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The effects of the indoor environment of residential care homes on dementia suffers in Hong Kong: A critical incident technique approach

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ABSTRACT

Dementia is an irreversible and incurable syndrome that leads to progressive impairment of cognitive functions and behavioural and psychological symptoms such as agitation, depression and psychosis. Appropriate environmental conditions can help delay its onset and progression, and indoor environmental (IE) factors have a major impact. However, there is no firm understanding of the full range of relevant IE factors and their impact levels.

This paper describes a preliminary study to investigate the effects of IE on Hong Kong residential care homes (RCH) dementia residents. This involved six purposively selected focus groups, each comprising the main stakeholders of the dementia residents' caregivers, RCH staff and/or registered nurses, and architects. Using the Critical Incident Technique, the main context and experiences of behavioural problems of dementia residents caused by IE were explored and the key causal RCH IE quality factors identified, together with the associated responses and stress levels involved.

The findings indicate that the acoustic environment, lighting and thermal environment are the most important influencing factors. Many of the remedies provided by the focus groups are quite simple to carry out and are summarised in the form of recommendations to current RCHs providers and users.

The knowledge acquired in this initial study will help enrich the knowledge of IE design for dementia-specific residential facilities. It also provides some preliminary insights for healthcare policymakers and practitioners in the building design/facilities management and dementia-care sectors into the IE factors contributing to a more comfortable, healthy and sustainable RCH living environment in Hong Kong.

1. Introduction

Dementia is an irreversible and incurable syndrome and the immense growth in the number of affected individuals in recent years is a global phenomenon [1]. Prime Minister, David Cameron, for instance has described dementia as being a "national crisis", affecting 800,000 people in the UK [2]. As a result, The World Health Organisation (WHO) and Alzheimer's Disease International have brought dementia to the forefront of the global public health agenda [3], with an urgent call for 'tackling the social and economic burden caused by dementia', while 'enhancing the quality of life (QOL) of people with dementia and their caregivers' [3]. Nations throughout the world are now sharing the challenge to create systematic approaches for dementia prevention, diagnosis and intervention. Australia, Denmark, England, France, Republic of (South) Korea, Netherlands, Norway, Scotland and Wales, for example, have established national dementia plans, being implemented through collaborations between government agencies, legislators, residential care providers, community care providers, dementia sufferers, family members, physicians and researchers [1].

Past studies (e.g. [4,5,6,7],) indicate the importance of environmental conditions, as people with dementia depend on their living and surrounding environment to compensate for their increasing frailty and sensory loss [5,8]. Indoor environmental (IE) factors such as sound and lighting levels have a major impact (e.g. Refs. [5,6,9,10]). Although some effects of architectural forms, layouts and designs are already known (e.g. Refs. [11,12]), the range of relevant IE factors and their impact levels is yet to be fully determined. There is also lack of firm understanding of the association between IE, behavioural and psychological symptoms of dementia (BPSD) and the quality of life (QOL) of those with dementia and their caregivers.

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In Hong Kong, one form of care facility is the Residential Care Home (RCH) for dementia, currently facing the task of providing residents with a healthy living care environment. At present, though, there is a lack of sufficiently reliable information concerning indoor comfort settings in their design to fully meet the needs of those affected by different dementia levels. Meanwhile, the Government plans to build new RCHs and better utilise existing homes for the frail elderly, including the provision of better and healthier living environments [13]. Knowledge of the various IE-BPSD/QOL interactions is needed, therefore, to help in the IE design of dementia-specific residential facilities; identify IE-related BPSD problems; develop ways to improve the BPSD/QOL of dementia suffers and their caregivers; and minimise the long term costs of IE-related behavioural and other problems.

The purpose of this study was to investigate the effects of IE on Hong Kong residential care homes (RCH) dementia residents with the Critical Incident Technique. This involved six purposively selected focus groups, each comprising the main stakeholders of dementia residents' caregivers, RCH staff and/or registered nurses, and architects. The findings of this project will generate valuable information to healthcare policymakers and practitioners in building design/facilities management and dementia-care sectors on how to create and maintain optimal IEs for people with dementia and their caregivers, and assist healthcare professionals by signalling IE-related behavioural and other health problems.

2. Literature review

2.1. Nature and level of dementia

Dementia is one of the most pressing health challenges in the world today, and one that many countries can no longer disregard [14]. It is a progressive and largely irreversible clinical syndrome that is characterised by a decline in cognitive abilities and a high prevalence of BPSD such as agitation, depression and psychosis [15,16]. Behavioural and psychological problems can bring tremendous distress for those afflicted by dementia and their caregivers/family and this is often the reason for referral of dementia patients for placement into high-cost residential or nursing home care [17,18,19]. The costs and burden relating to the care of people with dementia not only imposes huge economic stress on affected families, but also exerts significant pressures on the economic, health and social systems in many countries [20,21], with the current total worldwide cost of dementia care estimated to be US$604 billion [3]. The costs of social care, unpaid caregivers and productivity loss relating to dementia impose a significant negative impact on national economies (around 1.0% of aggregate worldwide GDP) with the highest proportions incurred in high-income countries [3]. As worldwide dementia cases are projected to double every 20 years (i.e. from 35.6 million cases in 2010 to 115.4 million cases in 2050), the societal cost of dementia care is likely to rise even faster in the near future [3].

In Hong Kong, dementia-related conditions are now one of the five biggest non-communicable causes of death [22]. In view of this, public spending on elderly services in Hong Kong has grown by 145% from 1997 to 2010 [23]. Based on the current incidence rate of dementia and the projected elderly population, the numbers of people suffering from dementia in Hong Kong is expected to increase significantly to 0.33 million by 2050 [24], and the need for long-term care for a large number of such sufferers will strain local health and social systems, and budgets. While the greatest proportion of direct costs of dementia care is associated with institutional support in care homes, effective dementia care in RCHs may help lessen the economic burden of caregivers, family, the community and the government in the long term [3]. If interventions could delay both disease onset and progression by just one year, there is estimated to be nearly 9.2 million fewer cases in 2050, mostly attributable to decreases in persons needing a high level of care [25]. With increasing evidence that the development of BPSD is associated with further cognitive decline (e.g. Ref. [26]), greater impairment in activities of daily living [27] and poorer QOL of dementia sufferers and caregivers (e.g. Ref. [19]), recognising the factors that can aggravate BPSD offers the best chance of alleviating the progression of dementia and promoting the wellbeing of both sufferers and caregivers.

2.2. Potential building and construction industry contribution

Research in the built environment has provided increasing evidence that a healthy and comfortable living environment can be therapeutic, and is considered to be an enabling factor in maintaining enjoyable activities for the chronically sick [28,29]. As residents in RCHs spend most their time within the boundaries of the home, they depend on its environment to compensate for the physical and cognitive frailties associated with their condition [5,8,11]. Since the physical environment in which we live is a universally recognised domain of QOL [30], maintaining and promoting the QOL of demented people in long-term residential care is particularly critical to their well-being, safety and health [31]. The provision of a healthy and comfortable built environment is therefore of crucial importance. The effects of architectural forms, layouts and designs are already known to some extent (e.g. Refs. [11,12,32,33,41]), while existing guidelines in the 'Universal Design Guidebook for Residential Development in Hong Kong' [34] provide general guidance and encourage good environmental design practice (i.e. Chapter 5-Environmental Factors [34]) applicable to a wide variety of people of varying abilities with age-, disability- or illness-related problems. However, as the Government has pointed out, there is a current lack of understanding of user-specific needs and indoor physical environment effects on RCH dementia residents [35]. In particular, little is known of the detailed implications of specific IE conditions (acoustical, illumination, thermal and indoor air quality levels, etc) on dementia residents and their caregivers.

2.3. Dementia and the indoor living environment

Recent studies have identified the general effects of four environmentally related factors on people with dementia: noise, lighting, temperature and air quality. Van Hoof et al. [6] review the impact of i) air and odour, ii) light and lighting and iii) the acoustic environment on older people suffering from dementia in the Netherlands in relation to the ageing of their senses and dementia, and suggest that light and lighting are the most important environmental parameters affecting the behaviour and well-being of dementia sufferers. Noise and acoustical environmental are considered the second most important parameter [7]. Good lighting, on the other hand, increases safety, particularly in relation to mobility [38,39,42]. This is particularly important for those with dementia since the increase of both contrast and brightness occurs in the image projected onto their retina – and retinal dysfunction is common [10]. For example, research by van Hoof et al. [5] indicates that high intensity lighting with a highly correlated colour temperature emitted by ceiling-mounted luminaires can positively influence the restless behaviour of institutionalised older adults with dementia. However, in a similar study, the lighting conditions of nursing homes were found to be poor, with many older residents living in a rather dark environment [40].

Noise levels determine the quality of sleep, and have been found to lead to increased agitation and fear in individuals with dementia