



CHAPTER I

INTRODUCTION

1.1. 1 Background

It is estimated that developing countries will experience a three-fold increase in the proportion of older people in the next 30 years. (Barreto et al., 2003)

Table 1 Countries with more than 10 million inhabitants (in 2002) with the highest proportion of persons above age 60 years

2002		2025	
Italy	24.5%	Italy	34.0%
Japan	24.3%	Japan	35.1%
Germany	24.0%	Germany	33.2%
Greece	23.9%	Greece	31.6%
Belgium	22.3%	Belgium	31.2%
Spain	22.1%	Spain	31.4%
Portugal	21.1%	Netherlands	21.1%
United Kingdom	20.8%	United Kingdom	29.4%
Ukraine	20.7%	Canada	27.9%
France	20.5%	France	28.7%

(WHO, 2002)

Moreover, in above table, it is obvious that there are gradually increasing rate of elderly people around the world.

Whereas, in Thailand according to age pyramid of 2550, older people above 65 years in men and women are about 4.0 million and 4.4 million respectively.

As epidemiology of complete edendulousness in Thailand over 65 years old is 16 percent whereas in China (11%), in Cambodia (13%), in Singapore (21%) and in Indonesia (24%) (WHO, 2005)

The functional integrity of the oral cavity is considered important for food selection, proper nutrition, and the enjoyment derived from the perceptions of taste, smell, texture, temperature, and other oral events. (Kapur et al., 1966)

Total tooth loss has well-documented consequences, including progressive alveolar bone resorption and diminished masticatory performance and oral comfort. Loss of natural teeth may also have a negative impact on psycho-social well-being (Slade et al., 1996; Allen and McMillan, 1999).

Millions of people throughout the world have lost all of their teeth, and prevalence increases with age. In the United States, prevalence of edentulism in seniors (aged 65 yrs and over) ranges from 13.9% in Hawaii and 16.2% in California to 44.0% in Kentucky and 47.9% in West Virginia (US Department of Health and Human Services, 2000). In Europe, the prevalence of edentulism ranges from 12.8% in Italy to at least 60% in Denmark, the Netherlands (65.4%), and Iceland (69.6%) (Bourgeois et al., 1998).

Some studies have shown that the average complete denture wearer achieves only 16% to 25% of the masticatory efficiency of the average person with full dentition (Manly et al., 1950; Kapur et al., 1964).

Conventional complete denture wearers experience a number of problems on a daily basis, such as instability of their mandibular dentures, inability to comminute foods, decreased self-confidence, decreased quality of life and decreased social contact and satisfaction (Redford et al. 1996).

Implant-supported or retained dentures have been increasingly accepted as an alternative to conventional dentures for oral rehabilitation of edentulous patients. (Batenburg et al., 1998; Stellingsma et al., 2004)

Subjective patient-based outcomes, including ratings by patients of masticatory ability, food preferences, satisfaction with treatment, and oral health-related quality of life, have been increasingly recognized as critical outcomes for Prosthodontics treatment (Guckes et al., 1996; Anderson 1998).

Dental implants that support mandibular prostheses provide significant benefit to edentulous patients (Melas et al., 2001; Awad et al., 2003; Heydecke et al., 2003; Timmerman et al., 2004; Allen et al., 2006; Attard et al., 2006).

Osseointegrated dental implants offer the possibility of stabilizing oral prostheses and thus overcoming some limitations of conventional dentures. The outcomes of this procedure have been largely reported in terms of success of the clinical procedure, and the technique is accepted as safe and reliable (Adell et al., 1990; Collaert and De Bruyn, 1998).

Satisfaction and Quality of Life (QoL):

Oral health-related quality of life is defined as an individual's assessment how the following affect his or her physical well-being: functional factors, psychological factors, social factors, and experience of pain/discomfort in relation to orofacial concerns (Inglehart et al., 2002).

They have recently shown that a simple overdenture with ball attachments on 2 implants in the anterior mandible provides significantly greater satisfaction, masticatory function, and oral health-related quality of life (OHRQoL) than new conventional dentures (Awad et al., 2000). In most people, oral health changes, such as tooth loss, affect quality of life (McGrath and Bedi, 2002).

The fully edentulous condition has negative impacts on oral health related quality of life (OHRQoL) (Szentpetery et al., 2005), including the inability to chew, poor speech, pain, and dissatisfaction with appearance (Walton and MacEntee, 2005). These results suggest that mandibular two-implant overdentures combined with maxillary conventional dentures provide better function and oral health-related quality of life than conventional dentures (Awad et al., 2003).

Masticatory performance:

In fact, it has been repeatedly shown that relationships between objective measures of masticatory performance and perceptual estimates of masticatory ability are weak in patients wearing conventional dentures (Garrett et al., 1996; Wayler et al., 1984) and implant-supported or retained dentures (Kapur et al., 1991; Lindquist et al., 1985; Carlsson et al., 1994; Geertman et al., 1999).

Nutrition:

The elderly edentulous avoid many types of foods, particularly raw vegetables and other hard and tough foods, because they cannot chew these with conventional dentures (Hartsook, 1974; Wayler and Chauncey, 1983; Chauncey et al., 1984). As a result, such individuals consume significantly less protein and other key nutrients—including fiber, calcium, non-heme iron, and some vitamins—than do individuals with teeth (Sheiham et al., 2001). This may explain why elderly institutionalized Japanese with no teeth have poorer general health and higher mortality rates than those with teeth (Shimazaki et al., 2001). A few studies have reported deficiencies of isolated nutrients in

denture wearers, but there is no consistent pattern. (Papas et al., 1998; Joshipura et al. , 1996; Greksa et al., 1995)

Some cross-sectional studies have found that denture wearers prefer easy-to-chew foods (Chauncey et al., 1984; Gunne et al., 1985). Furthermore, several studies have shown that the ability of edentulous patients to chew most foods improves significantly when the mandibular denture is fully or partly supported by endosseous implants (Feine et al., 1994; Geertman et al., 1999). In one study shown that a simple overdenture with ball attachments on 2 implants in the anterior mandible provides significantly greater satisfaction, masticatory function, and oral health-related quality of life (OHRQoL) than new conventional dentures (Awad et al., 2000).

In one randomized clinical trial (RCT) (seniors aged 65-75 yrs), the group with Implant overdentures (IOD Group) had a greater ability to chew tough meat and raw fruits and vegetables than the conventional denture group CD Group; (Awad et al., in press). Some studies also mention that satisfaction and perceived improvements in the ability to chew certain foods are associated with implant-retained or implant-supported mandibular dentures in patients with extremely resorbed mandibular ridges (Blomberg et al., 1983; Sandstrom et al., 1987; Boerrigter et al., 1995; Geertman et al., 1994; Sebring et al., 1995). One of the major aims of Prosthodontics is to restore dentition so that patients can effectively chew foods for enjoyment and nourishment. (Allen et al., 2006)

Cost-effectiveness:

In one finding suggested that, although mandibular implant-retained overdentures may be more satisfying for edentulous patients than conventional dentures, the magnitude of the effect is still uncertain. There is a need for additional evidence including cost-

effectiveness analyses on the impact of mandibular implant overdentures and conventional dentures.

Moreover, in one meta-analysis yielded two principal findings: firstly, the results of this metaanalysis demonstrate that mandibular implant overdentures might be a more effective treatment for edentulous individuals than conventional dentures, based on patient ratings of satisfaction or oral health related quality of life. However, there is still uncertainty about the true magnitude of the effect. Secondly, there is a lack of evidence concerning the impact of mandibular implant overdentures on perceived general health (Emami et al., 2009).

In one paper, they reported the results of anthropometric and nutritional analyses that were carried out during the trial. They tested the hypothesis that there is no difference in nutritional status between patients with mandibular two-implant retained overdentures and those with conventional dentures at 6 months post-treatment. Significant improvements in anthropometric parameters were detected in the IOD but not in the CD group, for percent body fat ($p = 0.011$) and skin-fold thickness at the biceps, subscapular, and abdomen ($p < 0.05$), with significant decreases in waist circumference ($p < 0.0001$) and waist-hip ratio ($p = 0.001$). Significant increases were seen in concentrations of serum albumin ($p = 0.015$), hemoglobin ($p = 0.01$), and B12 ($p = 0.01$). No significant between group differences were found. These results suggest that low-cost IOD treatment may improve the nutritional state of edentulous people (Morais et al., 2003).

1.1.2. Rationale of the study

A few studies have reported deficiencies of isolated nutrients in denture wearers, but there is no consistent pattern (Papas et al., 1998; Joshipura et al., 1996; Greksa et al., 1995).

Some of the studies generally have shown that prosthetic rehabilitation in the absence of dietary counseling does not lead to dietary improvement (Moynihan & Bradbury, 2001; Moynihan et al., 2006. Hildebrandt et al., 1997; Sahyoun et al., 2003; Sheiham et al., 2001). In one cross-sectional study, they hypothesized that “Nutritional counseling along with the provision of dentures in older adults can, however, result in dietary improvements” (Bradbury et al., 2006).

Moreover, interestingly, in one recent study, they concluded that the differences between the groups were not significant ($p>0.3$) for the questions arguing on the frequency of consumption of meats, raw fruit or vegetables (Muller et al., 2008).

The prevalence of elderly people over 65 years wearing conventional denture in Thailand is 107,366 in 2008, whereas 2155 people in Bangkok and 1038 persons in Pathumthani Province (MOPH, 2008).

Research Gap

It is unclear whether the replacement of conventional mandibular dentures with implant-supported overdentures alters the diet selection and thus improves nutritional status and quality of life of elderly edentulous persons. In this study we will control one of the factor related to food choice i.e knowledge, attitude and practice concerning about

healthy diet by NEED (Nutritional Empowerment in Edentulous people with Dentures) program by participatory learning approach.

1.2. Research questions

Have the mandibular two-implant supported overdentures (IOD) plus NEED programme more effectiveness than (IOD only), (conventional dentures, CD plus NEED) and control group (CD only) on improving nutritional status and quality of life in elderly Thai edentulous people?

1.3. General objective

The current randomized clinical trial was undertaken to explore the usefulness of IOD plus NEED programme by making comprehensive comparison of the efficacies of NEED plus mandibular implant-supported overdentures (IOD), IOD only, conventional dentures (CD) plus NEED and conventional dentures (CD) in Thai elderly edentulous people in Prachatipat hospital, Pathumthani province, in the aspect of satisfaction, OHRQoL (Oral health related quality of life), nutritional improvement, and cost-effectiveness.

Specific objectives

1. To compare before program patient satisfaction score, daily diet intake, OHRQoL and nutrition status among intervention group I (IOD plus NEED), intervention group II (IOD only), intervention group III (CD plus NEED) and control group (CD only).

2. To compare before and after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status within intervention group I (IOD plus NEED).

3. To compare before and after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status within intervention group II (IOD only).

4. To compare before and after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status within intervention group III (CD plus NEED).

5. To compare before and after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status within control group (CD only).

6. To compare after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status among intervention group I (IOD plus NEED), intervention group II (IOD only), intervention group III (CD plus NEED) and control group (CD only).

7. To determine the cost-effectiveness among the four groups.

1.4. Hypothesis

1. There are no different between before program patient satisfaction score, daily diet intake, OHRQoL and nutrition status among intervention group I (IOD plus NEED), intervention group II (IOD only), intervention group III (CD plus NEED) and control group (CD only).

2. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status are better than before program in intervention group I (IODNEED).
3. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status are better than before program in intervention group II (IOD).
4. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status are better than before program in intervention group III (CDNEED).
5. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status are the same as before program in control group (CD).
6. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status in intervention group I (IODNEED) are better than intervention group II (IOD), intervention group III (CDNEED) and control group (CD).
7. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status in intervention group II (IOD) are better than intervention group III (CD NEED) and control group (CD).
8. The after program patient satisfaction score, daily diet intake, OHRQoL and nutrition status in intervention group III (CDNEED) are better than control group (CD).

9. The cost –effectiveness in intervention group I (IODNEED) are better than the other groups.

1.5. Variables of the study

Independent Variables

Age
 Gender
 History of Medical illnesses
 Income
 Occupation
 Sex
 Smoking
 Edentulous
 Living status

Dependent Variables

Oral health related quality of Life
 Quality of masticatory function
 Mini Nutritional Assessment (MNA)
 Seven days DIET intake
 BMI, BFAT % (SFT)
 Anthropometric measurement
 Blood parameters

1.6 Operational definitions

Age : the amount of time during which a person or thing has existed in this research by year and date of birthday

Gender: Females or males considered as a group: expressions used by one gender

Education: the process of teaching, esp. at a school, college, or university in this research means the highest process.

Income: the total amount of money earned from work or obtained from other sources over a given period of time.

Occupation: the principal activity in your life that you do to earn money.

Smoking: is the inhalation of the smoke of burning tobacco encased in cigarettes, pipes, and cigars. Casual smoking is the act of smoking only occasionally, usually in a social situation or to relieve stress. A smoking habit is a physical addiction to tobacco products. Many health experts now regard habitual smoking as a psychological addiction, too, and one with serious health consequences. And smoke how much per day.

Edentulous

Complete loss of all natural teeth can substantially reduce quality of life, self-image, and daily functioning, age over more than 65 years.

1.7. Scope of the study

This study was conducted in, Prachatipat hospital Pathumthani province, Thailand. According to the limitation of rareness of case, case selection was the Thai elderly people (more than 65 years) with more than one year duration of complete edentulous.

1.8. Usefulness of the study

Many factors determine health both of body and mental support such as body weight, the way to happy their life. The result of this model can be used as a guideline to

improve quality of life and nutritional status of senior edentulous Thai people. In addition, the result can be used for policy enforcement. Lastly, this research will be useful and helpful for those who conduct similar type of diseases in other areas.

Figure 1: Conceptual Framework of the study: A Randomized Clinical Trial

