Re-Inventing Japan Project
大学の世界展開力強化事業

Inter-university Exchange Program toward Medical and Dental Networking in Southeast Asia
**東南アジア医療・歯科医療ネットワークの構築を目指した大学間交流プログラム**

# 国際セミナーⅨ

# オーラルヘルスサイエンス

International Seminar on

# Oral Health Sciences

2016 年 10 月 11 日

東京医科歯科大学
TOKYO MEDICAL AND DENTAL UNIVERSITY

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# International Seminar on Oral Health Sciences

**Date** : October 11th, 2016 (Tue), 10:00～15:00
(Lunch break: 12:00～13:00**)**

**Venue** : Library, 10th floor, Dental Building

**Organizer** : Department of Oral Health Promotion
Graduate School of Medical and Dental Sciences
Tokyo Medical and Dental University

**Program**

**Presentation**

1. **Dr. Nathawut Kaewsutha** (Associate Dean, Srinakharinwirot University)

   *A Causal Relationship Model of Oral Hygiene Care Behavior and the Oral Hygiene Status of Early Adolescents*

2. **Dr. Yen Nguyen** (4nd year Ph.D. student, TMDU)

   *Early childhood caries in Vietnamese children*

3. **Dr. Akiko Oshiro** (Clinical staff, TMDU)

   *Fresh Breath Clinic*

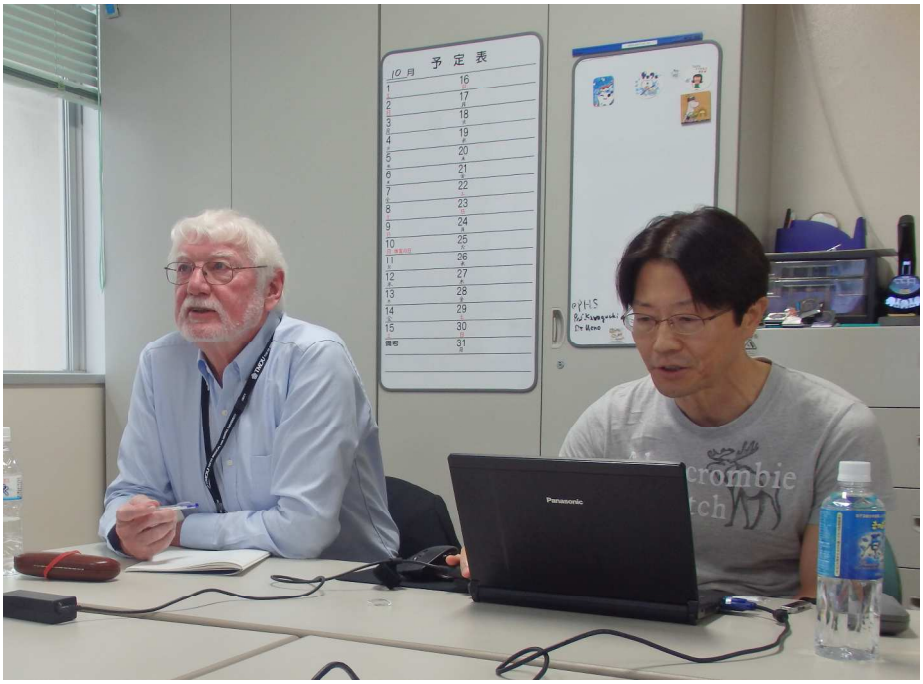
4. **Dr. Masayuki Ueno** (Assoc Professor, TMDU)

   *Parity and Dentition Status*

**Discussion**

OHP
Oral Health Promotion

セミナーの様子




川口先生から Dr. Nathawut Kaewsutha（ボール先生）へ感謝状贈呈

1. Dr. Nathawut Kaewsutha (Associate Dean, Srinakharinwirot University)

The International Seminar, 11 OCT 2016

# A Causal Relationship Model of Oral Hygiene Care Behavior and the Oral Hygiene Status of Early Adolescents

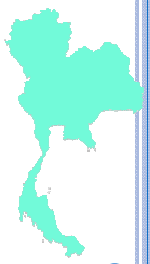
Nathawut Kaewsutha, DDS., MPH., PHD.

Srinakharinwirot University
Thailand

## Introduction and Background

### Thailand Situation

| Year | 1989 | 1994 | 2001 | 2007 | 2012 |
|---|---|---|---|---|---|
| Prevalent | 49.2 | 53.9 | 57.3 | 56.9 | 52.3 |
| DMFT | 1.50 | 1.55 | 1.64 | 1.64 | 1.3 |



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Dental public health division, Ministry of public health, Thailand, 2007; 2013

## Background and Significant of Problem

- Oral disease, especially dental caries and gingivitis is One of the important public health problem
  - Cause suffering to patients because of the chronic painfulness
  - Adverse effects on mental health, personality, vocalization and life performance
  - Malfunction of teeth in childhood has direct impact on eating ability of children and can result in children's malnutrition
  - The children may have learning problems because of absenteeism
  - Treatment of oral health problem is time- consuming and require a huge amount of budget and number of dental health professional → Economic and social impact.

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## Early Adolescents

- children of 12 years old , which are secondary school grade 7th
  - No surveillance program among secondary school students.
  - Number of secondary school students with oral disease is still untowardly increasing → risky group
    - Frequency of carbohydrate consumption and inappropriate dental hygiene
  - Significant epidemiological aspect → fully permanent teeth
  - Prevalence rate of dental caries and gingivitis among this group is good predictor of dental problem among future adults

(Thailand National Dental Health Survey, 2012)

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## Oral Hygiene Care Behavior

- A proper oral hygiene care during the early stage can prevent dental caries, gingivitis and the loss of permanent tooth in adult
- The data from Thailand National Dental Health Survey, 2012
  - 7.62 % of children aged 12 brushed their teeth more than twice a day
  - 9.06% brushed their teeth after having snack
- Lack of behavioral science study about causal relationship model of oral hygiene care behavior in early adolescent group

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## Research Objectives

The purposes of this study were

- to examine consistency of a hypothetical causal relationship model of oral hygiene care behavior with empirical data
- to examine the influence of causal relationship factors related oral hygiene care behavior in early adolescent group

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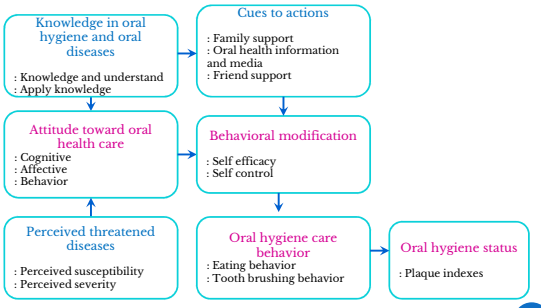
## Theory and Concept

- KAP Model
- Behavioral Modification
- Social Learning Cognitive theory
- Health Belief Model Theory



## Conceptual framework






## Materials and Methods

- The samples were 391 students, Nakhon-Nayok Province, selected through the stratified random sampling method.
- Seven latent variables of the study were measured from 15 observed variables.

The **exogenous latent** variables included

1. knowledge in oral hygiene and oral diseases
2. perceived threatened diseases
3. cues to actions

The **endogenous latent** variables included

1. attitude toward oral health care
2. behavioral modification
3. oral hygiene care behavior
4. oral hygiene status

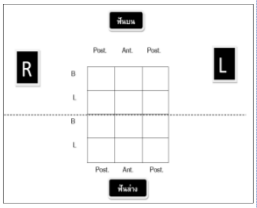


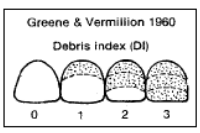
## Materials and Methods

- The instrument used for collecting data was
  - 6-point rating scale questionnaires
  - oral examination sheet.



## Research tools






## Research Analysis

- Data were analyzed by descriptive statistics and examined for consistency of hypothetical a causal model with empirical data using LISREL.

# RESULTS

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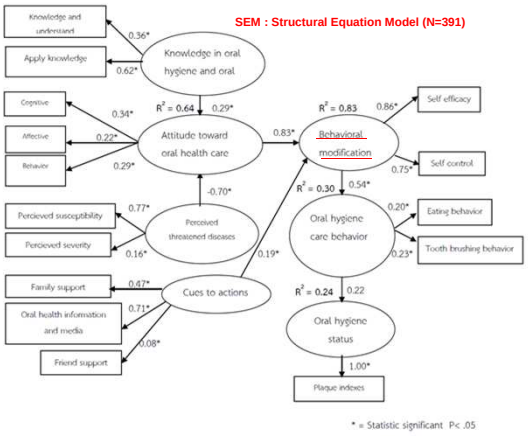


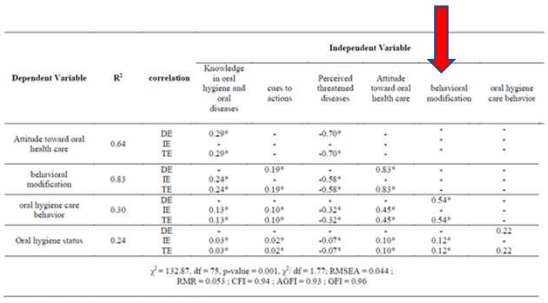

| Dependent Variable | $R^2$ | correlation | Independent Variable: Knowledge in oral hygiene and oral diseases | cues to actions | Perceived threatened diseases | Attitude toward oral health care | behavioral modification | oral hygiene care behavior |
|---|---|---|---|---|---|---|---|---|
| Attitude toward oral health care | 0.64 | DE | 0.29* | - | -0.70* | - | - | - |
| | | IE | - | - | - | - | - | - |
| | | TE | 0.29* | - | -0.70* | - | - | - |
| behavioral modification | 0.83 | DE | - | 0.19* | - | 0.83* | - | - |
| | | IE | 0.24* | - | -0.58* | - | - | - |
| | | TE | 0.24* | 0.19* | -0.58* | 0.83* | - | - |
| oral hygiene care behavior | 0.30 | DE | - | - | - | - | 0.54* | - |
| | | IE | 0.13* | 0.10* | -0.32* | 0.45* | - | - |
| | | TE | 0.13* | 0.10* | -0.32* | 0.45* | 0.54* | - |
| Oral hygiene status | 0.24 | DE | - | - | - | - | - | 0.22 |
| | | IE | 0.03* | 0.02* | -0.07* | 0.10* | 0.12* | - |
| | | TE | 0.03* | 0.02* | -0.07* | 0.10* | 0.12* | 0.22 |

$\chi^2$ = 132.87, df = 75, p-value = 0.001, $\chi^2$/ df = 1.77; RMSEA = 0.044 ; RMR = 0.053 ; CFI = 0.94 ; AGFI = 0.93 ; GFI = 0.96

DI = Direct effect; IE = Indirect effect; TE = Total effect
* Statistic Significant .05

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## THE RESULTS

- the hypothetical a causal model was consistent with empirical data
  $\chi^2$ = 132.87, df = 75, p-value = 0.001, $\chi^2$/ df = 1.77; RMSEA = 0.044; RMR = 0.053; CFI = 0.94; AGFI = 0.93; GFI = 0.96
- The variables that **directly effected** oral hygiene care was behavior behavioral modification; their standardized path coefficient was .54 respectively.
- The variables that **indirectly effected** to oral hygiene care behavior were knowledge in oral hygiene and oral diseases, attitude toward oral health care, perceived threatened diseases and cues to actions; their standardized path coefficients were .13 .45, -.32 and .10 respectively.

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## APPLICATION

- Developed the Oral Health Care behavioral modification Program ; focus on
  - Self Efficacy
  - Self Control

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## Activity 1: PBL Workshop – What is Caries?




## Activity 2 : Self Cleansing (Hand on)




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## Activity 3 : Self Check




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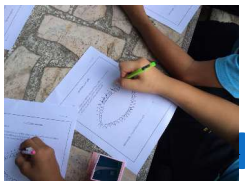
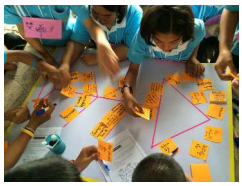
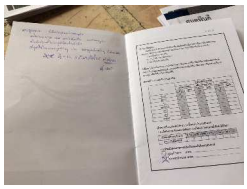
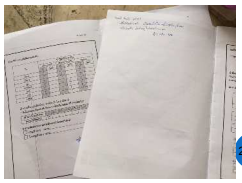
## Activity 4 Self Record



## Activity 5 : Self Goal



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## Activity 6 Program Evaluation





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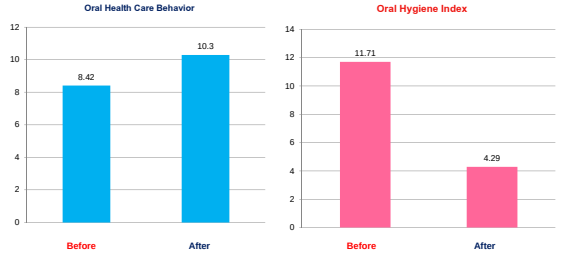
## Results: Experiment Group

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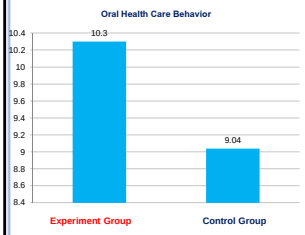
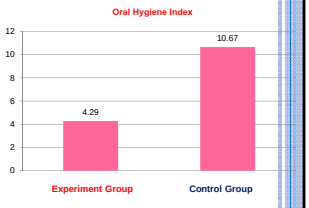
## RESULTS : AFTER TREATMENT

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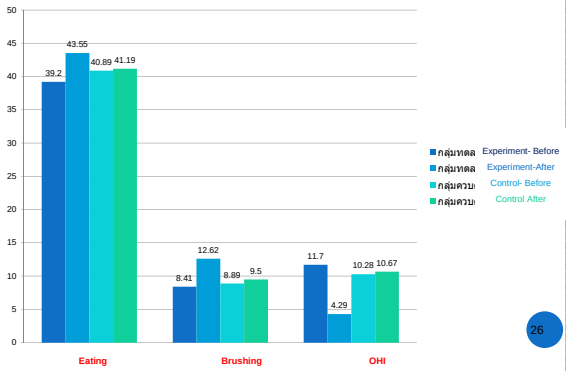
## RESULT

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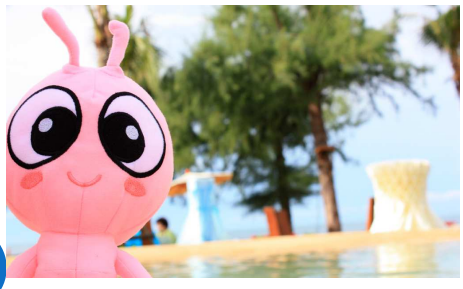

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## THANK YOU

ありがとう　ございます

2. Dr. Yen Nguyen (4nd year Ph.D. student, TMDU)

# Early childhood caries in Vietnamese children

Yen Hoang Thi Nguyen, Takashi Zaitsu, Masayuki Ueno, Yoko Kawaguchi
Department of Oral Health Promotion
Tokyo Medical and Dental University

## Contents

- Part 1: Early childhood caries (ECC) and related risk factors
- Part 2: Silver diamine fluoride (SDF) application for arresting caries

## Part 1: ECC and related risk factors

- Early childhood caries (ECC) is a significant oral health problem of children world-wide, especially in developing countries.
- ECC not only has adverse effects on health and quality of life in children but also creates a huge financial burden for families.

- In Vietnam, caries showed a high prevalence and most lesions were untreated.
- National oral health survey in 2001 reported 84.6% of 6 year-old children had caries.
- There are limited numbers of studies about ECC in Vietnamese pre-school children.

This study was conducted to investigate the prevalence of ECC and the related risk factors.

## Methods

**Subjects**

1028 kindergarten children, in Thua Thien Hue province - Vietnam in 2015.

**Questionnaire survey for caregivers**

- socioeconomic status
- child's dietary habits
- child's oral health habits

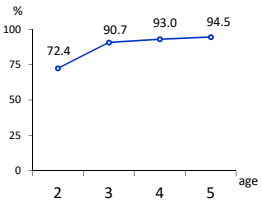
**Dental examination**

- Dentition (decayed, missing, filled)
- Modified debris index (DI)

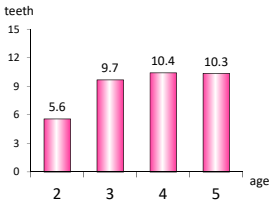
## Results

## Caries prevalence and mean dmft

Caries prevalence: 89.1%




Mean dmft: 9.3




Photos of ECC of preschool children in Thua Thien Hue province

## Socioeconomics and health behaviours

| Variables | | % |
|---|---|---|
| Mother's educational level | Up to middle school | 43.6 |
| | High school and above | 56.5 |
| Duration of breast-feeding | ≤12 months | 22.5 |
| | 13-18 months | 33.5 |
| | >18 months | 39.6 |
| | No breast-feeding | 4.5 |
| Duration of bottle-feeding | ≤12 months | 5.4 |
| | 13-18 months | 6.7 |
| | >18 months | 57.2 |
| | No bottle-feeding | 30.7 |
| Food retaining in mouth for long time | Yes | 40.9 |
| | No | 59.1 |

| | | |
|---|---|---|
| Sweet food consumption at home | < 2times daily | 40.7 |
| | ≥2 times daily | 59.3 |
| Sweet drink consumption at home | < 2times daily | 36.9 |
| | ≥2 times daily | 63.1 |
| Water drinking after breast /bottle-feeding | Usually | 62.9 |
| | rarely | 37.1 |
| Mouth rinsing after eating | Usually | 48.8 |
| | rarely | 51.2 |
| Thumb sucking | No | 73.6 |
| | Yes | 26.4 |
| Modified DI score | ≤1 | 7.0 |
| | >1 | 93.0 |

| Variable | | 2-year-olds | 3-5-year-olds |
|---|---|---|---|
| Persons who brush child's teeth | Both child & parent | 14.7 | 22.0 |
| | Parent only | 54.7 | 33.0 |
| | Child only | 9.4 | 41.2 |
| | Not yet | 21.0 | 3.8 |

## Logistic regression on caries status by age groups

### 2-year-olds

| Significant independent variable | | OR | 95% CI | | *P*-value |
|---|---|---|---|---|---|
| | | | Lower | Upper | |
| Mother's educational level | High school or above | ref | | | |
| | Up to middle school | 0.045 | 1.02 | 5.78 | 0.045 |
| Retains food in mouth for a long time | No | ref | | | |
| | Yes | 2.50 | 1.10 | 5.71 | 0.029 |

Adjusted for sex, duration of breast-feeding, duration of bottle-feeding, sweet consumption at home, sweet drink at home, water drinking after breast of bottle-feeding, mouth rinsing after eating, thumb sucking, person who brush child's teeth, modified DI score.

### 3-5-year-olds

| Significant independent variable | | OR | 95% CI | | *P*-value |
|---|---|---|---|---|---|
| | | | Lower | upper | |
| Duration of breast-feeding | ≤12 months | ref | | | |
| | 13-18 months | 3.11 | 1.42 | 6.82 | 0.005 |
| | >18 months | 3.25 | 1.53 | 6.90 | 0.002 |
| | No breast-feeding | 1.02 | 0.31 | 3.38 | 0.981 |
| Sweet food consumption at home | <2 times daily | ref | | | |
| | ≥ 2 times daily | 2.22 | 1.21 | 4.10 | 0.010 |
| Thumb sucking | No | ref | | | |
| | Yes | 0.40 | 0.21 | 0.76 | 0.005 |
| Modified DI score | ≤ 1 | ref | | | |
| | > 1 | 8.85 | 4.38 | 17.86 | <0.001 |

Adjusted for sex, mother's educational level, duration of bottle-feeding, sweet drink at home, water drinking after breast of bottle-feeding, mouth rinsing after eating, person who brush child's teeth.

## Conclusion

- The study showed a high caries prevalence and experience of ECC.
- Caries status was associated with socioeconomic status and oral health related habits.
- Increasing people's knowledge of ECC, planning new programs, and implementing effective interventions are the important strategies to improve the oral health status of Vietnamese children.

## Part 2: Silver diamine fluoride (SDF) application

- Silver diamine fluoride (SDF) is considered as a **safe**, **inexpensive** and **effective** medicament that can arrest caries progression.
- SDF has been used in Japan for more than 40 years.
- Recently, may countries have started using it.
- SDF has not been used widely and no research has been conducted in Vietnam.

**Evaluate the effectiveness of SDF on arresting caries**

## Saforide

(Toyo Seiyaku Kasei Co. Ltd., Osaka, Japan)

38% aqueous solution of SDF, or 44,800ppm of fluoride

## SDF application procedure

- Teeth surfaces were cleaned and isolated from saliva by cotton.
- Used a small applicator and applied SDF directly to tooth surfaces, removed SDF excess and kept mouth open for 1 minute.
- After application, eating or drinking was not allowed for at least 30 minutes.
- Caries surfaces with SDF application will become black or brown.

- SDF was applied to surfaces with enamel or dentine caries.
- Each surface was recorded as:
  - Active caries (cavity with soft floor or walls)
  - Arrested caries (cavity with hard floor and walls)
  - Filled
  - Missing due to caries

## Subjects

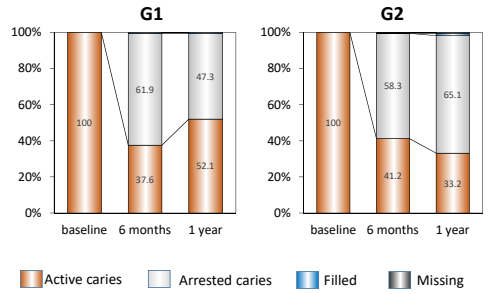
262 children aged 2-3 years who had caries.

Two groups: - G1: SDF application once a year
- G2: SDF application twice a year

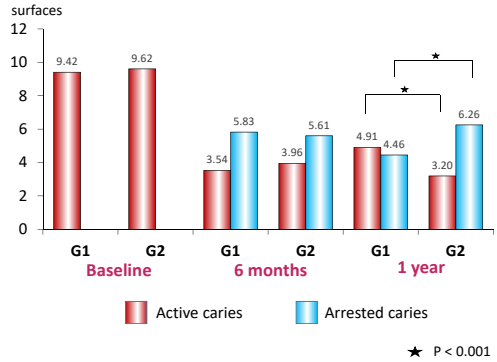
| | **G1** Number | **G2** Number |
|---|---|---|
| Baseline | 120 (SDF application) | 142 (SDF application) |
| 6 months | 109 | 136 (SDF application) |
| 1 year | **96** | **128** |

## Results

Proportion of SDF applied caries status at baseline, six month and one year follow-up




## Mean active caries, arrested caries surfaces from baseline to one year follow-up in two groups




## Photos before and after SDF application

Before After

## Conclusion

- The study demonstrated the arresting effect of SDF on caries progression in Vietnamese children.
- Biannual application of SDF was found to be more effective than annual application.

- SDF treatment procedure is simple without requiring expensive equipment.
  - ⇒ It is applicable even in communities where dental facilities or manpower is lacking.
- One of the disadvantages of SDF is that the active surfaces are stained black.
- However, SDF application would be an alternative preventive solution to improving Vietnamese children's oral health.

3. Dr. Akiko Oshiro (Clinical staff, TMDU)

OHP seminar 2016

# Fresh Breath Clinic

Tokyo Medical and Dental University
Dept. of Oral Health Promotion
Akiko Oshiro

## Oral malodor

- Bad breath, halitosis
- It is a condition in which someone's breath smells very bad when breathing and conversation.
- Sense of smell is a subjective sense and also affected by physical and a mental condition.
- There is the adaptation reaction of smelling.



## Problems of oral malodor

- Oral malodor obstacles to the communication in a social life.
- Because of oral malodor, one feels a large mental burden, exudes a negative attitude and cannot build the good relationship.



## Fresh Breath Clinic

**Fresh Breath Clinic** in Dental hospital, Tokyo Medical and Dental University is a special clinic for diagnosis, treatment and prevention of oral malodor (halitosis or bad breath) patients.



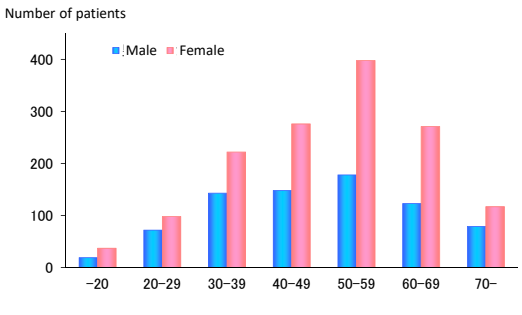
## Clinical services provided in the clinic

①Questionnaire and medical interview concerning patient's oral malodor condition
②Measurement of oral malodor and related parameters
③Diagnosis
④Treatment
⑤Maintenance/ other supporting therapy
⑥Preventative measures



## Age group of patients in Fresh Breath Clinic

**(male 762, female 1419 total 2181)**



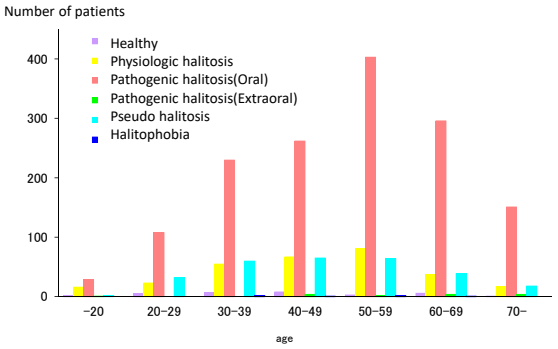
## Major causes of oral malodor

**About 90 % of oral malodor originate from oral problems**

- **Tongue Coating** (White debris on the tongue)
- **Periodontal Disease** (Bleeding & Pus from the gum)
- **Decrease of Saliva Flow** (Stress, drug induced xerostomia)
- **Tooth Decay** (Rotten food in decayed pit)
- **Lack of Oral Hygiene Care**
- **Systemic Diseases** (Nose and Throat・ Digestive System・ Diabetes Mellitus)



## Diagnosis in the clinic (n=2108)






## Measurement items in clinic

- Oral malodor
- Number of oral bacteria
- Saliva flow rate and pH
- Turbidity and coloration of mouth rinsed water
- Oral Examination



## Volatile Sulfur Compounds (VSCs)

**The main cause of oral malodor are 3 VSCs**

- **Hydrogen sulfide** $H_2S$
- **Methyl mercaptan** $CH_3SH$
- **Dimethyl sulfide** $(CH_3)_2S$

Volatile sulfur compounds (VSCs) is produced by bacteria and protein putrefaction of sulfur-containing amino acids.



## Oral Malodor Measurement

**①Gas Chromatography**

**②Gas Sensor**

- **Breathtron**
- **Halimeter**
- **Oral Chroma**

**③Organoleptic Test**



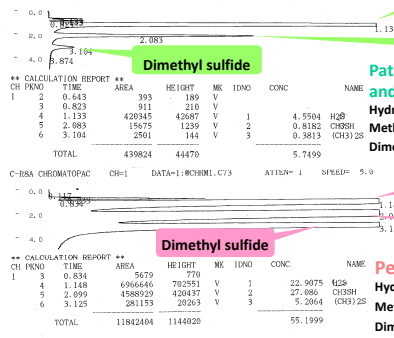
## Gas Chromatography (GC) Measurement

GC can specifically measure three types of VSCs which are the main causal substances of oral malodor

Detectable odor thresholds for three gases are as follow:

| | |
|---|---|
| Hydrogen sulfide | 1.5ng/10ml |
| Methyl mercaptan | 0.5ng/10ml |
| Dimethyl sulfide | 0.2ng/10ml |

## Gas Chromatography results




**Patient with healthy gingiva and tongue coating**

| | |
|---|---|
| Hydrogen sulfide | 4.6ng/10ml |
| Methyl mercaptan | 0.8ng/10ml |
| Dimethyl sulfide | 0.4ng/10ml |

**Periodontal Patient**

| | |
|---|---|
| Hydrogen sulfide | 22.9ng/10ml |
| Methyl mercaptan | 27.1ng/10ml |
| Dimethyl sulfide | 5.2ng/10ml |

**The ratio of methyl mercaptan to hydrogen sulfide is higher in patients with periodontal disease**



## Semiconductor Gas Sensor Measurement
## BREATHTRON

**Breathtron is capable of measuring the total concentration of VSC gases.**

**It automatically measures mouth odor in 45seconds.**

**Results might be affected by tooth paste, mouth rinse, and alcohol .**



## BREATHTRON results

| Category | Result（ppb） | Evaluation |
|---|---|---|
| NORMAL − | 0～250 | Normal odor |
| MILD ± | 251～600 | Slight malodor |
| MODERATE + | 601～1500 | Moderate malodor |
| SEVERE ++ | 1501～3000 | Strong malodor |



## Organoleptic test

**Smelling of patient's exhaled breath by trained and calibrated dentists.**

**Two types of organoleptic test:**

**(1) Examination of mouth air**

**(2) Examination of lung air**

**Result of examination is affected by the use of tooth paste, mouth wash, tobacco, food with strong smell, perfume, cosmetics, etc**



## Organoleptic test score

| Category | | Description（Strength and quality） |
|---|---|---|
| Absence of odor | 0 | Odor cannot be detected by the examiner |
| Questionable odor | 1 | Odor is detectable, although the examiner could not recognize it as malodor |
| Slight malodor | 2 | Odor is deemed to exceed the threshold of malodor recognition |
| Moderate malodor | 3 | Malodor is definitely detected |
| Strong malodor | 4 | Strong malodor is detected, but can be tolerated by the examiner |
| Severe malodor | 5 | Overwhelming malodor is detected and can not be tolerated by the examiner (examiner instinctively averts the nose) |

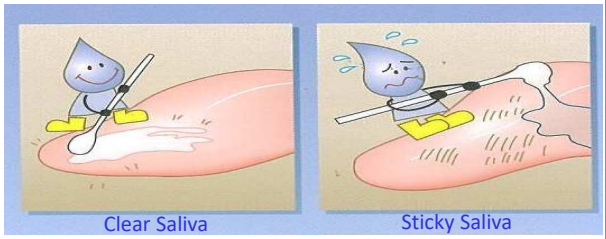


## Saliva Flow Rate Measurement

- **Resting Saliva**
  **Measures saliva flow rate for 5 minutes**
- **Stimulated Saliva**
  **Measures saliva flow rate for 5 minutes, with chewing Paraffin Gum**

| Normal Flow Rate of Saliva | |
|---|---|
| Resting | 0.1ml/min and over |
| Stimulated | 0.7ml/min and over |

## Clear Saliva and Sticky Saliva




- A person with high flow rate of saliva
- Tongue coating can easily be removed

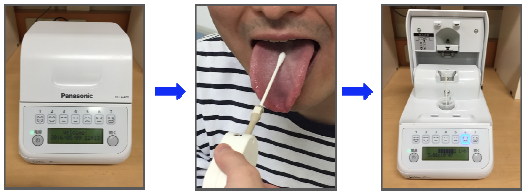
- Xerostomia
- Tongue coating is difficult to remove



## Number of oral bacteria measurement

### Bacteria counter

Bacteria counter is able to determine the bacterial number of clinical samples in few minutes.





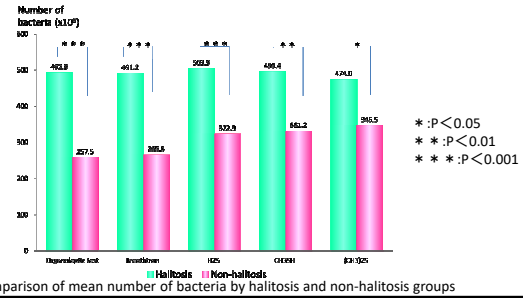

## Research topics about oral malodor

- Relationship of salivary viscosity with oral malodor
- Relationship between Social Anxiety Disorder and oral malodor
- Effects of a mouthwash with chlorine dioxide on oral malodor and salivary bacteria



## On going research

Relationship between oral malodor and oral bacteria in tongue coating




Comparison of mean number of bacteria by halitosis and non-halitosis groups

**“A woman who does tongue cleaning”**

**drawn by Kunisada Utagawa**

**She is cleaning her tongue with Tufting Toothpick**

**Stored in Dental Museum in Niigata school of Nippon Dental College**





## Thank you!

4. Dr. Masayuki Ueno (Assoc Professor, TMDU)



TMDU
TOKYO MEDICAL AND DENTAL UNIVERSITY

# Parity and Dentition Status

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OHP
Oral Health Promotion



## Parity

The number of children to which a woman gives birth.



## Background

Pregnancy and parturition have a tremendous effect on maternal health.
bleeding, puerperal endometritis, anemia
premature rupture of the membranes

Maternity is also closely related to oral health.
tooth loss, dental caries, periodontal disease

### Proverb

A mother loses one tooth every time she gives birth to a child.



## Previous Studies

### Denmark

The number of teeth in women was negatively correlated with the parity.

- ☞ Women in low SES (socio-economic status)
  ⇨ lost one additional tooth per child
- ☞ Women in high SES
  ⇨ lost one additional tooth per two children
- ☞ Identical female twins
  ⇨ twin with more children had fewer teeth



### USA

Parity was related to tooth loss among women. (NHANES Ⅲ)

Also, it was associated with the number of dental caries among women.

- ☞ Black and White Non-Hispanic women
  ⇨ Increased parity was related to a higher number of untreated decayed surfaces.

However,

Some studies have not found an association between parity and oral health conditions.



### Japan

No studies have been conducted to examine the association between parity and oral health.

Further,

This kind of research will become more difficult in the future due to the declining trend of birthrate, especially in developed countries.

⇨ Fertility rate in 2015 was **1.46** in Japan

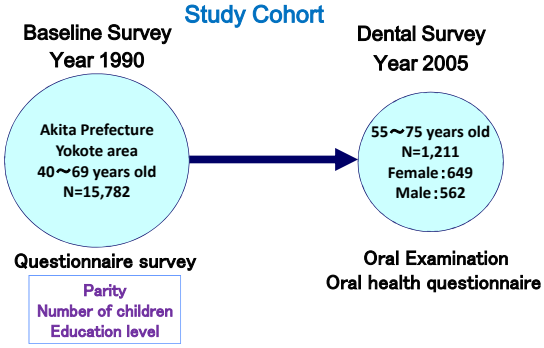
## Objective

To determine whether parity is related to dentition status, including the number of teeth, dental caries, filled teeth and posterior occlusion, in a Japanese population by comparing women with men.



## Methods

### Japan Public Health Center-Based (JPHC) Study Cohort






## Study Variables

### Self-administered questionnaire

Female: Parity - 0, 1, 2, 3, 4 or more
Male: Number of children - 0, 1, 2, 3, 4 or more
Education level
Frequency of sweet snacks and drinks
Presence of family dentist
Smoking status

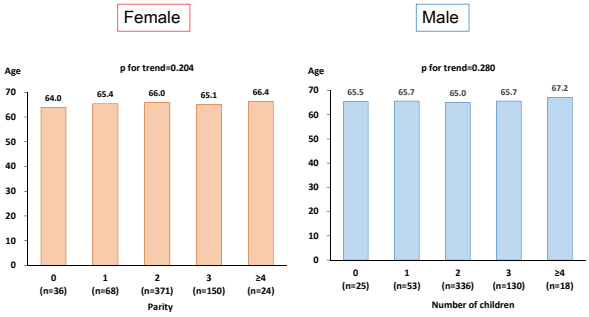
### Oral examination

Number of present, decayed and filled teeth
Functional Tooth Units (FTUs), oral hygiene



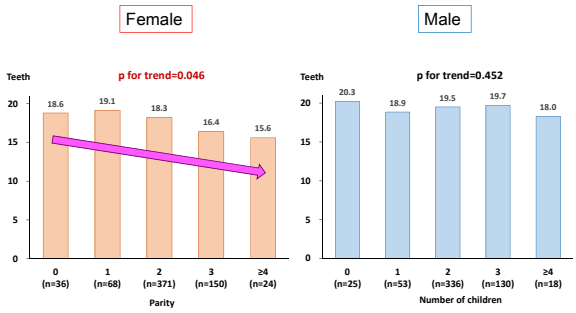
## Results

### Age





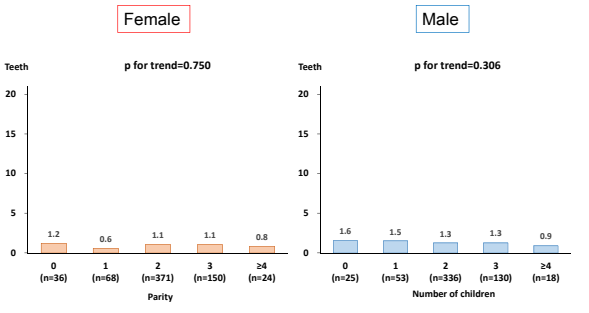

## Number of teeth present




Adjusted for age, education level, sweet drinks, sweet snacks, presence of family dentist, smoking status, oral hygiene status



## Number of decayed teeth

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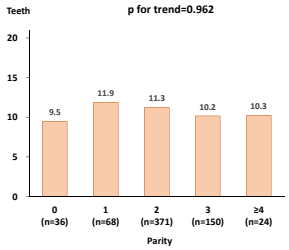
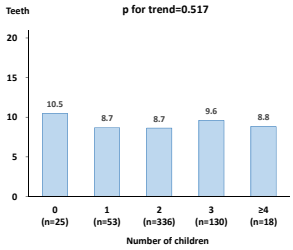
## Number of filled teeth

Female




Male

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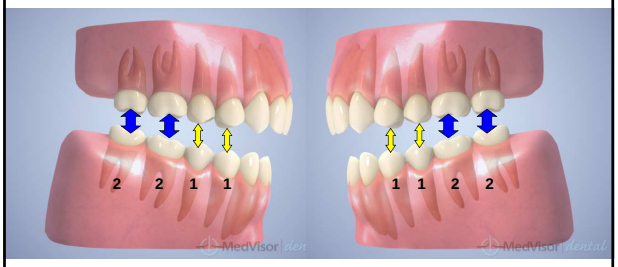
## FTUs (Functional Tooth Units)

Index of pairs of opposing posterior teeth
Score : 0-12 (excluding 3rd molars)

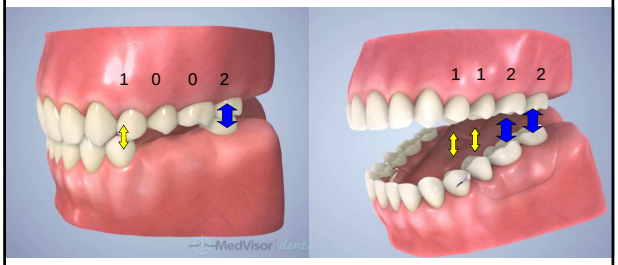



0 : No occlusion due to missing teeth or extensive carious teeth

1 : Occluding premolars ↕ 2 : Occluding molars ↕



## Calculation of FTUs




35 36 missing
FTUs: 1+0+0+2=3

35 36 37 removable denture
FTUs : 1+1+2+2=6



## 3 types of FTUs

**n-FTUs** : FTUs with natural teeth only
☞ sound teeth, carious teeth, filled teeth

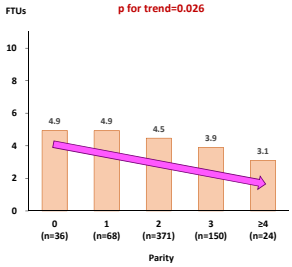
**nif-FTUs** : FTUs with natural teeth and artificial teeth on implant-supported and fixed prostheses (pontics)

**total-FTUs** : FTUs with all natural and artificial teeth, including removable prostheses

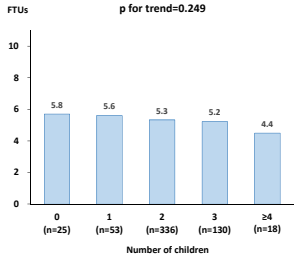


## n-FTUs

Female




Male

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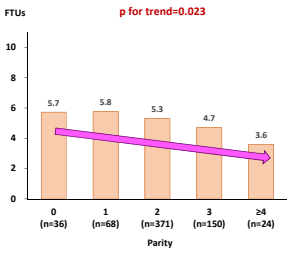
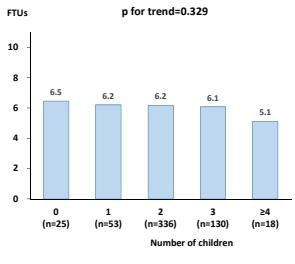
## nif-FTUs

Female

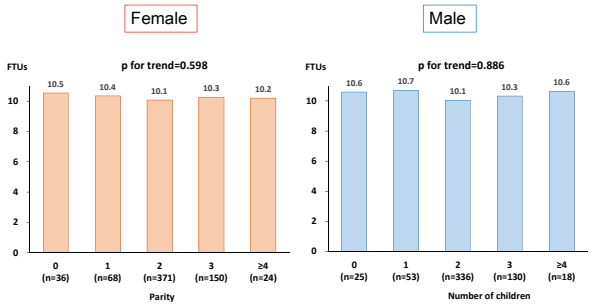



Male




Adjusted for age, education level, sweet drinks, sweet snacks, presence of family dentist, smoking status, oral hygiene status

## total-FTUs




Adjusted for age, education level, sweet drinks, sweet snacks, presence of family dentist, smoking status, oral hygiene status



## Discussion

- Parity in women is related to the dentition status, regardless of socio-demographic and health behavioral factors.
  No such relationships were observed in men.
- Higher-parity women are more likely to lose teeth than lower-parity women.
  Women with 4 or more children lose nearly 3 more teeth than women with no or one child, which also deteriorates posterior occluding relations.



## Biological mechanisms

- During the prenatal period, pregnancy hormones, such as progesterone and estrogen, fluctuate widely.
  - ⇨ increase the vascular permeability in the oral cavity
    - ⇨ change the quantity and quality of saliva
      - ⇨ decrease host immunity
        - ⇨ increase the susceptibility of pregnant women to oral infections



## Changes in bacterial proportions

- Subgingival periodontal pathogens in pregnant women increase and present a more pathogenic profile.
  - ⇨ *Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia/nigrescens, Tannerella forsythia, Parvimonas micra, Campylobacter rectus, Fusobacterium nucleatum*
    - ⇨ Place pregnant women at higher risk of exacerbation of periodontal disease



## Behavioral changes

- Pregnant women may not brush their teeth as usual due to morning sickness
  - ⇨ worsen oral hygiene condition
- Vomiting due to morning sickness
  - ⇨ elevate the risk of tooth erosion by acid
- Pregnancy changes women's taste
  - ⇨ elevate the risk of dental caries by increased consumption of sweet or sour foods



## Other plausible reasons

- Pregnant women with higher risk of dental disease are less likely to receive treatment.
  ex. dental treatments can harm the baby
- Pregnant women may mistakenly believe that dental problems are a usual and unavoidable experience during pregnancy.
  ex. baby takes calcium from the teeth of the mother
- Dentists, generally, are not willing to treat pregnant women and may postpone dental treatments until after childbirth.

## Conclusion

☞ It is necessary to narrow the discrepancy in parity-related oral health of women.

⇩

Deliver appropriate information and messages to pregnant women and also enlighten oral health professionals about dental management of pregnant women.

Oral Health Promotion

Thank you very much.

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