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Original Article

# The implementation of domiciliary dental care from a university hospital: A retrospective review of the patients and performed treatments in central Taiwan from 2010 to 2020

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Received 12 June 2021; Final revision received 13 June 2021

Available online 7 July 2021

## KEYWORDS

Domiciliary dental care;  
Central Taiwan;  
Retrospective study

**Abstract** *Background/purpose:* People who suffer with chronic illness, functional impairment, or cognitive impairment are not easily to visit dental clinics. Domiciliary dental care (DDC) can provide the feasible alternative for these clients. In this study, we first reported the DDC services from a university hospital in central Taiwan from 2010 to 2020.

*Materials and methods:* This retrospective study collected the DDC data from Department of Dentistry, Chung Shan Medical University Hospital, Taichung, Taiwan. The data including age, sex, geographic locations, place of residence, grade of disability, and type of dental treatment for the patients were obtained and analyzed.

*Results:* A total of 419 patients (168 females and 251 males) who received dental treatment were included in the study. The average age was 57.4 years old. The total DDC services were up to 2444 visits. The top of place of residence for DDC is patient's home (231/419; 55.13%). Scaling was the most common type of dental treatment for DDC (317/419; 75.67%). The male patients whose age <60 years old had received more DDC ( $p = 0.002$ ). The profound grade of disability had higher DDC in age <60 years old group ( $p < 0.001$ ).

*Conclusion:* Taken together, this study demonstrates the demographic data of DDC in central Taiwan. The results may be valuable for governmental policy to improve the availability of DDC and in turn to facilitate oral health in this specific group of dental patients.

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## Introduction

People who suffer with chronic illness, functional impairment, or cognitive impairment are not easily to visit dental clinics. In Taiwan, the cases of dental treatment for the disabled are gradually increasing.<sup>1,2</sup> In addition to people with disabilities, the dependent elder people also have the same problem. This will be resulted in the reduced access to oral health services. Oral diseases are crucial health concerns for people. Poor oral conditions and periodontal diseases are well-known linked to many systemic diseases.<sup>3</sup> This observation presents the considerable challenges for the current dental care system.

Domiciliary dental care (DDC), the so-called home dental care, is characterized by the patient receiving dental healthcare or treatment at home.<sup>4</sup> The dentist and oral health professional team travel to see patients in their place of residence such as their house or nursing home to prevent or treat oral health problems. Studies on the survey of DDC in elder population have been conducted in Scotland,<sup>4</sup> Finland,<sup>5</sup> Japan,<sup>6</sup> Australia,<sup>7</sup> and Malaysia.<sup>8</sup> The education of DDC was not implemented in the of 6-year post-secondary dental curriculum. The dental care of these vulnerable patients poses a challenge for the dentist.

In Taiwan, DDC was first carried out by Chung Shan Medical University Hospital (CSMUH) in March, 2010. At the beginning of 2011, July, DDC has been partly included in Taiwanese National Health Insurance system. However, little is known about the survey of DDC in Taiwan. Therefore, we conducted this retrospective analysis of the demographics and the trends of DDC service from CSMUH.

## Materials and methods

### Data collection

This retrospective study reviewed and analyzed the data from treatment records of DDC services at the Department

of Dentistry, CSMUH, Taichung, between March 2010 and December 2020. Patients with incomplete registered data were excluded from this study. This study received approval from the institutional review board at CSMUH (CS18217). All sensitive patient information was removed before analysis, written informed consent from each of the patients involved was not required according to the institutional review board. The demographic data including annual trends, age, sex, geographic locations, place of residence, grade of disability, and type of treatment for the patients were obtained and analyzed.

### Statistical analysis

SPSS version 18 (SPSS, Chicago, IL, USA) was used for all data processing and statistical analyses. Chi-square and Fisher's exact tests were used for categorical variables such as sex, age, place of residence, type of treatment, and grade of disability. Probability levels of <0.05 were considered significant.

## Results

Fig. 1 demonstrates the number of DDC service from 2010 to 2020. The total DDC services were up to 2444 visits. The peak of DDC service number was 416 in 2019. The service number of DDC analyzed by geographic locations is shown in Fig. 2. The population dwelling in Taichung city received the most DDC services with a ratio of approximately 60.07%.

The age, sex, place of residence, type of dental treatment, and grade of disability for DDC patients are shown in Table 1. A total of 419 DDC patients (168 females and 251 males) were recruited in the study. The average age was  $57.4 \pm 21.2$  years old. Patient's home was the most common place of DDC (231/419; 55.1%). Scaling was the most common dental treatment for domiciliary dental care (317/419; 75.7%). The grade of profound was the most disability seeking for DDC (291/419: 69.5%).

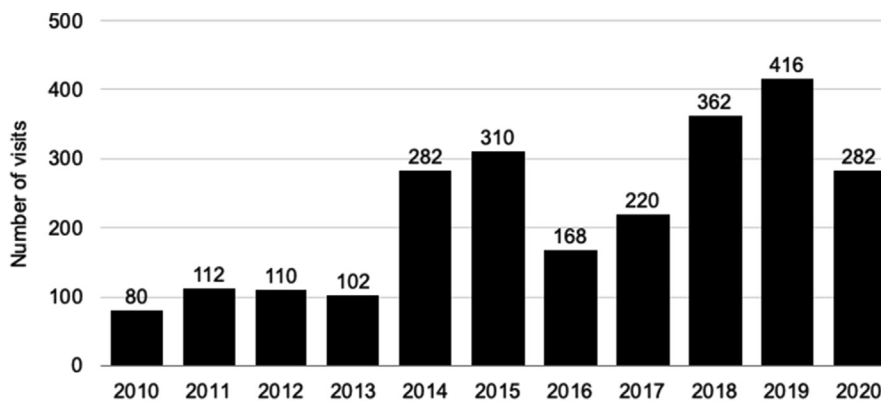


Figure 1 Annual trend in the number of patients receiving domiciliary dental care.

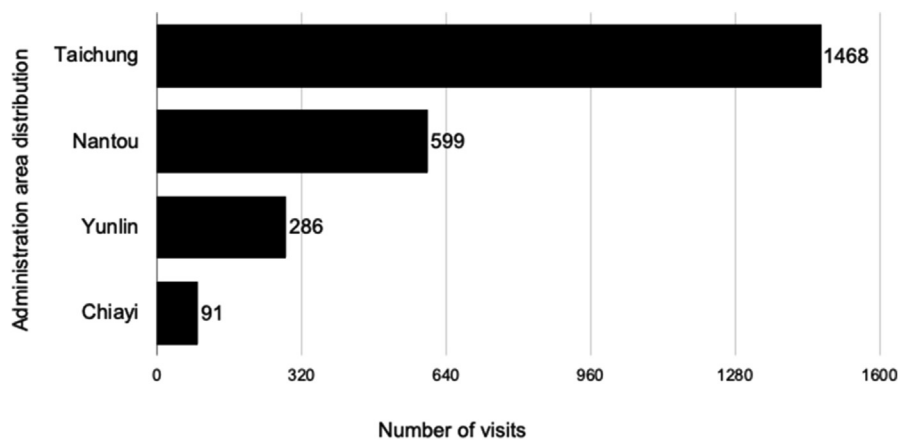


Figure 2 The geographic location of domiciliary dental care in Central Taiwan.

The association between age and epidemiology of DDC is shown in Table 2. The male patients age <60 years old had received more DDC ( $p = 0.002$ ). The place of residence in age <60 years group and age  $\geq 60$  years group was vegetative care home and patients home, respectively. For the DDC treatments, the age <60 years group received more scaling treatment and the age  $\geq 60$  years group received more tooth extraction treatment ( $p < 0.001$ ). The patients with profound grade of disability received higher DDC treatments in age <60 years group ( $p < 0.001$ ).

## Discussion

To the best of our knowledge, this is the first longitudinal study for the DDC survey in Taiwan. A total of 419 patients who received DDC at CSMUH were included in this

retrospective study. From the literature review, most DDC studies were focused on the elder group.<sup>4,5,7,8</sup> Our findings were in agreement with a survey in Tokyo that the people who received DDC predominantly was the males and age >50 years old.<sup>6</sup> The most place of visit was the patients' own house.<sup>9,10</sup> However, the most type of DDC service provided in Scotland was the replacement of dentures.<sup>4</sup> In Japan, the most common DDC services were removable prosthetic treatment and oral care, followed by dysphagia rehabilitation.<sup>10</sup> It is quite different as compared with this study. The reasons might be due to the unique influences of the geographic, cultural, and disability status of the study region.

With an aging population, Taiwan is going to step into the superaged society in 2026.<sup>11</sup> The need for care support for dependent older adults is supposed to increase for the general public. DDC may improve the access to dental care for older adults of the community who may find it difficult attending the dental clinic. A well-planned oral health care provision can be adapted to improve access to these individuals who experience poorer oral health and unmet treatment need.

However, the DDC services seem not be expanding. In Japan, DDC provided in Tokyo was demonstrated a relatively low rate: 36.6% in 2006 and 29.2% in 2011.<sup>6</sup> In Malaysia, only 36.1% dentists had the experience in providing DDC for elderly people.<sup>8</sup> A recent report also demonstrated that more than half of the dental clinics surveyed did not provide DDC in Japan.<sup>12</sup> The reasons might be due to complex medical history of this population and dentist's unfavorable working condition. The unfriendly environment leads few dentists to engage in DDC service. From the lesson of these barriers, the service provision models and workforce in Taiwan needs to be considered in the promotion of DDC service.

The implementation of DDC education into dental curriculum is important. In Taiwan, the first author Dr. Yu seems the pioneer to conduct DDC service from 2010. Initiating DDC into dental education was launched in School of Dentistry, Chung Shan Medical University from 2017 in the class of year 102 students. In addition to the traditional clinical skill-oriented competency-based dental education and training,<sup>13</sup> the concept of "narrative dentistry" is also conducted into the class of DDC. The narrative dentistry

Table 1 The demographic characteristics of DDC patients.

	n	%
Age		
<60	211	50.4
$\geq 60$	208	49.6
Mean $\pm$ SD	57.4 $\pm$ 21.2	
Sex		
Female	168	40.1
Male	251	59.9
Place of residence		
Patients home	231	55.1
Vegetative care home	173	41.3
Local hospital	15	3.6
Type of treatment		
Scaling	317	75.7
Extraction	21	5.0
Filling	2	0.5
Others	79	18.9
Grade of disability		
Profound	291	69.5
Moderate/severe	126	30.1
Others	2	0.5

**Table 2** The association between age and the epidemiology of DDC.

	Age <60 n %	Age ≥60 n %	p value
Sex			0.002 <sup>a</sup>
Female	69 (32.7)	99 (46.9)	
Male	142 (67.3)	109 (51.7)	
Place of residence			<0.001 <sup>a</sup>
Patients home	81 (38.4)	150 (72.1)	
Vegetative care home	129 (61.1)	44 (21.2)	
Local hospital	1 (0.5)	14 (6.7)	
Type of treatment			<0.001 <sup>b</sup>
Scaling	183 (86.7)	134 (63.5)	
Extraction	2 (0.9)	19 (9.0)	
Filling	2 (0.9)	0 (0.0)	
Others	24 (11.4)	55 (26.1)	
Grade of disability			<0.001 <sup>b</sup>
Profound	179 (84.8)	112 (53.1)	
Moderate/severe	32 (15.2)	94 (44.5)	
Others	0 (0.0)	2 (0.9)	

<sup>a</sup> Chi-square test.<sup>b</sup> Fisher's exact test.

competency can facilitate patient-dentist discourse, structured communication skills, and medical ethics.<sup>14,15</sup> Students learn not only delivery DDC service, but also heal patient holistically. Encouraging younger dentist is willing to provide DDC and be a full-time worker in this specialty.

The model of DDC with oral professional team work have been successfully conducted.<sup>6,7,16</sup> The results demonstrated that the assistance for maintaining oral hygiene with nursing staff can provide a good level among DDC. Recently, the guideline of DDC in Taiwan also needs two dental professional together either two dentists or dentist with nurse. With the alliance of "team resource management" for patient, it is believed to provide the good quality of DDC.

However, there are some limitations in the present study. Data analysis was based on retrospectively extracted data from patient files. The more detailed data such as beneficiary's medical conditions and social economic status are required to further analysis. The present study might have underestimated the proportion of DDC. Multiple centers or even the nationwide survey are necessary to reflect the whole perspective of DDC in Taiwan. In the opinion of the authors, a risk-benefit assessment should be taken into account before the DDC visit who occur more often with aged and disability population.

In conclusion, within the limitations of this study, we analyzed patients who received DDC in the last 11 years. This data may assist the medical center that performs dental treatments for DDC, as well as help to plan future directions for DDC treatments and establish new policies for DDC.

### Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

### Acknowledgments

This work is supported by a joint grant from Ministry of Education and Chung Shan Medical University. The authors would like to thank all the staffs of CSMUH for participating domiciliary dental care.

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