How does Multimorbidity affect Middle-Aged Adults? A Cross-Sectional Survey in the Singapore Primary Healthcare Setting.

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Abstract

Background

Multimorbidity is of increasing prevalence and importance. It has been associated with poorer health-related quality of life (HrQoL) especially in the elderly population. Despite substantial multimorbidity at midlife, defined as those between 40-64 years old, there is a paucity of research investigating the impact of multimorbidity in this population. This study aimed to investigate the association between multimorbidity and HrQoL in the middle-aged primary care population in Singapore.

Methods

A cross-sectional study involving 40-64 year old participants was conducted at a primary care centre in Singapore. Interviewer-administered questionnaires were used to collect data regarding the participants' sociodemographic characteristics, chronic conditions, and HrQoL, as measured by the EuroQol 5 dimensions 3-levels questionnaire (EQ5D-3L). The associations between multimorbidity and the components of the EQ5D were assessed using multivariable regression analyses.

Results

The study included 297 participants, aged 40-64 years, of which 124 (42.7%) had multimorbidity. Participants with multimorbidity had lower mean EQ5D Utilities Index (UI) and mean Visual Analogue Scale (VAS) scores (UI = 0.804 ±0.251, VAS = 64.9 ±16.8) compared to those without multimorbidity (UI = 0.871 ±0.198, VAS = 68.5 ±16.0). After adjusting for sociodemographic factors, those with multimorbidity had significantly lower EQ5D UI, (β-coefficient = -0.064 (C.I -0.125, -0.003), p = 0.04), but not significantly lower EQ5D VAS, (β-coefficient = -0.045 (C.I 0.102, 0.012), p = 0.12). Additionally, participants with multimorbidity had higher odds (OR = 2.41, p = 0.01) of reporting problems due to pain/discomfort.

Conclusion

Multimorbidity was not significantly associated with the overall health state, as measured by the EQ5D VAS, in middle-aged primary care patients. However, it was associated with the EQ5D UI which is a composite measure of five specific domains of HrQoL. Specifically, there was a significant association between multimorbidity and the pain domain. Further studies are required to understand the relationship between multimorbidity and pain to enable physicians to better manage pain and HrQoL in this population.

Introduction

Multimorbidity, defined as the presence of multiple chronic conditions without a specific index disease,[1] is prevalent in primary care.[2,3] About 30–58% of middle-aged patients have multimorbidity,[2–4] and the absolute number of these patients may even exceed that of elderly patients.[3] A survey of the general population in Singapore found that 35% of middle-aged participants had multimorbidity[5] and although there are no official estimates in the Singapore primary care setting, the figure is likely to be higher. The prevalence of multimorbidity rises steeply in midlife and plateaus in those aged 75 years and above,[2] and this may be contributed by the growing emphasis on screening and early detection of chronic diseases. In fact, many countries have national health screening programmes[6–8] targeting the middle-age (40–64 years old) population. Thus there is an urgent need for healthcare professionals and policy makers to understand how multimorbidity affects this population.

People with multimorbidity have poorer HrQoL,[9–11] higher healthcare costs and utilization,[12,13] and higher mortality.[14] The impact of multimorbidity may be different across various age groups. While many studies have focused on the elderly,[18–20] few have focused on middle-aged adults. Younger people may have poorer HrQoL compared to the elderly, possibly due to the lower health expectations of older people or their ability to adapt better to lifestyle changes imposed by adverse health events.[9,11] Middle-aged people have unique disease patterns,[15] perceptions of healthcare,[16] and pressures in life.[17] By understanding how the co-existence of multiple chronic conditions affects them, suitable interventions can be designed to improve patient care and satisfaction. We aimed to describe the association between multimorbidity and HrQoL in the middle-aged primary care population in Singapore.

Methods

A cross-sectional study was conducted in August 2017 at Hougang Polyclinic, which is a public primary care centre serving the Hougang Township in Singapore. The Hougang township is the fifth largest township in Singapore,[21] with approximately 223,010 residents of which 40% are middle-aged. There is no strict definition of "middle-age" and studies have defined it as age between 40–65 years[22] or 45–64 years.[3,5,23] In our study, the lower age limit was defined as 40 years old as that is also the minimum age at which general health screening is recommended.[6] According to the Singapore census those aged 65 years and above are considered elderly[21] and hence the upper limit of our middle-age range was defined as 64 years old. Potential participants were selected in a systematic manner based on their age (40–64 years old), their clinic appointment times and type (walk-in or scheduled) of clinic appointment. They were then approached and screened for eligibility. The inclusion criteria were a) aged 40–64 years, b) had at least one or more chronic condition(s) out of a predetermined list of 14 chronic conditions, c) consented to access of electronic medical records for data collection, and d) spoke and understood any one of the three main languages in Singapore: English, Mandarin or Malay. Participants were excluded if they were non-communicative, unable to give consent, or if they did not complete the survey.

Definition of Multimorbidity

We defined multimorbidity as the presence of three or more chronic conditions as it identifies patients with greater health needs and is more useful to clinicians.[2] The list of 14 chronic conditions to define multimorbidity was obtained from a previous study in Singapore, and included: diabetes mellitus, hypertension, lipid disorder, neurological conditions, respiratory diseases, psychiatric conditions, cancer, chronic kidney disease, heart diseases, arthritis, back/neck problems, gastrointestinal diseases, thyroid disease and physical disability.[18] Participants were asked to report if they had any of the chronic conditions listed above, as told to them by a registered physician. In this study, multimorbidity was categorized dichotomously, distinguishing those with one or two conditions (no multimorbidity) from those with three or more conditions (with multimorbidity).

Measurement of Health-related Quality of Life

HrQoL was measured by EQ5D-3L questionnaire,[24] which has been validated locally,[25–27] and is available in the three most spoken languages in Singapore-English, Mandarin and Malay. The EQ5Dconsists of two components. The first component is the health-state Utility Index (UI). It measures five dimensions of HrQoL (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) on a three-point severity scale (no problems, moderate problems or extreme problems). The Singapore time trade-off values were used to convert the information into UI scores, with – 0.790 being the worst health state and 1.000 being the best health state. The second component of the EQ5D is the visual analogue scale (VAS) which consists of a scale from 0 to 100. It is used to assess self-perceived global levels of health, with 0 representing the worst imaginable health state and 100 the best imaginable health state. Participants were asked to select a number on the VAS, which best represented their global health state for that day.

Sociodemographic variables

The sociodemographic variables collected included age, sex, ethnicity, main spoken language, marital status, education level, work status, monthly household income (in Singapore dollars), type of dwelling, home ownership, and living arrangement. With regards to the type of dwelling, the options are more varied in view of Singapore's unique housing landscape where the majority of the population live in subsidised housing provided by the Housing Development Board (HDB).[21] The size and value of these apartments correspond to the number of rooms stated. In addition, there are hybrids of public and private housing such as the Executive Condominiums and Housing Urban Development Company apartments that cost more than the usual HDB apartments. The minority of the population stay in private housing that includes private condominiums and landed properties.[21]

Study Sample

Sample size was calculated by assuming a Pearson's coefficient of -0.2, which was derived from the Spearman coefficient of the association between EQ5D UI and the Counted Multimorbidity Index reported in H Radner et al.[28] With alpha of 0.05 and power (1-beta) of 80%, the estimated sample size was 194. Assuming 30% refusal and incomplete data, the final calculated sample size was 278.

Statistical Analysis

The sociodemographic characteristics, number of chronic conditions, and EQ5D states of the study population were analysed descriptively. Means with standard deviations were calculated for continuous variables, while frequencies and percentages were computed for categorical variables.

A generalised linear model with log link function was used to analyse the associations between multimorbidity and each of the two components (UI and VAS) of the EQ5D, producing regression coefficients with 95% confidence intervals. Binary logistic regression was used to compare the responses i.e., "moderate or severe problems" to "no problem" for the sub-group analysis of each of the EQ5D domain. The analyses were adjusted for sociodemographic variables. A p-value of < 0.05 was considered statistically significant. All statistical analyses were performed using IBM SPSS for Windows Version 24 (IBM Corporation, Armonk, New York, USA)

Results

Of the 410 clinic patients who were approached and screened, 46 patients were not eligible and 64 patients declined to participate in the study. Of the 299 patients who participated in the survey, another two were excluded as they did not fulfil the inclusion criteria. A total of 297 participants were included in the study giving a response rate of 72.4%. Most of the participants were aged between 55 to 64 years, with a mean age of 56.6 ± 5.8 years. A portion of 41.7% had multimorbidity. The participants were mainly males (52.2%), Chinese (81.5%), married (78.1%), and employed (70.0%) (Table 1). The mean number of chronic conditions was 2.28 ± 1.2 and the most common conditions were lipid disorder (61.3%), hypertension (57.2%) and diabetes mellitus (34.3%).

All the participants completed the EQ5D questionnaire and the mean EQ5D UI and VAS were 0.843 ± 0.223 and 66.9 ± 16.4 respectively. There were 23 health states represented out of 243 possible ones from the study population. The most common (49.2%) EQ5D UI was 1.000, which corresponded to the best achievable health state of "11111", representing "no problem" with all five domains. The lowest EQ5D UI was – 0.357 which corresponded to a health state of "23222" i.e., "severe problems" with self-care and "moderate problems" with mobility, usual activities, anxiety/depression, and pain/discomfort. The EQ5D domain with the most reported problem was pain/discomfort (41.0%), followed by anxiety/depression (22.9%), mobility (13.5%), activities of daily living (9.8%), and self-care respectively (0.34%). Compared to participants with no multimorbidity, those with multimorbidity had a higher odds (OR = 2.04, p = 0.01) of reporting problems with pain/discomfort (Table 2).

Participants with multimorbidity had lower EQ5D UI and VAS scores compared to those without multimorbidity. However, after adjusting for sociodemographic factors, only EQ5D UI was significantly associated with multimorbidity (β-coefficient = -0.064, p = 0.04) (Table 3A). In the same regression model, age and living arrangement were also associated with EQ5D UI. Participants aged less than 50 years old and those living with others had lower EQ5D UI compared to those aged 60 to 64 years old (β-coefficient = -0.137, p = 0.01), and those living alone (β-coefficient = -0.151, p = 0.02), respectively (Table 3A).

Discussion

We conducted a cross-sectional study investigating the association between multimorbidity and HrQoL in middle-aged patients at a primary care setting in Singapore. In the study, participants with multimorbidity had significantly lower domain-specific HrQoL scores (EQ5D UI) but not global HrQoL scores (VAS). Specifically, participants reported more problems with the domain of pain/discomfort.

Middle-aged patients with multimorbidity had lower EQ5D UI, and is in keeping with the findings from other studies.[9,11,29] Multimorbidity increases the disease burden and affects one's HrQoL. Additionally, patients with multimorbidity are more likely to experience higher treatment burden which includes polypharmacy, adjustment to major lifestyle changes, constant monitoring of one's own health status, and navigation of a complex healthcare system.[30-32] Middle-aged adults also often have multiple financial and care-giving responsibilities[33] which may be overwhelming for them to balance these responsibilities with their own healthcare needs.

Although patients with multimorbidity had lower EQ5D VAS in our study, the association was not statistically significant. This is in contrast to other studies in the primary care[34] and general populations[35] that reported an inverse relationship between multimorbidity and VAS scores. The EQ5D UI is based on the participants' selection of one out of three responses to each of the five EQ5D domains that is weighted by general public preferences. In contrast, the VAS is derived from the participants' self-indication of their general health for that day. Compared to the choice-based UI, the VAS measures a broader construct of the individual's health which is not confined to the five specific domains and is more reflective of the individual's perception of his or her own general health state.[36] This study suggested that while multimorbidity was associated with poorer HrQoL compared to those without multimorbidity, as measured by a composite of pain, physical functioning, and mental wellbeing in the middle-aged participants, it was not associated with the general health state. When considering their general health state, the participants could have perceived their chronic conditions as mild, with little impact on their lives. While illness perception has been associated with HrQoL in single diseases,[37,38] its influence on HrQoL in patients with multimorbidity is not well studied. Further studies are required to understand the association of patients' illness perceptions with multimorbidity and their HrQoL.

Another interesting finding in our study was the significant association between multimorbidity and the EQ5D domain of pain/discomfort. The domain of pain/discomfort has the highest percentage of reported problems in our study and this is similar to other studies.[12,29,34,39] Chronic pain is a common, complex, and challenging condition and the extent to which multimorbidity is associated with chronic pain in the middle-aged population is unknown. A cross-sectional analysis of the elderly MultiCare Cohort Study sample found that chronic pain, as measured by the Graded Chronic Pain Scale[40] was largely associated with chronic lower back problems.[19] In our study, we were not able to distinguish if participants who reported problems to pain/discomfort had chronic or acute pain, neither were we able to determine the cause(s) of the participants' pain/discomfort. One may suffer from pain caused by the side-effects of medications, or from the discomfort caused by the disease(s). Moreover, chronic pain is strongly influenced by demographic and psychosocial factors.[41] Future studies may be undertaken to evaluate the factors contributing to chronic pain and HrQoL in middle-aged patients with multimorbidity. This can contribute to subsequent interventions to improve HrQoL in this population.

It is important to note that our sample is slightly older compared to other middle-aged primary care populations,[3,15,23] with most of our patients aged between 55-64 years old. This is reflective of the middle-age distribution at our centre as well as the fast-ageing Singapore population.[21] Within our population participants below 50 years had poorer HrQoL compared to those 60 years and above, a finding similar to that by Peters et al.[42] Possible explanations include the burden of additional responsibilities such as work or caring for children and elderly parents, and the higher likelihood of younger people reporting mental health problems which may have affected the EQ5D UI.[42] However, the adaptability of patients to the onset of new conditions and different chronic disease trajectories may change with time.[42] We also found that participants living with others had lower HrQoL compared to those living alone. Middle-aged patients with multimorbidity may face additional stress from caring for dependents, who would most likely be staying with them. Prazeres et al[43] also showed that living arrangement may affect both the physical and mental components of HrQoL in patients with multimorbidity.

Strengths and limitations

This study has a few limitations. Firstly, the cross-sectional nature does not allow establishment of causal relationships. Secondly, as the study was done at a single polyclinic, there was slight over-representation of Chinese and under-representation of Malays and Indians compared to the national population. Thirdly, the data collected were self-reported and there may be under or over-reporting of chronic medical conditions.[44,45]

The strengths of our study include the administration of the study questionnaires in multiple languages to maximize sample representativeness, and the selection of a validated HrQoL measure with local HrQoL weights. In addition, our study used a systematic randomized sampling method to select potential participants as an attempt to better represent the primary care population..

Conclusion

This study showed that multimorbidity, as measured by a count of chronic conditions, was not associated with self-perceived global HrQoL but was associated negatively associated with domain specific HrQoL, specifically for the domain of pain/discomfort. Further studies exploring chronic pain in the middle-aged primary care population with multimorbidity can help physicians better manage pain and improve the HrQoL in this population.

Abbreviations

EQ5D-3L: EuroQol 5 dimensions -3 levels; HDB: Housing Development Board; HrQoL: Health-related quality of life; UI: Utility Index; VAS: Visual Analogue Scale.

Declarations

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Tables

Table 1. Demographic Characteristics of the participants (N=297)		
	N	(%)
Age (years)		
< 50	38	12.8
50-54	54	18.2
55-59	98	33.0
60-64	107	36.0
Mean (± SD)	56.6	(± 5.8)
Median (IQR)	58.0	(53.0 - 61.0)
Sex		
Male	155	52.2
Female	142	47.8
Ethnicity		
Chinese	242	81.5
Non-Chinese	55	18.5
Main Spoken Language		
English	92	31.0
Mandarin	148	49.8
Malay/Tamil/Others	57	19.2
Marital Status		
Married	232	78.1
Others^	65	21.9
Education		
Primary/No formal	89	30.0
Secondary	131	44.1
Post-Secondary	77	25.9
Employed Or Not Employed		
Employed	208	70.0
Unemployed/Retired	89	30.0
Monthly Household Income		
<$2000	60	20.2
$2000-$3999	78	26.3
$4000-$5999	54	18.2
≥$6000	46	15.5
Not disclosed	59	19.9
Dwelling		
Institution/HDB 1-3 room	73	24.6
HDB 4 room	124	41.8
Other dwellings^^	100	33.7
Home Ownership		
Owner-occupied	266	89.6
Not owner-occupied	31	10.4
Living Arrangement		

Living alone	20	6.7
Living with others	277	93.3

^Other marital status: single, widowed, divorced, and separated

^^ Other dwellings: HDB 5-room or executive apartment, Housing and Urban Development Company apartment, HDB executive condominium, private condominium, and landed properties

HDB: Housing and Development Board

Table 2. ORs of participants reporting "Moderate or Severe problems" across each of the 5 EQ5D domains												
Mobility			Self-care			Activities of daily living			Pain / discomfort			Mood
Unadjusted OR	Adjusted OR±	p-value	Unadjusted OR	Adjusted OR±	p-value	Unadjusted OR	Adjusted OR±	p-value	Unadjusted OR	Adjusted OR±	p-value	Unadjusted OR
1.65	1.41	0.35	_¥	_¥	_¥	1.56	1.37	0.48	2.01	2.04	0.01*	1.23

± Adjusted for age, gender, ethnicity, language, marital status, education, employment, household income, dwelling, home ownership and living arrangement

¥ Unadjusted OR for the domain of self-care domain is 13133941.80, as all participants without multimorbidity reported "No problems" with self-care, while only 1 participant with multimorbidity reported "Moderate problems" with self-care.

*p-value <0.05

Table 3A. Unadjusted and adjusted means, and β coefficients of EQ5D UI across various predictors							
Predictor Variables	Un adjusted mean	(SD)	Adjusted mean	(SD)	β	95% C.I	p-value
Multimorbidity (MM)							
No MM	0.871	(0.198)	0.837	(0.034)	REFERENCE	-	-
MM	0.804	(0.251)	0.785	(0.032)	-0.064	(-0.125, -0.003)	0.04*
Age (years)							
<50	0.754	(0.304)	0.737	(0.042)	-0.137	(-0.246, -0.029)	0.01*
50-54	0.846	(0.217)	0.837	(0.042)	-0.01	(-0.095, 0.075)	0.82
55-59	0.845	(0.222)	0.828	(0.036)	-0.021	(-0.091, 0.050)	0.57
60-64	0.871	(0.187)	0.845	(0.036)	REFERENCE	-	-
Sex							
Male	0.843	(0.224)	0.801	(0.035)	REFERENCE	-	-
Female	0.843	(0.224)	0.82	(0.032)	0.023	(-0.040, 0.087)	0.48
Ethnicity							
Chinese	0.854	(0.212)	0.845	(0.034)	REFERENCE	-	-
Non-Chinese	0.795	(0.265)	0.777	(0.037)	-0.084	(-0.174, 0.005)	0.06
Main spoken language							
English	0.86	(0.249)	0.837	(0.036)	REFERENCE	-	-
Mandarin	0.835	(0.214)	0.778	(0.034)	-0.073	(-0.148, 0.001)	0.05
Malay/Tamil/ Others	0.838	(0.206)	0.817	(0.040)	-0.025	(-0.116, 0.066)	0.59
Marital status							
Married	0.856	(0.206)	0.845	(0.038)	REFERENCE	-	-
Others^	0.797	(0.275)	0.777	(0.034)	-0.084	(-0.171, 0.003)	0.06
Education							
Primary/ No formal	0.835	(0.218)	0.807	(0.038)	REFERENCE	-	-
Secondary	0.843	(0.239)	0.814	(0.036)	0.009	(-0.066, 0.083)	0.82
Post-secondary	0.851	(0.205)	0.811	(0.035)	0.005	(-0.087, 0.097)	0.91
Employment							
Employed	0.847	(0.217)	0.83	(0.032)	REFERENCE	-	-
Unemployed/ Retired	0.832	(0.239)	0.792	(0.036)	-0.047	(-0.116, 0.022)	0.18
Monthly Household Income							
<$2000	0.828	(0.284)	0.807	(0.037)	REFERENCE	-	-
$2000-$3999	0.861	(0.193)	0.831	(0.038)	0.03	(-0.059, 0.119)	0.51
$4000-$5999	0.808	(0.242)	0.791	(0.041)	-0.02	(-0.120, 0.079)	0.69
≥$6000	0.866	(0.186)	0.812	(0.045)	0.006	(-0.100, 0.113)	0.91
Not disclosed	0.848	(0.202)	0.811	(0.038)	0.005	(-0.090, 0.100)	0.92
Dwelling							
Institution/ HDB 1-3 room	0.841	(0.247)	0.824	(0.035)	REFERENCE	-	-
HDB 4 room	0.822	(0.222)	0.791	(0.036)	-0.041	(-0.122, 0.040)	0.32
Other dwellings^^	0.87	(0.207)	0.817	(0.038)	-0.009	(-0.096, 0.079)	0.85
Home Ownership							
Owner-occupied	0.855	(0.211)	0.842	(0.029)	REFERENCE	-	-
Not owner-occupied	0.743	(0.296)	0.78	(0.045)	-0.077	(-0.192, 0.037)	0.19

Living arrangement							
Living alone	0.919	(0.129)	0.874	(0.054)	REFERENCE	-	-
Living with others	0.837	(0.228)	0.751	(0.024)	-0.151	(-0.274, -0.028)	0.02*

^Other marital status: not married, single, widowed, divorced, and separated

^^ Other dwellings: HDB 5-room, HDB executive, Housing and Urban Development Company apartment, HDB executive condominium, private condominium, and landed properties

HDB: Housing and Development Board

*p-value < 0.05

Table 3B. Unadjusted and adjusted means, and β coefficients of EQ5D VAS across various predictors							
Predictor Variables	Un adjusted mean	(SD)	Adjusted mean	(SD)	β	95% C.I	p-value
Multimorbidity (MM)							
No MM	68.5	(16.0)	69.6	(2.5)	REFERENCE	-	-
MM	64.9	(16.8)	66.5	(2.5)	-0.045	(0.102, 0.12)	0.12
Age (years)							
< 50	62.8	(19.1)	63.2	(3.2)	-0.100	(-0.199. -0.001)	0.05
50-54	68.8	(16.2)	71.4	(3.3)	0.021	(-0.058, 0.101)	0.60
55-59	66.5	(16.8)	68.0	(2.7)	-0.027	(-0.095, 0.041)	0.43
60-64	68.0	(15.0)	69.9	(2.7)	REFERENCE	-	-
Sex							
Male	66.8	(16.1)	67.8	(2.6)	REFERENCE	-	-
Female	67.1	(16.7)	68.3	(2.4)	0.006	(0.053, 0.066)	0.84
Ethnicity							
Chinese	66.8	(16.2)	67.4	(2.5)	REFERENCE	-	-
Non-Chinese	67.9	(17.5)	68.7	(2.9)	0.019	(0.064, 0.101)	0.66
Main Spoken Language							
English	67.4	(16.3)	69.4	(2.8)	REFERENCE	-	-
Mandarin	66.4	(16.4)	66.8	(2.7)	-0.038	(-0.110, 0.034)	0.31
Malay/Tamil/ Others	67.8	(16.9)	68.0	(3.1)	-0.021	(-0.106, 0.065)	0.64
Marital Status							
Married	67.3	(16.0)	68.7	(2.8)	REFERENCE	-	-
Others^	65.8	(18.0)	67.4	(2.6)	-0.018	(-0.097, 0.061)	0.65
Education							
Primary/ No formal	67.8	(16.4)	70.1	(3.0)	REFERENCE	-	-
Secondary	67.3	(15.7)	68.6	(2.8)	-0.022	(-0.091,0.048)	0.54
Post-secondary	65.5	(17.7)	65.5	(2.6)	-0.068	(-0.156, 0.020)	0.13
Employment							
Employed	67.1	(16.5)	68.6	(2.4)	REFERENCE	-	-
Unemployed/ Retired	66.7	(16.3)	67.5	(2.7)	-0.016	(-0.081, 0.049)	0.62
Monthly Household Income							
<$2000	64.7	(18.0)	64.8	(2.8)	REFERENCE	-	-
$2000-$3999	68.8	(14.6)	70.4	(2.9)	0.083	(-0.002, 0.168)	0.06
$4000-$5999	66.0	(18.0)	68.2	(3.2)	0.051	(-0.042, 0.144)	0.28
≥$6000	68.6	(14.9)	70.7	(3.6)	0.087	(-0.015, 0.189)	0.09
Not disclosed	66.5	(16.7)	66.4	(2.9)	0.025	(-0.066, 0.116)	0.59
Dwelling							
Institution/ HDB 1-3 room	68.9	(19.0)	70.0	(2.7)	REFERENCE	-	-
HDB 4 room	65.1	(16.1)	65.9	(2.7)	-0.061	(-0.135, 0.013)	0.11
Other dwellings^^	67.9	(14.6)	68.3	(2.9)	-0.026	(-0.106, 0.054)	0.53
Home Ownership							
Owner-occupied	67.2	(15.8)	68.9	(2.3)	REFERENCE	-	-
Not owner-occupied	64.7	(21.2)	67.2	(3.4)	-0.026	(-0.127, 0.076)	0.62

Living Arrangement							
Living alone	70.3	(21.7)	71.0	(4.1)	REFERENCE	-	-
Living with others	66.7	(16.0)	65.2	(1.9)	-0.086	(-0.204, 0.033)	0.16

^Other marital status: not married, single, widowed, divorced, and separated

^^ Other dwellings: HDB 5-room, HDB executive, Housing and Urban Development Company apartment, HDB executive condominium, private condominium, and landed properties

HDB: Housing and Development Board

*p-value < 0.05