20% were removed, resulting in 1645 cases. Participants' cognitive impairment was categorized into three classes: normal Cognition (NC: MoCA scale; 28-30), (MCI: Moca scale; 20-25), and

Subjective Cognitive Decline (SCD: MoCA scale; 26-27) (Boettcher et al., 2020; Lin et al., 2021; Rotenberg et al., 2020). The MoCA variables were standardised for analysis. The descriptive analysis shows that the NC group has a younger mean age (69.26 years, SD = 6.16) and is predominantly female (mean gender value = 0.406, SD = 0.491), with a lower mean ethnicity value (0.57, SD = 0.89), indicating less ethnic diversity. In contrast, the MCI group shows an older mean age (72.41 years, SD = 6.87), a nearly equal gender split (mean = 0.487, SD = 0.500), and the highest ethnic diversity (mean = 1.26, SD = 1.06). The SCD group has a mean age of 72.04 years (SD = 6.60), a balanced gender distribution (mean = 0.485, SD = 0.500), and moderate ethnic diversity (mean = 0.91, SD = 1.02), suggesting increased symptoms as cognitive decline progresses (Table 1). The seven cognitive domains are described in Table 2; visuospatial ability (visuospatial 1-3), naming, attention (attention 1-3), language (language 1&2), abstraction, memory (delay recall), and orientation.

Table 1
Descriptive statistics of demography of participants

Participant Description	Mild Cognitive Impairment (MCI)		
	(n=1645) NC (n=773)	SCD (n= 398)	MCI (n=474)
Age, $\mu(\sigma)$	69.26(6.16)	72.04(6.60)	72.419(6.87)
Gender			
Female, No (%)	459 (59.38)	205 (51.51)	243 (51.27)
Male, No (%)	314 (40.62)	193 (48.49)	231 (48.73)
Ethnicity			
Chinese, No (%)	500 (64.68)	192 (48.24)	161 (33.97)
Indian, No (%)	134 (17.34)	74 (18.59)	85 (17.93)
Malay, No (%)	118 (15.27)	111 (27.89)	177 (37.34)
Others, No (%)	21 (2.72)	21 (5.28)	51 (10.76)
Education Level			
<= 6 years of Formal Education No (%)	44 (5.69)	77 (19.35)	175 (36.92)
> 6 years of Formal Education No (%)	729 (94.31)	321 (80.65)	299 (63.08)

NC = normal cognition; MCI = mild cognitive impairment; SCD = subjective cognitive decline; SD = standard deviation

Table 2
Description of cognitive domains

MOCA Variable	Description	Scale
Visuospatial_1	Number order arrangement	1
Visuospatial_2	Copy cube	1
Visuospatial_3	Draw a clock (Ten past eleven)	3

Table 2 (continue)

MOCA Variable	Description	Scale
Naming	Name the following; [] Lion [] Elephant [] Camel	3
Attention_1	Read a list of digits; Forward [] 2, 1, 8, 5, 4 Backward [] 7, 4, 2	2
Attention_2	Read the list of numbers; 6, 2, 1, 3, 7, 8, 1, 1, 9, 7, 6, 2, 1, 6, 1, 7, 4, 5, 1, 1, 1, 9, 1, 7, 9, 6, 1, 1, 2	1
Attention_3	Serial 7 subtraction starting at 100	3
Language_1	Repeat sentences; 1 point for each sentence successfully repeated	2
Language_2	Fluency; Name as many animals as possible in one minute)	1
Abstraction	Describe the similarity between; Train - Bicycle, Watch - Ruler	2
Delay recall	Recall words ; [] Face [] Silk [] Church [] Rose [] Red	5
Orientation	[] Date [] Month [] Year [] Day [] Place [] Country	6
Total Scale		30

Machine Learning Model

Two ensemble learning models, Gradient Boost and Random Forest, were employed for feature selection. The ensemble model used in this study—integrating Gradient Boosting and Random Forest techniques—is particularly well-suited for this task. Gradient Boosting constructs multiple weak models (typically decision trees) and combines them to form a stronger predictive model (Emami & Martínez-Muñoz, 2025). This method optimizes complex models like the MOCA by identifying and emphasizing the most important variables. Also, Random Forests, which consist of an ensemble of decision trees, provide robustness and flexibility, making them ideal for handling complex datasets with multiple variables (Li et al., 2020). Together, these techniques facilitate a thorough approach to refining the MOCA, ensuring that the final model retains diagnostic accuracy while enhancing usability. The data was split into training (80%) and testing (20%) sets. The models were evaluated based on their ability to predict cognitive impairment. The selected features were then applied on seven traditional machine learning models such as; Logistic Regression (LR), Linear Descriptive Analysis (LDA), K-Nearest Neighbor (KNN), Classification and Regression Tree (CART), Support Vector Machine (SVM), Random Forest Classifier (RFC) and Gaussian Naïve Baiye (GNB).

RESULTS

The ensemble models, Gradient Boost and Random Forest, identified Delayed Recall, Visuospatial 3, and Attention 3 as the most significant variables (see Figure 1 (a & b)). The Gradient Boost model achieved an accuracy of 81.2%, while the Random Forest model reached 83.5%. The study retained all seven cognitive domains but found four

variables (Visuospatial 1 & 2, Attention 2, and Language 2) to be redundant, supporting a streamlined MoCA with eight key variables. Unlike previous work that reduced the number of domains from seven to four (Tan et al., 2021), compromising accuracy, our approach maintains all seven domains, only reducing variables within them, resulting in better predictive performance. The eight selected variables were then trained using various traditional machine-learning models and compared results with the full MoCA in predicting cognitive impairment. The results show that the modified MoCA performs comparably to the full MoCA across all metrics in six models and even outperforms it in the Gaussian Naïve Bayes model, with 73% accuracy against 39% for the full MoCA (Table 3). These findings confirm that the modified MoCA retains its effectiveness in predicting cognitive impairment (CI) with a reduced variable count from twelve to eight.

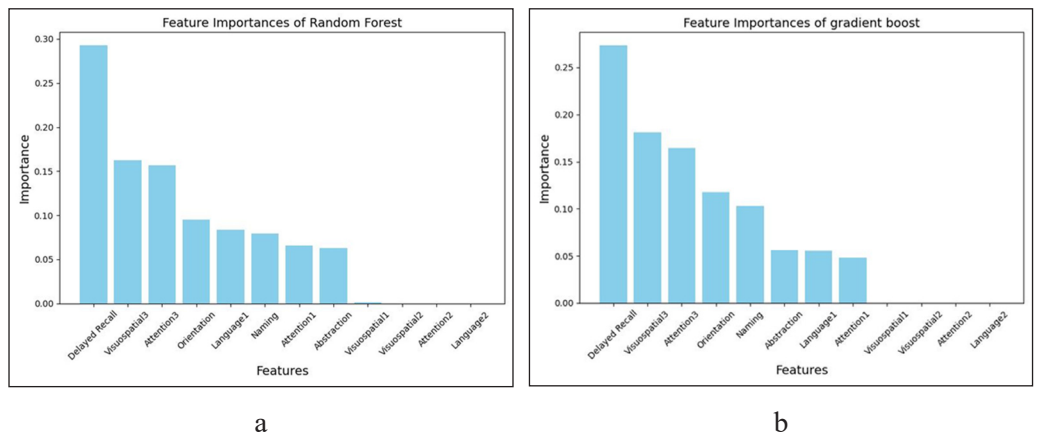


Figure 1. Visualisation of important features in (a) Random forest and (b) Gradient boost

Table 3
Machine learning results of modified and full versions of the Montreal Cognitive Assessment

Modified MoCA prediction of MCI					Full MoCA prediction of MCI				
Models	Accuracy	Precision	Recall	F1-Score	Models	Accuracy	Precision	Recall	F1-Score
LR	79	75	75	75	LR	79	75	75	75
LDA	80	77	75	76	LDA	80	78	75	76
KNN	81	80	79	79	KNN	82	80	79	80
CART	85	84	82	83	CART	85	84	82	83
SVM	82	80	80	80	SVM	81	80	80	80
RFC	85	84	82	83	RFC	85	84	82	83
GNB	73	70	68	69	GNB	39	70	50	38

MoCA=Montreal Cognitive Assessment; MCI=mild cognitive impairment; LR: Logistic Regression, LDA: Linear Descriptive Analysis, KNN: K-Nearest Neighbor, CART: Classification And Regression Tree, SVM: Support Vector Machine, RFC: Random Forest Classifier, GNB: Gaussian Naïve Baiye

DISCUSSION AND CONCLUSION

The findings indicate that the MoCA test can be optimized by concentrating on eight significant variables in the cognitive domain without sacrificing the accuracy of predicting cognitive impairment. This enhances its efficiency and reduces administration time. While the optimized MoCA tool promises reduced administration time, its practical implementation in clinical settings may face challenges, such as user acceptance by clinicians and adaptability across different healthcare systems. Future research should determine a new scale for the modified MoCA and validate the findings to confirm the optimized MoCA's effectiveness. This streamlined version promises to enable quicker and equally reliable cognitive assessments, benefiting both clinical geriatricians and patients.

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Factors Associated with the Use of Complementary and Alternative Medicine among Elderly Registered with Elderly Activity Centre in the Klang Valley

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ABSTRACT

Elderly individuals increasingly use complementary and alternative medicine (CAM) due to greater availability, but uncontrolled use can be unsafe. This study determined factors associated with CAM use among the elderly in the Klang Valley using the Theory of Planned Behaviour (TPB). A cross-sectional study was conducted among elderly individuals registered with *Pusat Aktiviti Warga Emas* (PAWE). Respondents were selected via simple random sampling, and data were collected using a self-administered questionnaire. Ethical approval was obtained from the Universiti Putra Malaysia Ethics Committee. The prevalence of CAM use was 64.3%. Common reasons included improving bodily performance, ingestion as the primary type, family or friends as the main information sources, and purchase at shops as the preferred method. Factors associated with CAM use included education level, spouse status, employment status, income level, and constructs of the Theory of Planned Behaviour (attitude, subjective norm, and perceived behavioural control). Higher education (AOR: 1.929, 95% CI: 1.100 - 3.385) and perceived behavioural control (AOR: 1.861, 95% CI: 1.475–2.347) were significant predictors of CAM use. It is recommended that healthcare providers receive adequate training on CAM use as Malaysia transitions to an aged population.

Keywords: Complementary and alternative medicine, elderly, theory of planned behaviour

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INTRODUCTION

The use of complementary and alternative medicine (CAM) in Malaysia is widespread, with estimates ranging from 29% to 65%. This indicates that nearly one in three to almost 70% of Malaysians use CAM. Several studies highlight this trend across different groups. Among chronic kidney disease patients, 29% reported using CAM

in the past year (Yusuf et al., 2019). A study in Tumpat, Kelantan, found that 51.4% of women used herbal medicine during pregnancy (Rahman et al., 2008). Among cancer patients, 60.8% used CAM (Salleh et al., 2021). Additionally, a study among non-urban populations reported a 65.3% CAM usage rate (Teow et al., 2021). CAM use among the elderly is particularly concerning due to chronic non-communicable diseases (NCDs), polypharmacy, and limited awareness of its risks and benefits. Studies show that CAM is more prevalent among the elderly, with odds ratios (OR) ranging from 1.15 to 1.75, indicating an increased likelihood compared to younger populations (Abdullah et al., 2018).

Unregulated use of complementary and alternative medicine (CAM) carries significant risks. For instance, delayed diagnosis and treatment have been observed in cancer patients using CAM (Chui et al., 2014; Mujar et al., 2017), while epilepsy patients who used CAM were more likely to be non-adherent to prescribed medications (Farrukh et al., 2021). Furthermore, studies involving elderly individuals and hypertensive patients in Malaysia reported a high prevalence of non-disclosure of CAM use to doctors (Joachimdass et al., 2021; Wahab et al., 2021). Among 102,461 adverse drug reaction (ADR) reports submitted to Malaysia's National Pharmaceutical Regulatory Agency (NPRA), 140 cases (0.14%) of acute kidney injury (AKI) were linked to traditional and complementary medicine (TCM) products, with 72.7% of these products being unregistered. Non-disclosure of CAM use to healthcare providers, particularly among elderly and hypertensive patients, has been associated with treatment complications (Lee et al., 2020). Additionally, the financial burden of CAM is significant. In a study of cancer patients, out-of-pocket (OOP) spending on CAM accounted for 42.9% of healthcare costs in upper-middle-income countries, increasing the risk of financial catastrophe (AOR: 1.52, 95% CI: 1.23–1.88) and medical impoverishment (AOR: 1.75, 95% CI: 1.36–2.24) (Kong et al., 2022).

Given Malaysia's aging population, more research is needed on CAM use, especially in urban areas. This will help inform strategies by the Ministry of Health and other stakeholders to ensure the safe and effective use of CAM, improving health outcomes and protecting against adverse effects.

METHODOLOGY

This cross-sectional study was conducted among elderly individuals registered at *Pusat Aktiviti Warga Emas* (PAWE), an Elderly Activity Centre in the Klang Valley, Malaysia. The study population was drawn from 15 PAWE centres that were chosen for this research. The study employed a self-administered questionnaire consisting of 31 questions, which were divided into three sections: socio-demographic details, Theory of Planned Behaviour (TPB) constructs (attitude, subjective norms, and perceived behavioural control), and CAM usage patterns. The socio-demographic and CAM pattern questions were developed based on existing literature, while the TPB construct questions were adapted from Ng et al. (2022).

The TPB section utilized a 7-point Likert scale, and the overall scores for each construct were calculated. Validity and reliability were ensured through content validation by public health experts, with a Content Validity Index (CVI) of 0.9, and back-to-back translation of the questionnaire. A pilot test with 30 elderly individuals confirmed the questionnaire’s reliability, with Cronbach’s Alpha scores for attitude (0.857), subjective norm (0.926), and perceived behavioural control (0.834).

RESULTS

Of the 319 respondents, females made up the majority (86.2%, n = 275). A total of 64.3% (n = 205) of respondents reported using CAM (Table 1). Table 2 showed the socio - demographic characteristics of the respondents. The largest ethnic group was Malay (86.8%, n = 277), and most respondents were Muslim (87.8%, n=280). Education levels varied, with 60.8% (n = 194) having secondary education. The median age of respondents was 67 years, and the median monthly household income was RM 1100.

Health issues were prevalent among respondents as shown in Table 3, with 86.2% (n = 275) reporting at least one medical condition. The most common conditions included hypercholesterolemia (62.2%, n = 171), hypertension (60.4%, n = 166), and diabetes (39.3%, n = 108). Regarding the TPB constructs, respondents generally had a positive attitude toward CAM (mean score of 4.50±1.14). Subjective norm,

Table 1
Prevalence of CAM use

CAM use	Frequency	Percent (%)
Yes	205	64.3
No	114	35.7

Table 2
Socio - Demographic characteristics of respondents (N = 319)

Variables	Frequency Median (IQR)	Percent (%)/ Range
Age	67 (7)	60 - 83
Sex		
Male	44	13.8
Female	275	86.2
Ethnicity		
Malay	277	86.8
Chinese	31	9.7
Indian	10	3.1
Others	1	0.3
Religion		
Islam	280	87.8
Buddha	26	8.2
Hindu	10	3.1
Christian	2	0.6
Others	1	0.3
Education Level		
Tertiary education	33	10.3
Secondary education	194	60.8
Primary education	86	27.0
No formal education	6	1.9
Having a Spouse		
Coupled	161	50.5
Single (divorced, widowed, single)	158	49.5
Employment status		
Public servant	0	0
Private sector	9	2.8
Self-employed	25	7.8
Pensioner	114	35.7
Unemployed	171	53.6
Monthly Household Income (RM)	1100.00 (1400.00)	100.00 - 20 000.00

which reflects the influence of family and friends on CAM use, had the lowest mean score (4.26 ± 1.54). Perceived behavioural control (PBC), which indicates one’s belief in their ability to control CAM use, had the highest mean score (4.59 ± 1.54) (Table 4).

Table 5 shows the pattern of CAM use among the respondents. The primary reason for CAM use was to improve bodily performance (68.8%, $n = 141$), followed by recommendations from family and friends (46.3%, $n = 95$) and health personnel (42.9%, $n = 88$). In terms of usage patterns, 55.6% ($n = 114$) used more than one type of CAM, with multivitamins (49.8%, $n = 102$), olive oil (33.2%, $n = 68$), and traditional herbs (23.4%, $n = 51$) being the most common. Purchasing CAM at shops was the most common method (38.5%, $n = 79$), with a median monthly expenditure of RM 100. Family and friends were the main sources of CAM information (69.3%, $n = 142$).

Table 6 and Table 7 presents the results of the bivariate analysis examining the relationship between socio-demographic

Table 3
Medical issues reported (N = 275)

Variables	Frequency (n)	Percent (%)
Medical Issues		
Yes	275	86.2
No	44	13.8
Lists of Medical Issues		
Hypercholesterolemia	171	62.2
Hypertension	166	60.4
Diabetes Mellitus	108	39.3
Arthritis	89	32.4
Heart Disease	26	9.5
Obesity	18	6.5
Asthma	16	5.8
Malaise	15	5.5
Cancer	10	3.6
Gout	7	2.5
Others	19	6.9
Erectile Dysfunction	0	0.0

Table 4
Average mean score of PTB constructs item (N = 319)

Constructs	Item	Mean Score $\pm$ SD	Average Mean Score $\pm$ SD
Attitude			4.50 ± 1.14
A 1	I extremely trust CAM.	4.52 ± 1.52	
A 2	I am very concerned about CAM.	4.48 ± 1.55	
A 3	I'd very much like to accept CAM concept	4.56 ± 1.50	
A 4	I think CAM is effective.	4.42 ± 1.49	
A 5	I think CAM is safe.	4.39 ± 1.61	
A 6	I think CAM has few side effects.	4.45 ± 1.52	
Subjective Norm			4.26 ± 1.54
SN 1	My family and friends support me to choose CAM.	4.26 ± 1.54	
SN 2	My family and friends think I should choose CAM.	4.24 ± 1.55	
SN 3	My family and friends will choose CAM.	4.26 ± 1.56	
SN 4	If my family and friends choose CAM, I would make the same choice.	4.22 ± 1.67	

Table 4 (continue)

Constructs		Item	Mean Score $\pm$ SD	Average Mean Score $\pm$ SD
Perceived Behavioural Control				4.59 $\pm$ 1.54
PBC 1		I have time to receive CAM services.	4.59 $\pm$ 1.54	
PBC 2		I am economically capable to receive CAM services.	4.06 $\pm$ 1.64	
PBC 3		I have the ability to decide whether to choose CAM.	4.98 $\pm$ 1.60	
PBC 4		I can share my knowledge and experience of CAM with others.	4.94 $\pm$ 1.58	
PBC 5		I can overcome my difficulty in choosing CAM.	4.14 $\pm$ 1.76	

Table 5
Pattern of CAM use (N = 205)

Variables		Frequency	Percent (%)
Amount of CAM intake			
Only 1 type		91	44.4
More than 1 type		114	55.6
Reasons for CAM Use			
To improve body performance to do daily activities		141	68.8
Recommended by family and friends		95	46.3
Recommended by health personnel		88	42.9
Affordable price		85	41.5
To explore a different option		84	41.0
To improve physical and emotional well - being		82	40.0
To enhance immune function		74	36.1
Readily available		74	36.1
To reduce the risk of getting infection		72	35.1
It is much more effective compared to the other types of treatment		65	31.7
Inclined towards this form of therapy instead of using modern medicine		65	31.7
It is safe compared to the other types of treatment		54	26.3
Other reasons		2	1.0
Types of CAM Use			
Multivitamin		102	49.8
Olive Oil		68	33.2
Dancing and Movement Therapy		51	24.9
Traditional Herbs Product		48	23.4
Fish Oil		45	22.0
Breathing Technique		37	18.0
Commercial Health Juice		26	12.7
Honey		23	11.2
Music Therapy		23	11.2
Aromatherapy		20	9.8
Therapeutic Mattress		19	9.3
Bird's Nest		18	8.8

Table 5 (continue)

Variables	Frequency	Percent (%)
Reflexology	18	8.8
Health Supplement	15	7.3
Spiritual Healing	14	6.8
Habbatus Sauda	13	6.3
Sacha Inchi Oil	12	5.9
Taichi	12	5.9
Topical Herb Ointment	11	5.4
Massage Machine	9	4.4
Meditation	7	3.4
Detox Food	3	1.5
Chiropractic	3	1.5
Sound and Light Therapy	2	1.0
Hypnotic Therapy	2	1.0
Magnetic / Energy Bracelet	2	1.0
Reiki	2	1.0
Other Types of Ingested CAM	19	9.3
Other Types of External CAM Application	13	6.3
Other Types of CAM Practices	2	1.0
Method of getting CAM		
Buy at the shop	79	38.5
From online	63	30.7
Buy from direct seller	54	26.3
Others	38	18.5
Monthly spending on CAM (RM)		
	100.00 (115.00)	Range 0.00 - 600.00
Information regarding CAM		
Family and friends	142	69.3
Internet	74	36.1
Books	17	8.3
Others	18	8.8

characteristics and TPB constructs with CAM use. Factors associated with CAM use included education level ($p < 0.001$), spouse status ($p = 0.026$), employment status ($p = 0.005$), income level ($p < 0.001$), and all TPB constructs (attitude, $p < 0.001$; subjective norm, $p < 0.001$; perceived behavioural control, $p < 0.001$). Table 8 presents the multiple logistic regression analysis identifying the predictors of CAM use. The regression analysis showed that higher education (AOR: 1.929, 95% CI: 1.100 - 3.385) and perceived behavioural control (AOR: 1.861, 95% CI: 1.475 - 2.347) were significant predictors of CAM use. The model explained 21.6% of the variation in CAM use, with a fair level of discrimination (ROC curve = 0.746, $p < 0.001$).

Table 6
Bivariate analysis between socio - Demographic characteristics and CAM use

Variables	CAM Use Status		χ^2 / Z	p-value
	Yes n (%)	No n (%)		
Age (Median (IQR))	67 (7)		- 1.647	0.099 ^a
CAM Users	67 (7)			
Non-CAM Users	68 (8)			
Sex				
Male	28 (63.6)	16 (36.4)	0.009	0.926 ^b
Female	177 (64.4)	98 (35.6)		
Ethnicity				
Malay	175 (63.2)	102 (36.8)	1.081	0.298 ^b
Non - Malay	30 (71.4)	12 (28.6)		
Religion				
Muslim	176 (62.9)	104 (37.1)	1.972	0.160 ^b
Non-Muslim	29 (74.4)	10 (25.6)		
Education Level				
Higher (Secondary & Tertiary)	159 (70.0)	68 (30.0)	11.453	<0.001 ^{b*}
Lower (Primary & No Formal)	46 (50.0)	46 (50.0)		
Having a Spouse				
Coupled	113 (70.2)	48 (29.8)	4.966	0.026 ^{b*}
Single (divorced, widowed, single)	92 (58.2)	66 (41.8)		
Employment status				
Unemployed	98 (57.3)	73 (42.7)	7.760	0.005 ^{b*}
Others (Pensioners & Active)	107 (72.3)	41 (27.7)		
Monthly Household Income (RM) (Median (IQR))	1100.00 (1400.00)		-3.987	< 0.001 ^a
CAM users	1500.00 (1250.00)			
Non-CAM users	1000.00 (1000.00)			
Having Medical Issue				
Yes	181(65.8)	94 (34.2)	2.099	0.147 ^b
No	24 (54.5)	20 (45.5)		

Note. a Mann-Whitney U Test; b Chi-Square Test; * Significant at $P < 0.05$

Table 7
Bivariate analysis between theory of planned behaviour constructs and CAM use

Construct	Mean Difference (95% CI)	t (df)	p-value
Attitude	0.502 (0.246, 0.757)	3.863 (317)	< 0.001 ^{a*}
Subjective Norm	0.720 (0.413, 1.026)	4.621 (317)	< 0.001 ^{a*}
Perceived Behavioural Control	0.859 (0.607, 1.110)	6.715 (317)	< 0.001 ^{a*}

Note. ^a Independent Sample T- Test; *p < 0.05

Table 8
Predictors of CAM use among the elderly

Variables	Coefficient (B)	Adjusted OR	95% CI for Odds Ratio		p value
			Lower Bound	Upper Bound	
Intercept	-2.263				
Age	-0.009	0.991	0.937	1.049	0.762
Religion					
Non-Muslim	Ref				
Muslim	-0.717	0.488	0.215	1.109	0.087
Education					
Lower education	Ref				
Higher education	0.657	1.929	1.100	3.385	0.022*
Having a Spouse					
Single	Ref				
Couple	0.287	1.332	0.792	2.243	0.280
Employment Status					
Unemployed	Ref				
Others	-0.232	0.793	0.456	1.379	0.411
Monthly Household Income	< 0.001	1.000	1.000	1.000	0.090
Medical Issues					
Yes	ref				
No	0.183	1.201	0.586	2.461	0.617
Average Mean Attitude Score	-0.056	0.946	0.690	1.297	0.729
Average Mean Subjective Norm Score	0.130	1.139	0.897	1.445	0.285
Average Mean Perceived Behavioural Control Score	0.621	1.861	1.475	2.347	< 0.001*

Note. * p < 0.05

DISCUSSION

The study revealed a prevalence of 64.3% for CAM use among elderly respondents, which falls within the range of other studies in Malaysia. For instance, Wahab et al. (2021) found a prevalence of 45.8%, while Lee et al. (2020) reported 85.1% among elderly individuals with chronic musculoskeletal pain. In other countries such as in Saudi Arabia, a study conducted among elderly aged 60 years and older found a CAM use prevalence of 62.5% (Aljawadi et al., 2020).

Several socio-demographic factors were found to be associated with CAM use. Those with a spouse were more likely to use CAM, possibly due to the emotional and decision-making support provided by partners, a finding consistent with research by Salleh et al. (2021). Additionally, employment status and household income were significant, with retired and employed individuals showing higher rates of CAM use compared to the unemployed, a relationship supported by studies such as Zhang et al. (2007) and Wahab et al. (2021).

Within the TPB framework, attitude was a significant factor in CAM use, with higher attitude scores correlating with a more positive inclination toward CAM. This was consistent with research linking cultural beliefs and scepticism about conventional treatments to higher rates of CAM usage (Conboy et al., 2007; Jasamai et al., 2017). However, subjective norms were found to be less influential, as respondents generally rejected the idea that social influences, such as family or friends, should dictate their use of CAM. This finding stands in contrast to other studies that highlighted the predictive role of social norms in health decisions, such as Dzulkipli et al. (2017).

The study identified two key predictors of CAM use: educational level and perceived behavioural control. Individuals with higher education levels were more likely to use CAM, a trend also observed in studies by Wahab et al. (2021) and Salleh et al. (2021), where higher education was associated with greater openness to alternative treatments and higher health literacy. Perceived behavioural control, specifically the ability to manage resources and overcome barriers, was another important predictor. Although respondents generally felt they had sufficient time and freedom to make decisions about CAM, financial limitations remained a significant barrier (Ajzen & Madden, 1986; Lino et al., 2014).

CONCLUSION

Several recommendations can be proposed to improve the safe use of CAM among the elderly in urban areas. Interventions should consider sociodemographic factors such as education, marital status, employment, and income. Healthcare policies should integrate CAM into primary care, ensuring that healthcare providers are well-trained to offer informed guidance and prevent harmful interactions with conventional treatments. The Ministry of Health (MOH) should expand CAM services in primary care facilities and implement stricter regulation of CAM products, particularly those sold online, to ensure that only safe and scientifically validated products are available. Public health campaigns led by the MOH, and other ministries should raise awareness about the risks and benefits of CAM, promoting informed decision-making among the elderly. Additionally, ongoing research and evaluation of CAM practices should be incorporated into health services to ensure policies remain responsive to emerging trends in CAM use.

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Oral Health Status of Older Patients on Admission to the Hospital

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ABSTRACT

Oral health is important for overall health, especially among older patients. Their frailty, nutritional status and dependency may affect their oral health. Screening can identify poor oral health early and prompt intervention can be made. This study aimed to identify the oral health status of older patients admitted to hospital. A cross-sectional study was conducted involving older patients admitted to the geriatrics ward at a teaching hospital in Kuala Lumpur. Data was obtained from patients and their electronic medical records (EMR). Their oral health was assessed using the Oral Health Assessment Tool (OHAT), with a cut-off score of ≥ 4 indicating unsatisfactory oral health. Of the 46 patients approached, 39 had OHAT conducted. Patients bed or wheelchair bound (OHAT done, 12 (30.8%) vs OHAT not done, 6 (85.7%), $p = 0.01$), and delirium (OHAT done, 18 (46.2%) vs OHAT not done, 7 (100%), $p = 0.01$) were less likely to have OHAT conducted. Among those who had their OHAT done, 28/39 (70%) had unsatisfactory oral health. Only 1/20 (5%) were referred to dental services. Most older patients in the hospital have poor oral health but only 1/14 are referred to inpatient dental services. Oral health assessments should be a part of routine assessments.

Keywords: Dental, hospital, geriatric, oral health

INTRODUCTION

Oral health is crucial for overall health, especially in older adults with risk factors such as multiple comorbidities and polypharmacy, which can lead to further complications. Tinker et al. (2018) demonstrated that some of them are worried that their general health affects their oral health such as medical conditions and disabilities, yet some also view the two as being separate. Those frailer are also more

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dependent. Hence their oral health may be neglected as they require assistance in their basic activities of daily living (bADL). Despite its importance, routine screening of oral health among hospitalised patients is uncommon due to lack of awareness, time constraints and presumed low priority. Screening is essential to identify and address oral health issues to prevent further complications and improve overall health outcomes. Our study aims to observe how are the oral health status of older patients upon admission to the hospital and identify whether oral health affects their overall health upon discharge from the hospital.

METHODS

A cross-sectional study was conducted involving patients who were admitted to the Geriatric Medicine ward of Universiti Malaya Medical Centre (UMMC) in 2024. It included all patients who were admitted throughout the study duration (6 weeks). There were several exclusion criteria such as patients who refused to have their oral health assessed, critical ill, terminally unwell patients, and patients who were isolated for clinical precautions. 46 patients were recruited. Necessary data such as demographics and clinical status were collected such as their clinical frailty score (CFS), basic activities of daily living (bADL) and instrumental activities of daily living (iADL). Electronic medical records (EMR) were also utilized to supplement required data and monitor patient’s health status. Patients’ oral health was assessed using the Oral Health Assessment Tool (OHAT) which allowed us to assess the lips, tongue, gums and tissue, saliva, natural teeth, dentures, oral cleanliness and dental pain at the bedside. A cut-off score of 4 was used to indicate unsatisfactory oral health. Higher score indicated poorer oral health. After collecting the required data, analysis was conducted using descriptive statistics and the appropriate statistical tests. With this, we identified any correlations between the patients’ oral health and their overall health status at the end of the study. Ethical approval was provided by local ethics committee (UMMC MREC number 2024227-13468)

RESULTS

Table 1 compares those who had their OHAT done and those who did not had their OHAT done. A total of 46 patients were recruited. Those ambulating independently or with aids were more likely to have OHAT conducted (OHAT done, 27 (67.92%) vs OHAT not done, 1 [(14.3%), $p = 0.01$]; and those who were confused were less likely to have their OHAT conducted (OHAT done, 18 (46.2%) vs OHAT not done, 7 [(100%), $p = 0.01$].

OHAT was initially conducted upon patient’s admission to the hospital (OHAT 1). After 7 days after the first OHAT was conducted, OHAT was conducted again to observe changes (OHAT 2). For OHAT 1, 16 (41%) scored 0 for lips; 4 (10.3%) for tongue; 34 (87.2%) scored 0 for gums & tissues, 27 (69.2%) scored 0 for saliva, 0 for natural teeth, 5 (12.8%) for dentures, 12 (30.8%) for oral cleanliness and 37 (94.9%) for dental pain. Among those that had OHAT done, 20/29 (70%) had unsatisfactory oral health.

Table 1
Comparison between YES and NO groups

Total patients (n = 46)	OHAT Yes Group (n = 39)	OHAT No Group (n = 7)	p-value
Age	80.3 (6.29)	85.4 (10.63)	1.76
Clinical frailty score (CFS)			0.61
1-4	7 (17.9)	2 (28.6)	
5-8	32 (82.1)	5 (71.4)	
Mobility pre-admission			0.01
With or without aids	27 (69.2)	1 (14.3)	
Wheelchair or bed bound	12 (30.8)	6 (85.7)	
4AT score			0.471
0-3	8 (72.7)	15 (53.6)	
≥4	3 (27.3)	13 (46.4)	

There were no differences in outcomes between patients with lower and higher OHAT scores except biochemical abnormalities (such as hypokalemia or hyponatremia) and ONS (oral nutrition supplement) prescription. Patients with higher OHAT scores were more likely prescribed with ONS (Unsatisfactory OHAT, 21 (71%) vs Satisfactory OHAT, 4 [(36.4%), $p = 0.03$]; while patents with lower OHAT scores were less likely diagnosed with biochemical abnormalities throughout their hospital stay (Satisfactory OHAT 0 vs Unsatisfactory OHAT 10 [(35.7%), $p = 0.04$]. A second OHAT was conducted on average 7 days after the first OHAT was conducted. A total of 18/39 (46%) patients had their OHAT 2 conducted. There was no difference between the scores for both OHAT 1 and OHAT 2, Among those with unsatisfactory oral health, only 2/28 (7%) were referred to dental services.

DISCUSSION

Based on our findings, most older patients in hospital have poor oral health. This result is also seen in a study where 71% of older patients have poor oral health upon admission (Andersson et al., 2004). Gender is not a significant factor towards oral health status upon admission to the hospital. This is unlike the findings at hospitals in Australia (Gibney et al., 2017) where men are observed to have unsatisfactory oral health upon admission. Only one-in-five were formally referred to dental services. Hence, oral health should be routinely assessed in clinics, nursing homes or prior to admission at the hospitals. More research should be conducted to show any correlations between oral health and factors, including whether admission causes changes in oral health. Study limitations include small sample size which could be due the lack of manpower during the conduction of the study and presence of human error during the OHAT assessment. More research should be conducted to show correlations between oral health and other factors in larger sample size. Hence, oral health should be implemented in routine assessments of patients.

CONCLUSION

In conclusion, our study shows that most older patients have poor oral health upon admission and oral health should be part of routine assessments.

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Insight into Cancer-associated Thrombosis in the Elderly

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ABSTRACT

Cancer-associated thrombosis (CAT) is a clinically significant complication of cancer. This study aims to describe baseline characteristics, and detail the nature of CAT events in elderly cancer patient who developed CAT. A total of 208 cancer patients from the Radiology and Oncology Pharmacy Department, Hospital Kuala Lumpur between 2018 and 2021 who developed CAT. We analysed retrospectively demographic information, clinical characteristics, and CAT event characteristics of cancer patients. CAT events were then categorised according to type, location, and timing. Elderly CAT patient showed higher prevalence in lung, rectal, and kidney cancer ($p=0.001$). Older patients show a significantly ($p=0.005$) higher prevalence of Stage IV CAT (64.8%) compared to younger patients (44.7%). The presence of a central venous catheter ($p=0.009$), smoking, and a platelet level greater than $350 \times 10^9/L$ ($p=0.031$) and two comorbidities, hypertension ($p<0.001$) and ischemic heart disease (IHD) ($p=0.005$) were significantly higher in elderly. Both groups predominantly manifested CAT as deep vein thrombosis (DVT) with a significant proportion occurring within the first three months post-cancer diagnosis. This study emphasises the most relevant risk factors of CAT in elderly cancer patients and may help to inform the development of tailored CAT risk stratification to better manage this special population.

Keywords: Cancer-associated thrombosis (CAT), CAT events, clinical characteristics, deep vein thrombosis (DVT), elderly

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INTRODUCTION

Cancer-associated thrombosis (CAT) is a clinically significant complication of cancer (Ikushima et al., 2016). Evidence on epidemiology of CAT and the clinical characteristics of the cancer patients who succumb to CAT, particularly in Malaysia is limited. In the general population, older age

(United Nation, 2024) is a well-documented risk factor for venous thromboembolism (VTE). However, the presence of cancer further complicates this risk profile. Understanding the interaction between age, cancer, and VTE risk (Horsted et al., 2012) is essential for developing a tailored risk stratification tool to inform prevention and treatment strategies for this vulnerable population. The study aims to describe Malaysia-specific risk factors associated with cancer-associated thrombosis event in elderly cancer patient, finally contributing to the development of tailored CAT risk stratification tool for elderly cancer patient.

METHODOLOGY

A total of 208 cancer patients who were in the anticoagulant recipient list from the Radiology and Oncology Pharmacy Department, Hospital Kuala Lumpur between 2018 and 2021 met the inclusion and exclusion criteria of our study. We include (i) those who were newly diagnosed with cancer, (ii) aged 18, and (iii) individuals with confirmed cases of VTE events. Conversely, we excluded cancer patients who (i) had undergone any thromboprophylaxis or had a history of thrombosis before being diagnosed with cancer, (ii) presented with more than one primary malignant disease or had cancer sites that could not be categorised, and (iii) were currently pregnant at the time of diagnosis. We analysed retrospectively demographic information, cancer type and stage, and comorbidities. VTE events were confirmed and categorised according to type, location, and timing. Statistical analyses were performed using the SPSS software version 28 to compare significant ($p < .05$) difference in characteristics of elderly and non-elderly CAT patients. Listwise deletion was used to handle missing data.

RESULTS

Our findings indicate significant differences in cancer types and stages ($p=0.005$) between different age groups (Figures 1 and 2). Elderly patients showed higher CAT prevalence in lung, rectal, and kidney cancer, whereas younger patients had higher prevalence in heart/mediastinum, lung, and kidney cancer. Advanced cancer stages (Stage IV) were

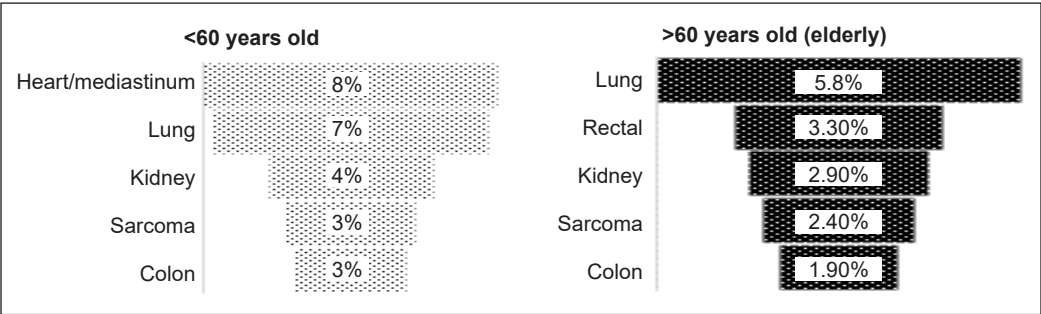


Figure 1. Prevalence of cancer type in CAT patients

more common in the elderly ($p=0.001$). There were significant different in comorbid hypertension and IHD among the groups. Additional factors found to be significant were the presence of a central venous catheter ($p=0.009$), smoking, and a platelet level greater than $350 \times 10^9/L$ ($p=0.031$) (Table 1). However, performance status and presence of infection have no significance difference between the groups ($p=0.061$). Most of the CAT events (63%) presented as deep vein thrombosis ($p=0.778$) and occurring within the first three months post-cancer diagnosis ($p=0.801$).

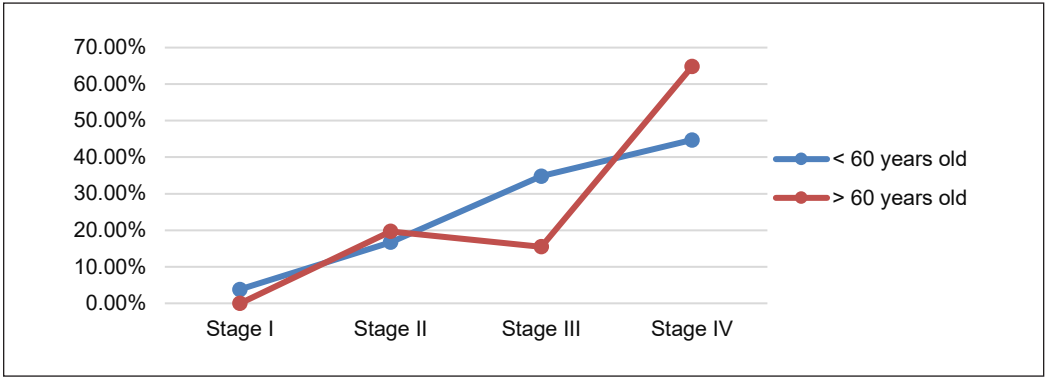


Figure 2. Cancer staging among elderly and young in CAT patient

Table 1
Clinical characteristics and VTE event characteristics

	Total	<60 years	>60 years	p-value
Comorbidities				
Hypertension	71(34.1%)	27(13.0%)	44(21.2%)	$p=0.001$
IHD ^b	5(2.4%)	0(0%)	5(2.4%)	$p=0.005$
BMI(n=184)	24.02(5.7)	23.96(6.14)	24.11(4.86)	$p=0.466$
ECOG				
0	63(30.3%)	43(20.7%)	20(9.6%)	$p=0.338$
1	91(43.8%)	58(27.9%)	33(15.9%)	
2	30(14.4%)	16(7.7%)	14(6.7%)	
3	17(11.6%)	14(6.7%)	3(1.4%)	
4	7(3.4%)	5(2.4%)	2(1%)	
CVC	145(69.7%)	103(49.5%)	42(20.2%)	$p=0.009$
Smoker	66(31.9%)	44(21.1%)	22(10.6%)	$p=0.007$
Infection	57(27.4%)	43(20.7%)	14(6.7%)	$p=0.061$
Platlevel (>350 × 10⁹/L)	99(49%)	72(54.4%)	27(38.6%)	$p=0.031$
Type of VTE				
DVT	131(63%)	85(40.9%)	46(22.1%)	$p=0.778$
PE	57(27.4%)	39(18.8%)	18(8.7%)	

Table 1 (continue)

	Total	<60 years	>60 years	p-value
DVT & PE	20(9.6%)	12(5.8%)	8(3.8%)	<i>p=0.801</i>
Time to event				
<3 months	105(50.5%)	69(50.7%)	36(50%)	
3-6 months	37(17.8%)	23(16.9%)	14(19.4%)	
6-12 months	26(12.5%)	19(14.0%)	7(9.7%)	
>12 months	40(19.2%)	25(18.4%)	15(20.8%)	

DISCUSSION

The elevated percentage of CAT in elderly cancer patients with stage 4 and prevalence of different cancer types suggest that they are strongly associated with elderly CAT patients, consistent with previous studies (Gade et al., 2017), and were the main factors used in the CAT risk assessment scoring (Khorana et al., 2008; Louzada et al., 2012). Most prevalent cancer in elderly CAT patients were lung and rectal cancer which is consistent with what was reported in Vietnam (Than et al., 2023). The presence of hypertension and IHD in elderly increases a layer of complexity, as these comorbid exacerbate the risk of thrombosis through mechanisms such as endothelial dysfunction (Akrivou et al., 2022; Sepúlveda et al., 2017). The association of the central venous catheters with CAT in our study ($p = 0.009$) is consistent with what was found by Verso et al. (2005). Elevated platelet counts and CAT ($p = 0.031$) in our study is consistent with (Khorana et al., 2008) who identified it as the contributor to CAT. Smoking has been found to be a significant risk factor for CAT patients and strong correlation with advanced cancer and smoking-related cancer (Paulsen et al., 2021). A potential thromboprophylaxis may be important predominantly in cancer patient with hypertension, IHD, elevated platelet level, smoker, and requiring CVC especially in elderly patients who may have further risk factors. Thromboprophylaxis with Low-molecular-weight heparin (LMWH) or mechanical compression stockings may be important for preventing venous thromboembolism in elderly cancer patients without increasing the bleeding complication (Kahn et al., 2012; Stanley & Young, 2010). Most of CAT events presented within 6 months of the cancer diagnosis and deep vein thrombosis found to be the most common type of CAT event and match those observed in earlier study (Qdaisat et al., 2020). The identification of significant risk factors highlights important factors for the development of risk stratification tool and CAT event characteristics may navigate thromboprophylaxis strategies for elderly CAT patient.

CONCLUSION

The insights into cancer-associated thrombosis in the elderly cancer patients, helps in identifying most relevant factors for the development of the high-performing risk prediction

model. It can significantly enhance decision-making processes and patient outcomes. However, the use of a cross-sectional design may lead to incomplete recorded information and capture limited scope of risk factors. Future research should emphasis on prospective studies and intervention trials to address the unique challenges in elderly CAT patients.

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Preliminary Findings of a Longitudinal Study Investigating the Language Attrition of Older Multilinguals in Malaysia

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ABSTRACT

The main aim of this longitudinal study is to explore language attrition among older multilinguals in Malaysia. As part of the study, it also examines gender differences in psychological well-being and language performance, adjusting for cognition and age to understand how these factors may influence patterns of language use over time. Over a 1.5-year period, 111 cognitively healthy older adults (baseline: $N = 111$, $M_{age} = 65.98$, 50.5% females) were assessed at three waves. Data included basic demographics, language history (LHQ-3.0), verbal fluency tests (COWAT, VFT), psychological measures (GDS, SWLS), and cognitive function tests (MoCA, MAC-Q). Baseline cross-sectional analysis indicated that increased age and lower education levels were linked to poorer language performance, while higher life satisfaction was associated among women compared to men. Changes over three phases revealed significant declines in the verbal fluency across phases, with greater declines between Phase 1 and Phase 3. Findings emphasise the complex interplay of cognitive, psychological, and sociolinguistic factors in language attrition, underscoring the need for interventions promoting psychological well-being and active language use to preserve cognitive health in aging multilingual populations.

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INTRODUCTION

Language attrition refers to the progressive deterioration of competency in a previously acquired language, resulting from decreased usage, alterations in linguistic contexts, or

reduced exposure (Schmid & Bot, 2011). Research on the language attrition has extensively examined the decline of L1 proficiency among individuals immersed in a second language (L2) environment particularly when individuals adopt a language in new social or cultural contexts. It has also explored the attrition of foreign languages in bilingual settings as shifts in language dominance occur. This process of attrition can impact multiple linguistic domains and manifest in both first (L1) and subsequent languages (L2, L3) (Gallo et al., 2021). Schmid and Köpke (2019) found that reduced exposure to L1 and increased use of L2 can lead to significant changes in language dominance and proficiency. Biological, cognitive, and external factors can also play a role (Köpke, 2007), with extralinguistic variables such as proficiency, age, attitude, motivation, language contact, and use being particularly important in language attrition (Mehotcheva & Köpke, 2019). A different angle could be explored in this sociolinguistic context as the consequences of the recent COVID-19 pandemic. With lockdowns restricting social interaction, there is a higher likelihood of intergenerational communication necessitating the use of L1 within households especially among the older population, reducing opportunities to use their L2 or L3. This situation presents a shift in the language dominance emphasising L1 over previously dominant L2/L3. Changes in linguistic environments can result in changes in dominance, illustrating that dominance is significantly context-dependent and can affect linguistic processing in brief intervals (Köpke & Genevska-Hanke, 2018). Study suggest that bi/multilingualism may contribute to cognitive reserve, potentially delaying or reducing the risk of late-life cognitive impairment (Perquin et al., 2013). Bialystok (2021) highlights the relationship between the language attrition and cognitive reserve among bilinguals. She suggests that sustained bilingual language use is integral in maintaining cognitive resilience, as it involves effortful cognitive processes such as attention and executive control (Bialystok, 2021). Cognitive reserve refers to the brain's capacity to adapt and discover alternative strategies to accomplish a task, enabling certain individuals to exhibit greater resilience to brain impairment than others (Stern, 2002). The attrition of a language could therefore diminish some of the cognitive benefits, potentially impacting brain health. Malaysia has a multi-ethnic population comprising Malays (63.5%), Chinese (20.1%), Indian (5.9%), other citizens (0.7%), and non-citizens (10.0%) according to the DOSM Department of Statistics Malaysia's Population Table (2024). Malay is the official national language, but English functions as a prevalent second language, especially in urban regions. Other common languages include Mandarin, Tamil, and other regional or heritage language. This distinctive situation offers a chance to examine changes in the language dominance, usage, and attrition during communication.

PROBLEM STATEMENT

As people get older, the probability of experiencing language attrition rises due to age-related cognitive impairment, decreased language usage, and other factors associated

with aging (Köpke & Schmid, 2004). The pandemic did significantly affect social interactions, potentially affecting language use due to reduced social engagement, limited opportunities for language practice, and increased psychological stress. This study seeks to explore potential correlations with cognitive function, psychological well-being, and language usage.

RESEARCH QUESTIONS

This research seeks to address key questions concerning language attrition in older multilinguals in Malaysia. It investigates language usage patterns among older adults and examines whether the after-effects pandemic has had long-term impact on these patterns over time, leading to measurable attrition. Additionally, it seeks to analyse the gender specific relationships between language attrition, cognitive performance, and psychological well-being, while considering the role of sociolinguistic factors in shaping these interactions over time.

METHODOLOGY

The study consisted of three phases of assessments over a 1.5-year period (1st phase in March, 2022). Data was collected when the recovery phase begun after the Movement Control Order (MCO) was implemented. Cognitively healthy older adults aged 60 and above (baseline: $N = 111$, $M_{age} = 65.98$, 50.5% females) were recruited and re-assessed every six months with the same measurements. Demographic data including age, gender, education, occupation status, and medical history. A comprehensive measurement for language ability, cognition, and psychological well-being were employed in this sequence: 1) language history questionnaire (LHQ-3.0) obtaining their language proficiency, language dominance, usage, and mixing; 2) verbal fluency tests (Controlled Oral Word Association-COWAT, Verbal Fluency Test-VFT); 3) psychological well-being measures (Geriatric Depression Scale-GDS, Satisfaction with Life scale-SWLS); 4) physical function assessment (Instrumental Activities of Daily Living-IADL); 5) subjective cognitive decline (Informant Questionnaire on Cognitive Decline in the Elderly-IQCODE); and 6) cognitive performance tests (Montreal Cognitive Assessment-MoCA, Memory Assessment Clinic-Q-MAC-Q). Ethical approval was obtained from the University of Nottingham Malaysia Ethics Committee (NR300422).

RESULTS

Baseline Cross Sectional Findings

Correlational analysis from the baseline data showed increasing age and lower years of education were significantly associated with poorer language performance. Subjective

memory complaints were correlated with higher depressive symptoms and lower educational levels. Regression analysis from the baseline data revealed higher life satisfaction was associated with better language performance, especially among women, (refer to Figures 1 and 2). Life satisfaction was positively associated with the proficiency, frequency of usage, and frequency of mixing of first (L1) and third languages (L3), with significant gender interactions showing stronger effects in females.

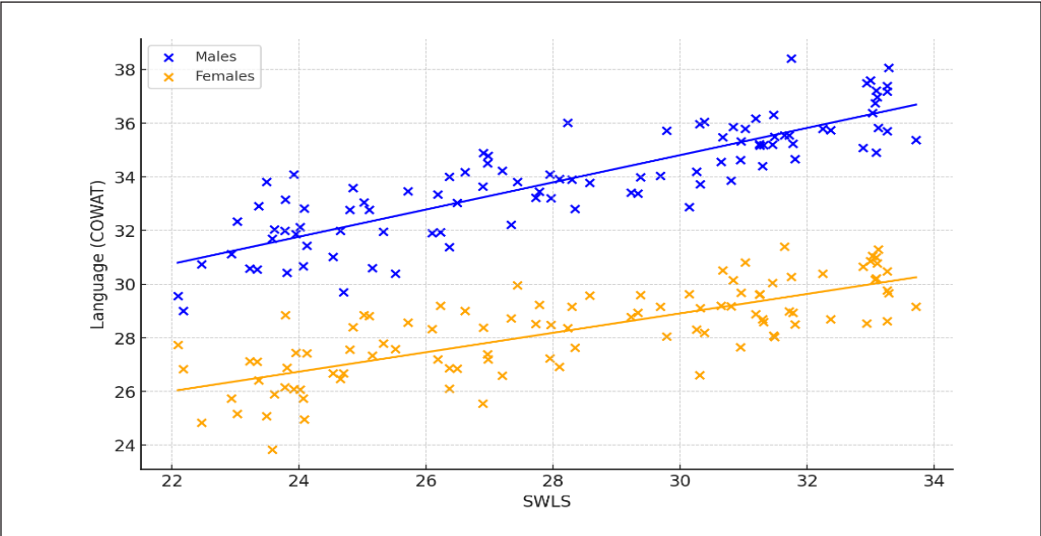


Figure 1. Interaction effect of SWLS and gender on language (COWAT) scores

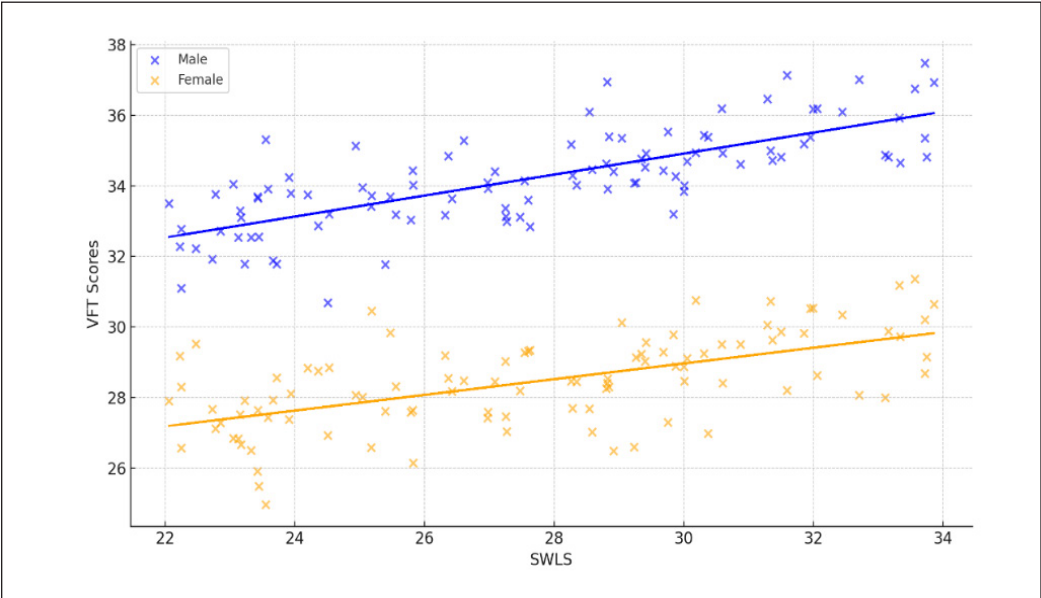


Figure 2. Interaction effect of SWLS and gender on language (VFT) scores

Longitudinal Findings

Repeated-measures of ANOVA on 75 participants who completed all the three phases revealed significant main effects of phase on the verbal fluency tests, with post-hoc analysis indicating a significant decline in verbal fluency from Phase 1 to Phase 3 and Phase 2 to Phase 3 (Figure 3). The COWAT scores showed significant changes across the three phases ($F = 21.55$, $p < .001$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Phase 3 was significantly lower than Phase 1 ($p=.05$) and Phase 2 ($p=.04$). For the VFT scores, there was also a significant main effect of phase, ($F=3.63$, $p=.03$) with scores decreasing from Phase 1 and Phase 2 to Phase 3. Post hoc comparisons revealed that the mean score for Phase 3 was significantly lower than Phase 1 ($p<.001$) and Phase 2 ($p<.001$), with no significant difference between Phase 1 and Phase 2 ($p=1.0$).

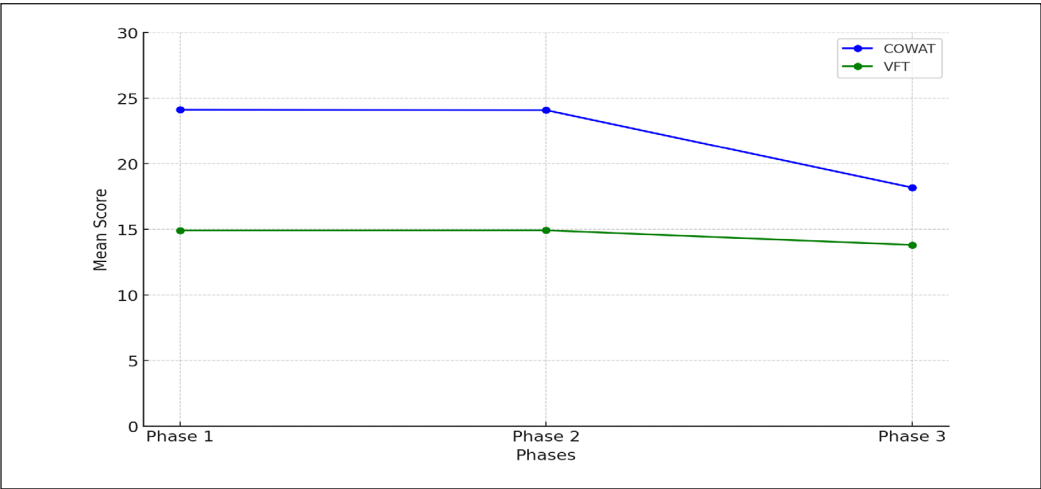


Figure 3. Decline in VFT scores across phases

DISCUSSION

Cross sectional findings revealed that age and education levels were associated with language performance, older age, and lower education correlated with poorer language performance. Higher education seems to mitigate changes in cognitive performance, allowing them to better withstand the effects of aging on the cognitive functions (Stern, 2013). While education was associated with language performance, this was included as a covariate to control for its potential influence. The primary focus remains on examining the relationships between psychological well-being, cognition, and gender differences in language performance. Aging is associated with slower processing speed, reduced working memory capacity, and neurobiological changes which impair executive functions critical for language proficiency (Salthouse, 2010). Additionally, reduced

language usage could have weakened neural pathways, particularly when older adults revert to using their dominant L1, limiting opportunities to practice L2 or L3 (Köpke & Schmid, 2004). Declines in verbal fluency among older multilinguals emphasise the vulnerability of lexical access to aging. This aligns with research showing that verbal fluency, dependent on lexical retrieval and executive function, is one of the cognitive abilities most susceptible to age-related decline (Birdsong, 2006). The regression analysis further revealed higher life satisfaction, moderated by gender, with a stronger relationship observed in women compared to men. This finding underscores the role of psychological well-being significantly contributing to cognitive resilience, especially in women, who often engage more in social activities that involve language use (Diener et al., 1999; Smith et al., 2017). Depression and reduced life satisfaction are strongly associated with lower language performance, suggesting that emotional and psychological states may impact language abilities (Wu et al., 2024). Longitudinal analysis would be required to determine whether these factors such as cognitive performance and psychological well-being contribute to language decline over time.

CONCLUSION

Overall, this study emphasises the complex relationship between psychological well-being, cognitive abilities, and sociolinguistic factors to mitigate language attrition in older individuals who speak multiple languages. These findings collectively suggest that interventions aimed at improving psychological well-being and encouraging active language use could be effective strategies for maintaining language abilities and cognitive health in an aging multilingual population.

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Geriatric Medicine Masterclass: Collaborative Learning Initiative for Undergraduate Healthcare Students

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ABSTRACT

The shift towards an aging population poses unprecedented challenges for the healthcare system, with more effort needed in developing our healthcare curriculum to address the issue. It is equally important to foster interprofessional education (IPE) collaboration among healthcare students and enhance their understanding and engagement in collaborative geriatric care through comprehensive and interactive learning experiences. Coordinated by respective undergraduate students and lecturers from the respective medical, dental, pharmacy and nursing departments, a workshop was organised, consisting of a forum, team-based case discussion and presentation sessions focussed on addressing the holistic healthcare needs of older people. Pre- and post-workshop assessment of students' confidence and feedback was undertaken. Improvement in confidence among participants was significant, with positive feedback on the organisation, content, and method of delivery. This interprofessional geriatrics masterclass had a positive impact on the participants' confidence level and might serve as a useful educational intervention in fostering holistic care for older people.

Keywords: Education, geriatrics, interdisciplinary, undergraduate

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INTRODUCTION

Malaysia's aging population is growing at a faster-than-expected rate, with the portion of the population aged ≥ 60 years projected to increase to 4.9 million or 13.6% in 2030 and 9.6 million or 23.6% in 2050 (Naraval et al., 2017). Hence, it is crucial to enhance the healthcare curriculum to align with the evolving needs of the nation's healthcare system and address the unique challenges associated with aged care. Older patients

often present with complex issues that involve multidisciplinary care. Interprofessional education (IPE) collaboration can help healthcare practitioners develop teamwork skills for effective and comprehensive care (Thompson et al., 2020). IPE is defined by CAIPE as “occasions when two or more professions learn with, from, and about each other to improve collaboration and the quality of care”. This study aimed to explore the impact of interdisciplinary collaborative learning in enhancing the understanding and competencies of undergraduate healthcare students in geriatric care through an interprofessional workshop (CAIPE, 2002).

METHODOLOGY

This student-led interprofessional workshop was organised by the undergraduate medical, dental, pharmacy, and nursing society of Universiti Malaya. It was also supported by their respective lecturers. The workshop consisted of (1) a forum which featured a panel composed of a geriatrician, geriatrics-trained nurse, pharmacist, and restorative dentist, sharing their experiences in providing holistic multidisciplinary geriatric care, (2) interprofessional small group discussion of geriatrics-specific cases designed by the student committee and facilitated by a healthcare professional with expertise in geriatric care and student facilitator, and (3) case presentation sessions by each group to the rest of the participants. Pre- and post-workshop assessments were conducted to evaluate the students’ knowledge in geriatric care, interest in geriatrics, and views on the workshop’s usefulness using a 5-point Likert scale. Additionally, confidence in various domains of geriatric care were assessed using a 10-point Likert scale. The questionnaire was developed internally based on what the study team felt were important measurable outcomes, with the domains based on the literature search of the relevant topic. Results were compared using a paired sample t-test, with the significance level set at $p < 0.05$. A post-mortem SWOT analysis was also summarised from participant feedback.

RESULTS

There were 48 participants, and 46 of them (medicine 30.43%, nursing 28.26%, pharmacy 21.74%, dental 19.57%) filled in our pre- and post-workshop assessment. Most of the participants (58.7%) reported encountering geriatric patients daily. From the pre- and post-workshop questionnaire, all aspects showed significance in improvement with the aspects of knowledge showing greatest improvement ($\bar{x}$ differences = 1.617), followed by interest ($\bar{x}$ difference = 0.532), and view of whether the workshop was beneficial to form interdisciplinary collaboration academically ($\bar{x}$ difference = 0.382). Results in Table 1 also showed a significant ($p < 0.001$) increase in confidence level across all the different domains.

Table 1
Changes in confidence levels among participants in pre- and post-workshop

Domain	Pre-Score (Mean ± SD)	Post-Score (Mean ± SD)	t (df = 45)
Improving patient care outcome	5.48 ± 2.401	8.46 ± 1.501	8.519
Reducing medical error	5.61 ± 2.436	8.35 ± 1.581	7.657
Starting treatment fast	5.33 ± 2.468	8.13 ± 1.681	7.426
Reducing healthcare inefficiencies	5.59 ± 2.286	8.43 ± 1.544	8.508
Reducing healthcare costs	5.24 ± 2.152	8.20 ± 1.708	8.949
Improving interprofessional relationships	5.93 ± 2.265	8.63 ± 1.466	8.678
Increasing job satisfaction	5.83 ± 2.254	8.63 ± 1.420	9.226
Improving patient’s quality of life	5.91 ± 2.411	8.70 ± 1.459	8.782
Improving caregiver-provided care	5.96 ± 2.394	8.67 ± 1.506	8.670
Working with students from other healthcare disciplines	6.35 ± 2.378	8.83 ± 1.355	7.542

Source: Authors’ work

Feedback was overwhelmingly positive, with a $\bar{x}$ score of 4.70 (S.D=0.462) on a 5-point Likert scale, showing their enjoyment in participating in the event. Many of them enjoy “Case discussion & Presentation” the most, while most of them commented that time allocation for each session should be more precise and longer.

DISCUSSION

The workshop was a significant step towards enhancing interdisciplinary collaboration in healthcare education, particularly in geriatrics, where a holistic approach is essential for improving care outcomes. The event achieved its intended objectives of bringing together students from various healthcare faculties, including medicine, dentistry, nursing, and pharmacy, to develop a comprehensive understanding of geriatric care through collaborative activities and discussions.

One of the main successes of the event was its focus on interdisciplinary small group case discussions that encouraged participants to engage deeply in real-world scenarios and exchange ideas across faculties. Participants highly appreciated the opportunity to work closely with peers from different fields, further reinforcing the importance of a collaborative approach in geriatric care. Additionally, the hands-on involvement of facilitators from various disciplines helped guide these discussions effectively, ensuring that participants could apply theoretical knowledge in a practical context. The event demonstrated its potential to grow and could serve as a platform for even more structured collaborations in future events, perhaps extending beyond Universiti Malaya to include students from other institutions. The measurable increase in the participants’ knowledge and confidence in geriatric care, based on pre- and post-workshop assessments, further highlights its educational value.

However, time management emerged as a challenge, with several activities, particularly the case presentations and forum sessions, feeling rushed. Participants expressed a desire for longer discussions and more time for refreshment breaks. This issue could be addressed in future events by extending the duration of the workshop or adjusting the schedule to allow for more flexibility. Another challenge was the participation numbers were lower than expected, partially due to the event clashing with exams for some batches of students. Finding a suitable date that fits with the academic calendars of multiple faculties was an issue. Moving forward, the organising committee can improve by coordinating event dates with academic calendars across faculties, and securing a date that minimises conflicts, would help to boost attendance. Additionally, the event's planning timeline was a bit tight due to the late start by the organising team. This compressed schedule limited marketing efforts, sponsorship opportunities, and left little room for adjustments. To avoid this in the future, the next organising committee should start preparations earlier as it would open up opportunities for securing partnerships and sponsorships, which could help alleviate financial constraints and improve the overall quality of the event.

Another area for improvement is the study design of our event evaluation, where the questionnaire should be validated or adapted from similar studies to enhance its reliability. Apart from that, our study relies primarily on self-reported outcomes and qualitative feedback, which, while still valuable, may not be sufficient for proving long-term effectiveness. More rigorous research designs, such as Randomised Controlled Trials (RCTs), Controlled Before-and-After (CBA) studies or Interrupted Time Series (ITS) designs could be considered to provide stronger evidence of the impact of our event on healthcare practice and patient outcomes (Reeves et al., 2013).

CONCLUSION

Overall, the workshop provided an important opportunity for students to experience the value of interdisciplinary collaboration, which is essential for addressing the complexities of aged care. The event helped not only improve participants' knowledge but also gain confidence in applying what they have learned to real-world situations. The success of this year's event provides a strong foundation for future iterations. Organisers should consider increasing the event duration, enhancing the interactive components, and engaging with a broader audience by expanding the event to include participants from other universities or healthcare disciplines. With these improvements, the Geriatrics Masterclass has the potential to become a flagship event that incorporates the interprofessional collaboration into our current healthcare undergraduate curriculum, which is an innovative strategy recognised by the World Health Organisation (WHO) and its partners (Gilbert et al., 2010), offering an even more rewarding and impactful experience for the students.

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The Synergy Model in Elder Care: Improving Agency and Institutional Roles for Aging in Place

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ABSTRACT

The diverse needs of older adults' present significant challenges for agencies to develop policies, services, infrastructure and providing services in maintaining the elderly well-being. Additionally, overlapping roles and unaddressed responsibilities among government and non-government agencies may exacerbate these issues. This study aims to identify the needs of the elderly and clarify the roles of agencies based on the Aging in Place and Well-Being (AiPWeB) Framework. Data were collected through a structured questionnaire from 134 respondents across four districts in Perak and Selangor, Malaysia. Respondents assessing their agency's role in relation to 48 items forming AiPWeB. A Likert scale evaluation revealed that most AiPWeB items were addressed, particularly by agencies involved in health, which showed multidimensional roles. However, items such as outdoor mobility, access to transportation, and paid job opportunities scored below par and were considered neglected. This study enhances the adaptability of Well Being (WeB) for aging in place but suggests the necessity for future research to incorporate relevant

approaches to address needs of older adults. The study is ongoing, with limitations that include the development of synergized roles among agencies and development of the final model to effectively address aging in place has yet to be fully developed.

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Keywords: Aging in place, aging population, quality of life, well-being

INTRODUCTION

This research investigates the integration of well-being and quality of life (QoL) notions to develop a comprehensive Aging in Place framework that addresses the diverse needs of older adults. Well-being (WeB) encompasses various aspects i.e. emotional stability, financial security, and physical health. Well-being is divided into subjective well-being (SWB), which focuses on life satisfaction, and psychological well-being (PWB), which emphasizes the ability to lead a meaningful life (Ng & Fisher, 2013; Rees et al., 2013). QoL reflects a person's ability to engage in daily activities and achieve satisfaction across multiple dimensions. Standard QoL models typically include six core domains: physical, psychological, social, spiritual, cognitive, and environmental (Kelley-Gillespie, 2014). Whilst, the WHOQOL-BREF introduced in the year 1996, assesses QoL across four key domains: physical health, psychological well-being, social relationships, and environment and the WHOQOL-OLD incorporating six domains tailored to aging: sensory abilities, autonomy, social participation, death and dying, intimacy, and engagement in life activities. The Aging in Place (AIP) framework by Bigonnesse and Chaudhury (2021) and Tobi et al. (2018) includes built environment component that support aging in place: place integration, place attachment, independence, mobility, and social participation. The integration of built environment components, as represented by Aging in Place (AiP), with life satisfaction, which signifies well-being (WeB), enhances understanding between the two concepts and fosters a cohesive living environment. This holistic approach identifies 11 critical domains; physical well-being, psychological health, outdoor mobility, independence in daily activities, work capacity, financial resources, social relationships, safety and security, access to new information and skills, and spiritual and belief systems—aiming to enhance the overall quality of life for older adults as they age in place.

METHODS

This stage of research employs a deductive approach, with quantitative approach was applied during data collection and analysis stage. The main survey engaging 43 agencies and institutions in Selangor and Perak through email and manual methods, assessing their roles based on the AiPWeB framework. Respondents evaluated the relevance of each item using a four-point Likert scale. The scores for each item across agencies were then summed and categorized into the following percentage ranges: Overlooked (0-25), Neglected (26-50), Considered (51-75), and Covered (76-100). Higher scores indicate greater coverage and synergy among agencies, while lower scores highlight areas of neglect or redundancy in addressing specific items.

RESULTS

Observation across items in all dimensions identified the average score for all items is 58.4 that ranked as *Considered* (Table 1). The highest score is 70.45 percent is for item *Provide facilities and services that enhance the health and well-being* (SS31). The analysis indicates that key areas requiring attention include: (OM09) facilities and services to assist the elderly in reaching key destinations, (OM10) facilities, services, or training to help them use alternative transportation such as e-hailing, (OM12) facilities and services to support mobility within their homes, and (WC16) facilities and services that enable access to paid employment.

Table 1
Descriptive analysis of dimension/item

Code	Dimension/Item	Cases	Score	Rank	Std. Deviation
Physical Well Being					
PWB01	Provide facilities and services for pain management.	134	56.8	Considered	1.459
PWB02	Provide facilities and services for proper diet/ nutrition.	134	54.54	Considered	1.441
PWB03	Provide facilities and services to fulfil activities, have independence, handle household chores, go out and interact, and participate in the society.	134	63.63	Considered	1.476
PWB04	Provide facilities and services for physical activities.	134	65.91	Considered	1.492
PWB05	Provide facilities and services for relaxation.	134	65.91	Considered	1.515
Psychological					
P06	Provide facilities and services to support happiness.	134	63.63	Considered	1.376
P07	Provide facilities and services to support elderly social connection.	134	61.36	Considered	1.343
P08	Provide facilities and services to support elderly self-esteem.	134	59.1	Considered	1.404
Outdoor Mobility					
OM09	Provide facilities and services to assist elderly reach key destinations.	133	50	Neglected	1.412
OM10	Provide facilities and services or training for elderly to use alternative transportation form such e-hailing.	133	50	Neglected	1.387
OM11	Provide facilities and services to reduce outdoor mobility barriers.	133	52.27	Considered	1.437
OM12	Provide facilities and services to assist elderly mobile in own house.	133	50	Neglected	1.425
Daily Chores					
DC13	Provide facilities and services to conduct regular activities.	133	56.8	Considered	1.423
DC14	Provide facilities and services that engage in hobbies, intellectual, and physical activities.	133	59.1	Considered	1.427
DC15	Provide grocery shopping assistance.	133	56.8	Considered	1.444

Table 1 (continue)

Code	Dimension/Item	Cases	Score	Rank	Std. Deviation
Work Capacity					
WC16	Provide facilities and services that help elderly access paid job.	132	50	Neglected	1.437
WC17	Provide facilities and services that help elderly for unpaid job, volunteer in the work community.	132	56.8	Considered	1.390
WC18	Provide training program for staff in organizing elderly program.	132	61.36	Considered	1.383
WC19	Provide facilities and services that encourage volunteering program of elderly.	132	61.36	Considered	1.354
Financial Resources					
FR20	Provide facilities and services to assist elderly's financial situations.	133	52.27	Considered	1.412
FR21	Provide monetary assistant for pay basic expenses.	133	54.54	Considered	1.454
FR22	Provide facilities and services for elderly on money management.	133	52.27	Considered	1.407
FR23	Provide facilities and services to prevent the elderly from being a target of money exploitation.	133	59.1	Considered	1.429
Social Relationship					
SR24	Provide facilities and services that support the love and companionship of elderly.	133	65.91	Considered	1.394
SR25	Provide facilities and services that support both emotional and intimacy.	132	63.63	Considered	1.404
SR26	Provide facilities and services of peer support or emotional-informational support.	133	61.36	Considered	1.436
SR27	Provide facilities and services for older adults; reproductive health and rights (RHR).	133	59.1	Considered	1.421
SR28	Provide funding elderly in participate in society.	132	52.27	Considered	1.409
Safety and Security					
SS29	Provide facilities and services that are safe from aby physical harm.	133	56.8	Considered	1.435
SS30	Provide facilities and services that involve elderly in communal life.	132	65.91	Considered	1.378
SS31	Provide facilities and services that enhance the health and well-being.	133	70.45	Considered	1.358
SS32	Provide facilities and services to provide safe and comfortable place.	132	54.54	Considered	1.498
SS33	Provide facilities and services to protect elderly from any environment pollution.	133	56.8	Considered	1.433
SS34	Provide facilities and services to protect from personal accidents/injuries.	134	52.27	Considered	1.452
Medication Management					
MM35	Provide facilities and services to avoid the inconvenience in waiting line.	134	59.1	Considered	1.520
MM36	Provide facilities and services that care coordination.	134	61.36	Considered	1.520

Table 1 (continue)

Code	Dimension/Item	Cases	Score	Rank	Std. Deviation
MM37	Provide facilities and services to have rapid access for medical treatment.	134	59.1	Considered	1.540
MM38	Provide facilities and services for complementary physical therapies.	134	56.8	Considered	1.438
MM39	Provide facilities and services prescription drugs.	134	56.8	Considered	1.538
MM40	Provide facilities and services to meet a medication schedule.	134	56.8	Considered	1.529
Information and Skills					
IS41	Provide facilities and services of formal education programs or long-life learning.	134	59.1	Considered	1.374
IS42	Provide facilities and services of leisure activities.	133	68.18	Considered	1.413
IS43	Provide facilities and services of information and communication technologies (ICT).	134	56.8	Considered	1.408
IS44	Provide facilities and services that encourage active aging and engagement in work and society.	134	68.18	Considered	1.331
IS45	Provide facilities and services to access telecommunication and economic wealth.	134	52.27	Considered	1.372
Spiritual, Religion and Belief					
SRB46	Provide facilities and services that support religious and spiritual practices.	134	59.1	Considered	1.473
SRB47	Provide facilities and services that help elderly in psychological distress.	134	61.36	Considered	1.479
SRB48	Provide facilities and services to connect with nature.	134	59.1	Considered	1.493

DISCUSSION

The data reveals AiPWeB are acknowledged by agencies. However, the scores for most items fall within the range of 51-75 percent, indicating a potential duplication of roles among these agencies. Alarminglly, mobility-related items scored less than 26-50 percent, highlighting significant gaps in the support provided to assist older adults with mobility needs in aging in place. This finding raises serious concerns, as the well-being and inclusion of elderly individuals are fundamentally tied to their mobility and accessibility (Rashid et al., 2021; Schwanen & Páez, 2010; World Health Organization, 2007). Additionally, access to employment is crucial for maintaining livelihoods and meeting daily needs, particularly for essentials like food.

CONCLUSION

This study has developed the AiPWeB Framework, which views well-being as the ultimate outcome of integrating Aging in Place (AiP) and Well-Being (WeB) components. The goal is to create conducive environments that allow older adults to live independently and

comfortably. An assessment of the AiPWeB framework against the roles of participating agencies revealed that most dimensions and items were addressed, although mobility-related items raised concerns. These items will be reassigned to relevant agency during the development of a synergy model for elderly care. As the study is ongoing, the development model also will consider degree of overlap, and the reassignment and realignment of responsibilities between agencies during the model development stage. However, these findings are limited to the roles of participating agencies and the specific district-level context. The study has identified items that received less focus and need to be reinforced by relevant agencies and institutions. The synergy model developed in this study will propose new roles for agencies to ensure comprehensive coverage of key AiP-WeB items.

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Senior Living: Insights from the Comparison of Three Full-age Retirement Community

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ABSTRACT

The AFCC policy framework advocates for communities that not only remove barriers to accommodate the elderly but also foster inclusivity across all age groups, thereby avoiding the pitfalls of discrimination and community vitality deficiency. The full-age retirement community goal is to create communities that are open, diverse, vibrant, and inclusive for individuals of all ages. In this context, this paper delves into the distinctive features of three full-age retirement community models: Naturally Occurring Retirement Communities (NORCs), Continuing Care Retirement Communities (CCRCs), and Age-Friendly Community Renovations through conducting a comparative analysis to assess the inclusivity of these community types across four critical dimensions: age, living mode, service mode, and residential scale. The study analyzes examples of these three community models in China: The Longevity Village (LV), Continuing Care Retirement Communities (CCRCs), and Regional Elderly Service Consortiums (RESC) informed by the aforementioned analytical framework. It is essential for the sustainable and inclusive development of retirement communities that can effectively respond to the multifaceted challenges of an aging demographic. This research through analysis of diverse communities emphasizes the need for policymakers, project developers, and builders to propose strategies that are sensitive to the varying economic conditions, demographic profiles, and geographical characteristics of different regions.

Keywords: Age-friendly community renovations, continuing care retirement communities (CCRCs), full-age retirement communities, longevity villages (LVs), naturally occurring retirement communities (NORCs)

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INTRODUCTION

The super-aging is becoming apparent. This raises several timely issues related to aging housing. The inherent inclusiveness of full-age retirement communities in China necessitates a dynamic and evolving approach to their construction. Specifically, three types of full-age retirement

communities: Continuing Care Retirement Communities(CCRC), Naturally Occurring Retirement Communities (NORCs) and Age-Friendly Community Renovations have been the focus of research respectively and there have been affluent studies on this scheme from diverse angles. (Ayalon, 2020; Ayalon & Avidor, 2021)

Continuing Care Retirement Community (CCRC)

A CCRC typically includes apartment or cottage living units (independent living), assisted living units, and skilled nursing care in a campus-style setting. As care and services for older adults continue to evolve, CCRCs have been adding additional components, such as memory support and wellness programs, to their services mix. The key point for this type is that even if the residents' medical and supervision demands change as they grow older, they also can avoid moving to another site, but remain in the original understanding and trust the community to receive the necessary health care (Zarem, 2010). CCRCs have been adapted to the Chinese context over a decade, with a series of projects taking root, particularly in the coastal regions of southeast China, and gradually spreading nationwide.

Naturally Occurring Retirement Communities (NORCs)

Naturally occurring retirement communities (NORCs) are neighborhoods or buildings in which a significant portion of the population is composed of older persons. Unlike traditional retirement communities, NORCs were not designed specifically for the needs of older persons; they simply evolved, often as a result of older people aging in places where they have lived for many years (Enguidanos et al., 2010). Longevity Villages is the most vivid manifestation of NORC in China. It is seen as the work of "Nature's masterpiece" and corresponds to the Chinese long tradition of emphasizing a culture of health preservation. In 2019, the China Association of Gerontology and Gerontology developed a set of Chinese standards for the identification of the Longevity Village (LV).

Age-friendly Community Renovations

Renovations have two paths: Create or reorganize existing resources. Industry insiders pointed out that in China, integration and upgrading of existing scattered resources are more effective solutions than new construction when confronted with the national conditions that the nearest problem is the shortage of pension resources and unbalanced elderly industry development levels. The Regional Elderly Service Consortiums (RESC) integration of community care centers, elderly care stations, and other fragmented endowment service resources can form a service joint force based on the community and radiate to aging in the home. Therefore, the optimal development path in China is to construct Regional Elderly Service Consortiums (RESC). At present, several towns and villages in Beijing have established regional elderly service consortiums. Among them, the earliest one is the

Chaoyang Men Street district elderly service consortiums. By 2021, the consortium has integrated more than 200 service projects, including three community endowment service stations, a home care center, nine community centers between the party and the masses, the jurisdiction of Banks, supermarkets, property management, etc. (Guan, 2022).

This article is a comparative study of three full-age retirement community models. Its principal objective is to introduce examples of the three full-age retirement communities and analyze respectively their characteristics in China.

METHODS

The aging community’s form is the direct reflection of various residential life patterns within diverse residential physical conditions and sociodemographic characteristics. (Yao, 2005) systematically analyzed the types of residential buildings for the elderly at home and abroad according to the four frame factors: elderly’s age, living mode, service content, and residential scale. The research adopts the method of focus group discussion, through the description and induction of the three typical cases of Naturally Occurring Retirement Communities (NORCs), Continuing Care Retirement Communities (CCRCs), and Age-Friendly Community Renovations according to Table 1 criteria from diverse value evaluation dimensions, and obtains the characteristics profiles of three kinds of inclusive aging care communities.

Table 1
Different aging community categories in four dimensions

Dimensions			Types		
Age type	Non-age-target	Age-target	Age-restrict	--	--
Living mode	Non-restrict family	Multi-generation family	Single-generation family	Non-family	Mixed-family
Service mode	Non-service	Basic-service	Amenity service	Informal care	
Residential scale	Large scale-family	Small scale-family	Large scale -nonfamily	Small scale -non family	

Note. The classification of the above dimensions and types is the result of Dr. Yao’s literature review and classification of the elderly residential programs in seven regions, including the United Kingdom, the United States, Sweden, Singapore, Hong Kong, Taiwan and Japan, from the origin aging housing project to the modern aging housing planning

Age Dimension

In LV, Residents and surroundings grow together naturally. So, it belongs to non- age-target. In RESC, different age people are concentrated purposely indicating it belongs to non- age-target categorization; Age-restricted is mainly aimed at satisfying the normal and diverse needs of the elderly. Since CCRC is developed by developers to serve specific customers, it pertains to the age-restricted type.

Living Mode Dimension

CCRC belongs to the single-generation family and non-family for it always divides under the service function unit, like assistant living units and independent living units. LV pertains to the multi-generation family in the traditional sense. However, under the influence of the modern one-child policy, couples' need for privacy in their living space, and other ideas, it gradually evolved into a single-generation family type. RESC just belongs to the mixed family type that concludes both the single-generation family and multi-generation family.

Service Mode Dimension

CCRC provides all the above services including medical services, since it includes apartment or cabin living units with care and services for the elderly continue to evolve (Zarem, 2010). For LV, As for RESC, it equips high-quality amenities and facilities services for recreation and relaxation through integrated district service facilities resources. Although rural infrastructure conditions have improved in recent years with the support of policies, it is still in the basic stage compared with the professional service facilities of CCRC and the all-inclusive entertainment and leisure facilities of RESC.

Residential Scale Dimension

CCRC is a large-scale family type for it always reaches the number of 1000 or above. LV may not be the same traits for most residents still observe the traditional value of a big family, but its scale is different. So, it belongs to the small-scale-family type and large-scale scale-family type. RESC is geographically large scale, but not in family units.

RESULTS

After the above four dimensions of factors analysis, A comparative table describing the differences among these three types of aging communities' performances in four dimensions is shown in the table below (Table 2). The black dots indicate that all cases belong to this dimension index, and the circles indicate that some cases belong to this dimension index. The multiple sign indicate that no cases belong to this dimension index. The short horizontal line indicates that this dimension indicator is not suitable for discussion in this case context.

DISCUSSION

The analysis framework of the above three models has its limitations for its statics and binary opposition characteristics. Aging types are experiencing evolution and development with the change in the external environment. For instance, Multi-generation family living has been an overwhelming phenomenon in the previous decades in LV. But the

rate of single-generation family cases has increased these years with more and more youngers leaving for the urban to pursue better job chances. Additionally for LV, it may be classified as having no service type for the service mode dimension since most of them are located in rural areas and lack basic infrastructure from the previous decades. However, with the rural development, the quality of community services has been improved, gradually adding basic services. In other words, it can be classified into basic service modes. So, (Lewis & Buffel, 2020) (Hill & Farrell, 2022) also propose to consider the need for dynamic research community development and issues of the times. More importantly, the dynamic and evolving ideology is just the full-age retirement communities' inherent inclusiveness prosperity, one that can embrace regional diversity and integrate the strengths of various models, thereafter, getting a steady stream of vitality and sustainability.

CONCLUSION

In a nutshell, the comparative analysis reveals that each of these community models has its own set of strengths and weaknesses. For instance, the long investment cycle and large scale of the full-age retirement community obstacle the CCRC to become the main aging housing type in China, but its social bonding deserves study. The aging village cannot be realized in most urban in China, but its aging core ideology and value practice method are most precious. To conclude, these three types of aging solutions are tailored to the diverse development phases and regions of an aging society for their advantages and disadvantages respectively.

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Table 2
Three types of aging communities' performances in four dimensions

Types	CCRC	RESC	LV
Dimension	Age		
Age-target	X	X	X
Age-restrict	●	X	X
Non-age-target	X	●	●
Dimension	Living mode		
Non-restrict family	--	--	●
Single-generation family	●	○	--
Multi-generation family	X	○	--
Non-family	●	--	X
Mixed-family	○	○	--
Dimension	Service mode		
Non-service	--	--	●
Basic service	●	●	○
Amenity service	●	●	X
Informal care	●	●	X
Dimension	Residential scale		
Large scale-family	●	X	●
Small scale-family	X	X	●
Large scale - nonfamily	●	●	X
Small scale - nonfamily	X	X	X

Note. ●- Complete; ○- Partial; X-None; --Null

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Designing a Blended Learning Approach for Digital Literacy and Language Acquisition among Senior Learners

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ABSTRACT

The swift advancement of digital technologies underscores the need for digital literacy across all age groups, including older adults. However, the “digital divide” remains a significant challenge. To bridge this gap, a multifaceted strategy that includes access to technology and fostering digital literacy in inclusive learning setting is essential. This study introduces a program aimed at enhancing digital literacy among seniors aged 55 and above that enables them to engage in a Mandarin learning program through a blended approach, while combining face-to-face and online learning sessions for a holistic educational experience. The program is designed using the ADDIE model, a structured instructional design framework consisting of five phases - Analysis, Design, Development, Implementation, and Evaluation.

Keywords: Blended learning, digital inclusion, digital literacy, language learning, lifelong learning

INTRODUCTION

The rapid advancement of digital technologies has led to a growing need for digital literacy among all age groups, including older adults. In the field of digital learning for older adults, one of the significant issues is the disparity in access and technological skills, commonly known as the “digital divide”. Addressing the digital divide among older adults necessitates a comprehensive approach that includes not only providing access to technology but also promoting digital literacy and creating inclusive learning environments.

The adoption of technology among older adults remains a challenge due to

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issues of uncertainty and lack of confidence. It calls for the need for targeted activities and tailored training programmes to increase seniors' technology use and integration into their daily lives (Perdana & Mokhtar, 2022). To make technology-based products user-friendly for seniors and support their independent use, it is important to first consider the physical challenges they may potentially face. This, in turn, could help to reduce the psychological barriers that may prevent them from engaging with technology for educational purposes. Adopting this holistic approach is essential for creating an inclusive and effective learning environment for older individuals (Chiu et al., 2019).

The ability to navigate digital environments is crucial for maintaining social connections, accessing information, and continuing lifelong learning. Therefore, this study focuses on developing a program aimed at enhancing digital literacy among older adults aged 55 years and above, with a specific goal of enabling them to participate in online language learning classes, through a blended approach. The program's design integrates both face-to-face and online learning sessions to provide a comprehensive and accessible learning experience. The program comprises four structured lessons combining face-to-face and online learning sessions, aimed at familiarizing participants with online learning tools and basic Mandarin language skills.

DESIGN AND DELIVERY OF PROGRAMME

The intention of this study was to explore the implementation of blended learning approach in a two-fold learning program for older adults aged 55 years and above through "Bengkel Teknologi Senior", a project launched by the Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia in 2019. Developed in collaboration with Multimedia University and Amanz Media, this initiative aims to foster active engagement and knowledge sharing among public and private universities, industry experts, and older individuals. It addresses digital literacy issues within the senior citizen community in Malaysia, promoting lifelong learning and independence by equipping participants with digital technology skills.

In this program, ADDIE instructional design model is used for designing and developing the learning modules (Branch et al., 2009). The implementation of ADDIE is shown in Table 1.

The initial phase focuses on introducing them to basic digital tools and platforms through user-friendly tutorials, face-to-face orientation sessions, and ongoing support from digital buddies. Once they have acquired essential digital literacy, the program transitions into engaging them in an online Mandarin course. This second phase leverages their newly developed skills to facilitate language learning in online learning environment, using virtual classes and learning activities to enhance their Mandarin proficiency. The program structure is shown in Table 2.

Table 1
Implementation of ADDIE model

Phase	Description	Details
Analyse	Identifying learning needs	Conduct analysis that consists of: (i) instructional need analysis; (ii) goal analysis; (iii) learner analysis; (iv) task analysis; (v) context analysis; and (vi) content analysis.
Design	Planning the learning process	Document specific learning objectives, assessment instruments, exercises, and content
Development	Creating learning materials	Develop learning modules tailored to the chosen delivery mode and media, create learning activities, and develop both formative and summative assessment tools to measure outcomes
Implementation	Executing the program in real settings	Upload content to the selected learning management system, train the facilitators, ensure instructor-student interaction, and conduct pilot tests of the learning system and module
Evaluation	Assessing effectiveness	Evaluate course design and materials, assess student skills through summative reflective activities, and make revisions to improve course effectiveness.

Table 2
The program structure

Session	Learning Mode	Structure
1	Face-to-face	Lesson 1 - Program Introduction. Introduces participants to the blended learning format and helps them to be comfortable with the digital tools that will be used in the online sessions.
2	Online	Lesson 2 - Self-Introduction Focuses on basic Mandarin, specifically self-introduction. It provides foundational language skills necessary for everyday conversations.
3	Online	Lesson 3 - Hobbies and Favourites Builds on the previous lesson, covering topics related to hobbies and favourites. Participants enhance their conversational skills and vocabulary related to personal interests.
4	Face-to-face	Lesson 4 - Interactive Activities Focuses on interactive activities to consolidate learning. This session aims to build confidence and fluency in speaking Mandarin.

Various activities are designed by incorporating active learning principles (Horton, 2011) into the blended learning approach. By embedding these active learning strategies into the curriculum, the course aims to create an inclusive and stimulating educational environment that addresses the needs of senior learners.

DISCUSSION AND CONCLUSION

Older adults may encounter mobility challenges that can impede their ability to attend traditional face-to-face classes, leading to fatigue and additional physical strain. These

challenges are particularly pronounced in educational contexts where regular attendance is required. To address this issue, a blended learning approach has been introduced, allowing them to participate in a mix of in-person and online learning sessions. This model may not only could mitigate the physical demands associated with commuting but also provides a flexible learning environment tailored to their needs. In-person sessions offer valuable opportunities for face-to-face interaction, hands-on guidance, and real-time support, fostering a more engaging and socially enriching learning experience. It allows seniors to receive immediate assistance and build confidence in using new tools especially when learning digital technology for the first time. Meanwhile, online sessions allow them to engage with educational content from the comfort of their homes, reducing the need for travel and the associated fatigue. Therefore, this approach is seen to be able to promote sustained engagement and inclusivity, ensuring that mobility issues do not become a barrier to lifelong learning.

However, the implementation of such approach requires careful consideration of the digital literacy levels of senior learners, with additional support and resources provided to ensure they can navigate online platforms confidently and effectively. Ultimately, fostering learning among older adults goes beyond merely altering their perceptions or societal attitudes; it necessitates addressing the genuine challenges associated with aging. Therefore, it is essential to ensure that they are provided with adequate support and opportunities to continue learning and developing.

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Systematic Review of Social Media’s Role in Enhancing Subjective Well-being among Elderly Users

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ABSTRACT

The world is experiencing a significant demographic transformation, with social media now appealing to a broader age range beyond just the youth. In China, the population is aging quickly, and by 2023, over 296.97 million individuals will be 60 years old or older. Data from Age Club indicates that many middle-aged and older online influencers are active on social media, attracting a substantial following among younger audiences. However, research on social media users has primarily focused on young and female demographics, leaving a gap in the study of elderly users. This paper employs a systematic literature review (SLR) methodology to investigate the connection between social media usage and subjective well-being in older adults, highlighting key research trends in this area. The findings underscore the significant impact of social media engagement on enhancing the subjective well-being of the elderly. Additionally, this study discusses the potential of social media as a means to improve public relations, bridge the digital divide, and promote overall societal health.

Keywords: Ageing population, social media use, subjective well-being, elderly influencers, systematic literature review (SLR)

INTRODUCTION

As one of the most populous countries, China is facing significant challenges related to aging. According to the seventh national census conducted by the National Bureau of Statistics in 2021, there are 264.02 million individuals aged 60 and above, which accounts for 18.7%

of the total population. Additionally, the population aged 65 and older stands at 216.76 million, making up 15.4% of the total. The 50th “China Internet Development Statistical Report,” released by the China Internet Network Information Center (2022), reveals that the total number of Internet users in China has exceeded 1.05 billion, with a

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penetration rate exceeding 74.4%. Notably, users aged 60 and above represent more than 11.3% of this total, and 99.6% of Internet users access the Internet through mobile phones (1). The increasing popularity of the Internet and smartphones has positively impacted older adults, alleviating feelings of loneliness and depression while enhancing their social participation and sense of value. This paper emphasizes the relationship between social media use and the subjective well-being of elderly users. Factors such as the physical, intellectual, economic, and technological development levels of older adults contribute to individual differences in their use of social media, which in turn affects their subjective well-being. (2). This highlights the necessity of paying more attention to and studying the sense of fulfilment experienced by elderly users of social media. Therefore, this paper aims to examine the relationship between social media use and subjective well-being, as well as the feasibility of utilizing social media as a means to proactively address aging, improve public relations, bridge the digital divide, and promote overall social health.

METHODOLOGY

This paper employs a systematic literature review as its primary research method. The keywords used for retrieving relevant articles include: “Elderly and SWB” or “SMU and SWB”, or “Elderly SMU and SWB”, searched through the Google Scholar, Scopus, and ScienceDirect databases. After conducting title searches and screening the abstracts of full-text research papers published after 2023, an initial selection of 63 articles was identified. Ultimately, through detailed search queries, 12 articles were chosen for review. These articles were analysed according to the following topics: (a) the impact of social media use on the elderly; (b) the effect of social media use on subjective well-being; and (c) the influence of elderly users of social media on their subjective well-being.

RESULTS AND DISCUSSION

SMU Enhances the Elderly’s SWB

The findings from this systematic literature review underscore the significant role that social media plays in enhancing the subjective well-being of elderly individuals. Notably, this area of research has gained substantial international attention, as evidenced by studies that span multiple countries, including China, Malaysia, Saudi Arabia, and the Netherlands. This suggests a shared global interest in understanding how social media can be leveraged to support the well-being of older adults.

Review of Theoretical Framework

A comprehensive review of literature published after 2023 reveals various theoretical frameworks utilized by researchers investigating the intersection of ageing, social

media use, and subjective well-being. In Table 1, the theories used in the literature are detailed listed. For example, the application of Maslow’s Hierarchy of Needs, Social-Emotional Selectivity Theory, and Activity Theory has provided a solid foundation for understanding the dynamics at play (El-Keshky et al., 2023). Specifically, Activity Theory and the Information Systems (IS) Success Model have emerged as particularly influential frameworks. These theories aid in exploring how social media functions can fulfil the needs of elderly individuals, leading to improved emotional health and life satisfaction.

Table 1
Studies of elderly social media users for enhancing subjective well-being

	Methodology	Authors	Theory	Country	Mediator	Moderator
1	Mix method	Gao & Wu, 2024	Maslow's theory of needs	China		Expectation
2	Experimental	El-Keshky et al., 2023	The social emotional selectivity theory	Saudi Arabia	Social Support and Enjoyment of Life	
3	Experimental	Yue et al., 2024	Self-esteem	China	Social Support and Enjoyment of Life	
4	Experimental	Zhang et al., 2024	Social media usage and well-being	China		
5	Experimental	Chen et al., 2023	Activity theory; IS success model	Taiwan		
6	Survey	Zhang,et al., 2024	Activity theory	China	Subjective social Fairness	
7	Experimental	Yue et al., 2024		China	Perceived Social support (PSS) and self-esteem	Gender
8	Experimental	Zolkepli et al., 2024	Stressor-strain-outcome (SSO) model	Malaysia	Privacy Invasion	Boredom
9	Survey	Duan, 2024		China	Social Capital	
10	Survey	Shi et al., 2023		China	Perceived Usefulness	
11	Mix method	Hou et al., 2024		China	Perceived Social Support	
12	Experimental	Egberts, 2023	Activity theory	Netherlands		

Review of Research Method

Among the 12 studies reviewed, methodological approaches varied widely. It can be learned from Figure 1, two studies employed mixed research methods, three utilized survey methodologies, and seven were centred on empirical quantitative analyses. The survey reports often relied on official statistical panel data, ensuring robust data sources. Notably, most

empirical studies utilized questionnaire surveys to collect data, focusing on how the functionalities and social attributes of social media contribute to subjective well-being. The independent variables assessed in these studies typically centred on the emotional engagement facilitated by social media, while dependent variables consistently measured subjective well-being. Mediating variables identified across the literature included social support, enjoyment of life, perceived social support (PSS), and self-esteem.

For instance, Duan (2024) emphasizes the role of digital village construction in enhancing social interactions, which subsequently boosts the subjective well-being of older adults. Furthermore, moderating variables such as expectations, gender, and feelings of boredom were also examined, revealing a nuanced understanding of the factors influencing the experiences of elderly social media users. The consensus emerging from 10 out of the 12 selected studies indicates that social media use has a predominantly positive effect on the subjective well-being of elderly individuals. Yue et al. (2024) demonstrated that social media forwarding enhances emotional connectivity, subsequently leading to greater life satisfaction among Chinese older adults. These findings are supported by Shi et al. (2023), who found that increased internet usage among older adults correlates with improved well-being, highlighting the need for facilitating digital literacy to optimize these benefits.

However, it is essential to address the counterpoints presented in two studies that suggest potential downsides of social media engagement. One study noted that excessive information overload and privacy breaches could diminish elderly users’ subjective well-being, echoing the concerns raised by Zolkepli et al. (2024) regarding the negative connotations of social media. Additionally, the digital divide stemming from generational differences in technology usage has been identified as a substantial barrier leading to decreased well-being among certain segments of the elderly population (Zhang et al., 2024).

Review of Outcomes

Overall, the literature affirms the positive impact of social media on enhancing the subjective well-being of older adults while also pointing to the complexities and challenges that accompany its use. This underscores the pressing need for targeted interventions that maximize the benefits of digital engagement while addressing the disparate experiences based on individual circumstances and backgrounds.

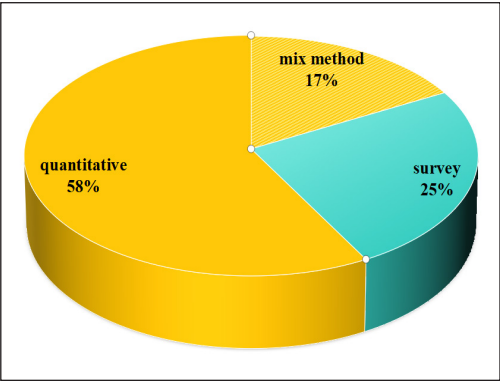


Figure 1. Research methods statistics

CONCLUSION

Both actively coping with aging and promoting active aging are crucial topics that warrant attention in the current social development of China and the world. This study reviews existing research on how older adults can enhance their subjective well-being through social media use. It underscores the significant role of social media in fostering the subjective well-being of older individuals and confirms the moderating effects of user expectations, boredom, and age on the digital divide and overall well-being. These findings highlight the necessity for targeted interventions that focus on managing user expectations. This guidance will direct future research to examine the impact of the digital divide on social equity and access to technology, particularly in less developed regions and among underrepresented groups within the elderly population. Ultimately, these efforts aim to inform practice with more robust theories, enhancing the quality of life for older adults in an increasingly digital world.

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Smartphone Usage and Cognitive Function in Older Adults Living in Beijing: A Cross-sectional Study

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ABSTRACT

The study aimed to examine the association between smartphone usage and cognitive function among older adults in Beijing, China. A cross-sectional study was conducted on 209 older adults aged 60 years and above in Beijing in 2023. This study was divided into two parts: a face-to-face questionnaire and objective data collection on smartphone usage. Multiple linear regression was used to identify predictors of cognitive function. Results showed that education level, marital status, and years of smartphone use were significant predictors of cognitive function. Besides, apart from social applications, there was a positive correlation between smartphone usage and cognitive function. Therefore, it is advisable to encourage older adults to start using smartphones across various categories, with particular emphasis on non-social applications.

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INTRODUCTION

Studies have demonstrated that smartphone use can enhance cognitive abilities by providing rich cognitive stimulation. For instance, older adults could use smartphones to access health information, stay connected

with family and friends, enhance their sense of safety, and engage in entertainment and cognitive activities (Benge et al., 2023; Peek et al., 2016).

However, previous research has notable limitations in assessing smartphone usage patterns. Self-reported measures show weak correlations with objective metrics, are prone to bias, and lack sensitivity in predicting basic technology use (Ellis et al., 2019; Mahalingham et al., 2023; Parry et al., 2021). In contrast, objective data offer ecologically valid insights in a shorter time while minimizing subjectivity, memory biases, social desirability, and response preferences in older adults (Hartanto et al., 2023; Ryding & Kuss, 2020). Moreover, many studies tend to focus narrowly on one aspect of smartphone use and lack comprehensive measurement across multiple dimensions. For example, most studies concentrated solely on social media use and employ items that only yield dichotomous yes or no responses, overlooking the intricate interactions between different functional applications. This narrow focus limits our understanding of older adults' internet usage patterns and the potentially intricate effects they may have (Foong et al., 2022). This study combines self-assessment and objective data to examine the relationship between smartphone use and cognitive function among Chinese community-dwelling older adults.

METHODOLOGY

A cross-sectional study was conducted from October to December 2023. The participants were community-dwelling older adults residing in Beijing, China.

The inclusion criteria were: 1) aged 60 years and above, 2) community residents with Beijing household registration, 3) users of a single smartphone operated independently, and 4) users of the Android operating system for over one year. Exclusion criteria were: 1) reluctance to provide screenshots of screen usage, 2) previous diagnosis of dementia, 3) severe depression or other mental illnesses, and 4) severe impairment of vision, hearing, or communication skills. Ultimately, 209 respondents met the inclusion criteria and completed the survey for this study.

The sample size calculation was performed using G*Power 3.1. A linear multiple regression F-test was used to determine the required sample size. The statistical test employed was linear multiple regression with a fixed model and R^2 deviation from zero. An effect size $f^2 = 0.15$, significance level = 0.05, a power $(1-\beta) = 0.95$, and 11 predictors were used for the calculations. Based on these parameters, G*Power determined the required sample size to be 178. Since the actual number of participants reached 178, the sample size requirement for this study was met.

The study exclusively targeted Android users, as Android is the most widely used operating system in China, accounting for 78.3% of mobile devices (Quest Mobile, 2022). This selection also helped minimize potential biases arising from differences in system performance and interface design.

The survey in this study comprised two components: a questionnaire and the collection of objective smartphone usage data. The questionnaire covered demographic variables, the paper version of the Montreal Cognitive Assessment (MoCA) Chinese-Beijing 7.1 (Nasreddine et al., 2005), and self-assessed smartphone usage. It was primarily self-administered, supplemented by face-to-face interviews to ensure clarity, provide necessary guidance, and enhance the reliability and completeness of responses.

The objective smartphone usage data were collected through screenshot techniques and were accessible via common Android operating systems, such as Huawei, Xiaomi, and Samsung. The sample was instructed to submit screenshots of their screen usage via WeChat before bedtime, including one workday and one non-workday within a week.

Pearson correlations was used to investigate the association between smartphone use and cognitive function. Subsequently, multiple linear regression was employed to explore predictors of cognitive function related to smartphone usage.

Ethical approval for the study was obtained from the JKEUPM (Ethic Committee for Research Involving Human Subject) Universiti Putra Malaysia (Approval No. JKEUPM-2023-1189). Information sheets detailing the study were provided to participants before the survey, and consent was obtained from those who agreed to participate. All data collection was kept confidential for the purposes of this study.

RESULTS AND DISCUSSION

Table 1 shows the demographical variables, smartphone use, and cognitive function of the samples.

Table 2 shows the Pearson correlations between demographical variables, smartphone use, and cognitive function. Years of smartphone use, the number of applications used, and non-social applications usage were positively associated with cognitive function ($r_s > 0.180$, $P_s < 0.01$). However, a negative relationship was observed between social applications usage and executive functions ($r = -0.160$, $P < 0.05$). Despite the numerous cognitive benefits linked to smartphone usage, our study revealed a negative association between the use of social applications and executive functions, consistent with prior research. This line of inquiry suggests that engaging with social media can foster a fear of missing out, which may prompt individuals to continually refresh social networking sites. This heightened anxiety can lead to excessive smartphone use and reduced inhibitory control, thereby impairing executive functioning (Baumgartner et al., 2014).

The standardized coefficients of the model are shown in Table 3. The results showed that education level ($B = 2.285$, $P < 0.001$), marital status ($B = 1.775$, $P = 0.020$) and years of smartphone use significantly predicted cognitive function. Overall, the model had an R^2 of 0.265, indicating that approximately 36% of the variance in cognitive function was explained by years of smartphone use, age, years of education, and marital status. Following

the convention of Cohen (1988), a combined effect of this magnitude can be considered large ($f^2 = 0.361$).

There was a positive correlation between years of smartphone use, number of applications used, non-social applications usage time, cognitive function, and partial of sub-domains cognition. This association was primarily attributed to the cognitive stimulation provided by smartphone usage among older adults (Chen et al., 2024; Krug

Table 1
Demographical variables, smartphone use, and cognitive function of the sample (N = 209)

	Category/unit	n	%	M	SD
Age		209		66.49	4.36
Gender	Female	126	60.3		
	Male	83	39.7		
Education level	Junior high school and below	60	28.7		
	High school and above	149	71.3		
Personal income	CNY	209		5493.94	2155.44
Marital status	Unmarried	18	8.6		
	Married	191	91.4		
Years of use	Year	209		8.38	2.30
Number of applications used	Items	209		50.96	22.15
Number of unlocks	Times	209		91.90	53.74
Social applications usage	Minute	209		561.93	341.60
Non-social applications usage	Minute	209		317.85	298.32
Cognitive function		209		23.67	3.39

Note. n= frequency, % =percentage, M= mean, SD = standard deviation; Unmarried: including divorced, widowed, unmarried or single; Personal income: personal monthly income; \$1=MYR4.68=CNY7.18 at time of the data collection; Number of unlocks, social applications usage, and non-social applications usage represent the total time for both a working day and a non-working day

Table 2
Correlations between smartphone use, cognitive function and six cognitive domains

	MoCA SCORE	SUB-SCORE OF MoCA IN SIX COGNITIVE DOMAINS (r)					
		Memory	Visuospatial	Executive	Attention	Language	Orientation
Years of use	0.221**	0.199**	0.117	0.202**	0.098	0.216**	-0.058
Number of applications used	0.236***	0.175*	0.092	0.110	0.191**	0.192**	0.118
Number of unlocks	0.073	0.035	-0.080	0.056	0.140*	0.031	0.113
Social applications usage	-0.125	-0.099	-0.067	-0.160*	-0.040	-0.102	0.038
Non-social applications usage	0.187**	0.108	0.145*	0.166*	0.121	0.155*	-0.044

Note. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Table 3
Unstandardized and standardized coefficients, t value and p value for demographic variables, years of use, number of applications used, number of unlocks, social applications usage time and non-social applications usage time in predicting cognitive function

Dependent variable: Cognitive function, $R^2 = 0.265, f^2 = 0.361$					
Variable	Unstandardized coefficient		Standardized coefficient	t Value	p Value
	B	SE	β		
Age	0.098	0.052	0.126	1.895	0.059
Gender (0 = female, 1 = male)	0.014	0.445	0.002	0.031	0.975
Education level (0 = junior high school and below, 1 = high school and above)	2.285	0.508	0.305	4.499	<0.001***
Personal income	2.137	1.463	0.097	1.460	0.146
Marital status (0 = unmarried, 1 = married)	1.775	0.757	0.147	2.344	0.020*
Years of use	0.201	0.093	0.137	2.159	0.032*
Number of applications used	0.018	0.010	0.116	1.781	0.076
Number of unlocks	0.003	0.004	0.051	0.783	0.434
Social applications usage	-0.001	0.001	-0.052	-0.706	0.446
Non-social applications usage	0.001	0.001	0.086	1.229	0.221

Note. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

et al., 2019; Qi et al., 2021). In a study in Norway, research investigated the years of use among smartphone users over 60 years old, reporting an average of 8.7 years of usage, which aligns with the findings of our study (Busch et al., 2021). However, studies have not examined the association between years of use and cognitive function. Many previous studies have focused on assessing smartphone usage frequency using single measurement indicators, lacking objectivity. However, this study made up for this shortcoming and provided an in-depth assessment of the older adults’ smartphone usage from multiple dimensions. It not only verified previous research, but also provided correlations between multiple smartphones usage indicators and cognitive function and identifies years of smartphone use as a positive predictor of cognitive function through multiple linear regression analysis. Despite the numerous cognitive benefits associated with smartphone use, our study identified a negative correlation between social apps usage time and executive functions, consistent with previous research findings (Al-Khlaiwi et al., 2020; Parry et al., 2019). These studies showed that the use of social media could produce fear of missing out, which was an anxious experience. This anxiety may lead to excessive smartphone use and diminished inhibitory control, impairing executive functioning. Notably, previous research has predominantly focused on adolescents and workers, leaving a gap in understanding the relationship between social app usage time and executive functions in older adults.

CONCLUSION

In summary, this study integrates self-assessment and objective data to measure smartphone use among older adults across multiple dimensions. The results indicate a positive relationship between years of smartphone usage, the number of applications used, and non-social applications usage with both cognitive function and sub-domains cognition in older adults. Thus, promoting sustained smartphone usage among older adults, particularly for non-social activities such as memory games, reading e-books and news, and listening to music, may enrich their lives and support cognitive function.

This study has several limitations. Firstly, as a cross-sectional design, it cannot establish causality but effectively examines associations between smartphone use, cognitive functions. Secondly, categorizing applications as either social or non-social based solely on their primary function may oversimplify application usage. Finally, this study focused on Android users to avoid potential data discrepancies arising from differences in system design. Future studies could include iOS users by employing experience sampling methods to capture a more comprehensive dataset.

This study underscores the necessity of longitudinal research to establish the causal relationship between smartphone use and cognitive function in older adults. Additionally, future studies should examine the underlying mechanisms mediating these associations, such as cognitive load and neural plasticity. Furthermore, expanding research to diverse cultural and socioeconomic contexts could enhance the generalizability of findings and provide a more comprehensive understanding of the impact of smartphone use on cognitive ageing.

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Shifting Perspectives: Addressing Bone and Muscle Health Concerns among Malaysian Adults

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ABSTRACT

Bone and muscle health issues have traditionally been associated with the aging process, often overlooked in younger demographics. The current study was carried out to determine the bone and muscle health among Malaysian adults aged 19 years old and above. A total of 9220 respondents enrolled in a bone and muscle screening conducted nationwide at various community settings. Our results revealed that around 30% of Malaysian adults had poor muscle strength and bone quality. Milk drinkers were found to have significantly higher bone quality ($t=2.441$, $p<0.05$) and hand grip strength ($t=2.656$, $p<0.01$) than non-milk drinkers. The findings highlight that poor bone health and muscle strength are not confined to older adults but are also prevalent among younger and middle-aged Malaysian adults, which support the emerging research in these areas. Efforts to promote milk drinking should be prioritised to mitigate these musculoskeletal issues in Malaysian adults, irrespective of age.

Keywords: Bone and muscle health, Malaysian adults, milk consumption

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INTRODUCTION

Bone and muscle health issues have traditionally been associated with the aging process, often overlooked in younger demographics. However, emerging research suggests that these concerns are not exclusive to older adults but are also affecting young and middle-aged adults (Chan et al., 2020; Kang et al., 2021). Factors such as sedentary lifestyles, poor

nutrition, inadequate exercise, and increasing prevalence of chronic conditions contribute to the compromised bone and muscle health in this population (Curtis et al., 2015; Kopiczko, 2020). Ignoring these issues during this period can lead to accelerated decline and increased risk of chronic diseases later in life. This paradigm shift necessitates a reevaluation of our healthcare strategies to encompass preventative measures and early intervention for this demographic. This study aimed to determine the bone and muscle health among Malaysian adults aged 19 years old and above.

METHODOLOGY

A total of 9220 respondents enrolled in the bone and muscle nationwide screening conducted between May 2022 to April 2023. Bone quality was conducted using an ultrasound heel scanner (Osteopro UBD2002A, Korea) while hand grip strength, as the proxy for muscle strength, was ascertained using a digital hand dynamometer (Camry EH101, China). Statistical analysis was performed using the IBM SPSS 29.0. Descriptive statistics were presented as frequency and percentage for categorical variables while mean and standard deviation for continuous variables. Pearson correlation test and independence t tests were performed to determine the associations of bone quality and muscle strength with age, gender, and consumption pattern of milk drinking, respectively. Statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

The mean age of the respondents was 47 ± 15 years old. Approximately two-thirds, half and one-third of the respondents were female, Chinese and Malays, respectively (Table 1). One in six respondents claimed to be a milk drinker. However, only slightly 30% of the respondents drank milk once (23.1%) or twice (7.4%) daily, respectively. A total of 31.9% and 14.8% of the respondents had moderate and poor bone qualities, respectively. Specifically, there were 17.0% males and 13.6% females at high risk of poor bone quality, with no significant difference between the males and females ($t=1.507$, $p=0.132$). Conversely, there were 37.5% and 31.1% of the male and female respondents had poor hand grip strength (HGS), respectively, with female respondents have significant lower hand grip strength compared to male respondents ($t=-8.35$, $p<0.001$). Age was correlated negatively with both bone quality score ($r=-0.264$, $p<0.001$) and muscle strength ($r=-0.278$, $p<0.001$). Bone quality of respondents was correlated positively with muscle strength ($r=0.122$, $p<0.001$). As depicted in Table 2, the bone quality score of the milk drinkers was significantly higher than the non-milk drinkers ($t=2.441$, $p=0.015$). Similarly, the milk drinkers had significantly higher HGS than the non-milk drinkers ($t=2.656$, $p=0.008$). These findings highlight the importance of incorporating milk into

Table 1
Characteristics of respondents

Variables	Mean±SD / n (%)
Mean age (years)	47±15.3
Age group distribution	
Young adults (19 – 39 years old)	3318 (36.0%)
Middle-aged adults (40 – 59 years old)	3551 (38.5%)
Older adults (≥60 years old)	2351 (25.5%)
Gender	
Male	3203 (34.7%)
Female	6017 (65.3%)

Table 2
Associations between selected characteristics with bone quality and muscle strength

	Bone Quality		Hand Grip Strength	
	Mean score	r/t values [#]	Mean score	r/t values [#]
Age		-0.264**		-0.292**
Gender				
Male	-0.81	0.37	29.50	-8.35***
Female	-0.76		21.15	
Consumption pattern of milk				
Drinker	-0.748	2.441*	24.06	2.656**
Non-drinker	-0.836		23.58	

Note. Data were analysed using the independent t-test or Pearson correlation test; *p<0.05; ** p<0.01; *** p<0.001

the habitual diet of Malaysian adults. It is generally recognised that milk provides an optimal source of essential nutrients such as calcium and protein, which could contribute meaningfully to the bone and muscle health (Auestad & Layman, 2021; Caroli et al., 2011). The main limitation of the current study was the cross-sectional nature of the study, therefore the cause-and-effect relationship between milk intake and muscle strength or bone quality could not be established.

CONCLUSION

The nationwide screening programme underscored a significant proportion of Malaysian adults do not habitually consume milk, which is associated with poor muscle strength and bone quality. Our findings highlight that poor bone health and muscle strength are not confined to older adults but are also prevalent among younger and middle-aged Malaysian adults. The implication of this study suggests that promoting milk consumption should be a priority to support optimal bone and muscle health status among Malaysian adults, irrespective of age.

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Examining Cognitive and Psychological Health in Malaysia: A Socio-demographic Analysis using MoCA and DASS

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ABSTRACT

This paper analysed data from the Ageless Cognitive Assessment, a tool used to evaluate cognitive function in older Malaysians. Its objective was to examine the relationship between cognitive function, psychological distress, and socio-demographic characteristics among the elderly in Malaysia, using the MoCA and DASS. The study included 919 participants aged 60 and above from three cohorts (MELoR, TUA, and New Recruit). Kruskal-Wallis and Mann-Whitney tests identified factors influencing the MoCA and DASS scores. Results showed Chinese ethnicity had a superior cognitive capacity ($p < 0.05$), with an average rank of 348.79. DASS ratings indicated significant differences ($p < 0.05$) in psychological distress, with the Chinese group exhibiting higher scores, reflecting increased depression, anxiety, and stress. A significant difference ($p < 0.05$) in DASS scores was observed between genders, with females experiencing higher psychological distress than males. Despite these differences, no significant variations were found in the total MoCA or DASS scores between single or married respondents, indicating marital status did not significantly affect cognitive function or psychological suffering. These findings underscore the influence of ethnicity and gender on psychological distress and cognitive function, highlighting the need for targeted interventions to address disparities.

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Keywords: Aging, cognitive function, psychological distress, socio-demographic

INTRODUCTION

With the aging of global populations, the cognitive and psychological well-being of elderly individuals has emerged as a vital focus of research (United Nations, 2022). Cognitive decline and psychological

suffering are common in the elderly, rendering them especially susceptible to a reduced quality of life (Wittlinger et al., 2022).

The current paper examines data from the 2021 Ageless Cognitive Assessment. The objective of this study is to examine the relationship between cognitive function, psychological distress, and other socio-demographic characteristics among the older population in Malaysia. We use the Montreal Cognitive Assessment (MoCA), which assesses cognitive function, to evaluate quality of life (QoL). Additionally, we utilise the Depression, Anxiety, and Stress Scale (DASS) to evaluate psychological distress, providing a holistic picture of an individual's mental health. Understanding how socio-demographic factors such as ethnicity, gender, and marital status influence these outcomes is essential for targeted interventions (Avery et al., 2023).

Problem Statement

Various studies such as Smith and Read (2024) and Weissman et al. (2018) have reported ethnic and gender disparities in cognitive health and psychological distress, yet these disparities remain underexplored in specific populations. For example, research has suggested that cognitive performance may differ across ethnic groups due to the various socio-economic, educational, and cultural factors (Beydoun et al., 2014). Similarly, psychological distress, particularly depression and anxiety, is more common in certain ethnicities and among females due to the complex socio-cultural and biological influences (González et al., 2015). Understanding these disparities within different demographic contexts is vital for developing culturally sensitive healthcare policies and interventions tailored to the needs of these diverse populations. While existing studies such as Novak et al. (2020) suggest disparities in cognitive performance and psychological distress across ethnic and gender groups, a comprehensive data specific to elderly Malaysians are limited.

Research Question

This study aims to examine how socio-demographic factors influence the cognitive function and psychological distress, as measured by the MoCA and DASS, among elderly participants. It also seeks to explore the impact of these factors on their mental and cognitive well-being (Ageless Cognitive Assessment, 2021). The findings would guide healthcare practitioners and policymakers in designing culturally and gender-sensitive interventions to address the unique challenges faced by diverse demographic groups.

METHODOLOGY

This cross-sectional study implemented a comprehensive survey utilising validated instruments (MoCA and DASS) to assess the participants' cognitive function and psychological distress. We recruited from the Ageless Cognitive Assessment's data a total

of 919 elderly individuals, aged 60 years or older, from three cohorts: MELoR (Malaysian Elderly Longitudinal Research), TUA (Towards Useful Ageing), and New Recruit (Ageless Cognitive Assessment, 2021). The Ageless Cognitive Assessment collected data through structured interviews and self-administered questionnaires, focussing on the cognitive function, psychological distress, and socio-demographic variables such as age, gender, marital status, and ethnicity. As the data was not normally distributed, we used nonparametric tests such as the Kruskal-Wallis and Mann-Whitney test to evaluate the influence of socio-demographic factors on the cognitive function and psychological distress assessments.

RESULTS AND DISCUSSION

The analysis revealed significant differences ($p < 0.05$) in both the MoCA and DASS scores across ethnicities and genders. When comparing ethnicities, the Chinese group displayed the highest average rank for MoCA (348.79), suggesting potentially better cognitive performance. Conversely, the Chinese group also had the highest average rank for the DASS scores (117.37), indicating a possibility of higher levels of depression, anxiety, and stress compared to other ethnicities. Interestingly, gender also played a role, with females having a higher average rank for the DASS scores (115.68) compared to males, suggesting potentially greater mental health concerns among females.

The research showed a notable disparity in the total MoCA scores among various ethnic groups ($p < 0.05$). Individuals of Chinese ethnicity exhibited outstanding cognitive capacity, as evidenced by their average rank of 348.79, surpassing that of other ethnic groups. A notable discrepancy was seen in the DASS ratings of different ethnic groups, indicating a substantial difference in psychological distress ($p < 0.05$). The Chinese ethnic group once again demonstrated higher DASS scores, with a mean rank of 117.37, indicating elevated levels of depression, anxiety, and stress in comparison to other ethnicities.

The findings revealed a noteworthy disparity in the DASS scores between genders ($p < 0.05$). Female individuals demonstrated a greater degree of psychological distress compared to male individuals, as indicated by their higher average rank of 115.68 in the DASS scores. Despite variations in ethnicity and gender, there were no notable disparities in the total MoCA scores or DASS scores among different marital status groups ($p > 0.05$). These findings indicate that the marital status of individuals in this sample does not have a substantial impact on their cognitive function or psychological suffering.

CONCLUSION

The analysis revealed significant differences in both the MoCA and DASS scores across ethnicities and genders, but not marital status. Chinese individuals exhibited the highest cognitive performance (MoCA) but also reported the highest levels of psychological distress

(DASS). Females demonstrated higher levels of psychological distress (DASS) compared to males. Marital status did not significantly impact cognitive function or psychological distress in this sample. These findings underscore the importance of considering both ethnicity and gender when assessing cognitive health and mental well-being. To address these issues, we need to develop culturally sensitive interventions and conduct further research to investigate the underlying factors that contribute to these disparities.

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Sociodemographic and Family Influence in Elderly Digital Health Behaviours with Chronic Diseases: A Theoretical Review

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ABSTRACT

This paper focuses on the socio-demographic characteristics (age, gender, ethnicity, income, education, and occupation) and family relationships in the determination of digital health behavior among older adults. This study analyzes the literature of the last decade to determine how age, gender, ethnicity, income, education, and occupational status interact with family to influence the adoption of health technologies and shows that social and demographic factors significantly influence digital health behaviors; the role of the family in providing support and encouragement for the adoption and maintenance of these health technologies is equally critical. It also provides theoretical and practical insights for designing digital health interventions tailored to the elderly. This allows emphasizing the prevalence of a multifaceted approach to technology and policy development in consideration of the individual and family factors to promote digital involvement of the elderly. A combination of keywords and MeSH terms was used to search for articles published between 2015 and 2024 in the PubMed, Scopus, and EBSCOhost databases. The family support and collective health objectives have a huge effect on the health acceptance of the elderly population, and thus, interventions should be made to enhance these systems. Previous studies were evaluated then the research gaps and objectives were identified. Providing practical solutions and new insights into the interaction between socio-

demographic factors, family dynamics, and digital health behaviors among the elderly can improve health and well-being outcomes through the use of technologies.

Keywords: Digital health, family system theory, Health Belief Model (HBM), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT)

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INTRODUCTION

The world is ageing, and the number of older adults is expected to exceed 1.5 billion by 2050 (United Nations, 2019). The percentage of people aged 65 and above is expected to continue increasing substantially worldwide (He et al., 2020), not only in the U.S. also in Europe (Vespa et al., 2018). This change in demographics is particularly significant in underdeveloped areas, and it is associated with an increasing rate of chronic diseases (Abbasian et al., 2020). Wearables, telemedicine, and mobile health (mHealth) applications are among the promising health technologies that can improve access to and outcomes of healthcare among older adults (Kvedar et al., 2014; World Health Organisation, 2019). The tools can be used to provide personalized and remote care, which facilitates efficient healthcare provision (Kumar et al., 2012). The aging trend is accelerating, making it more crucial than ever to take advantage of digital development (Kalhori et al., 2021). Despite the increasing number of older adults using digital health tools, there is a high level of variation in adoption rates, which is attributed to inadequate technical literacy, insufficient access to devices, and a lack of confidence in their effectiveness as health tools (Chen et al., 2021). The COVID-19 pandemic accelerated the adoption of telemedicine, and the number of visits grew by 50% during the first quarter of 2020 as compared to 2019 (Malouff et al., 2021).

There is no equality in smartphone ownership: 73% of adults aged 50-64 own a smartphone as opposed to 53% of adults aged 65 and above (Chen et al., 2021). Other obstacles such as high learning curves and privacy considerations are keeping adoption at bay (Mitzner et al., 2016). Digital health technologies can enhance the quality of life and reduce hospital readmissions by monitoring the elderly in real-time and managing chronic complications (Reeves et al., 2020).

Telemedicine helps overcome geographic barriers, thereby expanding access in underserved areas (World Health Organisation, 2019). These tools are also advantageous in medication adherence, mental health counselling, and physical activity. mHealth adoption requires comprehension of the factors that influence its adoption. Digital literacy, technology anxiety, health status, and self-efficacy influence the concept of acceptance in different groups (Chen et al., 2021; Mitzner et al., 2016), theoretical frameworks of UTAUT and HBM conceptualize them. The research investigates how sociodemographic data and family factors affect the digital health adoption of older adults. The objectives are to explore the relationship between sociodemographic factors, family support, and digital health behaviors and how it can synthesize the essential theoretical frameworks, such as UTAUT, HBM, and family systems theory, to understand patterns of adoption and create evidence-based intervention that would improve the use of eHealth technologies among older adults.

METHODOLOGY

Literature search was based on PubMed and Scopus databases; the search was done on sociodemographic and family factors that affect elderly digital health behaviors. The keywords were digital health, technology adoption, and the theoretical frameworks (UTAUT, HBM, and Family System Theory) and restricted the search to English studies published since 2015. The screening was done based on the title, abstract, and full text articles and only peer-reviewed articles on people aged 65 and above were considered. Two reviewers extracted data separately. In case of disagreements, a third reviewer was used to resolve such differences.

RESULTS

This search identified 639 studies, of which 21 review articles were selected after removing duplicate and irrelevant articles. These papers examined some of the digital health tools, including mobile health apps, telemedicine, wearables, and electronic health records (EHRs). It shows that 42.86% of the articles focused on how socio-demographic factors (age, education, income) influence the use of digital health technologies. Support of family was highlighted in 33.33% of the studies, where the support of family members in the form of emotional and technical assistance increases adherence to digital health. The remaining 23.81% discussed theoretical frameworks (UTAUT, TAM) that help explain and improve digital health adoption. Characteristics of identified documents with demographic effects, family dynamics and digital health acceptance are shown in Table 1.

DISCUSSION

The review integrates the literature on three key topics: socio-demographics, family support, and theoretical frameworks that influence the adoption of digital health among the elderly. Age and income are socio-demographic variables that have a strong influence on eHealth use, as the higher the level of digital literacy, the better the health outcomes and the greater the use of digital tools. Digital health interventions are significantly impacted by family support, emotional support, and technical support, which are essential to the success of a digital health intervention, especially during the treatment of chronic diseases. Theoretical frameworks are sometimes used; however, only 23% of these studies are based on these frameworks, which may indicate their provisional use. This review suggests the potential of digital health tools and the need for theory-based, user-centered interventions that may improve older adults' acceptance and in turn the effectiveness of digital health.

Table 1
Key research themes in digital health literature

Theme	Article	Authors	Key Findings
Theme1 sociodemographic Factors Influencing Digital Health Use	Sociodemographic Factors Influencing the Use of eHealth in People with Chronic Diseases	Reiners et al., 2019	Higher age, lower income, lower education, and living alone are linked to lower eHealth use. Family support is crucial.
	Digital Literacy and Health Outcomes	Berkowsky et al., 2022	Higher digital literacy correlates with improved health outcomes. Older adults need support to enhance digital literacy
	Sociodemographic factors and Digital mental Health intervention	Abouzeid & Lal, 2024	Sociodemographic factors like age, gender, race, and education affect the acceptability of digital mental health interventions.
	Adoption and Use of Digital Tools for Physical Activity	Petrica et al., 2024	Age and gender significantly influence the adoption and use of digital tools for physical activity.
	Technology Use Among Low-Income Older Adults	Chan et al., 2023	Age, education, ethnicity, income, and social support significantly impact technology use among low-income older adults.
	Technology Acceptance in Health Informatics	Rahimi et al., 2018	Factors like compatibility, subjective norm, self-efficacy, and anxiety significantly impact health information systems adoption
	Mobility Limitations Among Older Adults	Onyeso et al., 2023	Age, gender, race, location, income, occupation, education, and social status are significant in understanding mobility limitations among older adults.
	Health Technology Adoption by Older Adults with Chronic Diseases	Bertolazzi et al., 2024	Factors that have a strong influence on technology adoption among older adults with chronic diseases include age, education, income, and family support
	eHealth Literacy and Media Health Literacy	Levin-Zamir Bertschi 2018	Media health literacy and eHealth literacy were significantly influenced by age, education, socioeconomic status and family support.
	Family Dynamics and Health Behaviors	Wäsche et al., 2021	The use of eHealth services among older adults is strongly dependent on family and social support.
Theme2: Role of family support in Digital Health Adoption.	Family Support in Chronic Disease Management	Weiss-Laxer et al., 2020	Family cohesion and support enhance health outcomes; need for family-centric health interventions.
	E-Health Services Use Among Older Adults	Wilson et al., 2021	Family and social support are critical in facilitating the use of e-health services among older adults.

Table 1 (continue)

Theme	Article	Authors	Key Findings
Theme3: Theoretical Frameworks in Digital Health	Family-Centric Health Interventions	Pediatrics 2020	
	Adherence to mobile health interventions in patients	Triantafyllidis et al., 2022	Family support is crucial in enhancing patient adherence to mHealth interventions.
	Culturally Adapted Interventions	Naderbagi et al., 2024	Family involvement is crucial in designing culturally adapted interventions, providing insights into cultural values and norms that influence health behaviors.
	Adoption-Related Communication Dynamics	Colaner 2022	Communication openness and family support are highlighted as vital for the well-being and adjustment of adoptees.
	Family Health Development & Health Trajectories	Pediatrics 2020	Uses Family System Theory and ecological models to explain family health development and its impact on health trajectories.
	Technology Acceptance in Health Informatics	Rahimi et al., 2018	Integrates components from various theories like TAM and UTAUT to analyze technology acceptance in health informatics.
	Shared Decision-Making Interventions	Bunn et al., 2018	Utilizes context-mechanism-outcome configurations to explain how shared decision-making interventions work for older adults.
	Factors Influencing Telemedicine Adoption	Al-Aiad et al., 2020	Uses thematic analysis to classify factors influencing the adoption and usage of telemedicine for chronic diseases.
	Sociodemographic Factors and Digital Health Literacy	Marta et al., 2023	Uses regression analyses to determine the impact of sociodemographic factors on digital health literacy.
	Cultural Adaptation of Digital Health Interventions	Naderbagi et al., 2024	Based on different frameworks including PEN-3 model, ecological validity model, and theories of cultural humility to help in structuring the adjustment process.
	Adoption-Related Communication Dynamics	Colaner 2022	Utilizes various communication theories to explore adoption-related communication dynamics.

CONCLUSION

This paper has surveyed three major themes, including socio-demographic, family support, and theoretical frameworks in digital health. Digital tools are more likely to be used by younger and educated people with higher income. Engagement and outcomes are improved with the help of family support, which is achieved through communication and emotional encouragement. Nevertheless, gaps remain including little longitudinal studies, the lack of consistency in the application of the theory, and the lack of attention to vulnerable populations (low-income older adults). Future studies should try to use universal methods and long-term programs that focus on the dynamics and needs of the entire family. It is possible to enhance the insights into adoption behaviors by incorporating such models as UTAUT, TAM, HBM, and family systems theory. Disparities will be minimized by promoting digital literacy and increasing its accessibility by age-specific programs that will empower older adults.

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Immediate Complete Overdenture for Aesthetic Consideration to Improve Quality of Life—A Case Report

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ABSTRACT

Conventional denture fabrication involves multiple steps that may leave patients temporarily without teeth, affecting both function and esthetics. Many patients find this period difficult to tolerate due to concerns about appearance. In such cases, immediate dentures provide an effective solution. This report describes the design and fabrication of an immediate complete overdenture. A 74-year-old male patient with a history of heart disease presented to the Prosthodontic Department of Universitas Airlangga Dental Hospital seeking dentures. He wished to avoid the edentulous phase. The remaining teeth were 11, 23, 31, 33, 43, and 44, all with poor prognosis. Immediate complete overdentures were planned for both arches. The remaining teeth underwent endodontic treatment followed by decoronation. The dentures were fabricated in advance and inserted immediately after decoronation. Immediate overdentures are indicated for patients whose tooth roots remain healthy but whose crowns are compromised, particularly in geriatric cases. The patient expressed satisfaction with the immediate overdenture.

Keywords: Aesthetics, immediate denture, geriatric

INTRODUCTION

Preliminary procedures required for conventional denture production may push a patient into a period of toothlessness. The patient will undoubtedly be forced into this stage if the remaining teeth require extractions and decapitation before the complete denture is made (Budihargono et al., 2018). The functional and aesthetic aspects will both be impacted by this

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situation. Some patients cannot go through this toothless phase for reasons related to their interests or careers that are esthetic in nature. In these situations, an urgent denture will be the best option (Kamadajaja et al., 2023).

CASE

A 74-year-old male patient with a heart disease came to the Department of Prosthodontic Clinic, Universitas Airlangga Dental Hospital, to make an upper and lower denture. He desired dentures free of the period of being toothless. Teeth 11, 23, 31, 33, 43, and 44 were the ones that remained. The teeth's prognosis was poor.

METHODOLOGY

During clinical examination, 7 teeth were found, namely teeth 15, 11, 23, 33, 31, 43, 44, and some remaining tooth roots with a diagnosis of chronic apical periodontitis et causa gangren radix on teeth 18, 14, 13, 24, 28, 35, 34, 32, 41, 42, 47, 48, chronic apical periodontitis on teeth 15, 23 (Figure 1). Anatomical impressions were taken at the first visit.

The next step is to perform a preliminary treatment. A preliminary treatment is performed before the prosthodontic treatment. This treatment is the extraction of teeth 15, 18, 14, 13, 24, 28, 35, 34, 32, 41, 42, 47, 48 and endodontic treatment for teeth 11, 23, 33, 31, 43, 44 (Figure 2).

Individual trays were made to perform border molding and take functional impressions of the upper and lower jaw. For the purpose of border molding and functional imprints of the upper and lower jaw, individual trays were created. A window in the anterior part of the lower jaw's individual tray was included in its construction to allow for the imprint of the flabby tissue. Regular body and light body polyvinylsiloxane were utilised for obtaining imprints, and monophase elastomer was utilised for border molding.

The models were then mounted on a free plane articulator. After that, we set the non-immediate artificial teeth. We did the try-in of wax denture with the non-immediate artificial teeth (Figure 3).

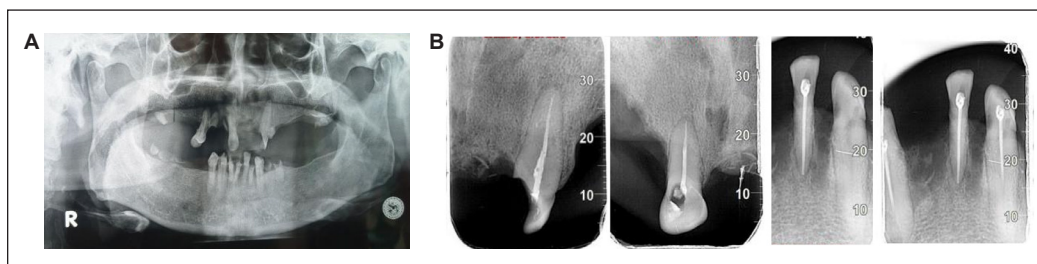


Figure 1. Radiographic examination: (A) panoramic radiograph; and (B) periapical radiograph showing teeth 11, 23, 31, 33, 43, and 44

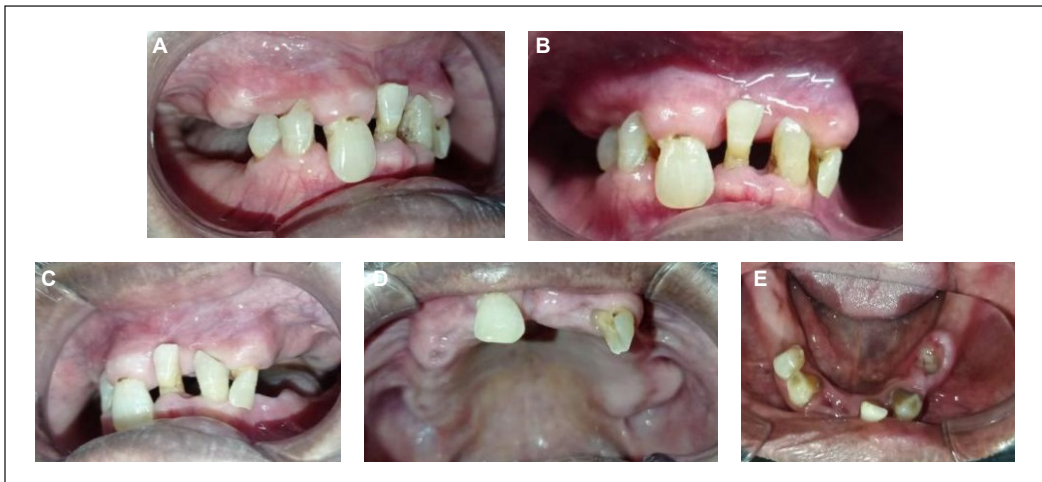


Figure 2. Intra oral condition: (A) anterior view; (B) lateral right view; (C) lateral left view; (D) upper occlusal view; and (E) lower occlusal view

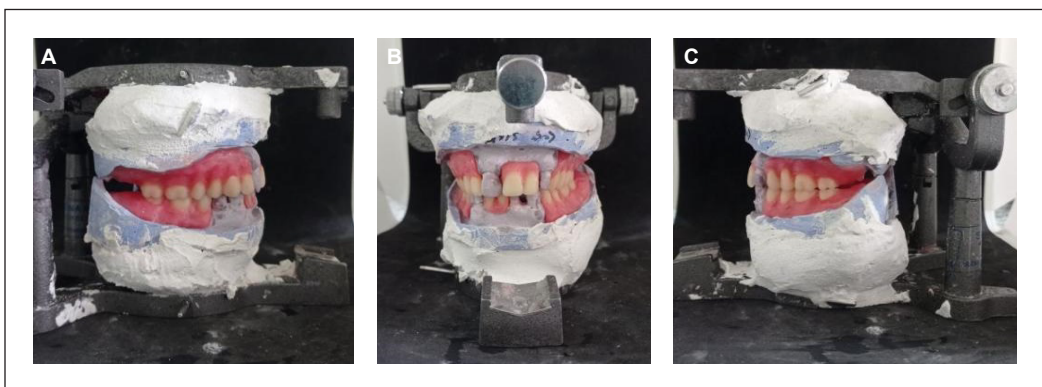


Figure 3. The setup of artificial teeth on the models mounted on a free plane articulator without artificial teeth 11, 23, 31, 33, 43, and 44: (A) lateral right view; (B) anterior view; and (C) lateral left view

RESULTS

Some individuals may experience psychological anguish if their front teeth are lost. In this case, patient desired dentures free of the period of being toothless. Therefore, immediate partial denture treatment was chosen for this case (Figure 4).

DISCUSSION

The treatment results of immediate dentures could not be properly assessed before they are fitted. Overlapping maxillary and mandibular relationships could be corrected. In addition, the dentist needs to be aware of the potential side effects of extended dental visits (Caputi



Figure 4. (A) Acrylic denture; (B) Intra oral condition with the new denture; (C) Patient's profile after denture insertion; (D) Anterior view; and (E) lateral view

et al., 2014). However, in this instance, the patient's issue of the anteriorly projecting teeth was addressed by the therapy, which made him extremely happy with the denture. Patients with heart disease need treatment with a small number of visits. So immediate helps patients with heart disease (Crespo-Leiro et al., 2018).

Alveolar ridge preservation, proprioception, force distribution, stability, and retention are benefits of overdenture. The necessity to practice good oral hygiene and the increased risk of periodontal and dental cavities are the drawbacks of having an overdenture (Soesetijo, 2012).

According to the WHO Global Oral Health Status Report, the average prevalence of edentulism in those over 60 was 22.7% worldwide, which means that over 25% of those over 60 were toothless. According to a Saudi Arabian research of 892 adults 60 and older, gum disease was responsible for 74.21% of the missing tooth rate while lost teeth accounted for 76.69%. The oral health rate of middle-aged and older people in China was less than 15%, according to the Fourth National Oral Health Survey. Of these, the prevalence of dental caries was as high as 98%, and the percentage of people in the 65–74 age group who had missing teeth was 86.1% (Figure 5) (Yu et al., 2024).

The cumulative impact of the oral disease throughout life drives the biology of nutritional status and dental health. Malnutrition in older individuals is caused by a number of factors, including dental caries, periodontal disease, dysgeusia, and missing teeth, which impair chewing ability, restrict food and nutrient intake, and worsen the gastrointestinal load (Azzolino et al., 2019).

The high incidence of tooth loss, dental caries, periodontal disease, xerostomia, and oral precancer/cancer lesions in the elderly has been linked to oral health issues (Razak

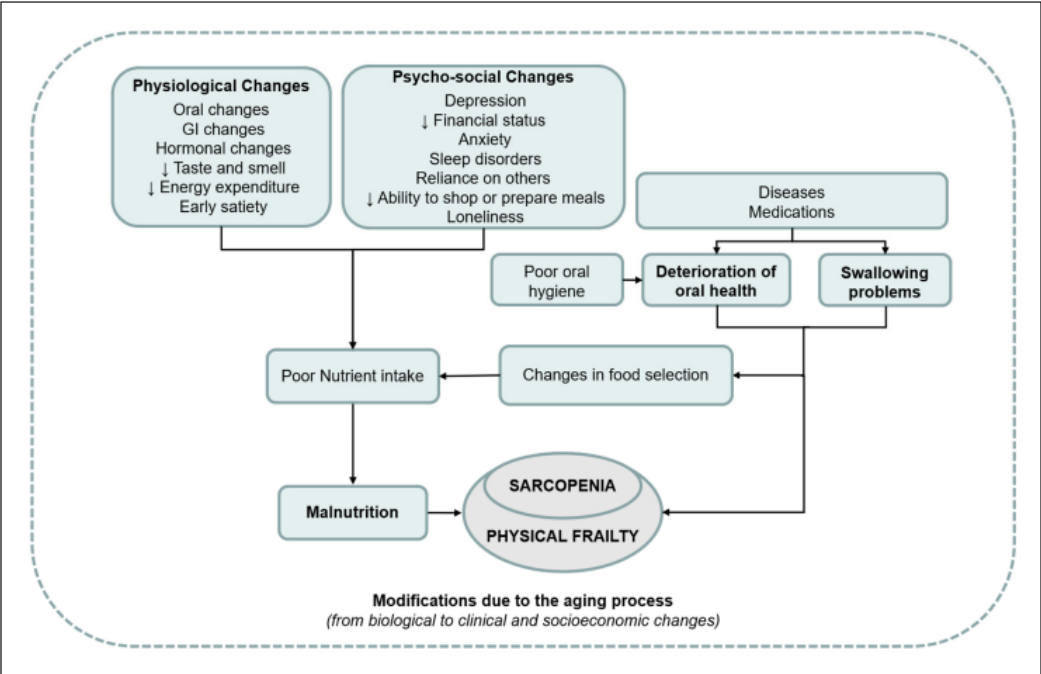


Figure 5. Overview of the interplay between poor oral status, malnutrition, and sarcopenia (Yu et al., 2024)
Note. GI—gastrointestinal

et al., 2014). Dental caries and periodontitis are prevalent conditions, particularly in the elderly, and are thought to be the primary cause of tooth loss (Chapple et al., 2017).

However, as was covered in the previous section, a number of dental issues that older adults face could result in a deterioration in their overall health by causing discomfort, poor dietary intake, and a decreased quality of life (Azzolino et al., 2019). According to reports, malnutrition, dysphagia, and a reduction in activities of daily living have been linked to poor oral status, which affects 71% of patients in rehabilitation settings (Andersson et al., 2004) and 91% of patients in acute-care hospitals (Hanne et al., 2012). Therefore, inadequate nutritional intake from poor dental health might result in sarcopenia. Additionally, through a number of pathways, including anorexia, decreased food intake, and altered metabolism, inflammation further exacerbates malnutrition.

Prosthetic rehabilitation of the edentulous patient may help to prevent malnutrition since it restores the chewing function (Andreas et al., 2015). It is well recognised that poor dental health affects people in a variety of areas, which is related to the quality of life. Additionally, edentulism has been linked to decreased life satisfaction, decreased self-esteem and morale, and communication difficulties. In order to lessen the effects of edentulism, oral rehabilitation becomes increasingly important in public health systems as life expectancy rises and people strive for the higher quality of life that comes with aging

well. Oral rehabilitation with complete dentures, however, has personal and technological constraints that necessitate patient education and professional expertise for effective therapy (Silva et al., 2024). A prosthesis known as an immediate denture is intended to replace missing teeth right away following tooth extraction or decapitation. The patient's comfort, functionality, and appearance are the main priorities, thus improving the patient's quality of life.

CONCLUSION

Immediate dentures are still regarded as crucial treatments in the age of implant therapy. It can improve the healing process, function, and give the patient with aesthetics. A successful and functionally acceptable treatment plan for the patient will result from appropriate evaluation, planning, follow-up, and directions. In addition, there is a need for greater collaboration among countries, institutions and authors to improve the oral health in older adults.

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Optimising Walking Frame Use among the Elderly: Proposed Recommendation based on User Condition, Walking Frame Design, and Physical Environment Challenges

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ABSTRACT

The effective use of walking frames is essential for enhancing mobility and safety among the elderly individuals with mobility impairments. However, the effective use of walking frames can be hindered by various challenges or issues. This study aims to develop comprehensive recommendations to optimise the use of walking frames among the elderly. Semi-structured interviews and postural observation with walking frame users were performed to gain practical insights. Data were analysed using thematic analysis and postural assessment to identify recurring themes and inform the development of the proposed recommendation. The study identified three main themes of challenges: user-specific issues, walking frame design, and environmental factors. Common user-related issues included physical weakness, imbalance, and fear of falling. Design-related challenges were less quality, no adjustable width function, slow movement, and expensive. Environmental challenges were primarily related to uneven surfaces, slippery floor, and narrow space. Based on these findings, specific recommendations were developed to address each category of the challenges. The proposed recommendations are intended to serve as a foundation for usage and future studies on walking frames, and also are expected to contribute towards the advancement of healthy aging and quality of life for the elderly in Malaysia.

Keywords: Elderly, Malaysia, recommendation, use, walking frame

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INTRODUCTION

As the global population ages, the importance of mobility aids, particularly walking frames for the elderly is increasingly recognised. These aids enhance safety and independence

by providing crucial support for walking, reducing fall risks, and enhancing confidence. However, many elderly users face challenges in effectively using walking frames due to various factors, including individual conditions, design issues, and environmental obstacles. User conditions such as physical health, cognitive function, and prior mobility experiences greatly influence how well an elderly person can utilise a walking frame. Some designs may be better suited for users with different levels of strength, balance, and coordination. For instance, those with weak upper bodies may struggle with heavier frames. Additionally, design aspects like weight, adjustability, and aesthetics can affect user engagement; overly heavy or difficult-to-adjust frames may discourage use, leading to reduced mobility and increased reliance on caregivers. The physical environment also plays a critical role, as many elderly individuals live in homes with uneven floors, cluttered spaces, or challenging outdoor areas, which can create obstacles and diminish feelings of safety and autonomy while using walking frames. Thus, in order to create focussed recommendations for maximising walking frame use among the elderly, this study intends to explore these interrelated factors: user conditions, walking frame design, and environmental challenges. These suggested recommendations may serve as a foundation for future research on walking frames and also make a significant contribution to the advancement of healthy aging through a supportive design.

METHODOLOGY

A total of 30 community-dwelling elderly people in Selangor and Kuala Lumpur, aged 60 years and above, who are current walking frame users, participated in this study. Participants were selected through purposive sampling to ensure a diverse representation of experiences. Prior to the data collection, all participants received complete information about the study and signed an informed consent form. To obtain useful insights, semi-structured interviews (face-to-face or via phone) were conducted. An interview guide facilitated discussions on the various aspects of walking frame use, including ownership, usage patterns, challenges encountered, suggestions for improvement, and sociodemographic information. All interviews were digitally recorded using a voice recorder to ensure accurate data capture. Then, a thematic analysis by Braun and Clarke (2006) as shown in Figure 2 was used on the interview data in the form of verbatim transcripts. In addition, two postural observations (the elderly standing and walking with the assistance of a walking frame) using the Rapid Entire Body Assessment (REBA) worksheet form (Figure 1) were also carried out. The Digital Rapid Upper Limb Assessment (RULA) analysis was employed to analyse postural assessment data. The study was granted ethical approval by the Universiti Putra Malaysia Ethics Committee for Research Involving Human Subjects (reference: JKEUPM-2018-122).

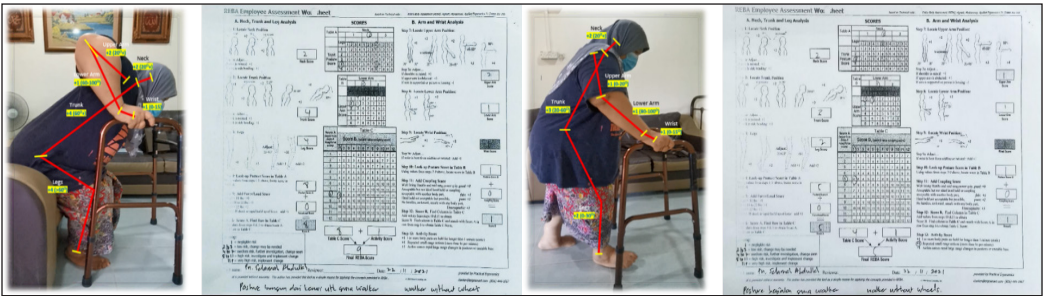


Figure 1. REBA assessment during stand-up and walking using walking frame

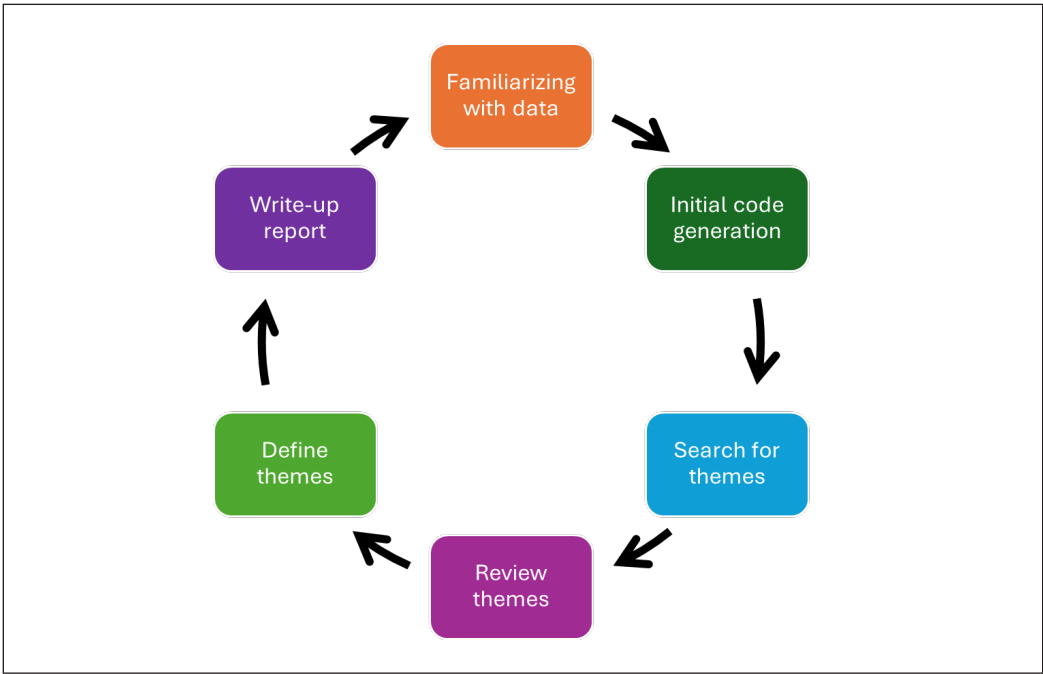


Figure 2. Braun and Clarke (2006) thematic analysis
Source: Braun and Clarke (2006)

RESULTS

Based on the study’s findings, recommendations to improve the walking frame guidelines for the elderly users in Malaysia are focussing on addressing the identified issues (Table 1). Besides, a RULA simulation study (Figure 3) suggests that users should first use the chair arm for support before reaching for the walking frame when standing up or sitting down. This approach reduces pressure and discomfort on the upper arm, wrist, and body posture compared to using the walking frame directly. Additionally, it is recommended that users maintain an upright posture and face forward while walking with the frame, as this position

Table 1
Recommendation guidelines for Malaysian elderly walking frame users

Theme issue	Sub-theme issue	Issues	Recommendation guidelines
User condition Walking frame	Physical	Physical imbalance, limb weakness, surgery on leg/hand due to injury, fatigue	To use a walking frame effectively, first move it forward a short distance after standing up. Step forward with your injured or weaker leg, using your palms for support, followed by your stronger leg. Ensure your feet are at a comfortable distance apart and within the frame's boundaries. Adjust the frame's height for optimal hand grip comfort. Move each side of the frame alternately while walking, without lifting both sides simultaneously. Additionally, perform regular leg exercises, either independently or with a physiotherapist.
	Psychology	Fear of falling, less confident	To obtain guidance and demonstration of proper use from physiotherapy or professional.
	Quality	Noise, the handle is damaged easily, the frame is loose, broken wheels, damage rubber pad	To conduct regular inspection to ensure it is in good condition. Replace or repair any damaged parts.
	Design	No adjustable width function, the wheels slide easily, unable to climb stairs/level and less stable due to lightweight	Manufacturers should offer extra-wide walking frames with adjustable mechanisms for larger users. For users, when walking or descending gradients, use brakes to control speed. Seek assistance from a caregiver when navigating stairs, and always follow proper usage procedures.
	Usage	Difficult to stand-up, slow movement	Follow proper usage procedures provided by a professional/physical therapist.
Physical environment	Home environment	Slippery floors, uneven floor, narrow spaces, obstacle	Ensure that the user's path at home while using the walking frame is clear of obstacles, and use anti-slip mats on slippery floor surfaces for safety.

enhances balance by aligning the centre of mass with the base of support. Getting closer to the device also can further improve stability for the user.

CONCLUSION

The effective use of the walking frames is vital for improving mobility and safety among elderly individuals with mobility impairments. This study identified several challenges that hinder their effectiveness and use. The proposed recommendations aim to enhance walking frame usage and serve as a foundation for future research, ultimately contributing to a healthier aging and an improved quality of life for the elderly in Malaysia.



Figure 3. RULA simulation analysis on Malaysian elderly male and female using recommendation technique during stand-up/sit-down and walking using walking frames

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Examining Quality of Life and Depression in Malaysia's Aging Population: A Socio-demographic Study using CASP-12 and GDS

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ABSTRACT

The study examined data obtained from the Ageless Cognitive Assessment, 2021, to explore the relationship between Quality of Life (QoL), depression, and socio-demographic characteristics in Malaysia's elderly population. Its objective was to analyse the associations between these variables. The data were collected using the CASP-12, a tool for assessing the QoL, and the GDS, a metric for measuring depression, among 897 participants aged 60 and older from three cohorts (MELoR, TUA, and New Recruit). The Kruskal-Wallis and Mann-Whitney test were conducted to identify factors influencing the QoL and depression scores. The findings revealed a significant difference in the QoL ratings based on marital status ($p = 0.008$), while no significant differences were observed for ethnicity ($p = 0.717$) or sex ($p = 0.934$). Ethnicity significantly influenced depression levels ($p = 0.020$), whereas sex did not ($p = 0.661$). The results indicated that marital status significantly influenced the QoL, with single individuals demonstrating the highest mean rank and, consequently, greater QoL. Conversely, ethnicity exerted a more pronounced effect on depression, with the Malay ethnic group exhibiting the highest mean rank and elevated levels of depression relative to other ethnicities.

Keywords: CASP-12, depression, GDS, quality of life, socio-demographic factors

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INTRODUCTION

The elderly population in Malaysia is experiencing significant growth, leading to a heightened focus on their welfare (Department of Statistics Malaysia, 2020). Quality of life (QoL) and specifically, depression, significantly impact the well-being and mental state of individuals in this group (Mutalip et al., 2020).

The current paper examines data from the 2021 Ageless Cognitive Assessment. The objective of this study is to examine the relationship between the QoL, depression, and other socio-demographic characteristics among the older population in Malaysia. We employ the CASP-12 scale, which assesses control, autonomy, self-realisation, and pleasure, to evaluate the QoL (Hyde et al., 2003). Additionally, we utilise the Geriatric Depression Scale (GDS) to quantify degrees of depression (Balqis-Ali & Fun, 2024). Analysing the influence of socio-demographic features on these variables could aid in formulating more effective policies and initiatives to enhance the well-being of the elderly. The study has 897 people who are 60 years old or older, selected from three cohorts: MELoR (Malaysian Elderly Longitudinal Research), TUA (Towards Useful Ageing), and New Recruit (Ageless Cognitive Assessment, 2021).

The aging population in Malaysia faces diverse challenges impacting their QoL and mental health. Studies by Jimenez et al. (2013) and Park et al. (2014) highlighted ethnic disparities in mental health among older adults, showing that different ethnic backgrounds result in varying mental health outcomes, particularly in depression. These findings underscore the need for culturally sensitive interventions tailored to the unique socio-cultural contexts of Malaysia's diverse ethnic groups.

Nurhasanah et al. (2022) reported that marital status does not influence the QoL, while Lee et al. (2020) found gender differences in the QoL among older adults. Together, these studies demonstrate the complex interplay of ethnicity, marital status, and gender in shaping mental health and the QoL outcomes. This highlights the importance of developing targeted, context-specific interventions to address the needs of Malaysia's aging population.

METHODOLOGY

This cross-sectional study utilised a comprehensive survey from the Ageless Cognitive Assessment that employed validated measures (CASP-12 and GDS) to evaluate the participants' QoL and degrees of depression. We enlisted a grand total of 897 senior citizens, all 60 years old or older, from three separate groups: MELoR, TUA, and New Recruit. The Ageless Cognitive Assessment gathered data through structured interviews and self-administered questionnaires, focussing specifically on QoL, depression, and socio-demographic factors such as age, gender, marital status, and ethnicity. As the data was not normally distributed, we used nonparametric tests such as the Kruskal-Wallis and Mann-Whitney test to assess the impact of socio-demographic characteristics on the QoL and depression ratings.

RESULTS AND DISCUSSION

The results of the study revealed several significant findings. The participants' QoL ratings showed a significant difference based on the marital status ($p = 0.008$), with single individuals

reporting a higher QoL compared to their married, widowed, or divorced counterparts. The mean rank of single individuals was 146.73, indicating that different marital statuses significantly impact the QoL, with single individuals demonstrating the highest mean rank and, consequently, greater QoL. These findings contrast with the results of Nurhasanah et al. (2022), who concluded that marital status does not affect the QoL in older adults.

In contrast, ethnicity exerted a more pronounced effect on depression levels ($p = 0.020$), with the Malay ethnic group exhibiting the highest mean rank (276.25) and elevated levels of depression compared to other ethnicities. These findings align with those of Park et al. (2013), highlighting that depression levels vary across different ethnicities among older adults, necessitating culturally tailored mental health interventions.

Moreover, there were no significant disparities in the QoL scores based on ethnicity ($p = 0.717$) or sex ($p = 0.934$), indicating that neither the ethnic background nor gender significantly influenced the QoL among the elderly. Similarly, no significant effect of sex on depression levels was observed ($p = 0.661$), suggesting that depression affects elderly men and women similarly.

Overall, the findings underscore the significant impact of marital status on the QoL and the crucial role of ethnicity in influencing depression levels among Malaysia's elderly population. These insights are essential for developing targeted interventions to enhance the QoL and address depression in this demographic.

CONCLUSION

This study emphasises the significant influence of marital status on the QoL and the effect of ethnicity on depression among Malaysia's senior population. These findings emphasise the significance of taking sociodemographic aspects into account when formulating policies and implementing intervention programmes that aim to enhance the well-being of the elderly population. Subsequent investigations should delve deeper into the root causes of these discrepancies and assess the efficacy of targeted interventions designed for various socio-demographic categories.

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