

Continuous Health Care Model Lab

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● Purpose

Developing care models for persons living with dementia, older persons following a hip fracture and their families

● Research focus

- Smart home nursing care for families of persons living with dementia and older persons following a hip fracture
- Family caregiving processes for persons living with dementia
- Care models for older persons following hip fracture
- Dementia friendly community

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● Research Contribution

- **Dementia-Friendly Community (Policy Implications)**. Our recent studies focus on a dementia-friendly community (DFC) and have an impact on the development of dementia-friendly communities in Taipei and Taiwan. One study on persons living with dementia (PLWDS) and their family caregivers in an aboriginal community found that the experiences of older Atayal PLWDS and family members were captured by the overarching concept of 'low dementia awareness, high family-like ambience in the community'.¹ Despite the low or absent community awareness of dementia, older Atayal PWDS functioned as freely in the community as at home due to a family-like supportive environment. Our results suggest that this Aboriginal community and culture offer many DFC-like elements that could be studied to enhance DFC models elsewhere. Strategies are needed to reduce environmental challenges for PLWDS and their families. The low community awareness of dementia suggests that services introduced must be culturally appropriate and non-disruptive to naturally help systems that are already in place. A second study identified indicators for a DFC in Taiwan from the perspectives of PLWDS and dementia-family caregivers.² This study compared perceived dementia friendliness from different perspectives including people living in the community, service providers, family caregivers and PLWDS³. These indicators and findings have been used as a guide for developing and evaluating dementia-friendly communities in Taipei city and Taiwan.
- **Smart-Clothes Assisted Home Nursing (Technology Applications)**. We developed a smart-clothes assisted home nursing model based on the use of smart clothing combined with a 24-hour continuous remote monitoring system. This monitoring system is able to identify daily activity patterns and deviations in the patterns of PLWDS who are recovering from hip-fracture surgery. Based on the continuous monitoring data and real-time alerts, the home care nurse can identify risks of adverse health outcomes early, which can then be used to provide

feedback and guidance for the family caregivers. This smart-clothes assisted home nursing was able to increase family caregivers' knowledge of the care recipient's situation and condition, inform healthcare providers of the care recipient's physical health and cognitive status, help home care nurses provide timely interventions, balance the care recipient's exercise and safety, motivate recipients to exercise, help family caregivers balance work and caregiving, provide guidance for caregiving activities, and provide indirect benefits to the care recipients due to the timely interventions and caregiving.⁴ We also found that this program was able to offer supplementary support to family caregivers during the heightened COVID-19 alert⁵. These findings can enhance the applications of smart clothes in community settings and were awarded the National Innovation Award of "Smart Clothes as a Health Care Platform 2021." Currently, randomized clinical trials on smart-clothes assisted home nursing have been conducted in persons living with dementia (MOST 111-2314-B-182-010-MY3) and older adults following hip fracture surgery (NHRI-EX111-10906PI).

- **Care models for older persons following hip fracture surgery (Practice Implications).** I have had an especially productive 20-plus-year collaboration with Professor Jersey Liang from the University of Michigan on longitudinal studies and clinical trials with hip-fractured elderly persons, which includes an interdisciplinary team of orthopedic surgeons, geriatricians, geriatric nurse specialists, physical therapists, and a health economist. They have extensive experience not only in exploring recovery trends and health outcomes of hip-fractured older adults,⁶⁻¹² but also developed two very effective models for older adults with hip fracture: an interdisciplinary care model,¹³⁻¹⁹ and a comprehensive care model.²⁰⁻²³ These models have been implemented in some of the medical centers in Taiwan. My team and I extended these care models and tested them in clinical trials on hip-fractured older adults with comorbid conditions, including diabetes mellitus²⁴ and cognitive impairment²⁵. A model to understand the relationships among nutritional status, cognitive impairment and post-operative recovery of older persons with hip fracture was also developed.²⁶ The findings could provide future development of intervention models.
- **Family caregiving for persons with dementia (Theory Development).** I developed a model of "finding a balance point" to explain the phenomenon of family caregiving to frail older adults and older adults with dementia in Taiwan. Balance, defined as the effort to maintain equilibrium between the competing needs of the caregiver and care receiver in daily life,²⁷ was shown to benefit both caregivers and care receivers. Caregivers who did well in balancing competing needs while providing care to a frail older family member at home provided better

quality care to the care receiver and had more positive caregiving outcomes,²⁸ such as better mental health.²⁹ Conversely, caregivers with a poor sense of balance between providing for the care receiver's ongoing needs and meeting their own daily demands might suffer from greater role strain and more depressive symptoms. This model was used to develop and validate instruments to measure caregivers' felt balance between competing needs,³⁰ caregiving consequences,³¹ and caregiving-related factors,³² thus providing reliable tools to help clinicians assess the family caregiver's situation. My research team later identified a cutoff score for the Finding a Balance Scale to identify family caregivers at high risk for depression.³⁰ My research team has also developed a community-based family-caregiver training program delivered by home nurses for family caregivers of patients with dementia; we found that the program enhanced not only caregiver self-efficacy and competence in handling behavioral problems, but also their health outcomes.³³⁻³⁶ In addition, this model was tested using longitudinal data and found that caregivers with poor balance between competing needs are more likely to have worse longitudinal caregiving outcomes. We also found that family caregivers with lower caregiving task difficulty and/or better knowledge of the care receiver were more likely to be in the good balance trajectory group³⁷. This culturally relevant model has been tested in cross-sectional and longitudinal empirical data and can provide an unique perspective for clinicians and policy makers who work with families of persons living with dementia for developing effective and appropriate interventions and policies. The education program I developed for family caregivers of persons with dementia has been implemented in the Dementia Centers in Taiwan and as home care nurse training for the Ministry of Health and Welfare, Taiwan. My research findings on the education program delivered by home care nurses supported my successful advocacy work for reimbursing families for extended home care nursing visits in the Taiwanese government's Ten-Year Long-Term Care Plan. Because of my research achievements, I have been actively involved, by invitation, in developing and implementing Taiwan's National Dementia Plan 1.0 and 2.0 and have used my findings to advocate for persons with dementia and their family caregivers.

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● Research funding projects

1. A clinical trial on an Upgraded Smart Cloth Home Care System with Interactive Family Caregiver App for Persons with Dementia (2022-2025)
2. The Roles of Caregiver Rewards and Mutuality for Persons with Dementia in Family Caregiving: A Correlational Longitudinal Study (2021-2024)
3. Smart care for older persons recovering from hip-fracture surgery (2020-2024)
4. A care model for elderly hip-fractured persons with cognitive impairment and their family caregivers (2015-2018)
5. Processes of post-operative recovery and family caregiving for hip fractured older persons with cognitive impairment: A grounded theory study (2014-2017)
6. A model of family caregiving and model-based intervention program for family caregivers of patients with mild cognitive impairment (2013-2016)

7. Influences of balance on caregivers of patients with dementia: Cutoff for the "finding a balance point" scale and its effect on trajectories of caregivers' health outcomes (2013-2014)
8. Cardio-vascular complications in hip fractured elderly following surgery (2011-2014)
9. A care model for hip-fractured elderly persons with diabetes mellitus (2010-2014)
10. Working carers of frail elderly: How to make employment and care responsibilities compatible? (2008-2011)
11. An investigation of post-hip fracture recovery and related factors in elderly persons with diabetes mellitus (2009-2012)
12. Three care models for elderly patients with hip fracture (2005-2009)
13. Expansion of family care transition model of 'role tuning' on families of children with autism (II / III) (2005-2007)
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15. Family care for persons with Alzheimer's disease in Taiwan and the US: Development and testing of a cross-national family care inventory (2004-2009)
16. A preparation study for remote monitoring of well-being and medical resources utilization of the elderly within the community (2004-2005)
17. The influences of environmental quality on medical resources utilization of the elderly within the community (2004-2005)
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19. Intervention program for elderly patients with hip fracture (2001-2003)
20. A nurse-directed discharge planning program for hospitalized elders and their family caregivers (2000-2002)