



Monetary cost of family caregiving for people with dementia in Singapore



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ABSTRACT

This study quantified the monetary cost of family caregiving for 51 patients with different severity of dementia. The mean annual informal cost of care was higher ($M = \text{SG}\$44,530.55$, $SD = \text{SG}\$31,354.82$) compared to the mean annual formal cost of care ($M = \text{SG}\$25,654.11$, $SD = \text{SG}\$10,016.48$). Costs were found to increase with severity of dementia (Severe: $\text{SG}\$47,251.30$; Moderate: $\text{SG}\$38,607.84$; Mild: $\text{SG}\$13,847.68$). For each point increase in CMMSE scores, the informal cost lowered by $\text{SG}\$1,173.94$. There was a significant negative correlation of cost and cognitive impairment but not functional impairment. The informal cost of care did not vary much with or without the use of day care centres, however the costs for those who did not have domestic helpers (DHs) was more than twice the costs for those with DHs. Results from this study show there were cost savings in care of people with dementia with DHs.

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1. Introduction

The proportion of older adults (defined as persons aged 65 years and older) in Singapore has increased dramatically from 2.5% of the resident population in 1965 to 11.8% in 2015 (Singapore Department of Statistics, 2015). With this ageing population, the number of elderly with dementia is expected to increase proportionately. There are currently 40,000 people with dementia in Singapore and by 2030, that number is expected to more than double to 92,000 (Alzheimer's Disease Association, Singapore, 2016), thus posing a heavy burden on families, national healthcare, social services and the economy. With projected increases in the number of people at risk of developing dementia in Singapore, the economic impact of the disease in terms of future long-term care costs will be significant. Dementia is not just a medical problem, it is also a societal problem, where economic and financial resources will be utilised.

Monetary cost of care is a sum of formal and informal costs. Formal costs comprise primarily of medical costs and may be calculated based on costs of health service use and medications. Informal care costs comprise time spent by the caregivers

attending to the needs of people with dementia (PWDs) and play a major role in the total care costs for people with chronic diseases, including for PWDs. The primary aim of this study is to quantify the total monetary cost of time for the family to care for PWDs in Singapore and calculate the formal cost of care for them. This study is important as it is the first study to quantify the formal (i.e. out of pocket costs) and informal costs (monetary equivalent of "time") of people with mild, moderate and severe dementia in Singapore, and to evaluate the impact on monetary costs of the contribution of domestic helpers (DHs) and day care centres (DCCs). Data will be collected from caregivers regarding how much they pay from their own, or the PWD's own, resources for the services used directly for dementia-related care (e.g., day care, transportation). In addition, the impact on costs of the presence of DHs and of the severity of impairment of dementia will be explored.

2. Informal costs

The major informal cost of care is caregiving time. This generally consists of the amount of time spent caring or supervising the patient by the primary informal caregiver and can be quantified as actual or potential wages lost by the caregiver. However, the provision of this informal care is now gradually being shifted to more than one caregiver (Wimo et al., 2013). This shift has complicated the valuation of the caregiver's time.

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There are several methods that are used to value the price of informal care time. Two of the most common methods are opportunity and replacement cost approaches. Opportunity cost approach seeks to identify the opportunities forgone by the caregiver as a result of their caregiving responsibilities (Mauskopf & Mucha, 2011). This approach attempts to place a monetary value on the alternative activity which is forgone due to the time being spent in taking care of the patient. In calculating the opportunity cost, different values are assigned to this time forgone. The value depends on whether the foregone alternative use of time would have been as paid employment or unpaid leisure time. The price for labour, or wages forgone, is different for an employed caregiver compared to a retiree caregiver or a DH. If caregiver is a retiree, informal care time is valued with leisure time, as a percentage of work time usually between 25% and 33% (Shea, 2000).

Replacement cost approach calculates the time spent on caregiving at the labour market price of a close substitute worker. Informal care time is valued at the wage rate or market price of a professional caregiver (Berg & Spauwen, 2006). The replacement cost approach allows the division of informal care into several tasks. Thus, informal care time can be valued with different average wages, which can be based on the hourly rates for nurse's aides, cleaners, book-keepers, and social workers (Harrow, Tennstedt, & McKinlay, 1995).

The informal care cost was estimated by multiplying the informal care time spent taking care of the patients with the type of caregiver by the "price of labour" (i.e., average wages based on government published wage data). To best reflect reality, this study used the replacement cost approach for caregivers' supervision of activities of daily living (ADL) and the opportunity cost approach for instrumental activities of daily living (IADL).

3. Caregiving in Singapore

Singapore has a unique system where live-in full time DHs play an important role as additional caregivers for PWDs. The DHs main responsibilities are taking care of the family household chores including caring for children and elderly. DHs are often employed when PWDs are not in full-time residential care facilities (RCFs) or DCCs (Chong et al., 2013).

PWDs are typically either at a full time RCF, or cared for at home by full time DHs with primary caregiver support. Some PWDs may spend half or full day at DCCs and be cared for by DHs rest of the time at home. Some DHs are sole caregivers for these PWDs when primary family caregivers also have health problems.

The value of the informal cost of care varied depending on the proportion of care provided by caregivers foregoing employment, caregivers foregoing leisure or other unpaid retirement activity, or by DHs. The hourly labour cost paid to a DH is typically less than the earning capacity of a family caregiver. Based on the Singapore Ministry of Manpower data (Ministry of Manpower, 2016), a paid employee is paid based on a standard 44 h per week in Singapore. This is the base figure used to calculate lost earning capacity for caregivers.

Costs of service use in Singapore are typically low for the individual patient as majority of medications and services are subsidised by the government. However, dementia medications and other service costs such as facilities and equipment must still be considered, along with caregiver and DH salaries, as part of the total costs of care.

4. Measuring costs

The Resource Utilization in Dementia (RUD; Wimo, Wetterholm, Mastey, & Winblad, 1998) systematically considers caregiver time used in assisting with ADLs, IADLs and providing general

supervision. This allows monetary figures to be associated with caregiver time. This study adopts a cost of illness approach in the analysis of data. This analysis calculates both the direct and indirect costs of a particular illness (Ernst & Hay, 1994; Gray & Fenn, 1993). Its purpose is two-fold: 1) it provides an estimate on the monetary impact to caregiving by such a disease like dementia; and 2) it provides information on the importance of the problem and highlights areas for interventions to reduce costs. The output, expressed in financial terms, is an estimate of the full burden of a specific illness to society (Rice, 2000).

This paper aims to quantify the informal care costs incurred through time spent in caregiving by the primary caregiver and other caregivers (including DHs) for individuals in Singapore with mild, moderate or severe dementia. It is hypothesised that informal costs 1) for mild and moderate dementia will be commensurate with those found by Chong et al., 2) will be higher for cases of severe dementia, 3) will be lower with DHs providing care rather than family members alone, and 4) will be higher than formal care costs.

5. Method

5.1. Participants

There were 346 consecutive patients attending a routine psycho-geriatric consultation in a government funded public mental health centre in Singapore during a four-month period from August to December 2015. Of these, there were 59 patients who had dementia and fulfilled study criteria. However, four declined to participate while another four did not turn up for their appointments. The final study sample consisted of 51 patients with varying severity of dementia.

All patients were aged 65 years or above and met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision (DSM-IV-TR) criteria for dementia. There were 36 cases of Alzheimer's disease, 14 of vascular, and one of Lewy Body dementia. Participants were accompanied by reliable caregivers or other informants and fluent in either English or Mandarin. The sample included nine PWDs from RCFs.

5.2. Measures

5.2.1. Costs of care

The RUD was used as a structured interview to measure costs. Caregivers were asked to state the number of hours and days on a typical day they had assisted PWDs in ADL, IADL and supervision during the last four weeks. Caregivers were also asked about their work status and hours of work lost due to caregiving and DHs involvement in caregiving.

5.2.2. Cognition screening

The Chinese Mini-Mental State Examination (CMMSE; Saha-devan, Tan, Tan, & Tan, 1997) was used to screen PWDs general cognitive abilities. The possible CMMSE score ranges from 0 to 28, with lower scores indicating more severe impairment (0–10: Severe, 11–20: Moderate and 21–24: Mild).

5.2.3. Function screening

The Barthel Index (Lubke, Mencke, & von Renteln-Kruse, 2004) was used to measure the functional impairment of the patient, such as bowel and bladder continence, toilet use, bathing, feeding, grooming, dressing, mobility and ability to cope with stairs. The possible score ranges from 0 to 20, with zero indicating the greatest functional impairment. The Barthel Index score was divided into severe (0–9), moderate (10–15), and mild disability (16–20).

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