

Original Article

An Analysis of Elderly Patient Information at the Faculty of Dentistry, Chulalongkorn University during 2007-2009

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Abstract

The growth of the elderly population has affected the health care system due to their physical and oral tissue changes, together with a high prevalence of chronic diseases, relate to the quality of life in the elderly. The objective of this study was to analyze the characteristics and trends of elderly patients receiving dental care at the Faculty of Dentistry, Chulalongkorn University, Bangkok Thailand. The information of newly registered elderly patients from year 2007 to 2009 was collected from 1,320 dental treatment records using a systematic random sampling method. To evaluate prosthodontic treatment trends, 634 dental treatment records were selected from newly registered elderly patients in the postgraduate prosthodontic clinic. For the subjects sampled from all newly registered elderly patients, the most common systemic conditions identified were hypertension, diabetes mellitus, heart disease, and high cholesterol. The most common oral complaint was tooth loss with inefficient chewing and/or needing a new prosthesis. We found 38.3% of the subjects had a perceived need for prosthodontic treatment, while 64.8% had normative prosthodontic treatment needs. This survey revealed that the average number of occluding natural pairs of teeth was 2.8. The most frequent prosthodontic treatment received by elderly patients in the postgraduate prosthodontic clinic was removable dentures (60.3%). The average waiting period for prosthodontic treatment was 134.1 days, and the average prosthodontic treatment period was 155.4 days. However, there was a continuous decrease in the duration of both waiting and treatment periods from 2007 to 2009.

Key words: chief complaint; elderly; prosthodontic treatment

Introduction

Due to the demographic transition towards an aging society, Thailand, as in all developing countries, has been faced with a rapid increase in the proportion of older individuals.¹ In 2000, people aged over 60 years comprised 9.5% of the Thai population. By 2025, the number of older people is forecast to double to approximately 19.0% of the total population.² The growing proportion of the elderly, in particular those with an increase in the burden of diseases and its effect on quality of life, has challenged the health sectors.³ Oral health is considered an integral part of general health and is an important component of quality of life. It has been recognized that the oral diseases are age-

related and the risk factors for chronic diseases are common to most oral diseases.⁴ The National Oral Health Survey in Thailand recently revealed that the number of remaining teeth among the elderly has increased compared with the past surveys.⁵ However, tooth loss is still the main oral health problem among elderly Thais. As shown in previous studies, faulty prostheses were the most frequent oral complaints among the elderly.^{6,7} Hence, it appears obvious that the increase in the proportion of the elderly Thais in the near future will be a challenge for the establishment of policy in the health care sector, social services delivery, and oral health care.⁸ It is important for dental schools to improve their educational programs and their oral health care services to respond to the increase in the number of elderly with either normative or perceived needs. Knowing the characteristics and trends of elderly patients are necessary for educational development and planning for appropriate oral health care services. This study therefore aimed primarily to investigate the characteristics and the trends of elderly patients utilizing dental care at the Faculty of Dentistry, Chulalongkorn University during 2007 to 2009. Some elderly patients are medically compromised, with complicated oral health problems, or need special care in dental treatment, leading to the secondary objective of this study that aimed to investigate the prosthodontic treatment of elderly patients with complicated general health problems and/or complicated prosthodontic treatment. This study can be an important data base for the development of educational programs and the improvement in oral health services for elderly patients.

Materials and methods

The protocol of this study was approved by the ethics committee of Chulalongkorn University. The population in this study were newly registered elderly patients (aged 60 years and over) who received dental care at the Faculty of Dentistry, Chulalongkorn University from 2007 to 2009. The sample size was obtained using the formula calculated under 5% of acceptable error and 95% of confidence level.⁹ The data for the analysis was taken from the dental treatment records. The survey was designed as a two-stage stratified random sampling where the first stage was stratified by sex (male and female), and the second stage was stratified by age-group (60-70 year-old and over 70 years-old). One thousand three hundred and twenty dental treatment records were selected for this study. To achieve the primary objective of the study in investigating the

characteristics and trends of elderly dental patients, information concerning sex, age, working status, chief complaint, systemic disease, number of occluding natural pairs of teeth, perceived prosthodontic treatment needs, normative prosthodontic treatment needs, clinic obtained prosthodontic treatment, and consistency between their chief complaints and their first treatments were obtained from the selected dental treatment records. Subjects were defined as having perceived prosthodontic treatment needs when they reported chief complaints of tooth loss or inefficient chewing or needing a new prosthesis. Subjects with a record of being referred for prosthodontic treatment were defined as having normative prosthodontic treatment. Concerning the clinics at the Faculty of Dentistry, Chulalongkorn University, there are the academic-related clinics in which undergraduate or postgraduate students provide the dental treatment under the supervision of faculty members. Another venue for receiving dental care is the so-called "special clinic" where faculty members provide dental treatment at an additional expense similar to that in private clinics.

Patients with conditions requiring difficult or complicated prosthodontic treatments and need dental care from dentists trained in prosthodontics, and patients with health problems which impact the prosthodontic treatment (for example; severe limited mouth opening, severe Parkinson disease) were referred to the postgraduate prosthodontic clinic. To achieve the secondary objective in investigating the prosthodontic treatment for elderly patients who have health problems affecting prosthodontic treatment, and/or patients who need some complicated prosthodontic treatment, data of all newly registered elderly patients who received prosthodontic treatment at the postgraduate prosthodontic clinic from 2007 to 2009, were examined. Six hundred and thirty-four dental treatment records were selected and the information of sex, age, type of prosthesis, length of time waiting for the treatment to begin, duration of treatment time, and necessity of multidisciplinary approaches in dental treatments were gathered (Fig. 1). Subjects were defined as having necessity of multidisciplinary approaches in dental treatment when the patients had not only been referred to the postgraduate prosthodontic clinic, but also to other departments as well.

Any records missing more than one variable were excluded from the study. Missing data were coded as not reported and not included in the analysis of the average number of functional pairs of occluding teeth, the average waiting period

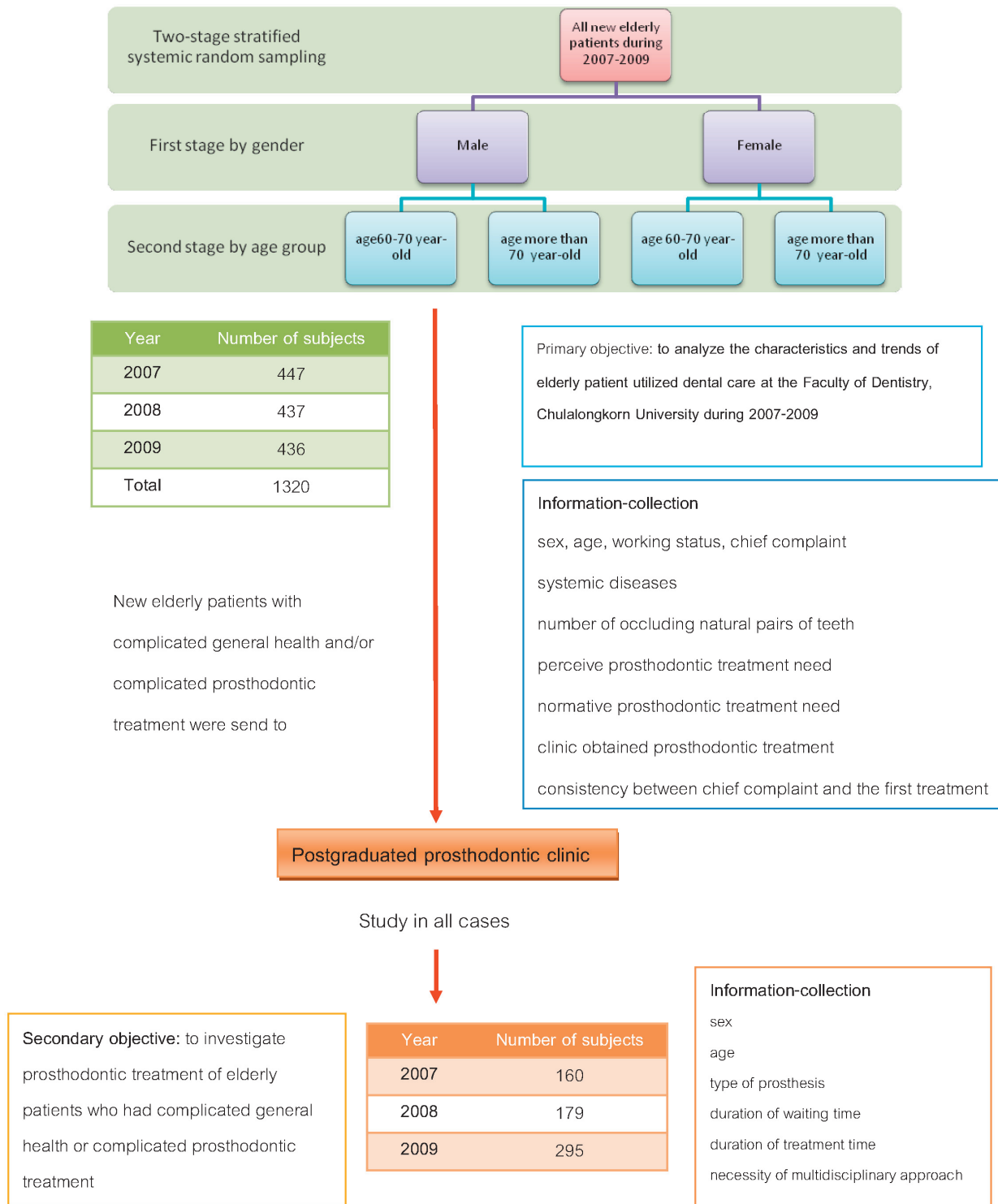


Fig. 1 Diagram of the selection of study samples and data collection

and the average treatment period. Descriptive analyses were performed with the Statistics Package for the Social Sciences (SPSS) version 17.0 (SPSS (Thailand) Co., Ltd., Bangkok, Thailand). The differences in chief complaints for the same sex between two age groups in the same year were tested by the Pearson chi-square test under the condition that the p-value was lower than 0.05, yielding the test result is guaranteed statistically significant.

Results

The percentage of newly registered elderly patients who received dental care at the Faculty of Dentistry, Chulalongkorn University were 9.6, 9.1, and 11.8 in years 2007, 2008, and 2009, respectively. These elderly patients comprised 578 (43.8%) males and 742 (56.2%) females, with an average age of 67.5 ± 6.3 (mean \pm sd) years. Regarding their working status, 43.2 percent were economically inactive. The most common chief complaints were tooth loss with inefficient chewing and/or needing a new prosthesis (36.2%), followed by pain or swelling (10.7%), broken teeth or fillings (9.2%), check up (8.1%), sensitive teeth (4.6%), caries or cavity (4.0%), and others (19.2%). The chief complaint could be classified into 2 groups; the prosthodontic-related chief complaint and the non prosthodontic-related chief complaint. Our study found that in the data groups comprised of male subjects per year, and female subjects in the year 2008, the subjects aged over 70 years old had a significantly higher number of prosthodontic-related chief complaints than those in 60-70 year old range with $p < .05$ (Table 1). All of subjects, 720 subjects (54.5%) reported having at least one systemic disease. The most common systemic diseases were hypertension (37.0%), diabetes

mellitus (15.2%), heart disease (8.1%), and high cholesterol (7.0%). Out of all 1,030 records (78.0%) had information concerning functional pairs of occluding teeth, with the average number of occluding natural pairs of teeth found to be 2.8 ± 3.2 pairs. Among all records from 3 years, 477 patients (36.1%) had a perceived need for prosthodontic treatment, while the remaining 853 patients (64.6%) had a normative need for prosthodontic treatment. The breakdown of the 853 patients receiving prosthodontic treatment by clinic at the Faculty of Dentistry, Chulalongkorn University showed most (45.1%) were treated at the special clinic followed by at the postgraduate clinic (27.5%), and at the undergraduate clinic (19.5%). The present study found the first treatment session for most of the patients (59.2%) addressed their chief complaints (Table 2).

With respect to the secondary objective, among all newly registered elderly patients receiving prosthodontic treatment at the postgraduate prosthodontic clinic during 2007 to 2009, 309 (48.7%) were males and 325 (51.3%) were females with an average age of 67.4 ± 6.2 (mean \pm sd) years old. The most frequent prostheses treatment types were removable dentures (either partial or complete denture) (60.3%), followed by the combination of removable and fixed dentures (18.0%), full mouth rehabilitation (11.2%), and fixed dentures (8.8%). From all of the records in 3 years, 400 patients were still awaiting treatment, while 270 patients had already finished their prosthodontic treatment. The average waiting time receiving the first prosthodontic treatment was 134.1 days, and the average treatment period was 155.4 days. From all of the records in 3 years, most (82.2%) needed a multi-disciplinary approach for their dental treatment (Table 3).

Table 1 Distribution of chief complaints among the selected samples at the Faculty of Dentistry, Chulalongkorn University during 2007-2009

Chief complaint	Year/ Gender/ Age-group (n, (%))											
	2007				2008				2009			
	Male	Female		Male	Female		Male	Female		Male	Female	
	Aged 60-70 years	Aged more than 70 years	Aged 60-70 years	Aged more than 70 years	Aged 60-70 years	Aged more than 70 years	Aged 60-70 years	Aged more than 70 years	Aged 60-70 years	Aged more than 70 years	Aged 60-70 years	Aged more than 70 years
- Prosthodontic-related chief complaint (a)	38(28.6)	25(47.1)	71(38.6)	38(49.3)	31(23.3)	22(41.5)	44(24.0)	26(38.2)	47(32.4)	38(62.3)	64(40.0)	34(48.6)
- Non prosthodontic-related chief complaint	95(71.4)	28(52.8)	113(61.4)	39(50.7)	102(76.7)	31(58.5)	139(76.0)	42(61.8)	98(67.6)	23(37.7)	96(60.0)	36(51.4)
- Pain/swelling	22(16.5)	1(1.9)	14(7.6)	4(5.2)	15(11.3)	8(15.1)	26(14.2)	6(8.8)	21(14.5)	1(1.6)	15(9.4)	8(11.4)
- Broken teeth/restoration	10(7.5)	3(5.7)	20(10.9)	7(9.1)	17(12.8)	3(5.7)	16(8.8)	6(8.8)	20(13.8)	2(3.3)	10(6.3)	7(10.0)
- Check up	15(11.3)	2(3.8)	21(11.4)	5(6.5)	11(8.2)	5(9.4)	15(8.2)	7(10.3)	11(7.6)	3(4.9)	8(5.0)	4(5.7)
- Sensitive teeth	6(4.5)	3(5.7)	9(4.9)	0(0.0)	8(6.0)	1(1.9)	17(9.3)	1(1.5)	4(2.7)	0(0.0)	10(6.3)	2(2.8)
- Tooth decay	8(6.0)	3(5.7)	9(4.9)	1(1.3)	9(6.8)	1(1.9)	10(5.5)	2(2.9)	2(1.4)	1(1.6)	4(2.5)	3(4.3)
- Others (b)	34(25.6)	16(30.1)	40(21.7)	22(28.6)	42(31.6)	13(24.5)	55(30.0)	20(29.5)	40(27.6)	16(26.3)	49(30.6)	12(17.2)
Total (n)	133	53	184	77	133	53	183	68	145	61	160	70
p-value	.016*		.108		.013*		.026*		.000*		.226	

* Statistical significance between chief complaints among samples with the same gender, different age-group within the same year.

Note: (a) Prosthodontic-related chief complaints include tooth loss, inefficient chewing, and needing a newly prosthesis.

(b) Others include tooth mobility, soreness/ulcer, gum problem, TMJ disorder, orofacial pain, food impaction, bad breath, dental deposits, epulis, exostosis, and others

Table 2 Descriptive characteristics of individual samples among newly registered elderly patients at the Faculty of Dentistry, Chulalongkorn University during 2007-2009

Characteristics		Year (n, (%))			
		2007	2008	2009	Over all
Working status	Not report	168(37.6)	151(34.6)	175(40.1)	494(37.4)
	Still Working	90(20.1)	82(18.8)	84(19.3)	256(19.4)
	Economically inactive	189(42.3)	204(46.7)	177(40.6)	570(43.2)
Reported systemic disease	Not report	73(16.3)	61(14.0)	66(15.1)	200(15.2)
	Absence	137(30.6)	140(32.0)	123(28.2)	400(30.0)
	Presence	237(53.0)	236(54.0)	247(56.7)	720(54.5)
Referral to Prosthodontic treatment	Absence	153(34.2)	154(35.2)	160(36.7)	467(35.4)
	Presence	294(65.8)	283(64.8)	276(63.3)	853(64.6)
	-Special clinic	135(45.9)	151(53.4)	99(35.9)	385(45.1)
	-PG clinic (a)	78(26.5)	75(26.5)	82(29.7)	235(27.5)
	-UG clinic (b)	54(18.4)	40(14.1)	72(26.1)	166(19.5)
	-Other clinics (c)	27(9.2)	17(6.0)	23(8.3)	67(7.9)
Consistency between chief complaint and the first treatment	Not report	31(6.9)	26(5.9)	37(8.5)	94(7.1)
	Consistent	251(56.2)	262(60.0)	269(61.7)	782(59.2)
	Not consistent	165(36.9)	149(34.1)	130(29.8)	444(33.6)

Note; (a) PG clinic - postgraduate prosthodontic clinic

(b) UG clinic - undergraduate clinic

(c) Other clinics included Oral and maxillofacial clinic and Implant and esthetic clinic

Table 3 Descriptive analysis of newly registered elderly patients at the postgraduate prosthodontic clinic, Faculty of Dentistry, Chulalongkorn University during 2007-2009

Information	Year			
	2007	2008	2009	Over all
Prostheses treatment type (n, (%))				
-Removable denture (a)	87(54.3)	97(54.1)	198(67.1)	382(60.2)
-Fixed denture	13(8.1)	23(12.8)	20(6.7)	56(8.8)
-combination of removable and fixed denture	36(22.5)	39(21.7)	39(13.2)	114(17.9)
-Full mouth rehabilitation	22(13.7)	17(9.4)	32(10.8)	71(11.1)
Average waiting period (days)	288.57	134.00	68.43	134.12
Number of subject who reported waiting period (n, (%))	86(53.7)	112(62.6)	202(68.5)	400(63.1)
Average treatment period (days)	183.59	158.05	139.90	155.40
Number of subject who reported treatment period (n, (%))	63(39.4)	79(44.1)	128(43.4)	270(42.6)
Number of subject needed multidisciplinary approach (b) in dental treatment (n, (%))	138(86.3)	152(84.9)	231(78.3)	521(82.2)

Note; (a) Removable dentures included partial and complete dentures.

(b) Multidisciplinary approach in dental treatment in this study indicates the subject was referred to not only postgraduate prosthodontic clinic but also to other departments.

Discussion

Among newly registered patients at the Faculty of Dentistry, Chulalongkorn University, the proportion of elderly patients tended to increase continuously (approximately 10% each year). This trend challenges dental schools to develop the educational programs about patients in this age group. There are some profound implications regarding the analysis from this study. First, the medical condition and general health of this age group is important information, and the presence of the most common systemic diseases including hypertension, needs to be considered when determining the appropriate dental treatment. This is consistent with previous studies that found the prevalence of hypertension in patients receiving dental treatments ranged from 6.3-30.9%.¹⁰⁻¹⁷ Other systemic diseases, such as diabetes are also related to oral health, and can contribute common risk factors for hypertension.¹⁸⁻²¹ This indicates that dentists should consider these when designing their treatment plans prior to providing dental care.

Considering the chief complaint of the elderly patients, the data revealed that prosthodontic-related chief complaints are the most common, and this result is consistent with previous studies.^{6,7,22,23} In our study, we found that the number of prosthodontic-related chief complaints were significant higher among the elderly over 70 years old. This implies that tooth loss and the necessity for prosthodontic treatment increase with age. The Ministry of Public Health has formally announced that the number of remaining teeth in elderly Thais is 3.3 pairs.⁵ However, the subjects in our study were limited to elderly patients who actively sought dental care which may be the reason for finding a lower number of occluding natural pairs of teeth compared to the government results. In the present study, the elderly patients evaluated had an average number of occluding natural pairs of teeth equivalent to 2.8 pairs.

Tooth loss is the major dental problem among the elderly, resulting in a need for dental replacement. This corroborates with a high prevalence of elderly patients in the postgraduate prosthodontic clinics needing removable partial or complete dentures. Our study suggests that the prosthodontic educational programs should provide dental students with the skills to deliver treatment ranging from fixed partial to removable dentures, especially for the elderly, so that clinicians are capable of providing the best care in all oral health life stages. In addition, the problem of tooth loss may lead to chewing and the swallowing

problems. Encouraging older people to maintain their teeth as much as possible, while at the same time, to improve their oral health status, and in the proper use their dentures will lead to a better quality of life

Concerning prosthodontic treatment needs, our study found the number of patients with normative needs (64.6%) was twice that of those with perceived needs (36.1%). The number of people with normative needs is always higher than perceived needs because the normative assessment is a measure of "disease" while perceived assessment is a combination of biologic factors, psychological factors and social factors of the individual. If their oral disease or oral health problems do not impact daily performance, they likely feel that they are in good oral health and do not require any treatment.²⁴

One issue that deserves particular attention among the elderly patients who had prosthodontic treatment is that most of them (45.1%) received prosthodontic treatment at the special clinic, which is at a higher expense than the academic-related clinic. Many elderly find their financial situation diminished. The elderly in the present study may have needed family financial support or used savings to fund their dental treatment needs because the majority of them were not working. The high number of elderly patient treated at the special clinic could be due to various factors such as less waiting time and lower number of appointments. To solve this problem, the development of educational courses for prosthodontic and geriatric training is suggested. The improvement of the services in the academic-related clinic to support the increasing number of elderly patients by using Information Technology (IT) is recommended. This can help in improving patient databases, patient referring processes, and recording treatment plans. The academic-related clinic should be available alternative for elderly patients to receive efficient dental treatment at lower expense.

Among the elderly patients who were referred to the postgraduate prosthodontic clinic, and defined as complicated cases, the waiting time for obtaining care tended to decline from 2007 to 2009 (Table 3). However, this might not reflect the actual waiting period and treatment period because of a high number of subjects who had no information regarding waiting or treatment periods due to many reasons including; rejection of dental treatment, rejection to continue dental treatment, or deciding to change dental clinic, etc. These choices may have resulted from barriers impeding access to dental care including physical disability, financial hardship, culture, linguistic miscommunication

and health care provider attitude.²⁵ Active barriers to dental care such as the cost of dental treatment, fear of dental treatment, accessibility of dental services, availability of dental services and characteristics of the dentist have been reported, as well as passive barriers demonstrated by a lack or absence of perceived need.²⁶ The average waiting period in our study revealed problems in service delivery and educational programs to serve the dental treatment needs of increasing elderly people. Therefore, this study suggests that the use of IT would be useful to improve service delivery for this age group, for example, waiting list management, appointment system management, and updating patient's health condition. The information concerning general health, oral health, and quality of life of elderly patients would be of benefit in preparing the most appropriate treatment plan. Dental treatment plans for the elderly should be modified to reflect the individual's needs.

There are limitations to this study regarding interpretation of the analyses. The data to perform the analyses was taken from dental treatment records which were sometimes missing information such as; medical problems, chief complaint, etc. From this aspect of this study results, we noted that some pertinent information about elderly patients was occasionally neglected by the dental profession. General health and oral health can change at anytime, thus the availability of updated information on general health status, oral health status and, use of oral health service by older people would help identify their specific needs and facilitate the formulation of service delivery and the development of programs for oral health and quality of life.

An additional limitation was that the investigation of the prosthodontic treatment type in our study could not represent a trend of prosthodontic treatment of all elderly receiving prosthodontic treatment at the Faculty of Dentistry, Chulalongkorn University because the data to perform our analysis was obtained only from elderly patients receiving prosthodontic treatment at the postgraduate prosthodontic clinic. This suggests further study to investigate the trend of prosthodontic treatment in all elderly patients receiving prosthodontic treatment at the Faculty of Dentistry, Chulalongkorn University and compare this trend with the national survey.

We suggest there should be an emphasis on preventive dentistry and oral health promotion for patients prior to their becoming elderly, which could reduce complicated dental treatment. Dental care and education must be emphasized to elderly patients together with their caregivers. Dental education

training courses must ensure that oral health care providers have skills in and understanding of the biomedical and psychosocial aspects of care for older people.²⁷ Previously, evaluation of oral health related quality of life was mainly in the form of research and most of dental treatment was not included in quality of life assessments. Our study indicates there should be an assessment of oral health related quality of life together with an assessment of the performance of prostheses in elderly patients to full fill the needs of elderly patients. Health care service for the elderly needs knowledge integration and teamwork for good treatment results and sustaining their oral health.

Conclusion

The elderly typically have one or more systemic disease, with the most common being hypertension. Thus, it is dentist's responsibility to integrate the information of systemic disease found in elderly patients with their dental treatment plan. The high frequency of a chief complaint of tooth loss with inefficient chewing and/or needing a new prosthesis together with the low average number of occluding natural pairs of teeth indicates a high need for prosthodontic treatment in elderly patients. The most common prosthesis treatment performed in the postgraduate prosthodontic clinic was removable dentures. Most of the elderly patients required a multidisciplinary approach for their dental treatment.

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บทคัดย่อ

การเพิ่มขึ้นของประชากรผู้สูงอายุส่งผลต่อระบบบริการสุขภาพเนื่องมาจากการเปลี่ยนแปลงทางกายภาพและเนื้อเยื่อในช่องปากร่วมกับการมีความชุกของโรคทางระบบสูงซึ่งส่งผลต่อคุณภาพชีวิตในผู้สูงอายุการศึกษานี้มีวัตถุประสงค์เพื่อวิเคราะห์ลักษณะและแนวโน้มของผู้ป่วยสูงอายุที่มารับบริการที่คณะทันตแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ทำการรวบรวมข้อมูลของผู้ป่วยใหม่สูงอายุตั้งแต่ปี พ.ศ. 2550 ถึง 2552 จากบันทึกการรักษาทางทันตกรรม จำนวน 1,320 คน โดยวิธีการสุ่มอย่างมีระบบ ในด้านการรักษาทางทันตกรรม ประดิษฐ์ รวบรวมข้อมูลจากบันทึกการรักษาทางทันตกรรมของผู้ป่วยใหม่สูงอายุที่คลินิกบัณฑิตศึกษา ภาควิชาทันตกรรมประดิษฐ์ จำนวน 634 คน ตัวอย่างจากการสุ่มจากผู้ป่วยใหม่สูงอายุทั้งหมด พบโรคทางระบบที่มากที่สุดคือ ความดันโลหิตสูง เบาหวาน โรคหัวใจและหลอดเลือดเรื้อรัง อาการสำคัญที่พบบ่อยที่สุดคือการสูญเสียฟันร่วมกับการบดเคี้ยวไม่มีประสิทธิภาพ และ/หรือความต้องการฟันเทียมใหม่ ร้อยละ 38.3 ของตัวอย่างมีความต้องการการรักษาทางทันตกรรมประดิษฐ์ ขณะที่ ร้อยละ 64.8 มีความจำเป็นทางวิชาชีพต่อการรักษาทางทันตกรรมประดิษฐ์ การสำรวจนี้พบว่า ค่าเฉลี่ยจำนวนคู่สบฟันธรรมชาติเท่ากับ 2.8 คู่ การรักษาทางทันตกรรมประดิษฐ์ที่พบบ่อยที่สุดในผู้ป่วยสูงอายุที่คลินิกบัณฑิตศึกษา ภาควิชาทันตกรรมประดิษฐ์ คือฟันเทียมชนิดถอดได้ (ร้อยละ 60.3) ระยะเวลาการรับการรักษาทางทันตกรรมประดิษฐ์เฉลี่ยเท่ากับ 134.1 วัน และระยะเวลาการรักษาทางทันตกรรมประดิษฐ์เฉลี่ยเท่ากับ 155.4 วัน อย่างไรก็ตาม ระยะเวลาการรักษาและระยะเวลาการรักษาลดลงอย่างต่อเนื่องจากปี พ.ศ. 2550 ถึง 2552