



Oral and Denture Status of Community-Dwelling Older People in the Long-term Care System , Maharat, Ayutthaya Province: A Cross-sectional Study.

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Abstract

This cross-sectional descriptive study aimed to determine oral and denture status, and denture need of community-dwelling older people in long-term care system. Samples were 80 older people who were in the long-term care system of Maharat district, Ayutthaya province, Thailand. The investigator interviewed the samples using a questionnaire comprising demographic data and information about denture (experience of denture use and denture need). The investigator evaluated dependency level of older people based on the Barthel ADL Index, which assessed a person's ability to perform basic daily activities. Oral and denture examination contained the number of remaining natural teeth, posterior occluding pairs, and removable denture use. The results showed that mean age of the samples was 79.7 ± 9.2 years, and most of them were independent. An average number of remaining natural teeth was 3 per person, and 41.3% of the samples were complete edentulism. Most of the samples did not have posterior occluding pairs, and only 6.3% had at least 4 posterior occluding pairs. In addition, most of the samples did not use dentures (77.5%) and did not need denture (66.3%). The main reason for refusing denture use was personal reasons of the elderly and their caregivers. In summary, community-dwelling older people in the long-term care system had extensive tooth loss and most of them did not use or need removable dentures as a dental substitution.

Keywords: Long-Term Care, Oral Health, Dependent elderly, Denture, Aged

1. Introduction

Presently, population structure of Thailand is changing due to declining birth rate and increasing life expectancy, switching from young to older population. In 2022, Thailand entered a "complete aged society" with a population of over 60 years old exceeding 12.9 million people, or 20% of the total population (Chuanwan S. et al., 2022). It is estimated that within the next 15 years, Thailand will become a "super-aged society" with the proportion of the population over 60 years old reaching as high as 28% of the total population (Office of the National Economic and Social Development Council, 2019; The Foundation of Thai Gerontology Research and Development Institute (TGRI), 2019). In addition, the proportion of dependent older people tends to increase because of declined physical and psychological ability with increasing age (Buakaew and Teungfang, 2016).

Common health problems in older people are related to visual, hearing, speech, and communication impairment, as well as memory loss and disability in controlling muscles and body movements. These limited their ability to perform daily activities, decreased capability to maintain their oral and general health in a healthy stage, and decreased accessibility in health service utilization (Baumgartner, Schimmel, and Müller, 2015). Therefore, older people often require support from their families and communities (Boonnak et al., 2020).

Thai government has developed the long-term care system for older Thai people (LTC). The system includes a multidisciplinary team comprising family, community, and medical teams from the primary care unit and the sub-district health promotion hospital (SHPH) that forms the "family care team" (FCT). The care model focuses on providing care for older people at home (Home health care; HHC) and in the community to increase healthcare service accessibility. Older people in the LTC system are categorized based on the Barthel Activity Daily Living (ADL) index, which assesses the ability to perform daily activities. The older people are divided into 3 groups: 1) social bound (independent older people who can help themselves), 2) homebound, and 3) bedbound. The homebound and bedbound groups are classified as dependent older people (Department of Public Health Nursing; Office of Public Health Administration, Office of the Permanent

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Secretary, and Ministry of Public Health, 2014; Somdej Phra Sangkharajyanasangvara Institute of Medicine for the Elderly, Department of Medical Services, and Ministry of Public Health, 2013; The Foundation of Thai Gerontology Research and Development Institute (TGRI), 2019).

Oral health care for older people in LTC offers dental services at their home through a HHC with a multidisciplinary team. In the HHC system, dental hygienists are responsible for creating an individual oral care plan for dentist coordination (Guidelines for oral health care in the elderly for dental personnel, 2020). However, oral health care in LTC has yet to be successful due to a shortage of dental personnel in the area. Most of the home dental service provides basic oral health care instruction that is not specific to an individual older person (Prayoonwong, Wiwatkhunupakan, and Lasuka, 2015). Likewise, in Maharat, Ayutthaya province, the number of dental personnel in the area is limited with a dentist and a dental hygienist to dependent older population ratio of 1:77 and 1:58, respectively (Ministry of Public Health, 2022). Despite the limited provision of oral health care in LTC, no studies have been conducted to examine the oral and denture status of older people in the system. The gap in knowledge highlights the need for a study.

2. Objectives

This study aimed to determine the oral and denture status and denture need of community-dwelling older people in the LTC system.

3. Materials and Methods

3.1 Study design and samples

This study was a cross-sectional descriptive design. Samples were 80 older Thai people who were in a LTC system of Maharat district, Ayutthaya province, Thailand. They were selected by a simple random sampling from a name list of community-dwelling older people in the LTC system of all districts. Inclusion criteria were older people aged 60 years and above who had been dependent for more than 6 months. Dependency level information was obtained from the screening report by community health volunteers in the community, which was assessed using the Barthel ADL Index. Exclusion criteria were those who did not consent to provide information to the researcher or follow the research methodology. This study was approved by the Human Study Ethics Review Board, Faculty of Dentistry, Chulalongkorn University (Ethical number: HREC-DCU 2022-055).

3.2 Data collection

An investigator collected data at the samples' resident. Data collection was divided into 2 parts: questionnaire interview and dentists' examination of oral and denture status. If samples could not response to the answer by themselves, their caregivers would give the information. Sociodemographic information was collected, comprising sex, age, marital status, educational level, source of income, self-reported income satisfaction, and living condition. The samples were divided into young old (60–69 years old), middle old (70–79 years old), and the oldest old (80 years and above). Denture-related factors experience of denture use (yes, no), denture need (yes, no), and related reasons.

The investigator assessed the dependency level of the older people using the Barthel ADL index which was used by the Thai Ministry of Public Health as a criterion to classify the older people in the LTC system to provide an appropriate healthcare. The index evaluates the individual's ability to perform 10 daily activities; feeding, personal toileting, bathing, dressing, getting on and off a toilet, controlling bladder and bowel, moving from wheelchair to bed and returning, walking on level surface (or propelling a wheelchair if unable to walk), and ascending and descending stairs. Two or four-rating scale were provided for each activity; can perform by themselves, can perform with some assistance, cannot perform at all. The total score ranged from 0-20, and the older people were divided into 3 dependency level: 1) social bound (>12) - independent older people who perform daily activities by themselves, 2) homebound (5-11) - older people who need some assistance from others, and 3) bedbound (0-4) - older people who must need help from others (Somdej Phra Sangkharajyanasangvara Institute of Medicine for the Elderly et al., 2013).



The investigator assessed oral characteristics and denture status of the subjects, using a flashlight, gauze, and mouth mirror. Data collection included the number of remaining natural teeth (0 to 28 teeth, excluding retained roots), the number of posterior occluding pairs (POPs), and removable denture wearing.

3.3 Statistical analysis

IBM SPSS Statistics version 22.0 was used for statistical analyses. Descriptive statistics was used to describe frequency and percentage for categorical data, and mean (standard deviations) or median (maximum, minimum) for continuous data.

4. Results and Discussion

4.1 Results

Among 80 samples in this study, 59 of them (73.8%) gave information by themselves, and information of the rest was provided by their caregivers. The mean age was 79.7 ± 9.2 years (range 60-96 years). Their income was predominantly obtained from the elderly allowance, followed by the cousin support. Most of the samples lived with the others, including spouses, children, grandchildren, or other family members during daytime and nighttime, and one of them was mainly responsible for caring for older people, whereas others were supporters. About two-thirds of the samples were independent. However, most of them had a limitation in body movements that need assisting devices such as canes, wheelchairs or walking sticks (Table 1). Nevertheless, there was still some missing data in the educational level part due to information provider who was the paid caregiver and did not know about this data.

Regarding oral and denture status, the samples had averagely 3 remaining natural teeth, and 41.2% of them was complete edentulism. Only 6.3% of the subjects had at least 4 POPs, and most of them did not use dentures. Moreover, a majority of the older people who use dentures were independent, and all dentures are acrylic-based removable. In addition, it was found that 66.3% of samples did not need to use dentures (Table 2).

Table 1 Sociodemographic and dependent status of community-dwelling older people in the LTC

Variables	n (%) (Total=80)
Sex	
Male	20 (25.0)
female	60 (75.0)
Age = 79.7 ± 9.2	
Young older (60–69 years old)	12 (15.0)
Middle older (70–79 years old)	22 (27.5)
The oldest old (80 years and above)	46 (57.5)
Marital status	
Single	10 (12.5)
Married	27 (33.7)
Divorce	4 (5.0)
Widowed	39 (48.8)
Educational level (n=79)	
Illiterate	4 (5.1)
Primary	70 (88.6)
Secondary	2 (2.5)
Bachelor or higher	3 (3.8)
Self-perceived sufficient income	
Sufficient	47 (58.8)
Insufficient	33 (41.2)



Source of income	
Working	6 (7.5)
Elderly allowance	73 (91.3)
Handicapped allowance	26 (32.5)
Government pension	4 (5.0)
Cousin support	42 (52.5)
Others i.e. Saving	4 (5.0)
Living condition	
Alone in daytime	13 (16.2)
With others i.e. Child, grandchild, couples	67 (83.8)
Dependency level	
Independent	49 (61.3)
- Young old (60–69 years old)	7 (14.3)
- Middle old (70–79 years old)	15 (30.6)
- The oldest old (80 years and above)	27 (55.1)
Semi-dependent (homebound)	17 (21.2)
- Young old (60–69 years old)	1 (5.9)
- Middle old (70–79 years old)	5 (29.4)
- The oldest old (80 years and above)	11 (64.7)
Dependent (bedbound)	14 (17.5)
- Young old (60–69 years old)	4 (37.5)
- Middle old (70–79 years old)	2 (12.5)
- The oldest old (80 years and above)	8 (50.0)

Table 2 Oral characteristics and denture status of community-dwelling older people in the LTC

Variables	Total (n=80)	Bedbound (n=14)	Homebound (n=17)	Independent (n=49)
	median (min,max)			
Number of remaining teeth	3 (0,28)	0.5 (0,22)	5 (0,26)	3 (0,28)
n (%)				
Posterior occluding pairs (POPs)				
0	64 (80.0)	11 (78.6)	12 (70.6)	41 (83.7)
3-Jan	11(13.8)	2 (23.5)	4 (30.0)	5 (10.2)
4 and above	5 (6.3)	1 (5.9)	1 (10.0)	3 (6.1)
Oral status				
Partial edentulism	47 (58.8)	7 (50.0)	13 (76.5)	28 (57.1)
Complete edentulism	33 (41.2)	7 (50.0)	4 (23.5)	20 (40.8)
Denture use				
Yes	18 (22.5)	1 (7.1)	1 (10.0)	16 (32.7)
No	62 (77.5)	13 (92.9)	16 (94.1)	33 (67.3)
Experience of removable denture wearing				
Yes	47 (58.8)	5 (35.7)	4 (23.5)	24 (49.0)
No	33 (41.2)	9 (64.3)	13 (76.5)	25 (51.0)
Denture need (patient's perceived)				
Yes	27 (33.7)	2 (14.3)	3 (17.6)	22 (44.9)
No	53 (66.3)	12 (85.7)	14 (82.4)	27 (55.1)

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4.2 Discussion

This study analyzed oral and denture status of older people in LTC system in Thailand, focusing on dependent older people. A survey was conducted using the Barthel ADL index to screen dependent older people in the community into the system according to their dependency level. However, the study found that when using the Barthel ADL index to assess dependency level, two-thirds of the subjects were classified as independent older people, while only a minority were classified as a dependent. However, we found that all older people required assistance from another person to perform at least one basic daily activity. Some older people could perform the activity but needed help or supervision for their safety. Thus, the total ADL score may not always meet the criteria for classification in the dependent group.

The proportion of dependent older people in this study (36.0%) was relatively higher than that reported in the national survey of Thailand, including the 5th Physical Examination Survey of Thai People in 2014 (20.7%) (Ekplakorn W. et al., 2016) and the analysis of health status, burden of disease and the demand for health services among the Thai elderly in 2020 (2.9%) (Boonnak et al., 2020). This is likely because the subjects in this study were taken from LTC system for dependent older people, whereas those of national survey were general older population.

Previous studies found that the dependence rate increases strongly with age (Gériatrie-CNEG, 2014; Saintrain et al., 2018). However, the present study showed that the dependence rate among the young and oldest old was similar and was higher than those in the middle old (31.8%). It might be explained that apart from chronological age, some other factors such as presence of chronic diseases (Boonnak et al., 2020; Hacıhasanoğlu, Yildirim, and Karakurt, 2012) and accidents, could contribute to being the dependence.

Older people in the LTC system had a significant tooth loss, and most of them had no POPs. Consistent with previous studies, dependent older people tend to have poorer oral health due to the presence of multiple systemic diseases and medications (polypharmacy) which can reduce saliva flow rate, making it difficult to maintain proper oral hygiene and increasing risk of oral disease such as dental caries and periodontitis which can eventually lead to tooth loss problem. Consequently, tooth loss occurs, and dental prosthetic need would be required to maintain proper oral function (Peltola, Vehkalahti, and Wuolijoki-Saaristo, 2004). However, despite extensive tooth loss, we found that most of the older people did not have denture to replace missing teeth, and 88.9% of older people with denture use were independent. As supported by a previous study, higher percentage of denture service utilization was found in low-dependent older people compared with high-dependent older people due to physical and communicational limitations that limit their ability to express symptoms and access dental service (Limpuangthip, Purnaveja, and Somkotra, 2019). Additionally, basic daily activities ability and manual skills related to denture use, such as dressing, rinsing the mouth, communicating, and transferring, are associated with denture adaptability and denture use (Ferreira, de Magalhães, and Moreira, 2008; Minakuchi et al., 2006). Some other factors that limited denture use of dependent older people include low socioeconomic condition and marital status (Ferreira et al., 2008).

Regarding denture need, we found that most older people had no need despite significant tooth loss. The main reasons were personal reasons such as dissatisfaction with previous denture use, the perception that dentures were dirty, difficult to clean, and a potential source of pathogens that increase the risk of infection. Additionally, some older people thought they did not have an eating problem or worried about becoming a burden for others to take them to receive dental service. Furthermore, dependent groups of older people rarely had denture need, possibly due to physical conditions such as receiving food through percutaneous endoscopic gastrostomy tube feeding or nasogastric tube feeding or difficult to socialization, which had decreased the denture need especially aesthetic or social aspect.

It was found that caregiver plays a crucial role in making decision for older people, especially those who are unable to communicate or express their needs. This includes choosing easy-to-chew food types and avoiding foods that may be difficult to be chewed, such as raw vegetables, meat, and some fruits. The caregivers may also use cooking methods, such as stewing, steaming, or boiling to make the food softer. Consequently, despite tooth loss, the caregiver may assume that the older people had no problem with chewing, and therefore, dentures may not be necessary. This may lead to malnutrition and frailty.



5. Conclusion

This study shows that community-dwelling older people in the LTC system were mostly dependent and need caregiver for assisting daily activity performance. Most of them had an extensive tooth loss, and most of them did not use or need removable dentures as a dental substitution. Therefore, the government should develop an oral health service system that facilitates access to oral health care for dependent older people, as well as implementing an oral health program to prevent tooth loss before older people become dependent.

Some limitations are noted in the present study. Due to a descriptive cross-sectional study design, the causal-effect relationship between denture use, tooth loss, and related factors could not be identified. The study was performed in only one setting, of which the finding could be different from others. Further studies are needed to identify oral and denture-related problems in the individual setting prior to establishing the health and oral health care policy for older people in the LTC system.

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