

Public perspectives on dementia: a Malaysian study on knowledge and attitudes

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ABSTRACT

Dementia is a leading cause of disability among older adults and imposes increasing caregiving demands on families and communities, including in Malaysia. Knowledge and beliefs about dementia are critical determinants of care quality. However, research on this topic in Malaysia remains limited; therefore, this study aimed to assess knowledge and attitudes towards dementia among the Malaysian general population.

A cross-sectional study was conducted among general population of Malaysia from June to July 2023 using an online self-administered questionnaire. Convenience sampling method was used to recruit the participants. The questionnaire was validated by experts, and it comprised sections on sociodemographic, knowledge, and attitudes towards dementia. Simple and multiple linear regression were performed.

A total of 291 participants responded. Our participants demonstrated limited knowledge of dementia (mean score 15.78) but generally positive attitudes (mean score 54.97). Knowledge was significantly associated with several sociodemographic factors, whereas attitudes were mainly associated with ethnicity and personal dementia experience.

Our study highlights gaps in dementia knowledge despite generally positive attitudes. Future research should include more diverse populations to enhance generalizability and integrate factors such as cultural beliefs, health literacy, media influence, the role of policy and health system support in shaping knowledge and attitudes toward dementia.

Keywords:

Dementia, Knowledge, Attitudes, Malaysia, Cross-sectional

INTRODUCTION

Population aging is an inexorable global phenomenon that presents numerous social and economic challenges. In 2022, approximately 771 million individuals worldwide were aged 65 years or older (United Nations, 2022), a figure projected to rise to 2.2 billion by 2070 (United Nations, 2024). Global life expectancy reached 73.3 years in 2024, largely due to advancements in healthcare and improved living standards (United Nations, 2024). This demographic shift affects both developed and developing

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nations, including Malaysia, where 5% of the population was aged 65 and above in 2010, projected to escalate to 14.5% by 2040 (Department of Statistics Malaysia, 2022).

Parallel to population aging, the prevalence of age-related neurodegenerative diseases like dementia has risen alarmingly. In 2020, an estimated 47 million people worldwide, accounting for approximately 5% of the elderly population were affected by dementia. This number is projected to rise to 132 million by 2050 (World Health Organization, 2017). This debilitating condition imposes staggering economic burdens, with global costs approximating US\$818 billion in 2015 and expected to rise to US\$2 trillion by 2030. Dementia not only has an economic impact on the country, but it also burdens the patients, their family and caregivers (Alzheimer's Disease International, 2019). In Malaysia, 8.5% of the elderly suffered from dementia in 2020, with higher rates among women and rural residents (Ganapathy et al., 2020). A systematic review has also revealed moderate to high levels of burden among caregivers of dementia with 34%-44% of elevated depressive and anxiety symptoms reported (Razi et al., 2023). A report has shown that although caregivers have positive sentiments towards their role, at least 50 percent of them have adverse impacts on their health, work and social life (Alzheimer's Disease International, 2019).

One of the major issues highlighted in Malaysia is the negative attitude and stigma towards dementia (Nikmat, Hawthorne and Al-Mashoor, 2011). Despite being a neurological condition, dementia is often feared and misunderstood as a mental illness which might be due to the poor level of knowledge which is even seen among healthcare workers (Jensen and Inker, 2015; Parveen et al., 2018). Numerous studies worldwide have revealed significant knowledge gaps and negative attitudes towards dementia in public (Diamond and Woo, 2014; Khonje et al., 2015; Mulyani, Artanti and Saifullah, 2019; Akifusa et al., 2020; Hossain et al., 2020; Lo et al., 2020; Zheng et al., 2020; Musoke et al., 2021). While some populations demonstrated reasonable symptom recognition, erroneous beliefs about prognosis, causes, and risk factors were prevalent (Mulyani, Artanti and Saifullah 2019; Siddiqui et al., 2022).

Comprehending gaps in public knowledge and attitudes is crucial for tailoring educational initiatives, dispelling misconceptions, reducing stigma, and fostering supportive environments for individuals living with dementia and their caregivers. Enhancing societal awareness and promoting positive attitudes are vital for creating inclusive, dementia-friendly communities. Therefore, we aimed to assess dementia knowledge and attitudes among the general Malaysian public, identify associated sociodemographic factors, and explore the influence of prior dementia interactions and educational exposure on public perspectives. We hypothesized that knowledge and attitudes towards dementia would differ significantly according to sociodemographic characteristics, prior dementia interactions and education exposure. Insights from this research could inform policy development, resource allocation, and the creation of targeted interventions to improve dementia literacy and cultivate a more inclusive society for those affected by this debilitating condition.

METHODS

A cross-sectional study was conducted among the general population of Malaysia between June and July 2023. Individuals who are aged 18 years and above, holding Malaysian citizenship, able to communicate effectively in either English or Bahasa Malaysia, and willing to provide informed consent were eligible to participate. The minimum required sample size was calculated using Epi Info version 7.2.5, based on a 95% confidence level, an expected proportion of 21.7% (respondents having correct knowledge of risk factors of dementia) (Rosato et al., 2019), and a 5% margin of error, yielding a minimum sample size of 261 participants. To account for an anticipated non-response rate of 30%, the final targeted sample size was adjusted to 373 participants.

A non-probability convenience sampling approach was employed, and participants were contacted and recruited through various social media platforms, including WhatsApp, Instagram, and Facebook. An information sheet containing all relevant details of the study was provided to participants prior to completing the questionnaire. Participation was entirely voluntary, with no coercion or incentives

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offered. All information collected was treated with strict confidentiality and used solely for research purposes. The privacy and anonymity of respondents were maintained throughout the study. Ethical approval for this research was obtained from the Research Ethics Committee of Manipal University College Malaysia (MUCM), Malaysia (MUCM/FOM/Research Ethics Committee – 029/2023).

We developed the questionnaire based on relevant literature on dementia (McParland et al., 2012; Tan et al., 2012; Seo, Lee and Sung 2015; Akifusa et al., 2020; Lo et al., 2020; Zheng et al., 2020). Content validity was established through expert review by five subject experts. Item content validity index (I-CVI) was calculated for each item, with values ranging from 0.8 to 1.0. Cronbach's alpha reliability coefficient was calculated to assess the internal consistency of the questionnaire. The reliability coefficients were 0.770 for the knowledge domain and 0.811 for the attitude domain. The questionnaire, originally developed in English, was subsequently translated into Malay language and then back translated into English to ensure linguistic and conceptual accuracy.

Data was collected using an online self-administered questionnaire, which included an informed consent form and three main sections: sociodemographic profile, knowledge, and attitudes towards dementia. The sociodemographic section included age, gender, ethnicity, area of residence, education level, occupation, marital status, total monthly income, personal dementia experience, and presence of family members diagnosed with dementia. The second section assessed participant's knowledge of dementia, encompassing general knowledge, symptoms, causes, risk factors, protective factors, and treatment options related to dementia. This section comprised a total of 19 items which included true/false questions, and multiple-choice questions. The final section assessed the public attitudes toward dementia which included 15 items, with nine positive statements and six negative statements. Responses were recorded using a five-point Likert scale such as strongly disagree, disagree, neutral, agree, and strongly agree.

We used Microsoft Excel for data entry and SPSS version 29 to analyse the data. Regarding the assessment of knowledge, each correct response was given one point, while incorrect responses were given zero points. Regarding attitudes, positively worded statements were scored from 5 to 1, with "strongly agree" assigned 5 points and "strongly disagree" assigned 1 point. Conversely, for negatively worded statements, the scoring was reversed, with "strongly agree" assigned 1 point and "strongly disagree" assigned 5 points.

Total scores were computed separately for the knowledge and attitude sections, with higher scores indicating greater knowledge and more positive attitudes toward dementia. Descriptive statistics such as frequency and percentage were calculated for categorical variables, whereas mean and standard deviation were computed for quantitative variables. To identify factors associated with knowledge and attitudes toward dementia, independent t-tests and one-way analysis of variance (ANOVA) and multiple linear regression were calculated. P value of <0.05 was considered statistically significant, and 95% confidence intervals were reported for parameter estimates.

RESULTS

A total of 291 respondents participated in this study. Table 1 presents their demographic and socio-economic characteristics. The majority were aged between 18 and 29 years (55.7%), female (62.6%), resided in urban areas (82.1%) and had attained tertiary education (93.8%) with nearly half identified as students (45%). Regarding ethnicity, nearly half of the respondents were Indian (47.8%), followed by Chinese (36.4%), Malay (12.0%) and others (3.8%). While 16.8% reported having a family member with dementia, only 14.8% had personal caregiving experience. Only 10.8% had previously attended any educational session related to dementia.

Table 1: Demographic and socio-economic characteristics of the respondents (n =291)

Variable	N (%)
Age (years)	
18 – 29	162 (55.7)
30 – 39	23 (7.9)
40 – 49	44 (15.1)
50 – 59	47 (16.2)
≥60	15 (5.2)
Gender (n=289)	
Female	181 (62.6)
Male	108 (37.4)
Ethnicity	
Indian	139 (47.8)
Chinese	106 (36.4)
Malay	35 (12.0)
Others	11 (3.8)
Living Area	
Urban	239 (82.1)
Rural	52 (17.9)
Education level	
Tertiary	273 (93.8)
Secondary	18 (6.2)
Marital status (n=289)	
Single	174 (60.2)
Married	112 (38.8)
Divorced	3 (1.0)
Monthly household income	
B40 (<RM4850)	107 (36.8)
M40 (RM4851 – 10,970)	106 (36.4)
T20 (>RM10,971)	78 (26.8)
Occupation	
Student	131 (45.0)
Private employee	64 (21.9)
Government employee	50 (17.2)
Self employed	16 (5.5)
Employer	9 (3.1)
Unemployed	9 (3.1)
Retired	7 (2.1)
Housewife	5 (1.7)
Family members with dementia	
Yes	49 (16.8)
No	242 (83.2)
Personal dementia experience	
Not known someone with dementia	172 (59.1)
Known someone with dementia but not cared for	76 (26.1)
Cared for someone with dementia	43 (14.8)
Have you ever attended lecture, workshop, seminar, or talk focused on dementia? (n=278)	
Yes	30 (10.8)
No	248 (89.2)

B40 (Bottom 40%), M40 (Middle 40%), T20 (Top 20%)

Table 2 illustrates that knowledge was relatively high for certain items regarding dementia such as the need for support in daily living during late-stage dementia (85.6%) and personality changes in dementia (81.4%) even though several misconceptions persisted. Only 7.9% correctly identified that dementia is not merely a disease of the brain, and less than half (48.8%) knew it is not classified as a mental illness. Fewer than half recognized that memory decline due to aging is not equivalent to dementia (47.8%). With respect to risk factors, the most frequently identified were mental illness (77.7%), a family history of dementia (68.0%), heavy alcohol consumption (67.0%), cigarette smoking (52.9%), hypertension (57.4%), and diabetes mellitus (40.2%). In terms of protective factors, physical exercise (80.8%),

mental exercise (80.4%), reading (73.9%) and social activity (71.5%) were most commonly acknowledged, whereas only 4.5% recognized the role of antihypertensives or hypolipidemic drugs.

Table 2: Knowledge towards dementia among the Malaysian general population

Knowledge question	N (%)
	Correct answer
Dementia is a disease of the brain. (F)	23 (7.9)
Dementia is a mental illness. (F)	142 (48.8)
Everyone develops dementia when he or she becomes old. (F)	175 (60.1)
There is no cure for dementia currently. (T)	178 (61.2)
If a person develops dementia, he or she may experience changes in his or her personality. (T)	237 (81.4)
Alzheimer's disease is the most common cause of dementia. (T)	178 (61.2)
If a person remembers well what happened a long time ago, he or she does not have dementia. (F)	154 (52.9)
Recent memories are better kept than old memories in dementia. (F)	145 (49.8)
Memory decline due to aging is the same as dementia. (F)	139 (47.8)
People with late-stage dementia need others to take care of their activities of daily living. (T)	249 (85.6)
People with mild dementia will eventually progress to moderate and severe dementia with time. (T)	177 (60.8)
Memory difficulty is the only symptom of dementia. (F)	133 (45.7)
There is no way to prevent dementia. (F)	123 (42.3)
Because a dementia patient does not have the ability to judge, the patient does not need to be given any explanation during treatment. (F)	180 (61.9)
If a person develops dementia, it is impossible for him or her to live together with the family. (F)	236 (81.1)
Which of the following increases risk of dementia? <i>(Select all that apply)</i>	
Mental illness (anxiety and depression)	226 (77.7)
Familial or genetic	198 (68.0)
Heavy alcohol drinking	195 (67.0)
Hypertension	167 (57.4)
Heavy smoking	154 (52.9)
Diabetes mellitus	117 (40.2)
Which of the following reduces risk of dementia? <i>(Select all that apply)</i>	
Physical exercise	235 (80.8)
Reading	215 (73.9)
Mental exercise	234 (80.4)
Social activity	208 (71.5)
Antihypertensives or hypolipidemic drugs	13 (4.5)
Healthy diet	178 (61.2)

T (True), F (False)

Table 3 shows that overall attitudes towards dementia were generally positive. A majority of respondents strongly agreed or agreed that individuals with dementia can get along well with others (45.4%), asking help from others (65.3%), and that raising public awareness about dementia is important (84.6%). Most participants strongly disagreed or disagreed with negative statements, with 81.4% disagreeing that having a family member with dementia is embarrassing, and 73.6% disagreed with avoiding association with dementia patients.

Table 3: Attitudes towards dementia among the Malaysian general population

Statement	N (%)		
	Strongly disagree/ Disagree	Neutral	Strongly Agree/ Agree
Dementia person also has ability to get along well with people around them. (P)	56 (19.2)	103 (35.4)	132 (45.4)
There may be an opportunity to associate with a dementia person in daily life. (P)	32 (11.0)	86 (29.6)	173 (59.4)
I can help dementia person in need without hesitation. (P)	43 (14.8)	94 (32.3)	154 (52.9)
A dementia person often annoys people around him/her. (N)	94 (32.3)	109 (37.5)	88 (30.2)
A dementia person has feelings different from us. (N)	88 (30.2)	89 (30.6)	114 (39.2)
I can share joy and pleasure with a dementia person. (P)	39 (13.4)	84 (28.9)	168 (57.7)
I like to make friend with people living with dementia. (P)	49 (16.9)	133 (45.7)	109 (37.4)
I am embarrassed if family member suffering from dementia. (N)	237 (81.4)	33 (11.3)	21 (7.2)
It is good for a person of dementia to ask help of various people. (P)	36 (12.4)	65 (22.3)	190 (65.3)
I do not want to associate with the person of dementia as much as possible. (N)	214 (73.6)	54 (18.6)	23 (7.9)
I cannot understand the action of a dementia person. (N)	124 (42.6)	113 (38.8)	54 (18.6)
I like to take care family member living with dementia. (P)	37 (12.7)	125 (43.0)	129 (44.3)
Malaysian government should build dementia friendly community actively. (P)	16 (5.5)	38 (13.1)	207 (81.5)
To arouse the public awareness of dementia in community is important. (P)	16 (5.5)	29 (10.0)	246 (84.6)
It is better to send people living with dementia to nursing home. (N)	129 (43.3)	107 (36.8)	58 (19.9)

P (Positive statement), N (Negative statement)

Table 4 presents the mean knowledge score of 15.8 and the mean score of attitudes was 55.0, suggesting that moderate level of knowledge and positive attitudes towards dementia.

Table 4: Descriptive statistics of knowledge and attitudes towards dementia among general population

Variable	Mean (SD)	Median	Minimum – Maximum
Knowledge total score (0-29)	15.8 (5.5)	16.0	0.0 – 29.0
Attitude total score (15-75)	55.0 (8.5)	54.0	28.0 – 75.0

SD (Standard deviation)

Table 5 shows simple and multiple linear regression analysis for factors associated with knowledge toward dementia. Simple linear regression analysis shows knowledge was significantly associated with age, gender, marital status, occupation, and personal dementia experience. However, multiple linear regression analysis reveals that knowledge was significantly associated with gender, ethnicity, marital status, monthly household income, occupation, and personal dementia experience when adjusted for the rest of the variables in the model of multiple linear regression. Male participants scored lower than

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females ($P=0.040$). Chinese participants had higher knowledge than Malay respondents ($P=0.016$), while divorced individuals scored lower than married participants ($P=0.048$). Participants from the top 20% (T20) income group had higher knowledge than those from the bottom 40% (B40) group ($P=0.043$). Dependents had lower knowledge scores than students ($P=0.035$). Those who knew someone with dementia ($P=0.003$) or had cared for someone with dementia ($P=0.006$) demonstrated significantly higher knowledge compared with participants who did not know anyone with dementia.

Table 5: Simple and multiple linear regression analysis of association between demographic, socio-economic variables and knowledge towards dementia

Variable	Knowledge			
	Unadjusted b (95% CI)	P	Adjusted b (95% CI)	P
Age				
18 – 29	Reference		Reference	
30 – 39	0.6 (-1.7, 3.0)	0.598 [§]	2.1 (-1.2, 5.3)	0.212 [¶]
40 – 49	-3.0 (-4.8, -1.2)	0.001 [§]	-1.1 (-4.2, 2.1)	0.498 [¶]
50 – 59	-1.9 (-3.6, -0.1)	0.035 [§]	-0.2 (-3.4, 3.0)	0.908 [¶]
≥60	0.6 (-2.2, 3.5)	0.674 [§]	3.7 (-0.4, 7.6)	0.076 [¶]
Gender				
Female	Reference		Reference	
Male	-1.4 (-2.7, -0.1)	0.035 [§]	-1.4 (-2.7, -0.1)	0.040 [¶]
Ethnicity				
Malay	Reference		Reference	
Chinese	1.7 (-0.4, 3.8)	0.107 [§]	2.6 (0.5, 4.6)	0.016 [¶]
Indian	0.2 (-1.8, 2.3)	0.812 [§]	0.7 (-1.2, 2.7)	0.462 [¶]
Others	3.5 (-0.2, 7.1)	0.066 [§]	2.7 (-0.9, 6.4)	0.138 [¶]
Living Area				
Rural	Reference		Reference	
Urban	1.0 (-0.6, 2.6)	0.232 [§]	0.5 (-1.1, 2.0)	0.571 [¶]
Education level				
Secondary	Reference		Reference	
Tertiary	1.3 (-1.3, 3.9)	0.326 [§]	0.8 (-1.8, 3.4)	0.545 [¶]
Marital status				
Married	Reference		Reference	
Single	1.6 (0.3, 2.8)	0.019 [§]	0.7 (-1.9, 3.2)	0.615 [¶]
Divorced	-2.9 (-9.1, 3.4)	0.363 [§]	-6.2 (-12.4, -0.1)	0.048 [¶]
Monthly household income				
B40 (<RM4850)	Reference		Reference	
M40 (RM4851 – 10,970)	0.2 (-1.2, 1.7)	0.788 [§]	0.9 (-0.6, 2.4)	0.255 [¶]
T20 (>RM10,971)	1.5 (-0.1, 3.1)	0.072 [§]	1.7 (0.1, 3.4)	0.043 [¶]
Occupation				
Student	Reference		Reference	
Employer	-3.0 (-5.3, -0.7)	0.012 [§]	-2.7 (-5.7, 0.2)	0.067 [¶]
Employee	-1.5 (-2.9, -0.2)	0.027 [§]	-0.8 (-3.1, 1.5)	0.503 [¶]
Dependent	-2.9 (-5.4, -0.4)	0.023 [§]	-3.4 (-6.5, -0.3)	0.035 [¶]
Family members with dementia				
No	Reference		Reference	
Yes	1.4 (-0.2, 3.1)	0.093 [§]	-0.7 (-2.9, 1.4)	0.503 [¶]
Personal dementia experience				
Not known someone with dementia	Reference		Reference	
Known someone with dementia but not cared for	2.3 (0.8, 3.7)	0.002 [§]	2.3 (0.8, 3.8)	0.003 [¶]
Cared for someone with dementia	2.8 (1.0, 4.6)	0.003 [§]	3.3 (1.0, 5.6)	0.006 [¶]

b (regression coefficient), 95% CI (95% confidence interval), B40 (Bottom 40%), M40 (Middle 40%), T20 (Top 20%), [§]Simple linear regression, [¶]Multiple linear regression, $P<0.05$ is significant

Table 6 presents the simple and multiple linear regression analyses for factors associated with attitudes towards dementia. Simple linear regression analysis shows attitudes toward dementia were significantly associated with ethnicity, marital status, occupation, and personal experience about dementia. For attitudes toward dementia, only ethnicity and personal experience were significantly associated after adjusting the rest of the variables in the model of multiple linear regression. Chinese participants demonstrated lower attitude scores compared to Malay participants ($P=0.028$), while individuals who had cared for someone with dementia exhibited higher attitude scores ($P=0.030$) than those without personal exposure to dementia.

Table 6: Simple and multiple linear regression analysis of association between demographic, socio-economic variables and attitudes towards dementia

Variable	Attitude			
	Unadjusted b (95% CI)	P	Adjusted b (95% CI)	P
Age				
18 – 29	Reference		Reference	
30 – 39	-2.6 (-6.4, 1.1)	0.165 [§]	-2.5 (-7.9, 2.8)	0.351 [¶]
40 – 49	-1.9 (-4.7, 0.9)	0.188 [§]	-0.8 (-6.0, 4.3)	0.745 [¶]
50 – 59	-2.6 (-5.4, 0.2)	0.065 [§]	-1.2 (-6.4, 4.1)	0.656 [¶]
≥60	-4.4 (-8.9, 0.1)	0.057 [§]	-0.7 (-7.4, 6.0)	0.837 [¶]
Gender				
Female	Reference		Reference	
Male	-1.7 (-3.7, 0.4)	0.110 [§]	-1.3 (-3.5, 0.8)	0.232 [¶]
Ethnicity				
Malay	Reference		Reference	
Chinese	-3.9 (-7.1, -0.6)	0.020 [§]	-3.8 (-7.2, -0.4)	0.028 [¶]
Indian	-2.7 (-5.9, 0.4)	0.089 [§]	-2.5 (-5.8, 0.7)	0.121 [¶]
Others	0.1 (-5.6, 5.9)	0.964 [§]	-1.5 (-7.5, 4.5)	0.626 [¶]
Living Area				
Rural	Reference		Reference	
Urban	1.3 (-1.2, 3.9)	0.305 [§]	0.9 (-1.7, 3.5)	0.484 [¶]
Education level				
Secondary	Reference		Reference	
Tertiary	2.8 (-1.3, 6.9)	0.177 [§]	2.9 (-1.4, 7.1)	0.183 [¶]
Marital status				
Married	Reference		Reference	
Single	2.2 (0.2, 4.2)	0.035 [§]	0.5 (-3.6, 4.7)	0.799 [¶]
Divorced	-2.0 (-11.7, 7.8)	0.694 [§]	-3.5 (-13.5, 6.6)	0.499 [¶]
Monthly household income				
B40 (<RM4850)	Reference		Reference	
M40 (RM4851 – 10,970)	0.3 (-2.0, 2.6)	0.776 [§]	0.9 (-1.5, 3.3)	0.463 [¶]
T20 (>RM10,971)	1.8 (-0.7, 4.3)	0.166 [§]	1.7 (-1.0, 4.4)	0.226 [¶]
Occupation				
Student	Reference		Reference	
Employer	-2.8 (-6.4, 0.9)	0.135 [§]	0.2 (-4.5, 5.0)	0.925 [¶]
Employee	-2.1 (-4.2, 0.04)	0.055 [§]	-1.1 (-4.8, 2.6)	0.566 [¶]
Dependent	-5.7 (-9.6, 1.8)	0.004 [§]	-4.8 (-9.9, 0.3)	0.065 [¶]
Family members with dementia				
No	Reference		Reference	
Yes	2.1 (-0.4, 4.8)	0.109 [§]	-0.8 (-4.3, 2.7)	0.655 [¶]
Personal dementia experience				
Not known someone with dementia	Reference		Reference	
Known someone with dementia but not cared for	1.0 (-1.3, 3.3)	0.382 [§]	0.9 (-1.6, 3.4)	0.475 [¶]
Cared for someone with dementia	3.6 (0.7, 6.4)	0.014 [§]	4.2 (0.4, 8.0)	0.030 [¶]

b (regression coefficient), 95% CI (95% confidence interval), B40 (Bottom 40%), M40 (Middle 40%), T20 (Top 20%), [§]Simple linear regression, [¶]Multiple linear regression, $P<0.05$ is significant

DISCUSSION

The present study sample was predominantly composed of younger adults aged 18–29 years, females, individuals residing in urban areas, those with tertiary education, and belonged to B40 and M40 income groups. Nearly half of the respondents were of Indian ethnicity, followed by Chinese participants, while Malay respondents were underrepresented. Most of the participants were students. In addition, only a small proportion of respondents reported personal or familial experience with dementia or prior exposure to dementia-related educational activities. These demographic characteristics may have influenced the observed levels of knowledge and attitudes towards dementia and may limit the generalizability of the results to the broader Malaysian population.

Our study revealed that participants from the general population in Malaysia demonstrated a moderate level of knowledge about dementia. Even though our participants exhibited correct understanding regarding certain clinical aspects of dementia, such as the need for support during late-stage disease (85.6%) and personality changes associated with the condition (81.4%), significant knowledge gaps persisted across several domains. Only 7.9% of our respondents correctly identified that dementia is not merely a disease of the brain. Moreover, fewer than half of our participants recognized that dementia is not classified as a mental illness (48.8%), memory decline due to aging is not equivalent to dementia (47.8%), memory difficulty is not the only symptom of dementia (45.7%), and dementia cannot be prevented (42.3%). Previous studies conducted in South Africa and among Bangladeshi immigrants in United Kingdom also reported limited knowledge about dementia regarding its symptoms, causes and treatment (Khonje et al., 2015; Hossain et al., 2020).

These misconceptions suggest a fundamental misunderstanding of dementia's multifaceted nature and may contribute to stigmatization and inadequate support for affected individuals and their families. Moreover, mental illness, family history, alcohol consumption, smoking, hypertension, and diabetes were commonly recognized as risk factors for dementia, while physical activity, mental exercise, reading, and social engagement were widely acknowledged as protective factors among our respondents. Nevertheless, awareness of the protective role of antihypertensive or hypolipidemic medications was notably low. This pattern is consistent with findings from a large population-based study in China, which similarly reported high recognition of lifestyle-related risk and protective factors but limited awareness of the role of medical management in dementia prevention (Zheng et al., 2020). Collectively, these findings highlight that the importance of chronic disease management and appropriate medication use in reducing dementia risk remains underrecognized.

We found significant associations between knowledge and several sociodemographic variables, with personal experience emerging as the most influential factor. Participants who had provided care for individuals with dementia demonstrated significantly higher knowledge scores compared to those without such experience. This finding supports the studies from China and Germany which emphasized the positive relationship between direct contact with dementia patients and public awareness and knowledge (Lüdecke, Von Dem Knesebeck and Kofahl, 2016; Zheng et al., 2020). Though our study did not exhibit any significant association between age and knowledge, previous studies had reported varied age-related patterns in dementia knowledge, with some studies showing that younger individuals tend to have greater knowledge while others indicate that older adults demonstrate better understanding (Lüdecke, Von Dem Knesebeck and Kofahl, 2016; Mulyani, Artanti and Saifullah, 2019; Zheng et al., 2020; Nugraha et al., 2022).

Gender differences were also evident in our study, with female participants achieving higher knowledge scores than males. This pattern is consistent with findings from previous studies which had shown that women tend to have greater awareness and understanding of dementia possibly due to their greater involvement in caregiving roles (Lüdecke, Von Dem Knesebeck and Kofahl, 2016; Mulyani, Artanti and Saifullah, 2019; Zheng et al., 2020; Nugraha et al., 2022). Participants from the highest income group had significantly higher knowledge than those in the lowest income group. Similarly, a population-based survey in Zhuhai, China found that higher average monthly household income per

capita was independently associated with greater Alzheimer's disease knowledge (Sun et al., 2024). Interestingly, contrary to findings from other studies that reported positive associations between educational attainment and dementia knowledge (Lüdecke, Von Dem Knesebeck and Kofahl, 2016; Zheng et al., 2020), our study found no significant relationship between educational level and knowledge scores, suggesting that factors beyond formal education and socioeconomic status may play more prominent roles in dementia knowledge within the Malaysian context. A possible explanation is that 45% of our participants were students, many might be from medical or health-related fields, whose exposure to dementia-related content may have minimized the expected influence of formal education and socioeconomic status on knowledge levels in this population. Moreover, dependents demonstrated significantly lower knowledge scores than students, indicating that limited academic engagement or health-related exposure may contribute to reduced awareness of dementia.

This study revealed that the general population of Malaysia had more favourable opinions towards individuals with dementia, indicating that most of our participants shared positive attitudes. Previous studies in Malaysia and other countries had similarly reported predominantly positive attitudes towards dementia (Tullo and Young, 2014; Akifusa et al., 2020; Griffiths et al., 2020; Musoke et al., 2021; Hussein et al., 2022). However, contrasting evidence from Indonesia showed that the general population in Yogyakarta held more pessimistic attitudes towards people with dementia (Mulyani, Artanti and Saifullah, 2019). In the multivariable analysis, significant associations were observed between attitudes and both ethnicity and personal dementia experience.

Personal dementia experience significantly impacted participants' attitude towards dementia, with people having cared for someone with dementia scoring the highest and people who never knew someone with dementia scoring the lowest. This finding aligns with prior studies from Japan, which also highlighted the influence of direct caregiving experience in fostering empathy and reducing stigma toward dementia (Akifusa et al., 2020). The paradoxical finding that Chinese participants demonstrated higher knowledge, but lower attitude scores compared to Malay participants suggests that knowledge alone does not translate to positive attitudes toward dementia. This discrepancy could be influenced by cultural perceptions, stigma, and caregiving norms. Similar racial and ethnic differences have been reported in previous research reflecting the influence of cultural and social factors on attitudes toward dementia (Im et al., 2023).

Our study has some limitations. Selection bias was evident in this study, as more than half of the respondents were between 18 and 29 years of age and nearly half were of Indian ethnicity. This bias might be due to the limited data collection period of six weeks and the use of online questionnaires, which may have affected participation among certain groups due to concerns about scams and phishing. Additionally, since most respondents were students, the findings may be subject to sampling bias and may not be fully generalizable to the wider population. Furthermore, as a cross-sectional study, causal relationships and temporal associations between exposure and outcome could not be established. Future research should consider employing a sampling method which provides more representative population across different age groups, ethnicities, religions and socio-economic background to enhance the generalizability of the findings.

Our study revealed that while the general population demonstrated positive attitudes towards dementia, their knowledge of the condition remained suboptimal. To address this gap, a multifaceted strategy is needed. Such efforts may include targeted public awareness campaigns, community-based education initiatives, and specialized training for caregivers. In addition, engaging in the media and social influences, promoting cultural sensitivity, fostering partnerships with advocacy groups, and supporting research and innovation in dementia can further strengthen public understanding. These approaches have the potential to enhance knowledge, nurture positive attitudes, and promote a more inclusive society that provides appropriate care and support for individuals with dementia and their families.

CONCLUSION

Our study revealed that participants from the Malaysian general population generally holds positive attitudes towards individuals with dementia, their knowledge of the condition remains limited. Significant associations were observed between knowledge, attitudes, and several sociodemographic factors, particularly ethnicity and personal dementia experience. These findings highlight the need for culturally sensitive educational initiatives and community-based awareness programs to enhance understanding and reduce stigma toward dementia in Malaysia.

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