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THE LIKELIHOOD OF SELF-PERCEIVED LONELINESS AMONG OLDER PERSONS IN MALAYSIA

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Abstract

As people grow older, the risk of becoming lonely increases. Loneliness has a negative impact on both mental and physical health in older persons. Although research on loneliness among older persons is expanding, less is known about loneliness in Southeast Asia, particularly Malaysia. Therefore, this study's purpose is to investigate the prevalence of loneliness and its associated factors among older persons in Malaysia using the most recent national survey data from the 2014 Malaysian Population and Family Survey. The sample was extracted to include ever-married Malays, other Bumiputera, and Chinese and Indian groups aged 60 and above who had children. Loneliness was measured using a single self-reported question about whether respondents had ever felt lonely, which was then categorised as a binary variable. A Chi-square test was performed on feelings of loneliness across socio-demographic characteristics, mental health, physical health, family support, and social participation, followed by logistic regression analysis using significant variables as predictors. The prevalence of loneliness among older persons was 35.7%. The logistic regression showed that factors contributing to the likelihood of feeling lonely include being widowed, divorced, or separated, experiencing anxiety, physical limitations, and sharing problems with children. In contrast, residing in urban areas, having higher education levels, having more sources of income, having life satisfaction, perceiving life as meaningful, having fair and good self-rated health, co-residence with adult children, and participation in religious activities were associated with a lower likelihood of experiencing loneliness. Loneliness is a serious issue among older persons in Malaysia. The government, community, and family should immediately address this psychological problem. The study suggests the need for appropriate strategies for the prevention of loneliness should be developed in the near future.

Keywords: *loneliness, logistic regression, Malaysia, older persons, prevalence*

Introduction

Population ageing is a global trend considered one of the four global demographic "megatrends" (United Nations, 2019). The declining trends in fertility and increasing life expectancy have resulted in population ageing (He et al., 2016). The population aged 60 and above will increase from 1 billion in 2020 to 1.4 billion in 2030 and 2.1 billion in 2050 (World Health Organization, 2022). In Southeast Asia, the population aged 60 and above will increase from 9.8% in 2017 to 13.7% in 2030 and 20.3% in 2050 (World Health Organization, 2023). In some countries, the ageing rate is very high, such as Singapore (23.0%) and Thailand (22.0%) (United Nations Economic and Social Commission for Asia and the Pacific [ESCAP], 2022).

This trend is not unique to Malaysia, but it is in line with the increasing older population worldwide. Malaysia is expected to become an ageing country in 2030 when the population aged 60 years and above reaches 15% of the country's total population (Jabatan Kebajikan Masyarakat Malaysia, 2011). According to the National Policy for Older Persons (Jabatan Kebajikan Masyarakat Malaysia, 2011), older persons are defined as those who are 60 years of age and older based on the definition made at the World Assembly on Ageing 1982. The 2020 Census recorded 3.5 million (10.3%) older persons in the country (Department of Statistics Malaysia, 2022). The older persons population is forecasted to reach 5.5 in 2030, making up about 15.3% of the nation's total population (Department of Statistics Malaysia, 2016). As a result, Malaysia will be an ageing nation in 2030, as the percentage exceeds 15% of the total population (Abdul Rashid et al., 2016; Hamid, 2015; Jabatan Kebajikan Masyarakat Malaysia, 2011). As the population of older persons continues to increase, the need for current information on this population increases, and thus, issues about this particular population are becoming increasingly pertinent to be discussed (Wan-Ibrahim & Zainab, 2012).

Ageing is a normal process in the course of human life. It is a condition that leads to a decrease in physical and mental capacity, increasing the risk of disease and, ultimately, death (World Health Organization, 2022). Ageing is also associated with life transitions such as retirement, loss of spouse or friends, migration of children, and disability or loss of mobility. All the above social changes increase older adults' vulnerability to experiencing loneliness (World Health Organization, 2021). According to the World Health Organization (2021), loneliness is widespread among older persons, and its prevalence varies across countries. The prevalence of loneliness among older persons in high-income countries was 28.5% (Chawla et al., 2021) and in middle-income countries, for example, 21.8% in Nigeria (Igbokwe et al., 2020), 17.7% in Ghana (Gyasi et al., 2022), 9.9% in South Africa (Phaswana-Mafuya & Peltzer, 2017), and 32.7% in India (Muhammad et al., 2023).

Loneliness is a social construct, not a mental disorder (Pengpid et al., 2023). It is a subjective dissatisfaction with one's social relationships (Taylor et al., 2023). It causes people to feel empty, alone, and unwanted (Bhagchandani, 2017). Loneliness is associated with various adverse health outcomes (Chen et al., 2014). It is a risk factor for all causes of morbidity and mortality, with outcomes comparable to cigarette smoking, physical inactivity, and obesity (Landeiro et al., 2017). Previous studies found that socio-demographic characteristics, such as age, gender, ethnicity, marital status, educational attainment, economic level, employment status, place of residence, living arrangement, and number of children, were significantly related to loneliness (Cantarero & Potter, 2014; Chen et al., 2014; Golden et al., 2009; Phaswana-Mafuya & Peltzer, 2017; Susanty et al., 2022; Teh et al., 2014).

Loneliness may contribute to mental and physical ill-health (Pengpid et al., 2023). In mental health, loneliness is positively linked to cognitive decline (Taylor, 2020), anxiety (Igbokwe et al., 2020), depression (Susanty et al., 2022), dementia (Landeiro et al., 2017), low life satisfaction, and poor happiness (Golden et al., 2009; Peltzer & Pengpid, 2019; Pengpid et al., 2023). Regarding physical health, loneliness is positively associated with increased poor self-rated health (Zhao & Wu, 2022), heart disease, hypertension, stroke, lung disease (Petitte et al., 2015), and functional disability (Gyasi et al., 2022; Pedroso-Chaparro et al., 2023).

Many studies have pointed out that social support is related to loneliness (de Jong Gierveld et al., 2015; Makhtar & Samsudin, 2020; Teh et al., 2014; Zhang & Dong, 2022). Older people expect to receive support from family members when they are sick or experience a disability (Chen et al., 2014). Apart from their spouses, adult children provide the most crucial support and social contact in old age (Teh et al., 2014). In the traditional Asian practice of filial piety, adult children provide care and financial support to their ageing parents (Tey, 2017), and frequent contact, care, and affection with spouses and children lessen the feelings of loneliness (Makhtar & Samsudin, 2020). Social participation, such as participation in social activities, is positively associated with greater happiness and well-being (Bruggencate et al., 2018; Teh & Tey, 2019). Instead, limited social participation significantly increases loneliness (Taylor, 2020).

The growing older population in Malaysia, as well as the realisation that loneliness endangers the physical and mental health of older persons, has created interest in research on this topic (Aung et al., 2017; Awang et al., 2022; Hussein et al., 2022; Makhtar & Samsudin, 2020; Teh et al., 2014). However, studies on the prevalence of loneliness among older persons at the national level remain lacking. Except for the study by Teh et al. (2014), which used national survey data to examine the prevalence of loneliness, most studies were conducted on a small

scale and involved a specific locality or community. Despite the essential factor of mental and physical health in loneliness, previous studies focused more on the effects of social support. Furthermore, there is a scarcity of data on loneliness and its associated factors among the older Malaysian population. More recent national survey data could shed more light on this critical issue. Furthermore, given the scarcity of data on this topic in Southeast Asian countries, it is in the interest of this study to contribute to the body of knowledge on loneliness among older people (Peltzer & Pengpid, 2019; Takagi & Saito, 2015).

Based on the cited research, we hypothesise that loneliness is associated with socio-demographic characteristics, mental and physical health, social support, especially from family members, and social participation among older persons in Malaysia. Therefore, this study aims to estimate the prevalence of loneliness and associated factors of socio-demographic characteristics, mental and physical ill-health, family support, and social participation among older persons in Malaysia.

This study is guided by the convoy model of social support (Antonucci et al., 2014) to assess the influence of social participation and social support, especially support from family members, towards an older person's psychological mind, specifically the feelings of loneliness. The convoy model of social support posits that each individual is surrounded by a convoy, which includes specific people who make up their network and affect their well-being (Chen et al., 2014). Research has shown that social support plays a significant role in improving happiness and reducing feelings of loneliness (Awang et al., 2022; Hussein et al., 2022; Makhtar & Samsudin, 2020; Teh et al., 2014; Zhao & Wu, 2022).

Literature Review

Concepts of loneliness

Peplau and Perlman (1982) have defined loneliness as an unpleasant experience that occurs when a person's network of social relationships is reduced in some important way, either quantitatively or qualitatively. According to de Jong Gierveld et al. (2006), loneliness is when an individual experiences unpleasantness or a lack of quality or quantity of a certain relationship. This includes situations where the number of existing relationships is smaller than what is considered appropriate or acceptable, and the intimacy one desires is not obtained. Therefore, loneliness is a subjective and negative experience that depends on a person's evaluation of the quality and quantity of an existing relationship (de Jong Gierveld et al., 2015). Loneliness is a universal problem at all ages, but it is more common and more serious among older people (Beutel et al., 2017; Hutten et al., 2022; Victor & Yang, 2012). There are two types of loneliness experienced by older people: social and emotional (Cohen-Mansfield et al., 2016). Social loneliness arises from

the absence or lack of connectedness with social networks, such as infrequent contact or lack of participation, while emotional loneliness arises from the absence or lack of attachment to a special or beloved person, such as a spouse, children, or friend (van Tilburg, 2021).

Prevalence of loneliness

Many studies show that loneliness is common among older persons (World Health Organization, 2021). According to a systematic review and meta-analysis, the prevalence of loneliness for older persons in Europe is as low as 2.7% in some countries, such as Northern European countries, and as high as 21.3% in some Eastern European countries (Surkalim et al., 2022). In addition to European countries, more than 40% of Americans aged 60 and above reported feeling lonely (Perissinotto et al., 2012). In Southeast Asia, the prevalence of loneliness among older persons was 31.7% in Myanmar (Khin et al., 2022), 21.7% in Thailand (Pengpid & Peltzer, 2023), 23% in Singapore (Lim & Chan, 2017), and 64.0% in Indonesia (Susanty et al., 2022).

There have been studies in Malaysia that have examined the prevalence of loneliness among older persons. Using 2004 Malaysian Population and Family Survey data, Teh et al. (2014) found that about one-third (32.5%) reported sometimes feeling lonely and about one-fifth (20.9%) always feeling lonely. In another nationwide survey, Awang et al. (2022) utilised the data from the Malaysia Ageing and Retirement Survey (MARS), showing that 32.0% of respondents aged 40 years and above experienced loneliness. Hussein et al. (2022) examined the prevalence of loneliness among older persons in a rural community and found that 62.4% of respondents experienced social loneliness, 59.7% experienced emotional loneliness, and 89.2% experienced family loneliness. On the other hand, Aung et al. (2017) reported that 75% of older people in nursing homes always feel lonely. A systematic review shows that the prevalence of loneliness among older persons living in long-term care facilities was between 56% and 95% (Syed Elias, 2018).

Data and Methods

Data source

The data for this study comes from the latest nationally representative Malaysian Population and Family Survey (MPFS) conducted in 2014 by the National Population and Family Development Board (NPFDB). The 2014 MPFS sample was selected using a two-stage stratified sampling design with technical assistance from the Department of Statistics Malaysia. The survey was fielded between September 2014 and January 2015. Data collection was carried out through face-

to-face interviews by trained interviewers. The survey methodology details have been described in the published survey report (National Population and Family Development Board [NPFDB], 2016).

For the current analysis, respondents aged 60 years and above were first selected. A few other ethnic groups and those who were never married and had no children were excluded from the analysis since our analysis focused on the role of family support among older persons in Malaysia.

Measures

Dependent variable

Loneliness was measured with one binary question, "Have you ever felt lonely?". The response option was "yes" or "no".

Independent variables

Socio-demographic variables

Socio-demographic variables included gender, age, ethnicity, marital status, place of residence, educational level, employment, number of children, and sources of income. The sources of income included (i) inheritance (assets, house, land, etc.), (ii) savings in "Tabung Haji" (Malaysian pilgrims fund board), (iii) savings in a bank, (iv) savings in the Employee Provident Fund (EPF), (v) pension, (vi) share investments, and (vii) insurance. The number of income sources was recoded into categorical variables: none, 1-2 sources, and 3 or more sources.

Mental health variables

Life satisfaction was assessed with the question, "Do you feel satisfied with your life?" with a response of "yes" and "no". Meaningful in life was assessed with the question, "Do you feel your life is meaningful?" with a response of "yes" and "no". Anxiety was assessed with the question, "Do you feel worried that something bad will happen to you?" with a response of "yes" and "no". Happiness was assessed with the question, "Do you always feel happy?" with a response of "yes" and "no".

Physical health variables

Self-rated health status was measured with the item "How do you rate your health status?". Response options ranged from 1 = "poor", 2 = "moderate", and 3 = "good". Illnesses were assessed by a self-report of having been diagnosed with any of the following: (i) high blood pressure, (ii) diabetes, (iii) heart disease, (iv) arthritis, (v) asthma, (vi) kidney problems, (vii) stroke, (viii) gout, and (ix) cancer. The number

of illnesses was recoded into categorical variables: none, 1 illness, and 2 or more illnesses.

Physical limitations were assessed by a self-report of having limitations in performing the following daily activities: (i) eating, (ii) bathing, (iii) dressing, (iv) going to the toilet, (v) getting in and out of bed, (vi) climbing stairs, and (vii) walking on a flat surface. The number of physical limitations was recoded into categorical variables: none, 1-2 limitations, and 3 or more limitations.

Family support variables

Family support was assessed based on common support provided by children monthly, which includes (i) financial support, (ii) help to pay bills, (iii) provision of food/other household necessities, (iv) housework, (v) personal care, (vi) listening to problems, (vii) accompanying to places, and (viii) co-residence. The responses for these different forms of family support were recoded into "yes" and "no".

Social participation variables

Social participation was assessed by asking respondents about their monthly participation in religious activities and sports, neighbourhood watch, and non-governmental organisations. The responses for this different participation were recoded into "yes" and "no."

Data analysis

Univariate analysis was performed to obtain the prevalence of loneliness, followed by the overall sample's socio-demographic characteristics, mental health, physical health, family support, and social participation. Bivariate analysis using the Chi-square test examined the association between loneliness across socio-demographic characteristics, mental health, physical health, family support, and social participation. This is followed by performing binary logistic regression to ascertain whether the factors of socio-demographic characteristics, mental health, physical health, social support, and social participation could predict loneliness. Binary logistic regression was used since the dependent variable loneliness was dichotomous, taking the value of 0 for not lonely and 1 for lonely. The analysis generated an odds ratio and a 95% confidence interval for predicting a given variable's likelihood of experiencing loneliness. The logistic model was tested using various tests, including Pearson's Chi-square test, the Nagelkerke R square test, and the Hosmer and Lemeshow test, to ensure the model's goodness of fit.

The IBM Statistical Package for Social Science (SPSS) version 26 was used in this instance.

Findings and analysis

Sample characteristics

Table 1 shows the sample characteristics and other study variables. The proportion of respondents who experienced loneliness was 35.7%. The majority of the respondents were female (55.0%), aged 60-69 (66.7%), Malays (65.7%), currently married (69.1%), and lived in urban areas (54.2%). Only 30% completed secondary education, were not working (77.7%), had at least more than one source of income (80.3%), and lived with their children (58.6%).

In terms of mental health, 93.0% of the respondents were satisfied with their lives, 87.1% felt life was meaningful, and 38.2% felt anxiety about their lives. For physical health, slightly more than one-third (34.2%) of the respondents rated themselves as being in good health. More than 75% of the respondents had more than one illness, and 30.4% had more than one physical limitation.

Regarding social support, more than half (58.6%) of the respondents lived with their family. On the various forms of family support provided to older persons monthly, 76% of the respondents received financial support, 46.7% received support on paying bills, 68.2% received food/other household necessities, 65.1% received help with housework, 62.0% received personal care, 56.1% received support in terms of sharing problems, and 24.1% received support on companionship to places.

Regarding social participation, 75.4% of the respondents participated in religious activities, 22.1% in leisure/sports activities, 31.8% in neighbourhood watch, and 15.2% in non-governmental organisation activities.

Table 1: Percentage distribution of respondents by prevalence of loneliness, according to socio-demographic characteristics, mental health, physical health, family support, and social participation (n = 3,710)

Variables	Percent (%)	Not lonely	Lonely	*p*-value
All		64.3	35.7	-
Socio-demographic factors				
Gender				.000
Male	45.0	74.0	26.0	
Female	55.0	56.4	43.6	
Age				.000

60-69	66.7	67.1	32.9	
70-79	28.1	60.7	39.3	
80+	5.3	48.7	51.3	
Ethnicity				.000
Malay	65.7	62.2	37.8	
Other Bumiputera	10.1	50.0	50.0	
Chinese	17.4	80.5	19.5	
Indian	6.8	64.6	35.4	
Marital status				.000
Married	69.1	72.2	27.8	
Widowed/ divorced/ separated	30.9	46.7	53.3	
Place of residence				.000
Urban	54.2	69.3	30.7	
Rural	45.8	58.5	41.5	
Level of education				.000
No schooling	20.2	45.2	54.8	
Primary	49.7	64.5	35.5	
Secondary	25.0	75.2	24.8	
Tertiary	5.1	85.3	14.7	
Working status				.000
Working	22.3	69.6	30.4	
Not working	77.7	62.8	37.2	
Sources of income				.000
None	19.7	55.8	44.2	
1-2 savings	44.9	62.4	37.6	
3 + savings	35.4	71.5	28.5	
Mental health				
Life satisfaction				.000
No	7.0	38.6	61.4	
Yes	93.0	66.3	33.7	
Life is meaningful				.000
No	12.9	47.3	52.7	
Yes	87.1	66.9	33.1	
Anxiety				.000
No	61.8	71.7	28.3	
Yes	38.2	52.4	47.6	
Physical health				
Self-rated health				.000
Poor	13.2	46.6	53.4	
Fair	52.3	62.8	37.2	
Good	34.5	73.4	26.6	
Illness				.000
None	24.2	70.3	29.7	

1 illness	29.9	67.3	32.7	
2+ illnesses	45.9	59.3	40.7	
Physical limitation				.000
None	69.6	69.8	30.2	
1 limitation	12.8	60.0	40.0	
2+ limitations	17.6	45.7	54.3	
Social support				
Co-residence				.000
No	41.4	60.8	39.2	
Yes	58.6	66.8	33.2	
Financial support				.324
No	20.4	65.9	34.1	
Yes	79.6	63.9	36.1	
Paying bills				.104
No	53.3	65.5	34.5	
Yes	46.7	63.0	37.0	
Food/other household necessities				.027
No	31.8	66.9	33.1	
Yes	62.8	63.1	36.9	
Housework				.711
No	34.9	64.7	35.3	
Yes	65.1	64.1	35.9	
Personal care				.004
No	38.0	67.3	32.7	
Yes	62.0	62.6	37.4	
Sharing problems				.001
No	43.9	67.3	32.7	
Yes	56.1	62.1	37.9	
Transportation/ companionship to places				.000
No	75.9	62.1	37.9	
Yes	24.1	71.6	28.4	
Social participation				
Religious activities				.000
No	24.6	55.7	44.3	
Yes	75.4	67.2	32.8	
Leisure/ sports activities				.000
No	77.9	61.5	38.5	
Yes	22.1	74.5	25.5	
Neighbourhood watch				.318
No	68.2	64.9	35.1	

Yes	31.8	63.2	36.8	
Non-government organizational				.001
No	84.8	63.2	36.8	
Yes	15.2	70.5	29.5	

Prevalence of loneliness

The prevalence of loneliness across the subgroups of the sample is shown in Table 1. The prevalence of lonely females (43.6%) was significantly higher than that of males (26.0%). The prevalence of loneliness significantly increased with age. The prevalence was highest among the 80+ years old (51.3%), followed by those aged 70-79 (39.3%) and 60-69 (32.9%). Across ethnicities, Other Bumiputera had the highest prevalence of loneliness, followed by Malay (37.8%), Indian (35.4%), and Chinese (19.5%). There is a significantly higher prevalence of loneliness among those who were widowed, divorced, or separated (53.3%) than those who were currently married (27.8%). Rural respondents (41.5%) had a significantly higher loneliness prevalence than urban respondents (30.7%). Loneliness was significantly higher among those with no schooling (54.8%) than their counterparts. Respondents who were not working (37.2%) and had no sources of income (44.2%) registered a significantly higher prevalence of loneliness than their counterparts.

The prevalence of loneliness was higher among those who were not satisfied in life (61.4%). Similarly, there was a significantly higher prevalence of loneliness among respondents who felt life was meaningless (52.7%) and anxiety (47.6%). The prevalence of loneliness among those in poor health (53.4%) was significantly higher than those who rated their health status as fair (37.2%) or good (26.6%). Similarly, there was a significantly higher prevalence of loneliness among those who had more than two types of illnesses (40.7%) and more than two physical limitations (54.3%) compared to their respective counterparts.

Loneliness was significantly higher among respondents who were not co-residing with family members (39.2%). While there was no significant difference in the prevalence of loneliness across financial support, paying bills, and housework, it was higher among respondents who received these forms of support. Loneliness was significantly higher among respondents who received support regarding food/other household necessities (36.9%) and personal care (37.4%) than their counterparts. Similarly, respondents who shared their problems (37.9%) and had no support from children to accompany them to a place (37.9%) had a significantly higher prevalence of loneliness compared to their respective counterparts. While there was no significant difference in the prevalence of

loneliness among those who participated in neighbourhood watch activities, the prevalence of loneliness was significantly higher among respondents who did not participate in religious activities (44.3%), leisure/sports activities (38.5%), or non-governmental organisation activities (36.8%).

Binary logistic regression model

A binary logistic regression model was performed to ascertain whether socio-demographic characteristics, mental health, physical health, social support, and social participation factors could predict loneliness. All significantly associated factors with loneliness in the bivariate analysis (Table 1) were entered into a binary logistic regression. A total of 22 independent variables were entered into the model. The logit (log odds) of the binary logistic regression model can be represented by the following equation:

$$\text{Logit } P = \ln(p/(1-p)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_3 X_3 \ldots + \beta_{22} X_{22}$$

Where

β_i is the coefficient for the variable X_i, $I = 1, 2, 3, \ldots 22$,

X_i is the variable that represents a factor, and

The odds for each independent variable are given by Exp(B).

The results of the logistic regression model revealed that socio-demographic characteristics, mental health, physical health, social support, and social participation significantly affect feelings of loneliness (Table 2). Regarding socio-demographic factors, females were 1.172 times (95% CI: 0.977 – 1.406) more likely to experience loneliness than males, but gender did not significantly affect loneliness. Compared to respondents aged 60-69, those aged 80 and above were 1.264 times (95% CI: 0.892 – 1.792) likely to experience loneliness; however, there was no significant difference between age and loneliness. Compared to the Malay respondents, the Chinese respondents were 0.397 times (95% CI: 0.311 – 0.507) less likely to experience loneliness, but there was no significant difference between Other Bumiputera and Indians. Those who were widowed, divorced, or separated were 2.235 times (95% CI: 1.879 – 2.684) more likely to experience loneliness as compared to the married. Urban respondents were 0.823 times (95% CI: 0.698 – 0.970) less likely to experience loneliness than those living in rural areas. Compared to those without schooling, those with primary education (OR: 0.726, 95% CI: 0.592 – 0.891), secondary (OR: 0.603, 95% CI: 0.464 – 0.783), and tertiary (OR: 0.420, 95% CI: 0.260 – 0.680) were less likely to feel lonely. Respondents with three or more income sources were 0.625 times (95% CI: 0.501 -0.781) less likely to experience loneliness.

In terms of mental health, respondents who were satisfied with their lives (OR: 0.445, 95% CI: 0.330 – 0.601) and felt life was meaningful (OR: 0.688, 95% CI: 0.550 – 0.861) were less likely to experience loneliness. In contrast, feelings of anxiety increase the likelihood of loneliness (OR: 1.821, 95% CI: 1.556 – 2.130). Regarding physical health, respondents who rated their health status as fair and good were less likely to experience loneliness than those who rated their health status as poor, with an odds ratio of 0.728 (95% CI: 0.579 – 0.915) and 0.618 (0.475 – 0.804), respectively. In addition, those with three or more physical limitations were 1.542 (95% CI: 1.249 – 1.904) more likely to be lonely than those without physical limitations.

Regarding family support, respondents who lived with adult children were 0.676 times (95% CI: 0.578 – 0.791) less likely to feel lonely than those without children. Respondents who shared problems with their children were 1.238 (95% CI: 1.054 – 1.453) more likely to experience loneliness than those who did not share their problems with their children. The result also showed that those who participated in religious activities were 0.819 times (95% CI: 0.682 – 0.983) less likely to feel lonely.

Therefore, the coefficient and intercept estimates give the following equation:

Logit P = 1.295 – 0.174(Chinese) + 0.809(widowed/ divorced/ separated) – 0.195(urban) – 0.320(primary) – 0.506(secondary) – 0.867(tertiary) – 0.470(3 or more sources of income) – 0.809(life satisfaction) – 0.374(meaningful life) + 0.599(anxiety) – 0.318(fair) – 0.481(good) + 0.120(3 or more physical limitation) – 0.391(co-residence) + 0.213(sharing problems) – 0.200(religious activities)

The logistics regression model was statistically significant: $\chi^2(31) = 730.551$, $p < .000$. This indicates a relationship between loneliness and other study variables. The Nagelkerke R^2 is 0.245, meaning that approximately 24.5% of the variation in feelings of loneliness can be explained by the independent variables in the model. The model correctly classified 71.8% of cases. The Hosmer and Lemeshow test statistics is 3.566 with a significant level of 0.894. The significant value is larger than .05; therefore, the current model fits reasonably well (Pallant, 2016).

Table 2: Logistic regression on the predictors of loneliness

Variables	**Odds ratio**	**95% CI**	***p*-value**
Socio-demographic factors			
Gender			
Male (RC)	-	-	-
Female	1.172	0.977 – 1.406	.088
Age			
60-69 (RC)	-	-	-
70-79	0.943	0.787 – 1.131	.528
80+	1.264	0.892 – 1.792	.188
Ethnicity			
Malay (RC)	-	-	-
Other Bumiputera	1.106	0.853 – 1.434	.447
Chinese	0.397	0.311 – 0.507	.000
Indian	0.840	0.616 – 1.146	.272
Marital status			
Married (RC)	-	-	-
Widowed/ divorced/ separated	2.245	1.879 – 2.684	.000
Place of residence			
Rural (RC)	-	-	-
Urban	0.823	0.698 – 0.970	.020
Level of education			
No schooling (RC)	-	-	-
Primary	0.726	0.592 – 0.891	.002
Secondary	0.603	0.464 – 0.783	.000
Tertiary	0.420	0.260 – 0.680	.000
Working status			
Working (RC)	-	-	-
Not working	0.963	0.791 – 1.173	.709
Sources of income			
None (RC)	-	-	-
1-2 savings	0.836	0.684 – 1.021	.078
3 + savings	0.625	0.501 – 0.781	.000
Mental health			
Life satisfaction			
No (RC)	-	-	-
Yes	0.445	0.330 – 0.601	.000
Life is meaningful			
No (RC)	-	-	-
Yes	0.688	0.550 – 0.861	.001

Anxiety			
No (RC)	-	-	-
Yes	1.821	1.556 – 2.130	.000
Physical health			
Self-rated health			
Poor (RC)	-	-	-
Fair	0.728	0.579 – 0.915	.007
Good	0.618	0.475 – 0.804	.000
Illness			
None (RC)	-	-	-
1 illness	0.994	0.801 – 1.232	.953
2+ illnesses	1.161	0.943 – 1.430	.159
Physical limitation			
None (RC)	-	-	-
1 limitation	1.012	.805	.916
2+ limitations	1.542	1.249 – 1.904	.000
Social support			
Co-residence			
No (RC)	-	-	-
Yes	0.676	0.578 – 0.791	.000
Food/other household necessity			
No (RC)	-	-	-
Yes	0.860	0.718 – 1.030	.101
Personal care			
No (RC)	-	-	-
Yes	0.989	0.829 – 1.180	.903
Sharing problems			
No (RC)	-	-	-
Yes	1.238	1.054 – 1.453	.009
Transportation/ companionship to places			
No (RC)	-	-	-
Yes	0.835	0.692 – 1.007	.059
Social participation			
Religious activities			
No (RC)	-	-	-
Yes	0.819	0.682 – 0.983	.032
Leisure activities/ sport			
No (RC)	-	-	-
Yes	0.890	0.725 – 1.093	.267

Non-government organisation			
No (RC)	-	-	-
Yes	0.968	0.773 – 1.212	.776
Constant	1.295		.000

Note: RC = Reference category; CI = Confidence interval; Logistics regression analysis: score test ($\chi^2(31) = 730.551$, $p < .000$; Nagelkerke $R^2 = 0.245$; classification accuracy = 71.8%; Hosmer and Lemeshow test = 3.566, $p = .894$.

Discussion

This study examined the prevalence of loneliness and its associated factors among older persons in Malaysia using national data from the 2014 Malaysian Population and Family Survey (MPFS). This study found that loneliness among older persons in Malaysia was 35.7%. The prevalence is lower than that of Teh et al. (2014) (53.4%). Compared to studies conducted in other countries in Southeast Asia, the prevalence of loneliness in the present study was higher than in Myanmar (31.7%) (Khin et al., 2022), Thailand (21.7%) (Pengpid & Peltzer, 2023), and Singapore (23.0%) (Lim & Chan, 2017), but very much lower than Indonesia (64.0%) (Susanty et al., 2022).

Among the socio-economic factors, the experience of loneliness was affected by ethnicity, marital status, place of residence, education, and sources of income, consistent with previous studies. In this study, older Chinese persons reported less loneliness than their Malay, other Bumiputera, and Indian counterparts. This study result is consistent with other studies that report that the Chinese were least likely to feel lonely, which could be due to the different norms embedded in their culture (Awang et al., 2022; Teh et al., 2014). It appears that older persons who were widowed, divorced, or separated had a higher risk of experiencing loneliness than their married counterparts. Non-married status and/or widowhood increase the risk of loneliness due to a lack or loss of support from a spouse/partner as a confidant to share intimate feelings and thoughts (Cohen-Mansfield et al., 2016). Urban respondents were less likely to feel lonely compared to their urban counterparts. This could be explained by the availability of more sporting, educational, and cultural activities in urban areas than in rural areas, making older urban people interact more with other people and possibly reducing their loneliness (Jones et al., 2023). In this study, it was established that older persons' educational levels significantly impact loneliness. An increase in education resulted in a decrease in the likelihood of experiencing loneliness. The previous literature also noted that higher education attainment was associated with lower chances of experiencing loneliness (Abshire et al., 2023; Peltzer &

Pengpid, 2019; Susanty et al., 2022). The effects of higher education levels led to less loneliness among older Malays and Indigenous persons (Teh et al., 2014). It may be hypothesised that older people with higher levels of education would have a better income status, better jobs, continued engagement with friends, and participate more in socio-cultural activities (Awang et al., 2022; Aylaz et al., 2012). Having more income sources was associated with less loneliness. This study's findings are consistent with those of (Teh et al., 2014), who discovered that having more sources of income was associated with less loneliness, particularly among Malays and Chinese.

Regarding mental health indicators, the findings of this study revealed that feelings of life satisfaction and life meaning were associated with a lower likelihood of experiencing loneliness among older persons in Malaysia. This is consistent with the findings from previous studies, where the positive connection between life satisfaction and perceived life is meaningful in reducing feelings of loneliness (Muhammad et al., 2023). Szcześniak et al. (2020) found that loneliness has a negative association with the life satisfaction of older people, and this relationship may be altered by involving older persons in lifelong learning. Loneliness leads to anxiety, and this study found that older persons who had feelings of anxiety were more likely to experience loneliness. This finding is consistent with a study conducted by Abdel Aleem et al. (2020), who found a positive correlation between anxiety and loneliness, which could be due to changing traditional family morals and the emerging social and cultural diversions in society.

Older persons who rated their health status as either fair or good were found to be less lonely. The findings are consistent with a study by Phaswana-Mafuya and Peltzer (2017) that found individuals with good subjective health were significantly less likely to experience loneliness than those with poor health. This could be an explanation why older persons with better health conditions are more independent, so they do not depend on other people in their daily lives (Susanty et al., 2022). Moreover, healthy older persons may have a better connection with society. The current study also found that older persons with physical limitations had higher odds of feeling lonely. Several studies have reported similar results (Aartsen & Jylhä, 2011; Cohen-Mansfield et al., 2016; Phaswana-Mafuya & Peltzer, 2017; Susanty et al., 2022; Teh et al., 2014)

The current study showed that older persons with co-residence with their children were less likely to experience this than those with non-co-residence. Older parents living with adult children are a traditional form of support practised in many parts of Asia (Takagi et al., 2020; Teh et al., 2014). This kind of support may lower feelings of loneliness (Berg-Weger & Morley, 2020; Chalise et al., 2007;

Koropeckyj-cox, 1998). The affection they receive from their children reduces loneliness (Susanty et al., 2022).

This study also found that older persons who engage in religious activities were less likely to experience loneliness. The finding of this study is consistent with research conducted by Achmad & Nasution (2020), Amir et al. (2022), Hassan et al. (2013), and Rote et al. (2013). Participation in religious activities can enhance older adults' social support networks and protect them against loneliness (Rote et al., 2013). Religious attendance to pray, meditate, and practice yoga would foster feelings of peace, hope, and forgiveness, reducing loneliness (Muhammad et al., 2023). In Malaysia, older adults who engaged in mosque/religious activities were found to be less lonely (Teh et al., 2014). Taking part in religious activities is not only for spiritual reasons; it also allows older adults to participate in social activities (Tan et al., 2022). Participating in religious activities can be a platform for older people to connect with their families, friends, and community while practicing their beliefs and faith (Pazim et al., 2022). However, only some are actively engaged in this activity (Zainab et al., 2012)Therefore, promoting more religious-based activities can help older adults reduce their feelings of loneliness and increase their quality of life.

Study limitations and advantages

There are some limitations to the current study. Because this was a cross-sectional study, no causal relationships could be drawn between loneliness and independent variables. Second, while this study used current national data, the data is from a survey conducted ten years ago. As a result, the findings may not reflect the current situation because Malaysia has undergone significant socio-economic changes in the last decade.

This study had a number of advantages. The findings of this study have revealed some determinants that require further investigation in order to understand the factors of loneliness and reduce loneliness among Malaysian older people. Second, this study can be used to compare to the upcoming Malaysian Population and Family Survey in 2024. Finally, because data on loneliness in Southeast Asian countries is scarce, this study adds to the body of knowledge.

Conclusion and Recommendations

This study found that loneliness is a serious problem among older persons in Malaysia. The government, social workers, community, and family should pay immediate attention to older persons. Appropriate programs and interventions need to be developed by the government and community to promote a healthy

lifestyle and encourage social activities among older adults. Family members, especially children, who are essential resources for older parents, must play their role by providing tangible and intangible social support for their elderly parents. Older parents need attention from their offspring. Thus, frequent contact and communication with their older parents and attentively listening to their problems would reduce their feelings of loneliness. Depending on their health situation, older adults must also be active by engaging more in community and mosque/religious activities. Engagement in such activities would increase their social network and communication, eventually reducing feelings of loneliness. Hence, programs or activities should be developed in the near future to increase the well-being of the older population in Malaysia, which is aligned with the National Policy for Older Persons and the United Nations SDGs 2030 Agenda's third goal.

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