

ACKNOWLEDGMENTS

The authors thank Evelyne Guillaudou for her assistance.

Conflict of Interest: None.

Author Contributions: The authors contributed equally to this work.

Sponsor's Role: No sponsor.

REFERENCES

1. Suzuki T, Matsuzaka H. Drug-induced Pisa syndrome (pleurothotonus): Epidemiology and management. *CNS Drugs* 2002;16:165–174.
2. Villarejo A, Camacho A, Garcia-Ramos R et al. Case report: Cholinergic-dopaminergic imbalance in Pisa syndrome. *Clin Neuropharmacol* 2003;26:119–121.
3. Kwak YT, Han IIW, Baik J et al. Relation between cholinesterase inhibitor and Pisa Syndrome. *Lancet* 2000;355:2222.
4. Huvent-Grelle D, Roche J, Camus FE et al. Relation between cholinesterase inhibitors and Pisa syndrome in a cohort of five French patients with Alzheimer's disease. *J Am Geriatr Soc* 2007;55:1472–1487.
5. Huvent-Grelle D, Roche J, Camus FE et al. Relation between Pisa syndrome and choline esterase inhibitors in a cohort of Alzheimer's disease patients. *Presse Med* 2009;38:150–153 (French).
6. Huvent-Grelle D, Pagniez C, Delabriere I et al. Relation between cholinesterase inhibitors and Pisa syndrome in a cohort of ten French elderly Alzheimer patients. *J Nutr Health Aging* 2013;17(Suppl 1):S588.
7. Vanacore N, Suzzareddu G, Maggini M et al. Pisa syndrome in a cohort of Alzheimer's disease patients. *Acta Neurol Scand* 2005;111:199–201.
8. Zannas A, Okuno Y, Doraiswamy M. Cholinesterase inhibitors and Pisa syndrome: A pharmaco vigilance study. *Pharmacotherapy* 2014;34:272–278.
9. Cossu G, Melis M, Melis G et al. Reversible Pisa syndrome (pleurothotonus) due to the cholinesterase inhibitor galantamine: Case report. *Mov Disord* 2004;19:1243–1244.
10. Chen C-F, Hsu H-C, Ouyang W-C et al. Galantamine-induced Pisa syndrome: Memantine as an alternative. *Int J Geriatr Psychiatry* 2008;23:660–661.
11. Miyaoka T, Seno H, Yamamori C et al. Pisa syndrome due to a cholinesterase inhibitor (donepezil): A case report. *J Clin Psychiatry* 2001;62:573–574.
12. Ashraf M, Peters V. Pisa syndrome—a side effect of donepezil therapy. *J Am Geriatr Soc* 2005;53(Suppl 1):S143–S144.
13. Wang HQ. Rivastigmine induced Pisa Syndrome. *Taiwan J Psych* 2008;22:154–158.
14. Arora A, Verma A, Ashraf J et al. Donepezil and the leaning tower of Pisa. *J Am Geriatr Soc* 2008;56(Suppl):73–74.
15. Leelavathi M, Rosdinom R, Suguna M. Pisa syndrome secondary to rivastigmine: A case report. *Clin Ter* 2012;163:31–32.
16. Panagiotis I, Pantelis M, Karacostas D. Acute Pisa syndrome after administration of a single dose of donepezil. *J Neuropsychiatry Clin Neurosci* 2012;24:E26.
17. Yagi Y, Watanabe Y, Yokote H et al. Cervical dystonia in an Alzheimer's disease patient treated with donepezil. *Acta Neurol Belg* 2013;113:363–364.

DETERMINANTS OF LONG-TERM CARE NEEDS OF COMMUNITY-DWELLING OLDER PEOPLE IN SINGAPORE

To the Editor: Aging and urbanization are critical challenges confronting developed cities.¹ Singapore initiated a national project to develop urban solutions for aging,² including integration of health and social services within the built environment. Frail older people often have complex, long-term care (LTC)³ needs and experience frequent rehospitalizations.^{4,5} Community care needs

assessments identify needs and service gaps not previously known to health professionals.⁶ Meeting these needs through effective care coordination and interventions can prevent complications and hospitalizations.⁵ In community-dwelling older people, self-reported perception of health or problems meeting basic needs has been shown to predict morbidity, mortality, physical functioning, and depressive symptom.^{7–9} Although studies have assessed the LTC needs of community-dwelling older people, there is limited information on the determinants of these needs.

Approximately 80% of Singapore's residents live in public housing. Such housing is built based on a town planning concept, in which entire towns are built from scratch in locations nationwide. Towns are compact and contiguous, with community services nearby. Marine Parade town has 20% of public housing residents aged 65 and older, compared with the 10% national average. It is a naturally occurring “aged” microcosm of what other precincts will become in 15 years' time. To better inform planning of community services, the determinants of self-reported care needs of older residents in Marine Parade were studied.

RESEARCH STUDY

A cross-sectional survey was conducted of 3,752 residents of Marine Parade public housing aged 60 and older (67% of eligible residents) between March and June 2011. The sample was representative of the population with respect to age and housing type. The response rate was 68%.

Survey domains included in the questionnaire were developed based on the determinants of active aging documented in the World Health Organization policy framework for active aging.¹⁰ Data were collected on sociodemographic characteristics, health status including chronic diseases, functional status, depression, LTC needs, and reasons for any unmet needs.

LTC needs, which was the dependent variable in the model, were defined as needs for health care, social help, and emotional or financial support services. Health care includes different types of home- and center-based services. Social help includes meal deliveries, housekeeping, personal hygiene services, and transportation. Emotional support consists of support groups and counseling services. Financial support includes subsidies for independent community living.

Fifty-seven percent of the respondents were female, 47% were aged 65–74, and 27% were employed. Multiple logistic regression showed that number of chronic conditions, functional status measured according to number of activity of daily living (ADL) and instrumental ADL deficits, depressive symptoms, educational level, size and value of residence, and living arrangement (whether living with close or extended family) were significant determinants of LTC needs (Table 1).

Nine percent of participants indicated that they needed emotional support, 8.2% needed financial support, 5.1% needed social support, and 1.6% needed formal healthcare support.

Table 1. Multiple Logistic Regression on Determinants of Long-Term Care Needs of Community-Dwelling Older People

Variable	Odds Ratio (95% Confidence Interval)	P-Value
Number of chronic conditions	1.27 (1.18–1.36)	<.001
Need activity of daily living assistance	1.26 (1.00–1.59)	.048
Dementia	1.75 (0.85–3.57)	.13
Depression	2.08 (1.58–2.74)	<.001
Cognition problem	1.09 (0.78–1.53)	.62
Currently employed	0.64 (0.51–0.80)	<.001
Live (reference alone)		
With close family	0.69 (0.52–0.91)	.009
With extended family only	0.69 (0.48–0.99)	.04
Number of rooms in residence (reference 1–2)		
3	0.26 (0.20–0.33)	<.001
4–5	0.22 (0.17–0.28)	<.001
Female	0.89 (0.73–1.08)	.24
Education (reference no formal education)		
Primary to junior college	0.65 (0.52–0.81)	<.001
Diploma or degree	0.52 (0.34–0.79)	.002
Age (reference 60–64)		
65–74	0.87 (0.72–1.05)	.16
75–84	1.04 (0.78–1.39)	.78
≥85	0.72 (0.50–1.05)	.09
Ethnic group (reference Chinese)		
Malay	1.07 (0.83–1.39)	.58
Indian	1.01 (0.64–1.59)	.96
Other	1.09 (0.70–1.70)	.69

A goodness-of-fit test between the fitted model and the original data gave a P-value of .19, which indicated that the model was a good fit for the data.

CONCLUSIONS

Community-dwelling older people with higher education and socioeconomic status or living with family were less likely to have care needs than those who lived in rental housing or alone. Another study in Singapore found that enabling factors including education, household income levels of care recipient, residence, and value of caregiver housing influenced use of formal community-based LTC services.³ Individuals who need care and support may be less likely to use formal care services. Targeted interventions for this vulnerable group, such as care coordination⁵ and community case management linked to the health service, are needed to better support and monitor older people with care needs but at risk of doing without the appropriate services.

It is not surprising that older community-dwelling adults with chronic diseases, ADL and instrumental ADL deficits, or depressive symptoms were more likely to indicate that they had more needs, but more wanted social-emotional and financial support than practical healthcare and social support services. Use of community LTC services in Singapore are lower than in Western countries,³ possibly because of the preference for informal care assistance with ADLs. However, there is a demand for community support, support groups, and self-care and management to better support older people who are informal caregivers³ or, as the current study suggests, as benefi-

ciaries themselves. A critical factor in the development of urban solutions for aging is to make it easy to nurture strong family and local communities that sustain elderly adults and nurture younger individuals.

This study has important implications for the planning and improvement of community services for older people.

Shiou-Liang Wee, PhD
Geriatric Education and Research Institute, Alexandra
Health, Singapore
Duke University—National University of Singapore
Graduate Medical School, Singapore

Ye Li, MEng
Agency for Integrated Care, Singapore

Yan Sun, PhD
National Healthcare Group, Singapore

Ying-Xian Chua, MPH
National University Health System, Singapore

ACKNOWLEDGMENTS

This work was funded by the Ministry of Community Development, Youth and Sport, and Ministry of Health and Ministry of National Development, Singapore.

Conflict of Interest: The editor in chief has reviewed the conflict of interest checklist provided by the authors and has determined that the authors have no financial or any other kind of personal conflicts with this paper.

Author Contributions: Wee: study concept, survey design, literature review, interpretation of results, manuscript drafting. Li: data analyses, manuscript drafting. Sun: data analyses. Chua: literature review, manuscript drafting.

Sponsor's Role: None.

REFERENCES

1. Global Age-Friendly Cities Guide. Geneva: World Health Organization, 2007.
2. City for All Ages Project to develop urban solutions for ageing. Ministry of Community Development, Youth and Sports, Media Release dated 2 March 2011, Singapore [on-line]. Available at <http://app.msf.gov.sg/Press-Room/City-for-All-Ages-project> Accessed May 22, 2014.
3. Wee SL, Liu C, Goh SN, et al. Determinants of community based long term care services use. *J Am Geriatr Soc* 2014;62:1801–1803.
4. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med* 2009;360:1418–1428.
5. Wee SL, Loke CK, Liang C, et al. Effectiveness of a national transitional care program in reducing acute care use. *J Am Geriatr Soc* 2014;62:747–753.
6. Stevens A, Gillam S. Needs assessment: From theory to practice. *BMJ* 1998;316:1448.
7. Sachs-Ericsson N, Schatschneider C, Blazer DG. Perception of unmet basic needs as a predictor of physical functioning among community-dwelling older adults. *J Aging Health* 2006;18:852–868.
8. Blazer DG, Sachs-Ericsson N, Hybels CF. Perception of unmet basic needs as a predictor of mortality among community-dwelling older adults. *Am J Public Health* 2005;95:299–304.
9. Blazer DG, Sachs-Ericsson N, Hybels CF. Perception of unmet basic needs as a predictor of depressive symptoms among community-dwelling older adults. *J Gerontol A Biol Sci Med Sci* 2007;62A:191–195.
10. Active Ageing: A Policy Framework. Geneva: World Health Organization, 2002.