Research Brief Series: 8 Psychological Resilience of Older Midlife Singaporeans: Findings from a National Study



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> General Editor Normala Manap

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# Psychological Resilience of Older Midlife Singaporeans: Findings from a National Study

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## **Key Findings:**

- At older midlife, social connections specifically having strong social networks and undertaking any type of informal volunteering – are associated with higher psychological resilience.
- Sociodemographic factors associated with higher psychological resilience include being Malay, having a higher number of children, living alone, being highly educated, and having enough income with some left over each month.
- On the other hand, adverse physical and mental health, in terms of health-related difficulty in instrumental activities of daily living and clinically relevant depressive symptom scores, is associated with lower psychological resilience.
- Older midlife sub-groups such as low-income individuals and those in worse health may need specific attention, both in terms of being less likely to be resilient in the face of adversity and being focused on in efforts to enhance psychological resilience.

## Introduction

Resilience as a concept has gained currency in Singapore and the rest of the world over the years, and it has been mentioned especially frequently in recent times in the light of the COVID-19 pandemic [1-3]. Resilience is widely cited as the potential or ability to "bounce back" from a disruptive event [4, 5]. It is used to refer to the capacity and resources for recovering from adverse events; in the context of communities or economies: from natural disasters, pandemics or economic shocks, and in the context of individuals: from an illness, accident, loss of job, bereavement, or other disruptive life event. In academic literature, resilience has also been defined as a "dynamic process of maintaining positive adaptation and effective coping strategies in the face of adversity" [6]. At the individual level, resilience is used to refer to the qualities and traits that enable individuals to respond to, cope with, adapt to, and recover from adversity [5, 7]. When studying individuals, we refer to this as their psychological resilience.

In this research brief, we analyse data from a national study of older midlife adults aged 50-59 years in Singapore and provide an overview of the levels of psychological resilience as well as examine its correlates. Older midlife is an important life stage to study, since individuals at this stage are at the cusp of entering 'older ages'. Many employed individuals are in the twilight of their working lives, others with children have just seen or are in the process of seeing their grown-up children navigate to full-time employment, migrate for further education or set up their own households. Physical health also begins to take primacy at these ages, with a greater emphasis on regular screenings and assessing risk factors for health conditions. Individuals in their 40s to the 70s in ageing societies such as Singapore are colloquially called the "sandwich generation" [8], requiring to balance continuing responsibilities towards children with added roles and responsibilities for taking care of ageing parents.

At this pivotal life stage, it is useful to consider to what extent individuals self-assess how they would respond to and recover from adversity, i.e. that they have the qualities and traits of resilience. Additionally, it is valuable to study which background factors, such as sociodemographic characteristics, health status, and social engagement in the form of social networks and volunteering are associated with higher or lower psychological resilience. From a policy perspective, this information can help identify individuals who may need external support in coping with adversity, and for designing interventions and programmes aimed at enhancing psychological resilience.

### Data

We analyse data from the Panel on Ageing and Transitions in Health Survey (PATHS), a national study of 1654 older midlife adults aged 50 to 59 years old, conducted in 2016-2017 by the Centre for Ageing Research and Education, Duke-NUS Medical School. The data collection for the study involved first drawing a random sample of 1940 Singapore citizens and permanent residents stratified by gender, ethnicity, and age (two 5-year age groups, 50-54 and 55-59) based on the estimated mid-2015 population distribution. All individuals in the sample were attempted to be contacted at least four times to be surveyed at his/her residence. If a potential respondent with an address in a Housing Development Board (HDB) block was uncontactable even after four contact attempts or refused participation, a nearest-neighbour matching method was adopted. Interviewers canvassed neighbouring HDB apartments until a replacement respondent was found, matched on gender, ethnicity, and the 5-year age group, of the potential respondent. Since the background or life circumstances of those available to be interviewed may be different from the original random sample, PATHS is a national study but not necessarily nationally representative of this age group in Singapore. A total of 1654 responses were obtained by the time that data collection was concluded. The study was approved by the Institutional Review Board of National University of Singapore (Reference No.: B-15-104).

## Measuring Psychological Resilience

Psychological resilience is measured in PATHS using the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) [9]. CD-RISC-10 has been widely used as a self-rated measure of psychological resilience, including with older populations and found to have both internal consistency and construct validity [10]. Respondents are presented with a set of 10 statements about coping with adversity, and asked to respond how much they agree with the statements in their own context. The statements range from their ability to adapt to changes, dealing with whatever that comes their way, staying focused and organized under pressure, not being discouraged by failure, their ability to handle sadness, fear, and anger, etc.<sup>1</sup> In the survey, the questions were administered in English, Mandarin, Malay, or Tamil. Respondents could choose from one of five answers: not true at all, rarely true, sometimes true, often true, and true nearly all the time, corresponding to scores of 0, 1, 2, 3, or 4 respectively. Each of the 10 statements thus received a score between 0 and 4, and a total CD-RISC-10 score for each respondent ranged between 0 and 40. Higher scores are indicative of higher psychological resilience.

In the case of 8 respondents who could not be administered the survey directly because of a health reason, a proxy respondent was chosen. However, since the CD-RISC-10 is a selfrated psychological resilience measure, proxy respondents were not administered these questions to answer on behalf of the respondent. We had incomplete CD-RISC-10 data for 1 respondent, and subsequently had a total of 1645 respondents with CD-RISC-10 scores.

<sup>&</sup>lt;sup>1</sup> CARE applied for and obtained the CD-RISC-10 scale to administer in PATHS from Dr. Jonathan R.T. Davidson, an author of the original 25-item Connor-Davidson scale. The scale is copy-written and therefore the exact wording of the statements cannot be shared.

## Average CD-RISC-10 Scores in Singapore Compared Internationally

We first present the average CD-RISC-10 score obtained for the entire sample in our study, compared with other international studies that have used the same set of questions to measure psychological resilience. Although this comparison is only suggestive of the differences across populations, we note that the average CD-RISC-10 score among the older - midlife adults in Singapore (26.5) surveyed in PATHS is lower than that recorded in other countries.

Location	Sample	N	Average (SD)	Source
USA	National random digital dial sample	458	32.1 (5.8)	Davidson et al (unpublished)
USA	Random digital dial sample in Memphis of adults aged 18-75	764	31.8 (5.4)	Campbell-Sills et al (2008)
USA	Older adults in a federally recognized Native American tribe, aged 55 and older	160	33.5 (6.2)	Goins et al (2012)
USA	Community dwelling older adults ages 50-99	1006	30.8 (7.0) to 32.1 (6.2) range, by age-group	Jeste et al (2013)
Portugal	Community sample, Lisbon	421	29.3 (5.7)	Faria et al (unpublished)
Spain	Adult sample aged 18-60	1922	29.0 (0.1)	Antunez et al (2015)
Singapore	Community-dwelling adults aged 50-59	1645	26.5 (5.9)	PATHS

 Table 1: Average CD-RISC-10 Scores in Singapore Compared to Other General Population

 Studies

Source: Amended from Davidson (2018).

Two-sample t-tests (results not shown here) confirmed that the difference between the average score in Singapore and each of the other studies is statistically significant. Exploring the reasons for these differences between older midlife adults in Singapore and others is beyond the scope of this study. Overall, there are only a handful of studies such as the ones listed in Table 1 that have measured psychological resilience using CD-RISC-10 in the general population. A number of other studies have measured psychological resilience among adult populations with specific characteristics such as those that have a chronic ailment or have had a recent experience of adversity such as injury, natural disasters, etc., and study the extent to which psychological resilience predicts differential response and recovery [11-13]. Our study, while not nationally representative, makes a contribution both internationally and within Singapore by offering insights about the factors associated with and possible intervention areas for enhancing psychological resilience among a specific age-group of the general population.

## Psychological Resilience among Different Older Midlife Sub-groups in Singapore

#### Analysis

We present the average CD-RISC-10 score (alternately referring to this as the average psychological resilience score) for different sub-groups defined in terms of demographic characteristics, socioeconomic status, and physical and mental health. In addition, we also study psychological resilience by the extent of social networks, and volunteering status of individuals. Both social networks and volunteering have been identified in international research as factors associated with higher psychological resilience, and we examine whether and to what extent these relationships hold true for older midlife adults in Singapore.

We also present results of linear regression models, equivalent to one-way analysis of variance, showing the statistical significance of the difference between the average CD-RISC-10 score across the different categories within each sub-group. For 26 cases out of 1645, we had missing data on one or more of the sub-group variables. We omitted these from all further analysis, and thus had a final analytical sample of 1619 respondents, about 98.5% of those with a CD-RISC-10 score.

#### **Demographic Characteristics**

	N	Score	p value of difference
Age-group			
50-54 years	779	26.6	Ref.
55-59 years	840	26.4	NS
Gender			
Females	778	26.4	Ref.
Males	841	26.6	NS

 Table 2:
 Average CD-RISC-10 score measuring psychological resilience, by gender and age group

Note: Ref. = reference group. NS = no statistically significant difference at p < 0.05.

We see first in Table 2 that there is no statistically significant difference between females and males, or between the two 5-year age groups of 50-54 and 55-59 years, in terms of their CD-RISC-10 scores.



Figure 1: Average CD-RISC-10 score measuring psychological resilience, by ethnicity

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

In terms of ethnic groups, the PATHS dataset included a small number of Others (n=17). We combined Indians (n=212) and Others to form the third ethnic group for this analysis. Among the three ethnic groups, Malays have the highest average CD-RISC-10 score (27.8), compared to Indians and Others (26.4) and Chinese (26.1). The difference between the Malay and Chinese is statistically highly significant.





Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

Figure 2 shows the distribution of average psychological resilience scores by current marital status. Across marital status categories, the average CD-RISC-10 score is highest among those currently married (26.7) and the lowest among those widowed (24.9), and the difference between these two categories is statistically significant. The average CD-RISC-10 scores does not differ substantially between those currently married, separated / divorced, and never married, and these differences are not statistically significant.



Figure 3: Average CD-RISC-10 score measuring psychological resilience, by living arrangements

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

The average CD-RISC-10 score is highest among those living alone (26.9) followed closely by those living with a spouse (26.8). It is the lowest among those living with others (25.4). The only statistically significant difference is between the reference category of living with a spouse and a child (26.6) and those living with others.

#### Socioeconomic Status

We measure socioeconomic status using variables for educational attainment, housing type, perceived income adequacy and employment status.



Figure 4: Average CD-RISC-10 score measuring psychological resilience, by educational attainment

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

We see the presence of an educational gradient in psychological resilience, with the highest average CD-RISC-10 score seen for those with tertiary education, i.e. junior college (JC), polytechnic or university education (27.8), followed by those with secondary education (26.5), primary education (25.1), and the lowest for those with no formal education (24.5).Compared to those with no formal education, the scores among those with secondary education and tertiary education are statistically significantly higher.



Figure 5: Average CD-RISC-10 score measuring psychological resilience, by housing type

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

Housing type has been shown in previous research to be a valid proxy for income in Singapore [14]. The highest average psychological resilience score is seen among those living in private housing (28.0), and the lowest among those in 1-2 room HDB apartments (24.8). Compared to the reference category of 3 room HDB apartments, the average score is statistically significantly higher among those in 5-room HDB, HUDC, and executive housing and in private housing.



Figure 6: Average CD-RISC-10 score measuring psychological resilience, by perceived income adequacy

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

Perceived income adequacy was measured in PATHS by asking respondents if they felt that they had adequate income to meet their monthly expenses. Respondents could indicate that they had some or much difficulty in meeting their monthly expenses, or that they had no difficulty but just enough money, or that they had enough money with some left over.

Individuals who reported having enough money with some left over have the highest psychological resilience score (28.2), followed by those with just enough money (26.1), and this difference was statistically highly significant. Those with some/much difficulty in meeting expenses have the lowest score (25.5), but this is not statistically different from those with just enough money.

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	N	Average	p value of difference
Currently working	1297	26.6	Ref.
Currently not working	322	26.2	NS

Note: Ref. = reference group. NS = no statistically significant difference at p < 0.05.

In Table 3, we find that the average CD-RISC-10 score is similar for those currently working and those not working.

Research Brief Series 8

#### **Health Status**

10

We measured physical health status in terms of self-reported 'ever-diagnosis' by a health professional of any one among 20 ailments,<sup>2</sup> health-related difficulty in independently performing any one among six basic activities of daily living (ADLs), and health-related difficulty in independently performing any one among seven instrumental ADLs. Basic ADLs are daily self-care activities (taking a bath or shower, dressing, eating, standing up from a bed or chair or sitting down on a chair, walking around the house, and using a sitting toilet). IADLs represent more complex tasks that involve greater organization and coordination (preparing own meals, leaving the home to purchase necessary items or medication, taking care of financial matters e.g. paying utility bills, using the phone, dusting, clean-up and other light housework, taking public transport to leave home; and taking prescribed medication).



Figure 7: Average CD-RISC-10 score measuring psychological resilience, by physical health status

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

<sup>&</sup>lt;sup>2</sup> The physical ailments were: heart attack/angina/myocardial infarction; heart failure; other forms of heart diseases; cancer; cerebrovascular disease; high blood pressure/hypertension; high blood sugar/diabetes; high blood cholesterol or lipids; chronic respiratory illness; chronic back pain; joint pain/arthritis/rheumatism/nerve pain; osteoporosis; glaucoma; age-related macular degeneration; autoimmune disorder; chronic skin conditions; epilepsy; thyroid disorders; migraine; and Parkinson's disease.

Our analysis of the average psychological resilience scores by physical health measures presented in Figure 7 shows that although those with 1 or more chronic physical ailments and those with health-related difficulty in 1 or more ADLs have a lower psychological resilience score compared to those who had none of either, these differences are not statistically significant. We did find, however, that individuals who have health-related difficulty in 1 or more IADLs have a significantly lower average psychological resilience score compared to individuals who report no health-related difficulties in IADLs.

Mental health was operationalized in terms of depressive symptoms, measured using the 11-item Centre for Epidemiologic Studies-Depression (CES-D) scale, a widely-used tool for screening of depressive symptoms [15]. Respondents were presented with eleven statements pertaining to poor appetite, restless sleep, feeling sad, lonely, feeling that people were unfriendly, being disliked by others, feeling happy, enjoying life, etc. and asked to what extent this was true for them in the week preceding the survey. The three response options of none/rarely, sometimes, and often corresponded to scores of 0, 1, or 2 respectively, with the total score for an individual thus ranging from 0 to 22. Based on previous research, a score of 7 and above was used to indicate that depressive symptoms for a respondent were clinically relevant [16].

 Table 4:
 Average CD-RISC-10 score measuring psychological resilience, by depressive symptoms

Depressive Symptoms	N	Average CD-RISC-10 score	p value of difference	
Not clinically relevant (<7)	1389	26.8	Ref.	
Clinically relevant (≥7)	230	24.6	***	

Note: Ref. = reference group. \*\*\* Statistically significance difference at p < 0.001.

Individuals with clinically relevant depressive symptoms (7 or more) have a lower average psychological resilience score, and the difference is statistically highly significant.

#### Social Networks

Social networks are a measure of the extent and strength of an individual's social relationships and ties. Social networks encompassing relatives and friends living outside the respondent's own household were measured using the 12-item Lubben Social Network Scale – Revised (LSNS-R) [17]. The LSNS-R comprises of 6 questions each about relatives and friends, with a total score ranging from 0 to 60, with higher scores indicating stronger social networks. For this analysis, we categorized the LSNS-R score into tertiles.



Figure 8: Average CD-RISC-10 score measuring psychological resilience, by social network tertiles

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

As shown in Figure 8, compared to those in the lowest tertile of social networks, those in the middle- or highest tertile have substantially higher average psychological resilience scores.

#### Volunteering

12

The relationship between psychological resilience and volunteering is of particular interest, because it suggests possibilities for ways by which resilience may be enhanced. Research has found that volunteering by older adults leads to an expansion of their own potential sources of support, and that it is associated with greater life satisfaction and higher self-esteem [18, 19].

Formal volunteering was measured in PATHS based on the provision of any unpaid help to any group, club or organization in the 12 months prior to the survey. Respondents could report either none or any volunteering in an organizational setup such as raising funds, participation in committees, organizing activities or events, education, teaching or coaching, administrative work, campaigning, etc. Informal volunteering was measured as the provision of unpaid help to friends, neighbours and other non-relatives in the past 12 months, such as helping individuals who had physical mobility difficulties, doing shopping or helping with financial matters, babysitting, help with household chores or repairs, personal care, transporting or escorting others, etc.



Figure 9: Average CD-RISC-10 score measuring psychological resilience, by volunteering status

Note: Figure within bar indicates the average CD-RISC-10 score for the category. Ref. = reference group. p value of difference between average CD-RISC-10 score for the category and reference group is shown above the bar. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001; NS = no statistically significant difference.

In Figure 9, the results show that those with any formal and those with any informal volunteering in the past 12 months have higher average psychological resilience scores compared to their counterparts with no formal and no informal volunteering respectively. The differences in both cases are statistically highly significant.

#### **Multiple Regression Analysis**

In order to further ascertain the relationship between psychological resilience and sociodemographic characteristics, physical and mental health, social networks, and volunteering status, we employed a multiple linear regression model with the CD-RISC-10 score as the dependent variable and the variables studied above included as independent variables. The multiple regression framework allows us to examine the association between psychological resilience and a variable of interest while statistically 'controlling' for, or holding constant, other variables included in the model.

We built upon the previous analysis of bivariate relationships between average psychological resilience scores and various sub-groups in two ways: (1) we included a variable for the number of living children, to study an additional dimension of demographic characteristics associated with psychological resilience, and (2) although we had not found a statistically significant difference in the average CD-RISC-10 score between males and females, we sought to explore the possibility that the association between gender and psychological resilience could vary based on the strength of social networks. Previous research has found differences between midlife males and females in the role of social networks in the provision and receipt of social support [20], and there are studies that suggest that when faced with adversity at older ages, for example bereavement, women are more resilient compared to men [21, 22].

Hence, we included an interaction term between gender and social network tertiles in the multiple regression model. We present the results in Table 5. We show the results only for those variable where at least one category was found to be statistically significant.

Variables	Regression coefficient (unstandardized)	p value			
Ethnicity (ref. = Chinese)					
Malay	1.646	***			
Indians and Others	0.268	NS			
Number of children	0.375	*			
Living arrangements (ref. = living with spouse and child)					
With spouse	0.771	NS			
With child	1.926	NS			
With others	1.766	NS			
Living alone	3.274	*			
Educational attainment (ref. = No formal education)					
Primary	0.384	NS			
Secondary/vocational/ITE	1.011	NS			
JC/Polytechnic/University	1.909	*			
Perceived income adequacy (ref. = No difficulty, just enough)					
Some / much difficulty	-0.065	NS			
Enough, with some left over	1.386	***			
Health-related difficulties with IADLs (ref. = none)					
1 or more	-3.423	*			
Depressive symptoms (ref. = not clinically relevant)					
Clinically relevant number of symptoms	-1.615	***			
Informal volunteering (ref. = none in past 12 months)					
Any	1.310	***			
Interaction between gender and social networks					
Gender (ref. = Males)					
Females	0.128	NS			
Social networks (ref. = lowest tertile)					
Middle tertile	2.018	***			
Highest tertile	3.014	***			
Female * Middle tertile	-1.600	*			
Female * Highest tertile	-0.878	NS			

Table 5: Multiple regression analysis of the factors associated with psychological resilience

Note: N=1619. \* p <0.05, \*\* p <0.01, \*\*\* p <0.001. NS = not statistically significant. IADL = instrumental activity of daily living. Only the variables where at least one category was associated with psychological resilience at p <0.05 are shown here. Model also adjusts for age group, marital status, housing type, employment status, any chronic physical ailment, health-related difficulty with any activity of daily living, and formal volunteering.

Research Brief Series 8



The multiple regression analysis presents interesting results. Older midlife Malays compared to Chinese, those with a higher number of children, those living alone compared to those living with a spouse and a child, those with stronger social networks, higher educational attainment, individuals with enough income with some left over each month, and those who undertook any type of informal volunteering have higher psychological resilience scores.

Conversely, adverse physical and mental health, in terms of health-related difficulty in 1 or more instrumental ADLs and clinically relevant depressive symptom scores, is associated with lower psychological resilience.

To aid the interpretation of the interaction terms, we calculated the predicted values of psychological resilience for males and females in each of the three social network tertiles based on the multiple regression model shown above. The values are presented in Figure 10.



Figure 10: Predicted CD-RISC-10 score by gender and social network tertiles

Note: Predicted values are based on model presented in Table 5.

At the lowest tertile of social networks, females are predicted to have marginally higher psychological resilience compared to males. We also note that psychological resilience is higher at the middle and highest tertiles compared to the lowest tertile of social networks for both males and females, but the increase across social network tertiles is higher for males than females. Furthermore, compared to lowest tertile social networks where the difference between males and females is marginal, psychological resilience is higher for males compared to females at both middle and highest social network tertiles.

### **Discussion and Recommendations**

The aim of this brief is to provide an overview of levels of psychological resilience among older midlife individuals in Singapore, and present a summary of the associations between psychological resilience and sociodemographic characteristics, physical and mental health, social networks, and volunteering status.

A comparison of the data from Singapore with other studies found that older midlife Singaporeans had lower psychological resilience scores compared to adults in other Western countries.

There are also cultural differences in psychological resilience within Singapore. Malays (who form 13.4 % of the resident Singapore population) report significantly higher psychological resilience compared to their Chinese counterparts (74.4%), the majority population. There are several potential reasons for this, a detailed study of which is beyond the scope of this study. However, it may be of interest in future studies to examine this further, for example, the role that a strong sense of family and community among Malays plays in enhancing psychological resilience among individuals.

Older adults who live alone are more psychologically resilient compared to their counterparts in other living arrangements. It is certainly possible that older midlife adults who live alone are more likely to self-rate that they have a high capacity to deal with adverse events and disruptions, compared to those who live with other family members or others. In the absence of longitudinal data or data on the length of time spent in different living arrangements, we cannot ascertain whether living alone causes an individual to become more psychologically resilient over time, or whether individuals who are more psychologically resilient choose to live alone and this can be explored in future research.

Financial stability is an important aspect of growing older and may be an area of increasing concern as older midlife adults look ahead to their older ages where they may be relying on savings, passive income sources, and support from children or others. Our data show the positive effects of having more than enough income each month on psychological resilience, for it may positively influence the self-perceived ability to respond to and recover from financially-disruptive events. Greater attention to retirement adequacy and adequate retirement planning at younger ages may aid in ensuring financial stability at older ages.

Psychological resilience is also significantly associated with health-related factors. In particular, older individuals with health-related difficulties in IADLs report lower psychological resilience. As stated earlier, IADLs require greater organization and coordination compared to basic ADLs, and some activities require interacting with the larger environment beyond one's household. Older midlife adults with difficulties in one or more IADLs may feel less mastery over their lives as they rely on others to interface with their environment, e.g., grocery shopping or taking public transport, thus adversely affecting the extent to which they think they can cope with stressors in life.

We find that a higher number of depressive symptoms at older midlife is associated with lower psychological resilience, confirming the findings of other research studies [23]. Depressive symptoms may be related to prior adverse life events, among other factors, although once again the causal relationship between the two cannot be established in a cross-sectional study such as this.

Stronger social networks are positively associated with higher psychological resilience, underscoring the importance of maintaining one's networks at older ages. Other studies have indicated that stronger social ties and receipt of emotional and instrumental support are positively associated with attitudes such as life satisfaction, openness, optimism, and greater acceptance, which can buffer the adverse effect of stress on wellbeing [24, 25]. Larger social networks may also increase the confidence of individuals that they will receive support and be able to cope at the time of adversity [26]. Our results suggest that males receive these advantages of stronger social networks more than females. Compared to females, males appear to benefit more from both middle and highest tertile social networks, whereas a marked increase in psychological resilience is seen for females only when they are in the highest tertile of social networks. Gender differences in the type of support that social networks provide, and the differential role of social network in overcoming stressors for males and females may explain some of these differences.

Our analysis finds that only informal volunteering and not formal volunteering is associated with higher psychological resilience. It may be worth exploring whether informal volunteering groups can be supported to expand the range of opportunities for older midlife adults to volunteer and engage further within their own communities. Overall, older midlife adults should also be aware of the advantages of remaining connected to their social networks, and be cognizant that social networks especially those related to work are likely to decline over time, and therefore make the effort to maintain and increase the strength if not the size of existing ties.

We have operationalized psychological resilience as a set of individual traits and selfperceived ability and capacity to respond to adversity; although this suggests that psychological resilience is a set of static traits or is expressed at a specific point in time, it is important to recall that psychological resilience is also conceived of as a dynamic process of adaptation to adversity [6]. This suggests that psychological resilience can be diminished or enhanced over time in response to stressful life events themselves and improved through interventions as well. There is an increasing body of research on "resilience-training" programmes and interventions pointing in this direction. Initiatives that promote the development of active coping strategies, cognitive flexibility, self-efficacy, as well as supporting individuals to expand their social support networks and engagement are among those that can enhance resilience [27].

In conclusion, our study has provided insights into the factors that can impact older midlife Singaporeans' psychological resilience as well as provided inputs for possible interventions. We have indicated that psychological resilience at the individual level is associated with both the individual's own sociodemographic characteristics, and health status as well as

the larger environment in terms of social networks and engagement with others in the form of volunteering. In particular, our findings suggest that sub-groups such as older males, low-income individuals, those with poorer functions as well as those with limited social networks and engagements may need specific attention, both in terms of being less likely to be resilient in the face of adversity, and being focused on in efforts to enhance psychological resilience.

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