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Chapter

Oral Health Problems of Thai People Reported by Khon Kaen University Staffs during 1984 to 2020

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Abstract

To improve the efficiency of the dental care service system in Thailand. To synthesize content from Khon Kaen University (KKU) staffs and students' research and presentations from 1984 to 2020 about oral health hygiene and related diseases. Sixteen publications and presentations by KKU staffs and their students about oral health problems and management were retrieved, reviewed and analyzed. Poor oral health of people in the northeast of Thailand is found in every age group: children, adults and the aging, both male and female. There are still many oral health problems of Thai people in the northeast. KKU Field Works, Projects and Research were able to help reduce these oral health problems. An appropriate preventive oral health program needs to be developed and implemented in Northeastern Thailand.

Keywords: Oral health problems, Oral health management, Khon Kaen University, Dental care service

1. Introduction

Khon Kaen University (KKU), Thailand has carried out field work to improve the health, including oral health of the population in the northeast of Thailand and other rural areas. KKU has an important mission to produce graduates with essential knowledge, skills and attitudes to be able to help in national development, especially in the northeast of Thailand, and has been actively pursuing this duty and responsibility since 1984.

The KKU field practice course began in 1984 for health sciences students in KKU and the College of Asian Scholars. These students will have direct experience in solving problems in rural areas under the supervision of our staffs in related fields. They gain the experiences of working together with other students for sustainable health development.

2. Objective

The objective of this study was to synthesize knowledge about oral health hygiene and related diseases from KKU staffs and their students’ projects and research presentations during 1984 to 2020.

3. Methodologies

The populations were 16 publications and presentations by KKU staffs and their students during 1984 to 2020 (**Tables 1** and **2**). The researches reviewed was approved by the Ethics Committee for Human Research at Khon Kaen University, Thailand [HE522167, HE532173, HE571074, HE591188, HE591199, and HE621269]. Most of the research was secondary data. Those who volunteered had signed a consent form.

Data and results about oral health problems and management were retrieved from 16 paper publications and presentations by KKU staffs and their students during 1984 to 2020 (**Tables 1** and **2**).

Study No.	Title	Ref.	Study Design	Age Group (year old)	Sample size (Sex) (Data from)	Findings	Year of pubn.
1[N.]	Betel Quid Chewing and Oral Health of Women	[1]	Descriptive Study and Analytical Study	31–86 women	2,253 F Data from (1992–1994)	Betel Quid Chewing associated with Periodontitis, Tooth Loss and Aging	2007
2 [I.]	ECO and Smoking Status	[2]	Cross-Sectional Study and Analytical Study,	15–70 smokers	420 Adults	ECO for Older =7 ppm, ECO For Younger = 8 ppm	2008
3 [I.]	ECO an Oral Health Status in Smokers active and passive smokers	[3]	Cross-sectional Analytical Study	30–72 workers	296 Adults (Data from 2007)	No Relationship between ECO and smoking	2011
4 [I.]	Periodontitis, ECO Level and Oral Health	[4]	Cross-sectional Analytical Study	30–89 rural 33–86 rural	625 (M) (1990–1991) 1,218 (M) (1992–1994) Adults	Tobacco smoking as a risk indicator for Periodontitis	2009
5 [I.]	Tooth Loss due to Dental Carries	[5]	In-depth Interview and Cross-sectional Analytical Study	19–53 workers	457 Adults [283 (M),174 (F)] 11 for in-depth interview	Causes from Lack of Knowledge & Time, Negative Attitudes, Inability to support cost of dental treatment	2012

Study No.	Title	Ref.	Study Design	Age Group (year old)	Sample size (Sex) (Data from)	Findings	Year of pubn.
6 [I.]	Dental and Jaw Injuries	[6]	Descriptive and Analytical Study	Thai boxing rural, urban	260 (M) (2009–2010)	Muay Thai boxing lead to dental & jaw injuries	2016
7 [I.]	Factors related to Tooth Loss	[7]	Descriptive Study and Analytical Study	19–25 urban	1,500 Adults [621 M,879F] (data from 2014)	62.2% had Tooth Loss, 60.0% Tooth Loss caused by Dental Carries	2017
8 [I.]	ECO and Age	[8]	Descriptive Study Analytical Study and ECO Level measured	16–70 workers	875 volunteers [584Non Smokers, 291Smokers] (data from 2009)	Smokers: Mean ECO Level = 11.24 ppm Non Smokers: Mean ECO Level = 2.25 ppm Optimal ECO Cut-Off Level varied by age	2017
9 [I.]	Smoking status and best ECO cut-off level and oral health conditions	[9]	Descriptive Study, Analytical Study, ECO Level Measured	19–53 workers	455 workers (data from 2009 to 2010)	Direct association between ECO Level > = 4 ppm and Periodontitis	2018

I, index journal; N, non-index journal; P, poster presentation; lr, literature review; Rw, research waiting for publication.

Table 1.
Summary of Oral health problems related to diseases from KCU staff and their students’ publications and presentations during 1984–2020.

Study No.	Title	Ref.	Study Design	Age Group (years old)	Sample size (Sex) (Data from)	Findings	Year of pubn.
10 [R]	Dental Clinic at PCU Samliaum of Srinagarind Hospital	[10]	In-depth Interviews and Descriptive Study	Age above 18	400 Adults	Most of villagers need to have a dental care clinic at PCU Samliaum of Srinagarind Hospital and were able to pay dental care treatment at 1,000 Baht on each visit.	2011
11 [I.]	Dental care services at industrial estates	[11]	Analytical Study	Age 19–25	1,500 Workers from 16 Factories [621 M, 879F]	Only 36.1% used Dental care services while 63.9% could not in previous year	2015

Study No.	Title	Ref.	Study Design	Age Group (years old)	Sample size (Sex) (Data from)	Findings	Year of pubn.
12 [I.]	Health Consciousness to be Young Dentist	[12]	Descriptive Study	Students Grade11 from two Schools in Kalasin Provn.	660 Students (During 2010)	320 were Peer leaders. The peer leader scores were higher than Non-peer leaders in all domain.	2013
13 [I.]	Youth Participation Towards health promotion	[13]	Mixed Methods 1. Situations Analysis 2. Model Synthesis 3. Model Effectiveness	Students Grade 9–11	1,192 Samples for Analytical Study 35 Subjects for In-depth Interview	103 of them were Peer volunteers. The CHANYA Model was supporting youth participation towards oral health promotion	2017
14 [P]	Poster Presentation: “Maelong Volunteer for Long Term Care”	[14]	Trained the Health Volunteers and Evaluated of their KAP	Health Volunteers at Maelong Village	28 Health Voluntrs. [1 (M), 27 (F)]	Increase awareness of “Long Term Care” Gain more knowledge Need repeat training every year	2018
15 [Ir]	Masticatory Function and related effects	[15, 16]	Literature Reviews	Paper publishing and Textbooks	36 Papers and Textbooks	One paper [16] presented that 83% of dentures were still in use after 5 years, Only 50% were still in use after10 years	2020
16 [Rw]	Chronic Gingival Inflammation leads to Esophageal Cancer	[17]	Analytical Study	105 EC 105 Control	Case [M = 60%, F = 40%], Control [M = 47%, F = 53%] (2007–2017)	<i>Campylobacter</i> infection, tobacco smoking and poor oral health were associated with esophageal cancer in Northeastern, Thailand	2020

I, index journal; N, non-index journal; P, poster presentation; Ir, literature review; Rw, research waiting for publication.

Table 2.
Summary of Oral health care management by KKU staff and their students during 1984–2020.

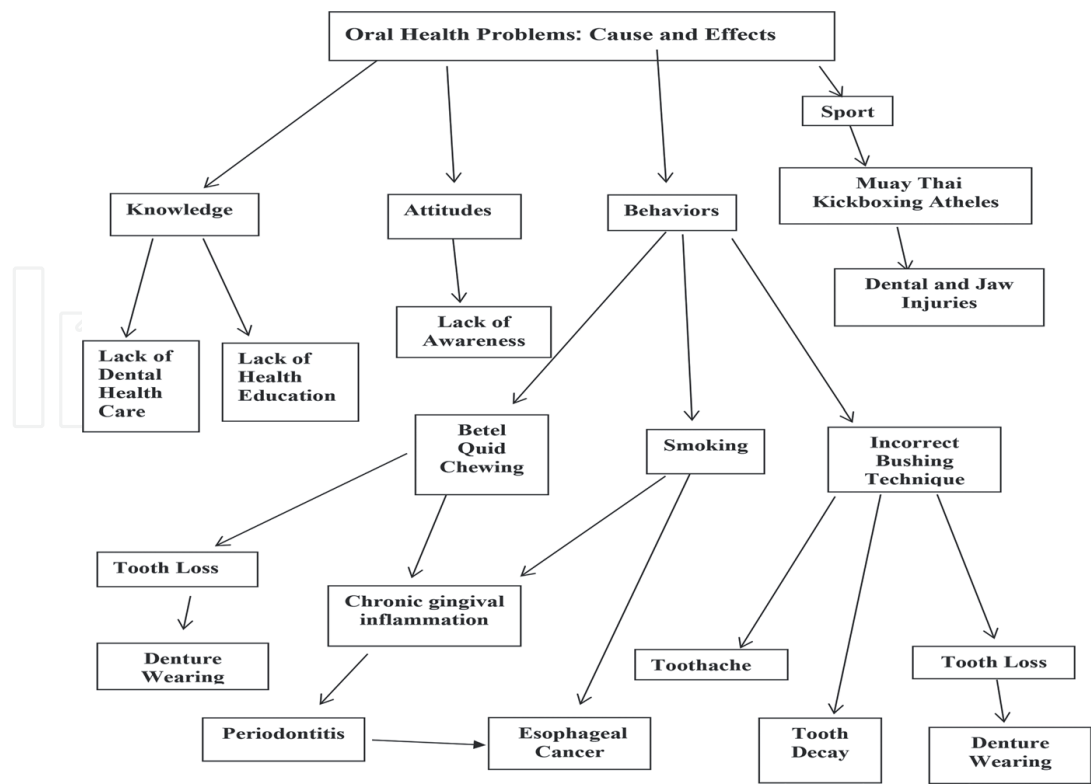


Figure 1.
Oral health problems: Causes and effects leading to related diseases.

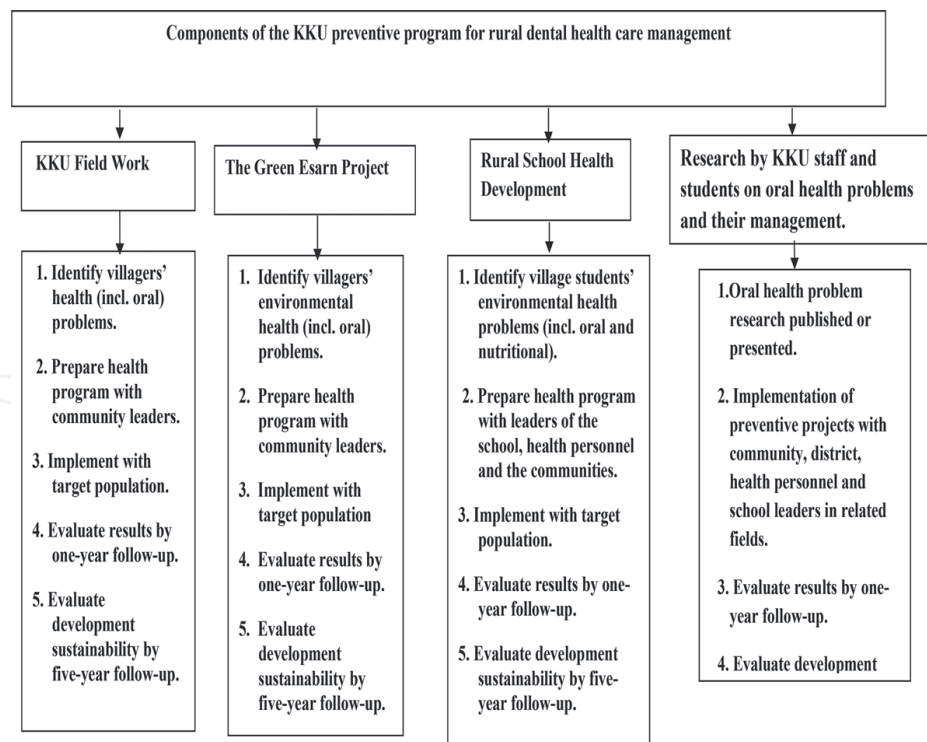


Figure 2.
Procedure for the KKU preventive program for rural dental health care management of people in the Northeast of Thailand.

To synthesize oral health problems and related diseases, included in the programs of health prevention and promotion from the 16 publications and presentations by KKU staffs and their students, we use two diagrams as follows:

1. Oral health problems: Causes and Effects leading to related diseases (**Figure 1**).
2. Procedure for the KKU preventive program for rural dental health care management of people in the Northeast of Thailand (**Figure 2**).

4. Results

In thirty-seven years of KKU field practice and research, it has been found that most students and staff had a good attitude towards practice in the community with other students and staff from various faculties. Each year, more than six hundred students and sixty staff participate in KKU field work. They provide oral health care and other health promotion work to the people in villages, and follow-up the work with those villagers after five years. Reports of follow-up studies have indicated that people in those communities have better health awareness, and the community leaders have discussed with KKU staff about other projects to implement in their community in later years. The KKU field practice has achieved its aim in equipping students with essential competency in sustainable health development for rural communities, while lessons learned had been discussed and distributed widely to the public [18–23].

Besides KKU field practice, the Department of Community Medicine, KKU has performed much more researches to develop the health status of the people in villages. Maternal and Child Health research studied children below 5 years and their mothers in two villages (Ban Had and Ban Nongtao) of Khon Kaen province [24].

Another two “excellence” projects have involved KKU staff which were 1) The Green Esarn Project which studied KAP of villagers in BanSum village, Mahachanachai district, Yasothorn province about oral health related to their environment [25], and 2) The Rural School Health Development Project: The School of the Royal Initiative of Her Royal Princess Mahachakri Sirindhorn studied KAP of villagers and dental treatment of the students in Nong Song Hong School, Khon Kaen province [26].

The results of these various studies show that poor oral health hygiene, smoking habits, betel quid chewing, and Muay Thai kickboxing of the Thai population still lead to many problems in all age groups (children, adults, workers, smokers, women who chew betel quids, Muay Thai kickboxing athletes, and the aging), both male and female. The studies indicate that bad oral hygiene leads to diseases such as oral health problems, exhaled carbon monoxide (ECO) levels, dental carries, tooth loss, and chronic gingival inflammation leading to esophageal cancer, and insufficient dental treatment (**Figure 1**).

The KKU Projects and other related projects show that after the projects had been performed by KKU staffs and their students from 1984 to 2020, the villagers had more awareness of their oral hygiene than in the previous year.

From **Figure 1**, we see that oral health problems: have 4 included variables; sport, knowledge, attitudes, and behaviors as follows:

1. Sport:

It was seen that 23.5% of 260 Thai boxing athletes had dental and jaw injuries. The popularity of this sport is still increasing in Thailand [6].

2. Knowledge:

In particular, people lacked knowledge of dental care and lacked health education. The results showed that 63.9% of 1,500 workers did not use dental care services

during the previous year, mostly because they had no time to see the dentist and were unable to pay the cost of dental treatment [11].

3. Attitudes:

It was found that 62.2% of 457 adults had tooth loss due to dental carries. From in-depth interview of 11 subjects, this was caused by 1) Lack of time to visit the dentist, 2) Negative attitude towards dental treatment, and 3) Inability to support the cost of dental treatment [7].

4. Behaviors:

Betel Quid Chewing:

It was found that most aging women in Thailand chew betel quid during the day. The results from 2,253 women, aged 31–86 years old showed that there was an association between betel quid chewing and periodontitis, and also tooth loss [1].

Incorrect Brushing Technique:

It was found in Nong Song Hong School that 75% of 67 students had oral health problem such as toothache and 58.5% of them were absent from class because of toothache, 17.9% had dental carries, but none of them had tooth loss [26].

Smoking:

Findings from multivariable logistic regression showed that tobacco smoking was a risk indicator for periodontitis from 1,218 males, aged 33–86 years residing in rural areas of Khon Kaen Province during 1990–1991 [4].

Chronic Gingival Inflammation leading to Esophageal Cancer Findings of multi-variable logistic regression indicated that *Campylobacter* infection, tobacco smoking, and poor oral health were associated with esophageal cancer in people in the northeast of Thailand [17].

5. Discussions

Dental Carries is believed to be a rapidly increasing oral health problem in developing countries. KKU Studies of tooth loss due to dental carries [5], factors related to tooth loss [7], dental care services at PCU [10], and dental care services at industrial estates [11] were similar to the study of Ahlberg et al. [27], which suggests that there should be dental services in industrial estates in order to prevent dental carries and its sequelae. Our finding suggest that utilization of dental care services varies by person, place, and time. It can be categorized into two factors e.g. economic factors and non-economics factors. The economic factors indicated the ability to pay for dental care treatment. Non-economic factors present awareness of oral health problems. People who use dental care services regularly will not have tooth decay.

Findings of KKU studies of ECO and smoking status [2], ECO and oral health status in active and passive smokers [3], ECO and age [8], and smoking status and best ECO cut-off level and oral conditions [9] were similar to prior studies [28, 29], which supports that the level of carbon monoxide in the exhaled breath might be used as an indicator of smoking status.

Findings of periodontitis associated with tobacco smoking [4] were similar to prior studies [30, 31], which found that tobacco smoking was related to periodontitis. Our findings from both data sets suggest that tobacco smoking is directly associated with periodontitis, and thus enhances the possibility of increased tooth extraction.

Results of KKU studies about betel quid chewing and oral health problems [1] were similar to Mehta et al. [32], which found the relationship of betel leaf chewing and periodontal disease. Our findings indicated that although betel quid chewing may reduce dental caries, betel quid chewing is a risk indicator of periodontitis enhancing the risk of increasing tooth loss.

KKU reports of dental and jaw injuries [6] were similar to the prior studies [33, 34], which have reported occurrences of injuries to the body as well as to oral cavity and jaw. We found that the location of boxing camps in the upper northeast of Thailand as well as boxing camps in rural area were directly related to dental trauma and injuries among these Thai boxing athletes.

6. Conclusions

The results from those projects and research indicate that these projects were successful because of the co-operation from the leaders of the schools, the leaders of the communities, health care providers in their districts, health volunteers in the villages, awareness of the students and the villagers, follow-up studies by KKU staffs and their students at least twice, one-year follow-up for evaluation of the outcome of villagers' health and oral health, as well as a five-year follow-up to evaluate the sustainability of the development under the supervision and funding support from the director of Khon Kaen University and all Faculties related in KKU and the College of Asian Scholars.

From the KKU projects and research above it was seen that Thai people faced oral hygiene and oral health problems. The KKU field practice course is useful to reduce this problem. There should be a policy of protection programs for Muay Thai athletes by the Muay Thai Committees. There should be a dental clinic provided near communities which can give them oral health education programs. Services and welfare for dental treatment should be provided, or there should be a dental clinic in the workplace eg. on an Industrial Estate. Preventive programs should be established to stop people chewing betel quids.

KKU field works, projects and research by KKU staffs and their students were able to assist the public and the related organizations that have the duty to deal with these problems. Some of them are effective in reducing oral health problems of students and villagers eg. PCU Samliaum of Srinagarind Hospital, Khon Kaen province, Nong Song Hong School, Khon Kaen province, and Ban Sum village, Yasothorn province.

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Conflict of interest

All authors declare that they have no conflicts of interest.

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