Research Brief Series: 16

A Profile of Family Caregivers of Older Adults in Singapore

Jeremy Lim-Soh, Nur Diyana Binte Azman, Ha-Linh Quach, Veronica Shi Min Goh, Rahul Malhotra

DukeNUS Medical School

Centre for Ageing Research & Education

A Profile of Family Caregivers of Older Adults in Singapore

Jeremy Lim-Soh, Nur Diyana Binte Azman, Ha-Linh Quach, Veronica Shi Min Goh, Rahul Malhotra

Key Findings:

- We interviewed 278 primary (or main) family caregivers and their older care recipients (aged 75 years and above and receiving assistance with one or more activities of daily living) between April 2019 and May 2020. The older care recipients were participants of two national surveys of older adults in Singapore.
- While 23% of the family caregivers were the spouse of the care recipient, the remainder were mostly a child or child-in-law (73%).
- Family caregivers faced health challenges of their own – 40% rated their health as fair or poor (versus good, very good or excellent), 58% had two or more chronic diseases, 26% had mobility difficulties and 27% reported clinically relevant depressive symptoms.
- Caregiving hours were long, on average 33 hours per week, and a quarter of the family caregivers were the only person taking care of their care recipient.
- Only 5% of the caregivers had attended any caregiver training and only 38% were aware of the government-subsidised caregiver training grant.
- Half of the non-spousal caregivers were working, yet only 28% of them had access to flexi-place work arrangements and only 27% were entitled to Eldercare Leave.

Table of Contents

Abbreviations

ADL / ADLs	Activity of Daily Living / Activities of Daily Living
CES-D	Center for Epidemiologic Studies-Depression Scale
CD-RISC	Connor-Davidson Resilience Scale©
HDB	Housing & Development Board
LSNS-6	Lubben Social Network Scale – 6
MDW / MDWs	Migrant Domestic Worker / Migrant Domestic Workers
mCRA	modified Caregiver Reaction Assessment
TraCE	Caregiving Transitions among Family Caregivers of Elderly Singaporeans
S-PAC	Short-Positive Aspects of Caregiving

1. Introduction

More older adults are requiring daily assistance with basic activities of daily living (ADLs), such as bathing, dressing, and toileting, as well as instrumental ADLs, such as taking public transport, shopping, and managing medications.[1] Thus, the need to shoulder the caregiving of an older family member is becoming increasingly common among many Singaporeans. With the expectation that most older Singaporeans will age in place, rather than being placed in a nursing home, family caregivers are key to ensuring that their needs are met.[2] Family caregivers often face multiple challenges, including the need to adapt to their care recipients' diverse and changing needs, maintaining their own physical and mental health, and balancing caregiving responsibilities with career or family aspirations.

The Survey on Informal Caregiving,[3] conducted in 2010-2011, found that primary (or main) family caregivers of older adults had significant health problems themselves, with an average of one chronic disease, and on average spent 38 hours a week on caregiving. A decade later, what is the profile and situation of family caregivers in Singapore? Has the rising educational profile of Singaporeans and the increased availability of home care and other services made an impact on caregiving?[4,5] Do working family caregivers have adequate access to flexible work arrangements and paid leave from work?

We conducted the baseline data collection of the 'Caregiving Transitions among Family Caregivers of Elderly Singaporeans' (TraCE) survey, from April 2019 to May 2020, to obtain an up-to-date picture of family caregiving for older adults in Singapore. We interviewed 278 primary (or main) family caregivers of Singaporean older adults aged 75 years and above who received basic or instrumental ADL assistance, and where possible, the older adults (i.e., the care recipients) they were caring for. In this report, we present descriptive statistics on caregivers' socio-demographics, health, caregiving situation, and work situation, as well as the care recipients' socio-demographics and health.

2. Caregivers' socio-demographics

Figure 1 shows the distribution of caregivers' gender and their relationship with the care recipient. The TraCE survey sample comprised 74 (27%) male and 204 (73%) female caregivers. About 75% of the caregivers had non-spousal relationships with their care recipient (among them, 95% were a child or child-in-law of the care recipient), and this distribution was similar between male and female caregivers.
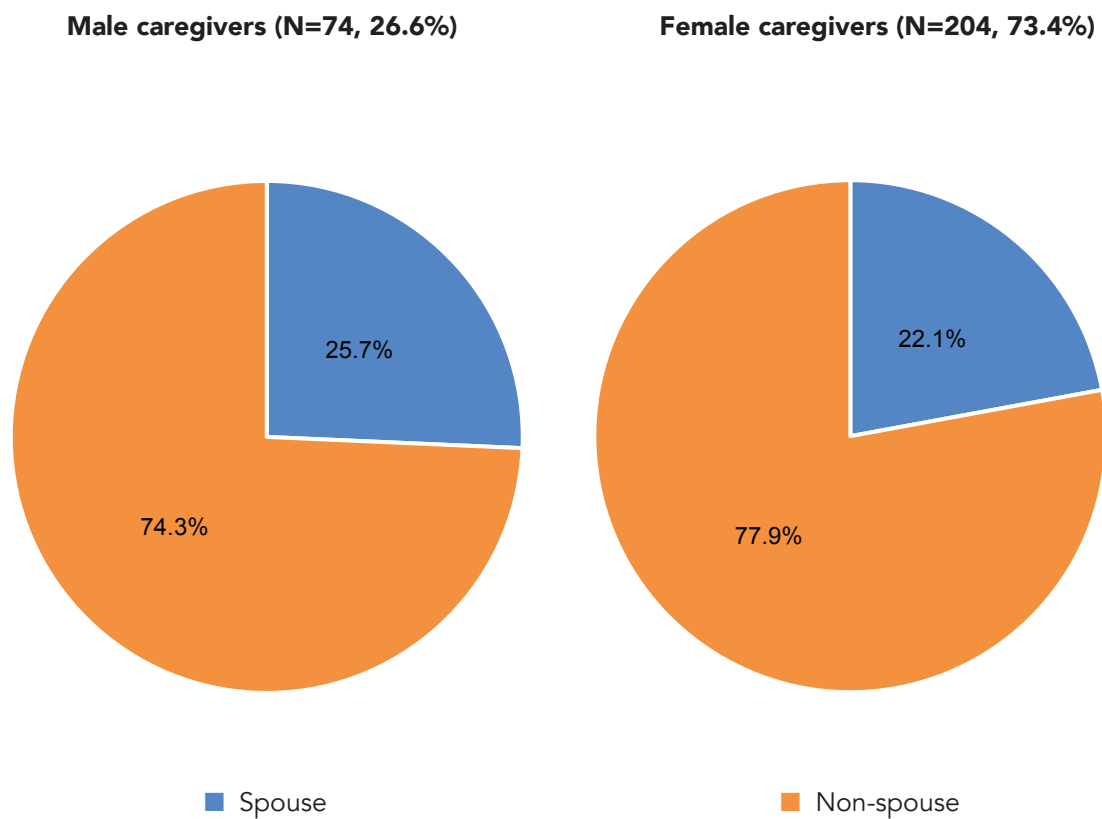
Male caregivers (N=74, 26.6%)   **Female caregivers (N=204, 73.4%)**

25.7%   22.1%

74.3%   77.9%

■ Spouse   ■ Non-spouse

Figure 1. Caregivers' gender and their relationship with the care recipient

While caregivers aged below 80 years were mostly female (Figure 2), the balance shifted towards male caregivers in the oldest age bracket of 80 years and above (65%). Furthermore, caregivers' age was closely aligned to their relationship with the care recipient (Figure 3). Caregivers younger than 70 years were most often a child or child-in-law of the care recipient. On the other hand, most caregivers aged 70 years and above were the care recipient's spouse.
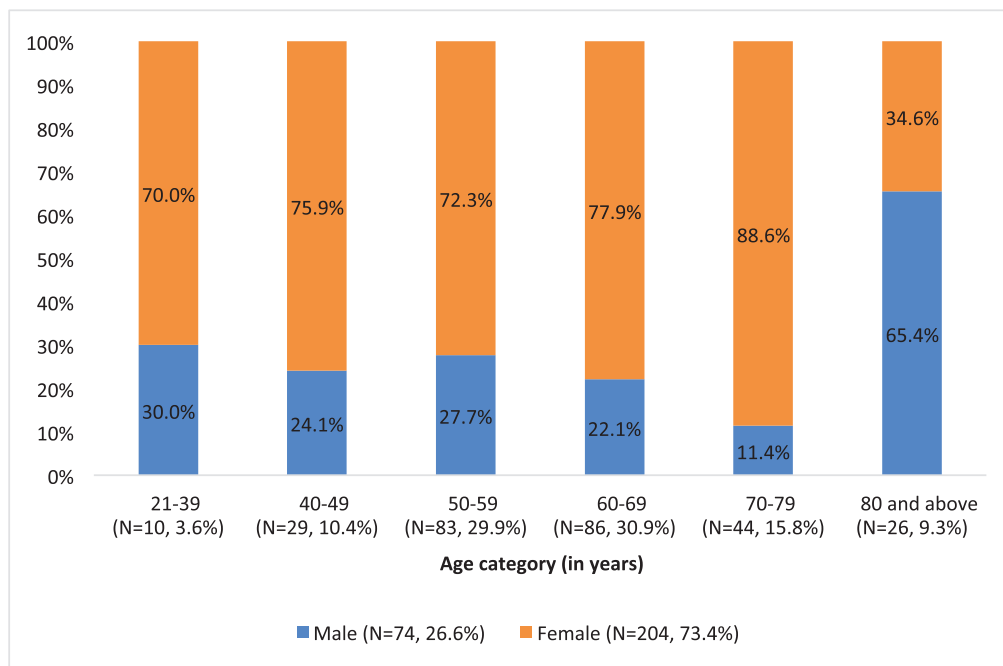

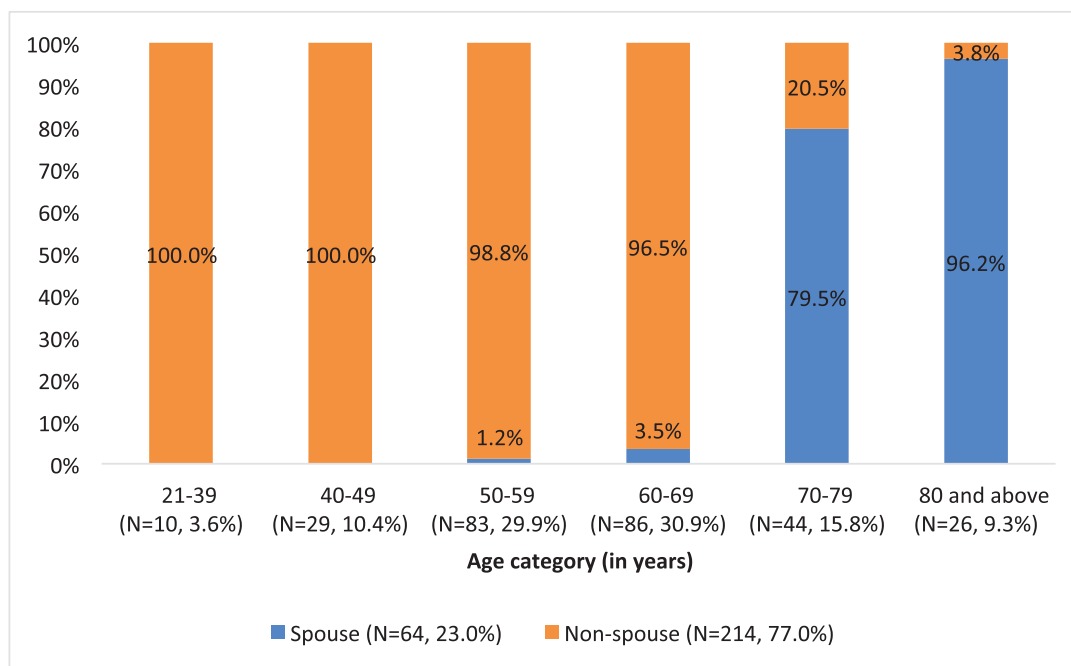**Figure 2. Caregivers' gender by caregiver age category**

Figure 3. Caregivers' relationship with the care recipient by caregiver age category

Table 1 shows caregivers' socio-demographics, overall and stratified by gender and relationship with the care recipient. The mean age of the caregivers was 61.7 years; a majority were of Chinese ethnicity (68%) and practiced Buddhism/Taoism (38%). Most (69%) of the caregivers had secondary or higher education, and more than 90% lived in HDB (Housing and Development Board) flats. While 60% of the caregivers were currently married, 31% had never married. Nearly two-thirds (65%) of the caregivers had children, with an average of three children. More than 85% of the caregivers co-resided with their care recipient. More than half of the caregivers were retired whereas 42% were still working.

While the largest ethnic group and practiced religion among caregivers were Chinese and Buddhist/Taoist respectively, there were significant differences in ethnicity and religion between male and female caregivers. There were significant differences between spousal and non-spousal caregivers in terms of age, education level, whether they had children, mean number of children, and employment status. The mean age was 77 years for spousal and 57 years for non-spousal caregivers. While 83% of non-spousal caregivers had at least secondary education, most spousal caregivers (78%) had received no formal education or only primary-level education. Almost all spousal caregivers (98%) and about 55% of non-spousal caregivers had children; among caregivers with children, spousal caregivers had on average three children while non-spousal caregivers had on average two children. Relatively few (14%) of the spousal caregivers and half (50%) of the non-spousal caregivers were employed.

Table 1. Socio-demographics of family caregivers, overall and stratified by gender and relationship with the care recipient

	All (N=278)	Gender		Relationship with the care recipient	
		Male (N=74, 26.6%)	Female (N=204, 73.4%)	Spouse (N=64, 23.0%)	Non-spouse (N=214, 77.0%)
Age in years, mean (SD)	61.7 (12.0)	63.2 (14.0)	61.2 (11.1)	**77.2 (5.9)**	**57.1 (9.1**)
Ethnicity					
Chinese	189 (68.0%)	**63 (85.1%)**	**126 (61.8%)**	46 (71.9%)	143 (66.8%)
Malay	50 (18.0%)	**6 (8.1%)**	**44 (21.6%)**	10 (15.6%)	40 (18.7%)
Indian	36 (12.9%)	**4 (5.4%)**	**32 (15.7%)**	8 (12.5%)	28 (13.1%)
Others	3 (1.1%)	**1 (1.4%)**	**2 (1.0%)**	0 (0.0%)	3 (1.4%)
Religion					
Buddhism/Taoism	105 (37.8%)	**38 (51.4%)**	**67 (32.8%)**	30 (46.9%)	75 (35.0%)
Christianity	66 (23.7%)	**15 (20.3%)**	**51 (25.0%)**	12 (18.8%)	54 (25.2%)
Islam	57 (20.5%)	**6 (8.1%)**	**51 (25.0%)**	11 (17.2%)	46 (21.5%)
Hinduism	19 (6.8%)	**2 (2.7%)**	**17 (8.3%)**	4 (6.3%)	15 (7.0%)
Other religion	4 (1.4%)	**0 (0.0%)**	**4 (2.0%)**	1 (1.6%)	3 (1.4%)
No religion	27 (9.7%)	**13 (17.6%)**	**14 (6.9%)**	6 (9.4%)	21 (9.8%)
Education level					
No formal education	30 (10.8%)	7 (9.5%)	23 (11.3%)	**26 (40.6%)**	**4 (1.9%)**
Primary	57 (20.5%)	16 (21.6%)	41 (20.1%)	**24 (37.5%)**	**33 (15.4%)**
Secondary	94 (33.8%)	22 (29.7%)	72 (35.3%)	**7 (10.9%)**	**87 (40.7%)**
Vocational / ITE	16 (5.8%)	6 (8.1%)	10 (4.9%)	**0 (0.0%)**	**16 (7.5%)**
JC / Polytechnic	45 (16.2%)	14 (18.9%)	31 (15.2%)	**4 (6.3%)**	**41 (19.2%)**
University	36 (12.9%)	9 (12.2%)	27 (13.2%)	**3 (4.7%)**	**33 (15.4%)**
Housing type					
HDB 1/2-room[a]	10 (3.6%)	4 (5.4%)	6 (2.9%)	5 (7.8%)	5 (2.3%)
HDB 3-room	68 (24.5%)	18 (24.3%)	50 (24.5%)	18 (28.1%)	50 (23.4%)
HDB 4-room	93 (33.5%)	22 (29.7%)	71 (34.8%)	21 (32.8%)	72 (33.6%)
HDB 5-room and others[b]	86 (30.9%)	23 (31.1%)	63 (30.9%)	16 (25.0%)	70 (32.7%)
Private condo / landed	21 (7.6%)	7 (9.5%)	14 (6.9%)	4 (6.3%)	17 (7.9%)
Marital status					
Never married	86 (30.9%)	22 (29.7%)	64 (31.4%)	0 (0.0%)	86 (40.2%)
Married	168 (60.4%)	48 (64.9%)	120 (58.8%)	64 (100.0%)	104 (48.6%)
Widowed	7 (2.5%)	0 (0.0%)	7 (3.4%)	0 (0.0%)	7 (3.3%)
Divorced / Separated	17 (6.1%)	4 (5.4%)	12 (5.9%)	0 (0.0%)	17 (7.9%)
At least one child	180 (64.8%)	50 (67.6%)	130 (63.7%)	**63 (98.4%)**	**117 (54.7%)**
Number of children, mean (SD)[c]	2.4 (1.1)	2.3 (1.1)	2.5 (1.1)	**2.9 (1.2)**	**2.2 (1.0)**
Co-residence with care recipient	240 (86.3%)	68 (91.9%)	172 (84.3%)	64 (100%)	176 (82.2%)
Employment status					
Working full-time	80 (28.8%)	23 (31.1%)	57 (27.9%)	**5 (7.8%)**	**75 (35.0%)**
Working part-time	36 (12.9%)	9 (12.2%)	27 (13.2%)	**4 (6.3%)**	**32 (15.0%)**
Retired / Unemployed	145 (52.2%)	42 (56.8%)	103 (50.5%)	**42 (65.6%)**	**103 (48.1%)**
Never worked	17 (6.1%)	0 (0.0%)	17 (8.3%)	**13 (20.3%)**	**4 (1.9%)**

[a]Includes public rental flats. [b]Includes Executive, Jumbo, Maisonette, Housing and Urban Development Company (HUDC), and other large or atypical flat designs. [c]For caregivers with children. **Bold figures** indicate a statistically significant difference between male/female or spousal/non-spousal at the 95% confidence level.
HDB = Housing & Development Board. ITE = Institute of Technical Education. JC = Junior College. SD = standard deviation.

3. Care recipients' socio-demographics

Of the 278 care recipients, 93 (33%) were male and 185 (67%) were female, with females forming the majority in all age categories (Figure 4).
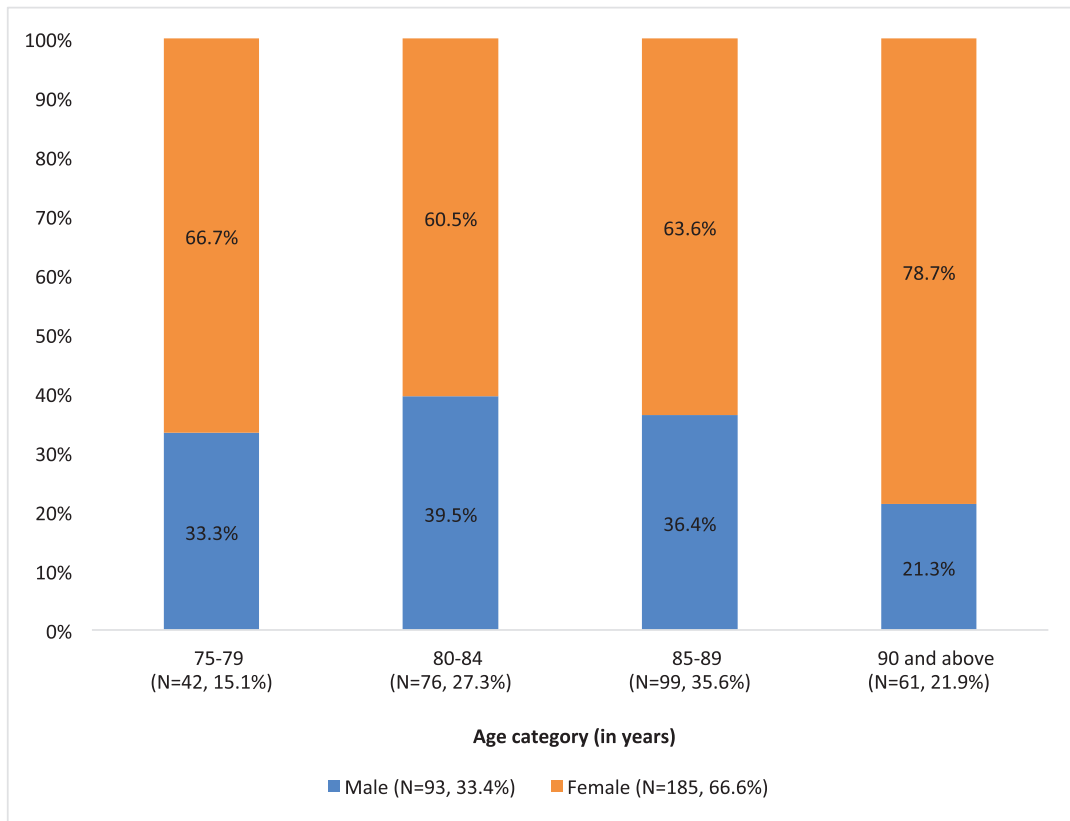

Figure 4. Care recipients' gender by age category

Table 2 shows the socio-demographics of the 278 care recipients, stratified by gender. Care recipients were predominantly female (67%) and of Chinese ethnicity (68%) with a mean age of 85.4 years. The most practiced religion among the care recipients was Buddhism/Taoism (45%). Just over half (55%) of the care recipients had received no formal education. Most (93%) of the care recipients lived in HDB flats. More than half of the care recipients (55%) were widowed and about 40% were married. Nearly all (97%) of the care recipients had children and their average number of children was four.

There were significant differences between male and female care recipients in terms of education and marital status. Male care recipients were more educated, with 69% having received some formal education in contrast to only 32% of female care recipients. Female care recipients were also much more likely to be widowed (72%) than male care recipients (19%).

Table 2. Socio-demographics of the care recipients, overall and stratified by care recipients' gender.

| | All (N=278) | Gender | |
		Male (N=93, 33.4%)	Female (N=185, 66.6%)
Age, mean (SD)	85.4 (5.4)	84.9 (5.2)	85.6 (5.4)
Ethnicity			
Chinese	189 (68.0%)	57 (61.3%)	132 (71.4%)
Malay	52 (18.7%)	18 (19.4%)	34 (18.4%)
Indian	34 (12.2%)	16 (17.2%)	18 (9.7%)
Others	3 (1.1%)	2 (2.2%)	1 (0.5%)
Religion			
Buddhism/Taoism	126 (45.3%)	39 (41.9%)	87 (47.0%)
Christianity	58 (20.9%)	18 (19.4%)	40 (21.6%)
Islam	58 (20.9%)	20 (21.5%)	38 (20.5%)
Hinduism	19 (6.8%)	10 (10.8%)	9 (4.9%)
Others	3 (1.1%)	1 (1.1%)	2 (1.1%)
No religion	14 (5.0%)	5 (5.4%)	9 (4.9%)
Education level			
No formal education	154 (55.4%)	**29 (31.2%)**	**125 (67.6%)**
Primary	72 (25.9%)	**38 (40.9%)**	**34 (18.4%)**
Secondary and above	52 (18.7%)	**26 (28.0%)**	**26 (14.1%)**
Housing type			
HDB 1/2-room[a]	14 (5.0%)	6 (6.4%)	8 (4.3%)
HDB 3-room	69 (24.8%)	25 (26.9%)	44 (23.8%)
HDB 4-room	94 (33.8%)	31 (33.3%)	63 (34.1%)
HDB 5-room and others[b]	83 (29.9%)	28 (30.1%)	55 (29.7%)
Private condo / landed	18 (6.5%)	3 (3.2%)	15 (8.1%)
Marital status			
Never married	7 (2.5%)	**1 (1.1%)**	**6 (3.2%)**
Married	113 (40.6%)	**72 (77.4%)**	**41 (22.2%)**
Widowed	152 (54.7%)	**18 (19.4%)**	**134 (72.4%)**
Divorced / Separated	6 (2.2%)	**2 (2.1%)**	**4 (2.2%)**
At least one child	270 (97.1%)	91 (97.8%)	179 (96.8%)
Number of children, mean (SD)[c]	4.2 (2.0)	3.8 (1.6)	4.4 (2.1)
Co-residence with caregiver	240 (86.3%)	82 (88.2%)	158 (85.4%)

[a]Includes public rental flats. [b]Includes Executive, Jumbo, Maisonette, Housing and Urban Development Company (HUDC), and other large or atypical flat designs. [c]For caregivers with children. **Bold figures** indicate a statistically significant difference between male/female or spousal/non-spousal at the 95% confidence level. HDB = Housing & Development Board. ITE = Institute of Technical Education. JC = Junior College. SD = standard deviation.

4. Caregivers' health

Table 3 shows health indicators of the caregivers, overall and stratified by their gender and relationship with the care recipient. While 47% of the caregivers perceived their health as good, about 35% and 5% perceived themselves as having fair and poor health respectively. Caregivers had two chronic diseases on average. About a quarter of the caregivers experienced at least one mobility difficulty. Very few caregivers had basic or instrumental ADL limitations. Only 5% of the caregivers were current smokers while 9% used to smoke. Caregivers had spent an average of 3.2 days doing at least 30 minutes of physical activity in the preceding week. In the context of psychological health, caregivers scored an average of 4.6 for depressive symptoms (range: 0-22; higher value reflecting a greater extent of depressive symptoms) which translated to 27% having clinically relevant depressive symptoms. Caregivers scored an average of 5.6 on the resilience scale (range: 0-8; higher value reflecting a greater extent of psychological resilience) and 13.2 on the social network scale (range: 0-30; higher value reflecting a stronger social network), with 39% being at risk of social isolation.

Significant differences were observed in mobility difficulties, smoking status, and social network between male and female caregivers. More female caregivers experienced mobility difficulties (28%) when compared to male caregivers (19%). Current or past smoking was much more prevalent among male caregivers (43%) than female caregivers (3%). Female caregivers scored significantly higher on the social network scale (13.7) than male caregivers (11.9) and hence, they were at a lower risk of social isolation (34% versus 53%).

There were no significant differences in the health indicators between spousal and non-spousal caregivers except mobility difficulties and risk of social isolation. Spousal caregivers reported more mobility difficulties (70%) than non-spousal caregivers (12%). More spousal caregivers were at risk of social isolation (45%) than non-spousal caregivers (37%).

Table 3. Health of caregivers, overall and stratified by gender and relationship with the care recipient

	All (N=278)	Gender		Relationship with the care recipient	
		Male (N=74, 26.6%)	Female (N=204, 73.4%)	Spouse (N=64, 23.0%)	Non-spouse (N=214, 77.0%)
Self-rated health					
Excellent	14 (5.0%)	1 (1.4%)	13 (6.4%)	2 (3.1%)	12 (5.6%)
Very Good	24 (8.6%)	10 (13.5%)	14 (6.9%)	5 (7.8%)	19 (8.9%)
Good	130 (46.8%)	27 (36.5%)	103 (50.5%)	23 (35.9%)	107 (50.0%)
Fair	97 (34.9%)	31 (41.9%)	66 (32.4%)	29 (45.3%)	68 (31.8%)
Poor	13 (4.7%)	5 (6.8%)	8 (3.9%)	5 (7.8%)	8 (3.7%)
Physical health					
Number of chronic diseases					
Mean (SD)	2.1 (1.8)	2.2 (1.9)	2.1 (1.8)	3.1 (1.9)	1.8 (1.7)
0	59 (21.2%)	14 (18.9%)	45 (22.1%)	5 (7.8%)	54 (25.2%)
1	58 (20.9%)	15 (20.3%)	43 (21.1%)	8 (12.5%)	50 (23.4%)
≥ 2	161 (57.9%)	59 (79.7%)	116 (56.8%)	51 (79.7%)	110 (51.4%)
Mobility difficulties[a,b]					
Mean (SD) (range 0-9)	1.7 (1.6)	**1.1 (1.6)**	**1.9 (1.6)**	**1.9 (1.7)**	**1.4 (1.4)**
≥ 1	71 (25.5%)	14 (18.9%)	57 (27.9%)	45 (70.3%)	26 (12.2%)
Number of basic ADL limitations[a]					
Mean (SD) (range 0-6)	0.01 (0.3)	0.1 (0.4)	0.01 (0.2)	0.01 (0.3)	--
≥ 1	2 (0.7%)	1 (1.3%)	1 (0.5%)	2 (3.1%)	0 (0.0%)
Number of instrumental ADL limitations[a]	0.1 (0.5)	0.1 (0.4)	0.2 (0.6)	0.1 (0.4)	0.2 (0.6)
Mean (SD) (range 0-7)	9 (3.2%)	1 (1.3%)	8 (3.9%)	4 (6.2%)	5 (2.3%)
≥ 1					
Health behaviors					
Smoking status					
Non-smoker	240 (86.3%)	**42 (56.8%)**	**198 (97.1%)**	51 (79.7%)	189 (88.3%)
Past smoker	24 (8.6%)	**20 (27.0%)**	**4 (2.0%)**	11 (17.2%)	13 (6.1%)
Current smoker	14 (5.1%)	**12 (16.2%)**	**2 (0.9%)**	2 (3.1%)	12 (5.6%)
Days with >=30 minutes of physical activity in the preceding week, mean (SD)[c]	2.3 (2.6)	2.7 (2.8)	2.1 (2.5)	1.8 (2.6)	2.4 (2.6)
Psychosocial health					
Depressive symptoms[d]					
Mean (SD) (range 0-22)	4.6 (4.1)	4.6 (4.1)	4.5 (4.1)	4.6 (4.1)	4.6 (4.1)
Clinically relevant symptoms	74 (26.6%)	23 (31.1%)	51 (25.0%)	18 (28.1%)	56 (26.2%)
Psychological resilience (range 0-8), mean (SD)[e]	5.6 (1.6)	5.5 (1.7)	5.6 (1.6)	5.3 (1.9)	5.6 (1.5)
Lubben Social Network Scale [f]					
Mean (SD) (range 0-22)	13.2 (6.2)	**11.9 (6.1)**	**13.7 (6.2)**	12.1 (5.8)	13.6 (6.3)
At risk for social isolation[g]	108 (38.9%)	**39 (52.7%)**	**69 (33.8%)**	**29 (45.3%)**	**79 (36.9%)**

[a]Caregivers younger than 65 years old were assumed to have no mobility, basic ADL, or instrumental ADL limitations. [b]2 missing responses. [c]7 missing responses. [d]2 missing responses; Higher scores indicating greater depressive symptoms; A score of 7 and above indicates clinically relevant depressive symptoms. [e]37 missing responses; Higher scores indicating a greater extent of psychological resilience. [f]8 missing responses; Higher scores indicating more social engagement; A score below 12 considered at risk for social isolation. [g]5 missing responses. **Bold figures** indicate a statistically significant difference between male/female at the 95% confidence level. ADL = Activity of Daily Living. SD = standard deviation.

5. Care recipients' health

Table 4 describes the health indicators of the 278 care recipients, overall and stratified by gender. Care recipients rated their health conservatively, with 22% and 45% reporting poor and fair health respectively. On average, care recipients reported four chronic diseases and experienced two basic ADL and four instrumental ADL limitations. Nearly 43% of the care recipients had at least three basic ADL limitations and nearly 70% had at least three instrumental ADL limitations. They scored an average of 5.2 for depressive symptoms, with 32% having clinically relevant depressive symptoms. Nearly one-third (28%) of the care recipients had been previously diagnosed with dementia. The distribution of health characteristics was similar between male and female care recipients.

Table 4. Health of the care recipients, overall and stratified by gender.

| | All (N=278) | Gender | |
		Male (N=93, 33.4%)	Female (N=185, 66.6%)
Self-rated health			
Excellent	4 (1.4%)	1 (1.1%)	3 (1.6%)
Very Good	17 (6.1%)	8 (8.6%)	9 (4.9%)
Good	71 (25.5%)	25 (26.9%)	46 (24.9%)
Fair	126 (45.3%)	37 (39.8%)	89 (48.1%)
Poor	60 (21.6%)	22 (23.7%)	38 (20.5%)
Physical health			
Number of chronic diseases			
Mean (SD)	4.2 (2.3)	4.0 (2.4)	4.3 (2.3)
0	7 (2.5%)	3 (3.2%)	4 (2.2%)
1	24 (8.6%)	12 (12.9%)	12 (6.5%)
≥ 2	247 (88.9%)	78 (83.9%)	169 (91.3%)
Number of basic ADL limitations			
Mean (SD) (range 0-6)	2.3 (2.3)	2.3 (2.4)	2.3 (2.4)
0	106 (38.1%)	35 (37.6%)	71 (38.4%)
1-2	53 (19.1%)	19 (20.4%)	34 (18.4%)
≥ 3	119 (42.8%)	39 (42.0%)	80 (43.2%)
Number of instrumental ADL limitations			
Mean (SD) (range 0-7)	3.9 (1.9)	3.9 (1.9)	3.9 (2.0)
0	8 (2.9%)	2 (2.1%)	6 (3.2%)
1-2	79 (28.4%)	26 (28.0%)	53 (28.7%)
≥ 3	191 (68.7%)	65 (69.9%)	126 (68.1%)
Psychological and mental health			
Depressive symptoms score[a]			
Mean (SD) (range 0-22)	5.2 (4.2)	4.7 (4.1)	5.5 (4.3)
Clinically relevant symptoms	39 (32.2%)	11 (29.0%)	28 (34.0%)
Ever diagnosed with dementia	75 (27.7%)	29 (32.2%)	46 (25.4%)

[a]171 respondents not asked due to low cognitive score; 1 missing response; Higher scores indicating greater depressive symptoms; A score of 7 and above indicates clinically relevant depressive symptoms. ADL = Activity of Daily Living. SD = standard deviation.

6. Caregiving Situation

Table 5 shows the caregiving situation of the caregivers, overall and stratified by gender and their relationship with the care recipient. On average, caregivers provided 33.0 hours of care per week to their care recipient. This consisted, on average, of 5.0 hours helping with basic ADLs, 10.2 hours helping with instrumental ADLs, 2.5 hours helping with healthcare or social service use, 4.4 hours to supervise Migrant Domestic Workers (MDWs) for the care recipient's care, and 10.9 hours for other caregiving support, e.g., personal supervision of care recipient, helping care recipient to read and communicate with others, and providing emotional support such as listening to and comforting care recipient. Slightly more than one third of the caregivers (38%) had been caring for their care recipient for at least one to five years. In addition to their care recipients, 10% of the caregivers were currently providing care to another person due to his or her poor physical or health condition while 34% had previously done so. Only very few (5%) caregivers had attended any caregiver training courses.

In terms of caregiving-related support and resources received by the caregivers, 50% of them received help from at least one other family member or friend and 48% of them received help from at least one MDW in caring for the care recipient. However, a quarter (26%) of the caregivers did not receive help from any family member or MDW. Around one-third of the care recipients (31%) had utilised formal care services, such as home nursing care, home personal care, or senior activity centre, at least once in the past six months. Only slightly more than one-third (36%) of the caregivers were aware of the Caregivers Training Grant, a $200 yearly subsidy for caregiving-related courses.[6]

The impact of caregiving on the caregivers was assessed using the Modified Caregiver Reaction Assessment (mCRA) scale[7,8] and Short-Positive Aspects of Caregiving (S-PAC) scale.[9,10] For the mCRA scale, a higher score on the caregiver esteem domain (range: 1-5) indicates a more positive effect of caregiving while higher scores on the disturbed schedule and poor health, lack of finances, and lack of family support domains (range: 1-5) indicate greater negative effects of caregiving in those domains. On average, the caregivers scored low on the disturbed schedule and poor health (mean 2.9), lack of finances (mean 2.6), and lack of family support (mean 2.4) domains and scored high on the caregiver esteem domain (mean 3.8), which indicates an overall positive caregiving experience. As for the S-PAC scale, a higher score indicates a more positive evaluation of the caregiving experience. Caregivers scored an average of 29 on the overall S-PAC scale (range: 7-35) with domain scores of 20.6 for self-affirmation (range: 5-25) and 8.3 for outlook on life (range: 2-10). This indicates a positive evaluation of their caregiving experiences, corroborating with the results of the mCRA scale.

Significant differences were observed between male and female caregivers in the weekly overall care hours provided to the care recipient, weekly care hours spent helping the care recipient with basic ADLs, weekly care hours spent supervising a MDW for the care recipient's care, previous caregiving experience, and outlook on life. Overall, female caregivers provided more hours of care per week (mean of 35.2 hours) as compared to male caregivers (mean of 27.0 hours). Furthermore, female caregivers, on average, spent

5.8 hours per week helping their care recipient with basic ADLs and 5.3 hours per week supervising a MDW who helped the care recipient while male caregivers only spent 2.7 and 1.8 hours per week doing the respective activities. Additionally, 40% of female caregivers had previously provided care or ensured provision of care to another person due to his or her poor physical or health condition while only 19% of male caregivers had done so. Despite providing more hours of care and having prior experience as a caregiver, female caregivers (mean score of 8.5) had a slightly more positive outlook on life in the context of caregiving than male caregivers (mean score of 7.9).

Significant differences could also be seen between spousal and non-spousal caregivers, specifically the number of years spent caring for the care recipient, current number of care recipients they were caring for, absence of help received from family or MDW, awareness of the Caregivers Training Grant, and caregiver esteem. While a large proportion of spousal caregivers (39%) and non-spousal caregivers (38%) had been caring for their care recipient for one to five years, one third (32%) of non-spousal caregivers had been caring for their care recipient for more than ten years while only 17% of spousal caregivers had been caring for more than ten years. This indicates that non-spousal caregivers had been caring for their care recipient longer as compared to spousal caregivers in general. In addition, 12% of non-spousal caregivers were also currently caring for at least one more care recipient apart from the care recipient identified in TraCE as compared to 3% of spousal caregivers. On the other hand, more spousal caregivers (42%) did not receive any help from any family member or MDW than non-spousal caregivers (21%). Only 20% of spousal caregivers were aware of the Caregivers Training Grant as compared to 41% of non-spousal caregivers. Overall, non-spousal caregivers had a slightly higher mean caregiver esteem score of 3.9 as compared to spousal caregivers who scored 3.6.

Table 5. Caregiving situation of the caregivers, overall and stratified by gender and relationship with the care recipient

	All (N=278)	Gender		Relationship with the care recipient	
		Male (N=74, 26.6%)	Female (N=204, 73.4%)	Spouse (N=64, 23.0%)	Non-spouse (N=214, 77.0%)
Caregiver involvement					
Weekly care hours, mean (SD)	33.0 (30.7)	**27.0 (29.8)**	**35.2 (30.8)**	33.4 (26.8)	32.9 (31.8)
Basic ADLs	5.0 (10.6)	**2.7 (8.0)**	**5.8 (11.3)**	4.5 (9.9)	5.1 (10.8)
Instrumental ADLs	10.2 (13.1)	8.9 (13.5)	10.7 (12.9)	12.1 (12.0)	9.7 (13.4)
Healthcare or social services	2.5 (3.8)	2.0 (2.1)	2.7 (4.2)	2.8 (4.0)	2.4 (3.7)
Supervise MDWs	4.4 (12.9)	**1.8 (5.7)**	**5.3 (14.5)**	2.4 (8.6)	5.0 (13.8)
Other caregiving support	10.9 (14.0)	11.6 (16.1)	10.7 (13.2)	11.6 (13.3)	10.7 (14.2)
Years caring for care recipients[a]					
Less than 1 year	18 (6.5%)	5 (6.8%)	13 (6.4%)	**5 (7.8%)**	**13 (6.1%)**
1-5 years	106 (38.1%)	24 (32.4%)	82 (40.2%)	**25 (39.1%)**	**81 (37.9%)**
6-10 years	67 (24.1%)	16 (21.6%)	51 (25.0%)	**19 (29.7%)**	**48 (22.4%)**
More than 10 years	80 (28.8%)	26 (35.1%)	54 (26.5%)	**11 (17.2%)**	**69 (32.2%)**
Currently cares for at least one more care recipient	28 (10.1%)	5 (6.8%)	23 (11.3%)	**2 (3.1%)**	**26 (12.1%)**
Previously cared for at least one more care recipient	96 (34.5%)	**14 (18.9%)**	**82 (40.2%)**	19 (29.7%)	77 (36.0%)
Caregiving-related support and resources					
Receives help from family	140 (50.4%)	36 (48.6%)	104 (51.0%)	22 (34.4%)	118 (55.1%)
Receives help from MDW	134 (48.2%)	35 (47.3%)	99 (48.5%)	24 (37.5%)	110 (51.4%)
Does not receive help from family or MDW	71 (25.5%)	24 (32.4%)	47 (23.0%)	**27 (42.2%)**	**44 (20.6%)**
Care recipient had used formal care services in past six months	87 (31.3%)	25 (33.8%)	62 (30.4%)	19 (29.7%)	68 (31.8%)
Aware of Caregivers Training Grant[b]	101 (36.3%)	23 (31.1%)	78 (38.2%)	**13 (20.3%)**	**88 (41.1%)**
Attended caregiver training	14 (5.0%)	2 (2.7%)	12 (5.9%)	2 (3.1%)	12 (5.6%)
Caregiving experience					
Modified Caregiver Reaction Assessment (mCRA) scale (range 1-5), mean (SD)[c]					
Disturbed schedule and poor health[d]	2.9 (0.7)	2.8 (0.7)	3.0 (0.7)	3.0 (0.7)	2.9 (0.8)
Lack of finances[e]	2.6 (0.9)	2.7 (1.0)	2.5 (0.9)	2.7 (0.9)	2.6 (0.9)
Lack of family support	2.4 (0.7)	2.4 (0.7)	2.4 (0.7)	2.4 (0.6)	2.4 (0.8)
Caregiver esteem[f]	3.8 (0.5)	3.9 (0.5)	3.8 (0.5)	**3.6 (0.6)**	**3.9 (0.5)**
Positive Aspects of Caregiving (S-PAC) scale, mean (SD)[g]					
Overall (range 7-35)[h]	29.0 (5.3)	28.4 (4.9)	29.2 (5.4)	28.6 (5.2)	29.1 (5.3)
Self-affirmation (range 5-25)[i]	20.6 (3.9)	20.5 (3.7)	20.7 (4.0)	20.3 (3.9)	20.7 (3.9)
Outlook on life (range 2-10)[j]	8.3 (1.7)	**7.9 (1.7)**	**8.5 (1.6)**	8.2 (1.6)	8.4 (1.7)

[a]7 missing responses. [b]5 missing responses. [c]A higher mean score on the caregiver esteem domain indicates a more positive caregiving experience while higher mean score on the other three domains indicates greater negative caregiving experience in that domain. [d]3 missing responses. [e]4 missing responses. [f]1 missing response. [g]A higher overall score indicates a more positive effect of caregiving; Higher scores in each of the subscale correspond to more positive feelings towards caregiving. [h]9 missing responses. [i]8 missing responses. [j]6 missing responses. **Bold figures** indicate a statistically significant difference between male/female or spousal/non-spousal at the 95% confidence level. ADLs = Activities of Daily Living. MDW = Migrant Domestic Worker. SD = standard deviation.

Caregivers also responded to an open-ended question which asked about any services or other forms of assistance that would be helpful to them in caring for their care recipient (Table 6). We categorised their responses under nine categories: (1) Financial assistance for care recipient's needs, (2) Home care services, (3) Informational support, (4) Caregiver support, (5) Day care services, (6) Medical care services, (7) Service accessibility and options in the community, (8) Stay-in care services, and (9) Others. Responses in each category were further categorised into sub-categories. The top three categories were financial assistance for care recipient's needs (17%), home care services (10%), and informational support (5%).

Table 6. Services or other forms of assistance that would be helpful for the caregivers in caring for their care recipient

Number of participants who voiced the need for services or other forms of assistance	98 (35.3%)[a]	
Category	N (%)[b]	Representative responses
Financial Assistance for Care Recipient's Needs Financial Assistance for Care Recipient's Needs Sub-categories: (1) General, (2) For Enabling Care Recipient's ADLs and/or Mobility, (3) For Care Recipient's Medicines and Medical Supplies, (4) For Care Recipient's Nutrition, (5) For Care Recipient's Medical Fees, (6) Care Recipient's Day Care Services, (7) Means-testing, and (8) For Caregiver	47 (16.9%)	*"Certain medicines are not subsidised and are on private rates. We cannot pay by Medisave. Would like them to be paid by Medisave."* *"More subsidies for senior activity centre. Elderly not working - how to afford? Why should other family members' salaries be included? They need to make a living, too."*
Home care services Sub-categories: (1) General, (2) Meal Delivery, (3) Escort and Transport, (4) Home Medical, (5) Home Nursing, (6) Home Therapy, (7) Home Personal Care, (8) Hospice Home Care, (9) Befriending Service, and (10) MDW Related	29 (10.4%)	*"Hope hospitals or polyclinic could provide free or subsidised medical escort/ transportation services for low-income elderly to/from home and hospitals/clinics."* *"Make 'short-term stay-in relief helper' available to caregivers when helper needs to go on leave or go back to her home country during contract renewal."*
Informational support Sub-categories: (1) Caregiving Knowledge and Skills and (2) Support Schemes and Assistance	14 (5.0%)	*"Any talks or workshops that would help caregiver in understanding elderly."*
Caregiver support Sub-categories: (1) Emotional and Social Support, (2) Respite Care Services, and (3) Workplace Support	13 (4.7%)	*"Time-off for caregivers. Respite services for caregivers."* *"Moral and emotional support for caregivers."*
Day care services Sub-categories: (1) Day Care Centre, (2) Senior Activity Centre, (3) Rehabilitation Centre, and (4) Centre-based Nursing	7 (2.5%)	*"To have activity centres nearby for elderly to exercise. Better facilities. Environment is very important. Current neighbourhood is not very good for pushing wheelchair and not many services."*

Medical care services Sub-categories: (1) General, (2) General Practitioner, (3) Community Health Centre, (4) Polyclinics, and (5) Hospitals	5 (1.8%)	*"Hope that self-help kiosk at polyclinics can stay open past 5pm to allow caregivers who work to self-pay for their family members' medical bills and medical supplies. As polyclinic cashiers often have long queues, it is very hard for caregivers to wait for a long time just to pay."*
Service accessibility and options in the community	4 (1.4%)	*"Make light exercises available in Residential Committee. Currently, only 'stretch exercise' is available in caregiver's Residential Committee."*
Others	4 (1.4%)	*"It is very troublesome to claim from the Eldershield insurance. The insurance company does not accept hospital doctor's certification of an elderly's disability to perform 3 or more ADLs, but need to pay an extra of $150 to hire the insurance panel doctor to re-certify. Hope this can change."*
Stay-in care services Sub-categories: (1) Community Hospital, (2) Nursing Home, (3) Inpatient Hospice Palliative Care Service, and (4) Shelter and Senior Group Home	1 (0.4%)	*"Hope nursing home allows elderly to stay temporarily so that MDW can go back to her home country for a break. MDW has not taken leave for 10 years. I was scolded by nursing home management when applying for 1-month temporary stay."*

[a]Responses from the 98 caregivers who voiced the need for services or other forms of assistance could be classified under multiple main categories. [b]Number and percentage of caregivers, out of the total 278 caregivers, whose response was classified in the main category. ADL / ADLs = Activity of Daily Living / Activities of Daily Living. MDW = Migrant Domestic Worker.

7. Working caregivers

While only 14% of spousal caregivers were working, half (50%) of non-spousal caregivers (mostly children) were working and most (70%) were employed full-time (Figure 5). Such individuals have been labelled "sandwiched caregivers" as they are often caught between caring for ageing parents and earning an income to provide for the next generation. This phenomenon that has only become more common in countries with a low fertility rate and a falling old-age support ratio.11 To better understand this situation, we asked working caregivers about several aspects of their experience, including their reasons for working, the types of supportive policies or practices available at their workplace, such as flexible hours, leave entitlement, and whether they had utilised these policies or practices.
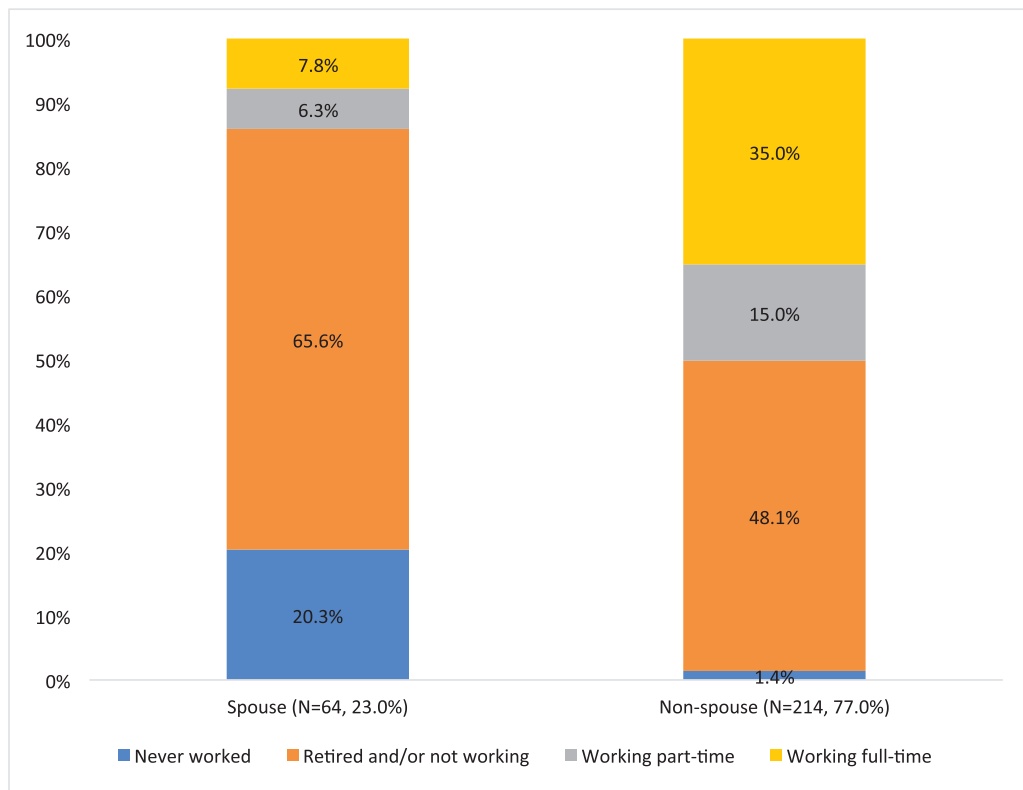
Figure 5. Work status of caregivers by relationship to the care recipient

Focusing on the caregivers who were working full-time, who are the larger group compared to those working part-time, many of them were very experienced, with an average of 31 years worked (Table 7). The vast majority (96%) indicated income as a main reason for working, while only 41% mentioned enjoyment as another reason. More than half (55%) had to leave work to accompany their care recipient for a medical appointment in the last six months. More than half (58%) also had a MDW at home.

Regarding flexible work policies, about half of the full-time working caregivers reported that their workplaces allowed flexi-time (51%) or part-time (47%) schemes, which would enable caregivers to be home at key times of the day to assist with activities that their care recipient is unable to safely perform on their own, such as bathing. However, workplaces of only 27% of the full-time working caregivers allowed flexi-place or remote work arrangements.

A vast majority of the caregivers were employed in workplaces that allowed for compassionate leave (91%) after the passing of a family member and emergency or urgent leave (90%) to return home for caregiving at a supervisor's discretion. However, fewer caregivers (28%) worked in workplaces that provided additional Eldercare Leave beyond the standard leave entitlement.

Table 7. Employment situation of working caregivers

	Working caregivers (N=116)	
	Full-time (N=80, 69.0%)	**Part-time (N=36, 31.0%)**
Years worked (Mean, SD)	30.7 (10.3)	27.2 (13.8)
Working mainly for income	96.3%	88.9%
Working mainly for enjoyment	41.3%	30.6%
Needed to leave work for care recipient's doctor appointment in the past six months	55.1%	41.2%
Migrant domestic worker helps with caregiving	57.5%	47.2%
Workplace allows flexi-time[a]	51.4%	71.4%
Workplace allows part-time[b]	46.5%	100.0%
Workplace allows flexi-place[c]	27.1%	31.0%
Had to change hours or shift due to care recipient in the past six months	32.5%	38.9%
Workplace allows Compassionate Leave[d]	91.3%	72.2%
Workplace allows Emergency or Urgent Leave[e]	89.9%	76.2%
Workplace allows Eldercare Leave[f]	28.4%	25.0%
Took leave to care for care recipient in the past six months	68.4%	27.8%

[a]Flexi-time allows employees to work at different hours than other employees in the office while fulfilling the fixed number of hours of work per day (i.e., considered as full-time work). [b]Part-time work allows employees to work about half the number of hours in a week compared to full-time employees. [c]Flexi-place allows employees to do their work outside their usual work location either in the employee's own homes, satellite offices or neighbourhood work centres. [d]Compassionate Leave allows employees to take leave in the event that a family member passes away; some organisations allow an employee to take leave to care for a sick relative (i.e., spouse, child, parent). [e]Emergency or Urgent Leave is a supervisor's discretionary measure to allow an employee to rush home due to an urgent need to support an elderly parent. [f]Eldercare Leave is two days of parent care leave per year on top of the statutory leave entitlement. SD = standard deviation.

8. Discussion and conclusion

Demographics

Caregivers' demographics were generally in line with the national population, with Chinese (68%) being the largest ethnic group, followed by Malays (18%) and Indians (13%). Buddhism/Taoism (38%) was also the most practiced religion, followed by Christianity (24%), Islam (21%) and Hinduism (7%). Spousal caregivers had mostly no formal education (41%) or only primary education (38%) while non-spousal caregivers, were mainly from a younger generation that had better access to education,[4] were more likely to have secondary (41%) or tertiary (42%) education. Most caregivers lived in HDB flats (92%), with the remainder in private properties. Spousal caregivers had an average of three children and all except one had at least one child, suggesting that they would likely have access to some form of family support. However, among non-spousal caregivers, 40% were never married and 45% had no children. Given the rapidly falling birth rate in Singapore, future studies will need to monitor the growing number of childless caregivers who may lack family assistance in their old age.[12]

Health

Spousal caregivers, with a mean age of 77.2 years, had three chronic diseases, on average. This was higher than an average of two chronic disease among Singaporean older adults aged 70-79 in a nationally representative survey,[13] suggesting that caregivers may face significant health problems and highlighting their predicament in juggling medical treatments for themselves and their care recipient. Furthermore, 28% of spousal caregivers had clinically significant depressive symptoms, compared to only 13% of the 70-79 age group in the national survey. This suggests that caregiving may take its toll on mental health, which has been found to be associated with cognitive decline.[14]

On the other hand, almost all spousal caregivers (94%) had no difficulties performing instrumental ADLs such as preparing meals and housework. This was more favourable than the nationally representative sample aged 70-79, of which only 79% faced no instrumental ADL limitations. This suggests that spousal caregivers are at least able to complete basic daily tasks for themselves and on behalf of their care recipient.

Caregiving situation and experience

More than half of caregivers were relatively experienced, with 53% having cared for their care recipient for more than 5 years, and 35% having previously cared for at least one other person. A good number also had access to alternative sources of support – 50% had assistance from at least one secondary family caregiver, 48% had assistance from a MDW, and care recipients of 31% had utilised formal care services such as day care centres or homecare services in the past six months. However, 26% of caregivers did not receive help from any family member or MDW.

Non-spousal caregivers had been caring for their care recipients for a longer time on average relative to spousal caregivers; one third (32%) of non-spousal caregivers had been caring for their care recipient for more than ten years, compared to only 17% of spousal

caregivers. Furthermore, non-spousal caregivers were much more likely to be concurrently caring for another care recipient (12%, compared to only 3% of spousal caregivers). Similar differences were observed between male and female caregivers. This underscores the heterogeneity in the caregiving situation, which should be considered while developing and implementing policies and programs for supporting family caregivers.

To gauge how caregivers are affected by the caregiving experience, we recorded responses to the mCRA scale.[8] While there were no significant differences between spousal and non-spousal caregivers for the negative domains of the scale, caregivers in general reported the worst outcomes for the "disturbed schedule and poor health" domain (score of 2.9 on a scale of 1 to 5) and the least negative outcomes for the "lack of family support" domain (score of 2.4 on a scale of 1 to 5). Furthermore, that caregivers on average provided 33 hours of care per week (the Ministry of Manpower considers up to 44 hours of work per week as full-time work) suggests that the time burden of caregiving may be an important factor to consider in the Singapore setting. Given the national policy preference for ageing in place supported by family caregivers over formal residential care options such as nursing homes, it is crucial that family caregivers receive adequate respite through affordable home care and day care options.

Regarding caregiver training and support, only 5% had attended training courses, and only 38% were aware of the government-subsidised Caregiver Training Grant. More efforts are needed to promote these opportunities and ensure that they are relevant to caregivers' needs, and that caregivers have access to suitable temporary care options so that they can take time off to attend such courses.

Work support

Half of non-spousal caregivers were working, and 55% had their own children to support. This highlights the problem of the "sandwich generation" who are torn between caring for the previous generation and providing for the next generation.[11] For example, 55% of full-time working caregivers needed to leave work to take their care recipient to the doctor in the past six months, and 68% took leave due to their caregiving duties. We also note that 58% of full-time working caregivers had caregiving assistance from an MDW, compared to only 44% among non-working caregivers, highlighting the importance of additional support when managing paid employment and caregiving.

In terms of supportive workplace policies, nine out of ten full-time working caregivers had access to compassionate and urgent leave; however, less than a third had access to Eldercare Leave. State support for Eldercare Leave in all workplaces could help caregivers to better juggle their multiple responsibilities; at the same time, businesses must be appropriately compensated for such paid leave to ensure that working caregivers are not subject to hiring discrimination.[15,16] Roughly half of full-time working caregivers were also eligible to apply for flexi-time and part-time working arrangements, while only a quarter had access to flexi-place arrangement. However, given that most caregivers (96%) in the study were interviewed in 2019 and how the COVID-19 pandemic has disrupted physical workplace attendance, future studies should observe how working caregivers' situation has

changed after the pandemic. Many employers have adopted remote work options, which enables greater flexibility in work hours and location, and can be conducive for family life.[17] On the other hand, the availability of MDWs was reduced, and it has also been more difficult to access healthcare, home care and respite services. It remains to be seen how working caregivers will adapt to these new constraints.

Comparison with The Survey on Informal Caregiving
Family caregivers surveyed in TraCE, in comparison to those surveyed in The Survey on Informal Caregiving[3] conducted a decade earlier, were more likely to be older (mean age of 61.7 years, compared to 55.6 years) and to have never married (31%, compared to 26%); however, educational levels were similar in both surveys with more than 65% of respondents having at least secondary education. Caregivers in TraCE also reported twice as many chronic diseases, with two on average, compared to one in the earlier survey. This possibly reflects the higher age of caregivers in TraCE as well as chronic disease screening efforts over the past decade which may have resulted in a higher proportion of individuals being aware of their chronic disease status. Caregivers in TraCE were less likely to be working (42%, compared to 56%), which again is likely due to the higher age of caregivers in TraCE. In the context of care hours, the average had come down from 38 to 33 hours per week. This possibly reflects the difference in the way a care recipient was defined in the two surveys – while those receiving human assistance with basic ADLs were considered as care recipients in The Survey on Informal Caregiving, those receiving human assistance with basic or instrumental ADLs – thus likely with lower care needs – were considered as care recipients in TraCE. Irrespective of this, there was little change in the role played by MDWs in supporting caregiving, with roughly half of caregivers receiving assistance from an MDW in both surveys.

Conclusion

Family caregivers play a crucial role in caring for older adults with limitations in daily activities as well as coordinating their receipt of assistance and treatment by health and social services or MDWs. However, further attention is needed on family caregivers' own physical and mental health, given that the prevalence of depressive symptoms among them is much higher than the national average. As caregiving is often similar to full-time work in terms of time commitment, it can be an obstacle to employment as well as family formation. Caregivers who have not accumulated sufficient Central Provident Fund savings and who do not have children of their own may be especially vulnerable in their own old age. In line with Singapore's focus on ageing-in-place and community care as the primary aspiration for the older adult population,[18,19] family caregivers will be the main touchpoint for long-term care, and should receive adequate support for this important contribution to our society.

Methodology

Sample

The 'Caregiving Transitions among Family Caregivers of Elderly Singaporeans' (TraCE) study is a longitudinal dyadic study that aims to understand the health and social lives of caregivers, caregiving contexts, and various caregiving-related outcomes in Singapore. A total of 1895 Singapore citizens or permanent residents aged 75 years and older who had participated in two national surveys of older adults in Singapore[13,20] were approached for participation in TraCE. A screener was administered to 1086 of them to assess their basic and instrumental ADL status. If an older adult met the criteria of being a care recipient (i.e., currently receiving human assistance for any ADL) or a potential care recipient (i.e., may be receiving human assistance for any ADL in the future), then a family member or friend aged 21 years or older who was involved or may be involved in at least two of the following activities: 1) providing direct care to care recipient or potential care recipient; 2) ensuring care provision to care recipient or potential care recipient; and 3) making care and treatment decisions for care recipient or potential care recipient, was identified as his/her caregiver or potential caregiver.

A total of 395 care recipient-caregiver dyads and 605 potential care recipient-potential caregiver dyads were identified. Of them, 278 care recipient-caregiver dyads (70% of eligible care recipient-caregiver dyads) and 310 potential care recipient-potential caregiver dyads (51% of eligible potential care recipient-potential caregiver dyads) gave consent for study participation. Written informed consent was taken either from both dyad members or from only the caregiver or potential caregiver if the care recipient or potential care recipient was unable to respond due to health reasons. In the latter situation, the caregiver or potential caregiver responded as a proxy for questions addressed to the care recipient or potential care recipient.

In the baseline wave of TraCE, between April 2019 and May 2020, face-to-face interviews were conducted for 572 (97%) dyads, while phone or online interviews were conducted for 16 (3%) dyads due to restrictions resulting from the COVID-19 pandemic. A vast majority (90%) of the interviews were conducted in 2019. The TraCE study was approved by the Institutional Review Board of the National University of Singapore (Reference Code: LS-18-387C). For this brief, data on 278 care recipient-caregiver dyads from the baseline wave of TraCE were used.

Scales used

Depressive symptoms were assessed using the 11-item version of the Centre for Epidemiologic Studies-Depression (CES-D) scale.[21] Respondents were asked to what extent had the statements relating to appetite, effort, sleep, happiness, sadness, loneliness, enjoyment of life etc. been true for them in the past week. Response options included none/rarely (which corresponds to a score of 0), sometimes (1), and often (2). The total scores can range from 0 to 22, with higher scores indicating greater depressive symptoms. A score of 7 and above indicates clinically relevant depressive symptoms.[22]

Psychological resilience of the caregivers was measured using the 2-item Connor-Davidson Resilience (CD-RISC 2) Scale©.[23] Respondents rated their ability to (i) adapt to changes and (ii)

bounce back after facing hardships on a 5-point scale: not true at all (scored as 0), rarely true (1), sometimes true (2), often true (3), or true nearly all the time (scored as 4). The total score was calculated as the sum of the two items, ranging from 0 to 8, with higher scores indicating a greater extent of psychological resilience.

Social Network outside of the caregiver's household was measured using the 6-item Lubben Social Network Scale – 6 (LSNS-6).[24] The scale asks six questions about the size of the social network, three in the context of relatives and three in the context of friends: (i) number the respondent sees or hears from at least once a month; (ii) number the respondent feels at ease with to talk about private matters; and (iii) number respondent feels close to such that he/she could call on them for help. Respondents answered on a 6-point scale corresponding to the responses of none, 1, 2, 3 to 4, 5 to 8, and 9 or more. The score for each item ranges from 0 for the response of none, to 5 for 9 or more. LSNS-6 thus has scores from 0 to 30, with higher scores indicating more social engagement. A score below 12 indicates risk for social isolation.[24,25]

Caregiving experience was measured using the 21-item modified Caregiver Reaction Assessment (mCRA) scale, a multidimensional tool that measures both the negative and positive aspects of caregiving.[7,8] Respondents were asked how strongly they agreed or disagreed with statements relating to certain caregiving situations such as the caregiver having to stop in the middle of work or activities to provide care, feeling tired all the time since he/she started being a caregiver, and feeling privileged to care for the care recipient. Response choices included strongly disagree (scored as 1), disagree (2), neither agree nor disagree (3), agree (4) and strongly agree (5). The 21 statements in the scale have been categorised into 4 domains: (i) disturbed schedule and poor health; (ii) lack of finances; (iii) lack of family support; (iv) and caregiver esteem. The scores are computed for each domain based on its mean score, ranging from 1 to 5. A higher mean score on the caregiver esteem domain indicates a more positive caregiving experience while higher mean score on the other three domains indicates greater negative caregiving experience in that domain.

Positive aspects of caregiving were further measured using the 7-item Short-Positive Aspects of Caregiving (S-PAC) scale.[9,10] Respondents were asked whether providing help/care to or ensuring provision of care to the care recipient had made the caregiver feel more useful, needed, appreciated, important, and strong and confident (where all correspond to the self-affirmation subscale), enabled the caregiver to appreciate life more, and strengthened his/her relationship with others (where both correspond to the outlook on life subscale). Response choices included disagree a lot (scored as 1), disagree a little (2), neither agree nor disagree (3), agree a little (4) and agree a lot (5). An overall score is generated by summing the 7 items, ranging from 7 to 35, with a higher score indicating a more positive effect of caregiving. The scores in the respective subscales can be computed by summing the scores of their individual items. The score for the self-affirmation subscale ranges from 5 to 25 while the score for the outlook on life subscale ranges from 2 to 10. Higher scores in each of the subscale correspond to more positive feelings towards caregiving.

References

1. Chan A, Malhotra R, Visaria A, Sung P, Seng BJSC, Tan YW. Transitions in Health, Employment, Social Engagement and Intergenerational Transfers in Singapore Study (The SIGNS Study) – II: Cross-Sectional and Longitudinal Analyses of Key aspects of Successful Ageing [Internet]. Centre for Ageing Research and Education, Duke-NUS Medical School; 2020. Available from: https://www.duke-nus.edu.sg/docs/librariesprovider3/research-policy-brief-docs/the-signs-study---i-report.pdf

2. Mehta KK. A Critical Review of Singapore's Policies Aimed at Supporting Families Caring for Older Members. J Aging Soc Policy. 2006 Nov 21;18(3–4):43–57.

3. Chan A, Østbye T, Malhotra R, Hu AJ. The Survey on Informal Caregiving [Internet]. Ministry of Community Development, Youth and Sports; 2011 [cited 2023 Jan 5]. Available from: https://www.msf.gov.sg/publications/Pages/The-Survey-on-Informal-Caregiving.aspx

4. Singapore Department of Statistics. Population Trends 2022. 2022.

5. Ministry of Health. Number of seniors benefitting from home-based care Services from 2016 to 2018 [Internet]. 2019 [cited 2023 Feb 7]. Available from: https://www.moh.gov.sg/news-highlights/details/number-of-seniors-benefitting-from-home-based-care-services-from-2016-to-2018/

6. Agency for Integrated Care. Caregivers Training Grant (CTG) [Internet]. Agency for Integrated Care. [cited 2023 Jan 5]. Available from: https://www.aic.sg:443/financial-assistance/caregivers-training-grant

7. Given CW, Given B, Stommel M, Collins C, King S, Franklin S. The caregiver reaction assessment (CRA) for caregivers to persons with chronic physical and mental impairments. Res Nurs Health. 1992;15(4):271–83.

8. Malhotra R, Chan A, Malhotra C, Østbye T. Validity and reliability of the Caregiver Reaction Assessment scale among primary informal caregivers for older persons in Singapore. Aging Ment Health. 2012 Nov 1;16(8):1004–15.

9. Siow JYM, Chan A, Østbye T, Cheng GHL, Malhotra R. Validity and Reliability of the Positive Aspects of Caregiving (PAC) Scale and Development of Its Shorter Version (S-PAC) Among Family Caregivers of Older Adults. The Gerontologist. 2017 Aug 1;57(4):e75–84.

10. Tarlow BJ, Wisniewski SR, Belle SH, Rubert M, Ory MG, Gallagher-Thompson D. Positive Aspects of Caregiving: Contributions of the REACH Project to the Development of New Measures for Alzheimer's Caregiving. Res Aging. 2004 Jul 1;26(4):429–53.

11. Spillman BC, Pezzin LE. Potential and Active Family Caregivers: Changing Networks and the 'Sandwich Generation.' Milbank Q. 2000;78(3):347–74.

12. Quashie NT, Arpino B, Antczak R, Mair CA. Childlessness and Health Among Older Adults: Variation Across Five Outcomes and 20 Countries. J Gerontol B Psychol Sci Soc Sci. 2021 Jan 18;76(2):348–59.

13. Chan A, Malhotra R, Manap NB, Ting YY, Visaria A, Cheng GHL, et al. Transitions in Health, Employment, Social Engagement and Intergenerational Transfers in Singapore Study (The SIGNS Study) – I: Descriptive Statistics and Analysis of Key Aspects of Successful Ageing [Internet]. Centre for Ageing Research and Education, Duke-NUS Medical School; 2018. Available from: https://www.duke-nus.edu.sg/docs/librariesprovider3/research-policy-brief-docs/the-signs-study---i-report.pdf

14. Brown MJ, Cohen SA. Informal Caregiving, Poor Mental Health, and Subjective Cognitive Decline: Results From a Population-Based Sample. J Gerontol Nurs. 2020 Dec 1;46(12):31–41.

15. Kang JY, Park S, Kim B, Kwon E, Cho J. The Effect of California's Paid Family Leave Program on Employment Among Middle-Aged Female Caregivers. The Gerontologist. 2019 Nov 16;59(6):1092–102.

16. Nadash P, Alberth AG, Tell EJ, Jansen T. Policies to Sustain Employment Among Family Caregivers: The Family Caregiver Perspective. J Appl Gerontol Off J South Gerontol Soc. 2022 Sep 16;7334648221125635.

17. Lim-Soh JW, Tan PL. Weathering the Storm: Longitudinal Evidence on Women's Changing Family Relationships During COVID-19. J Fam Issues. 2022;Advance online publication.

18. Chan A. An Overview of Singapore's Long-term Care System: Towards a Community Model Care. In: Komazawa O, Saito Y, editors. Coping with Rapid Population Ageing in Asia. Jakarta: ERIA; 2021. p. 28–35.

19. Ministry of Health. I feel young in my Singapore! Action plan for successful ageing [Internet]. 2016 [cited 2022 Dec 29]. Available from: https://sustainabledevelopment.un.org/content/documents/1525Action_Plan_for_Successful_Aging.pdf

20. Chan A, Saito Y, Matchar DB, Østbye T, Malhotra C, Ang S, et al. Cohort Profile: Panel on Health and Ageing of Singaporean Elderly (PHASE). Int J Epidemiol. 2019 Dec 1;48(6):1750–1751f.

21. Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J. Two shorter forms of the CES-D depression symptoms index. J Aging Health. 1993;5(2):179–93.

22. Malhotra C, Chan A, Malhotra R, Østbye T. Fifteen Dimensions of Health among Community-Dwelling Older Singaporeans. Curr Gerontol Geriatr Res. 2011 Oct 30;2011:e128581.

23. Connor KM, Davidson JRT. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). Depress Anxiety. 2003;18(2):76–82.

24. Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck JC, et al. Performance of an Abbreviated Version of the Lubben Social Network Scale Among Three European Community-Dwelling Older Adult Populations. The Gerontologist. 2006 Aug 1;46(4):503–13.

25. Rubinstein RL, Lubben JE, Mintzer JE. Social isolation and social support: An applied perspective. J Appl Gerontol. 1994;13:58–72.

Publisher

Centre for Ageing Research and Education (CARE) is an academic research centre based in Duke-NUS Medical School, Singapore. Drawing on its interdisciplinary expertise and collaborations across medical, social, psychological, economic, and environmental perspectives, CARE conducts research on the social and medical determinants of successful ageing, and actively engages with government and industry partners to identify needs and strategies to enhance the experience of ageing in Singapore. CARE also conducts educational programmes to build competencies in ageing research among researchers, policy makers and programme professionals.

CARE's vision is an ageing population that is healthy, socially included and enjoys a high quality of life.

CARE's mission is to:

- Provide an environment that enables interdisciplinary research and education on ageing
- Implement and evaluate best practices to improve health and function of older adults
- Inform policy and practice agenda on ageing

Acknowledgements

Authors

Dr Jeremy Lim-Soh
Research Fellow, Centre for Ageing Research and Education, Duke-NUS Medical School

Nur Diyana Binte Azman
Senior Research Assistant, Centre for Ageing Research and Education, Duke-NUS Medical School

Ha-Linh Quach
Senior Research Assistant, Centre for Ageing Research and Education, Duke-NUS Medical School

Veronica Shi Min Goh
Independent Researcher (Formerly: Senior Research Associate, Centre for Ageing Research and Education, Duke-NUS Medical School)

Dr Rahul Malhotra
Deputy Director, and Head of Research, Centre for Ageing Research and Education, and Assistant Professor, Health Services and Systems Research, Duke-NUS Medical School; Principal Investigator of the 'Caregiving Transitions among Family Caregivers of Elderly Singaporeans' (TraCE) study

For more information, please contact:

Centre for Ageing Research and Education (CARE)
Duke-NUS Medical School
8 College Road
Singapore 169857
Email: care@duke-nus.edu.sg

Centre for Ageing Research and Education (CARE)
Duke-NUS Medical School

8 College Road, Singapore 169857
www.duke-nus.edu.sg/care
Email: care@duke-nus.edu.sg