

## The surveillance of staffs' dental health at Queen Savang Vadhana Memorial Hospital

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- Problem/ background** : *The adult have certain risks for dental caries and periodontal diseases which need dental health surveillance to define the situation for effective dental health planning.*
- Research objective** : *To survey the status of staffs' dental health at Queen Savang Vadhana Memorial Hospital in 2007*
- Setting** : *Department of dentistry at Queen Savang Vadhana Memorial Hospital*
- Research design** : *Descriptive study*
- Patients/materials** : *The subjects were three hundred and fifty staff members, recruited from a simple random sampling from dental health investigation in July - August 2007.*
- Methods** : *The researcher conducted the instrument and the level of reliability was 0.90. The instrument contents consisted of WHO Oral Health Assessment Form (1996 simplified), the Graiger's severity index and the gingival status. The level of the inter-rater reliability of the two dentists who survey the staffs' dental health was 0.81.*

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- Results** : *Three hundred and fifty staff members which 80.29% were females and average age of 37.51 years old were surveyed. The percentages of staffs that had dental caries were 67.14. The average DMFT was 10.17 teeth per individual staff members. The most of dental caries restorations were one surface with average 1.25 teeth per staff member. The 87.41% of staff members were gingivitis which 49.43% of staffs were plaque index grade 1 and 57.71% of staffs were gingival index grade 1 also. 17.71% of staffs members were calculus surface index grade 1 and had the average of 3.67 sextants per staff member out of 12 sextants.*
- Conclusion** : *The results would be used for staff's dental prevention and planning in the dental health program.*
- Keyword** : *Dental caries, Graiger's severity index, Plaque index, Gingival index, Calculus surface index.*

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สมเด็จพระบรมราชเทวี ณ ศรีราชา. จุฬาลงกรณ์เวชสาร 2551 ก.ย. - ต.ค.; 52(5):  
357 - 67

**เหตุผลของการทำวิจัย** : โรคฟันผุและโรคปริทันต์เป็นปัญหาสำคัญของประชากรวัยผู้ใหญ่  
ซึ่งจำเป็นต้องมีการสำรวจสภาวะทันตสุขภาพ เพื่อแสดงสถานการณ์  
และปัญหาด้านทันตสุขภาพ สำหรับการวางแผนด้านทันตกรรม  
ป้องกันที่มีประสิทธิภาพ

**วัตถุประสงค์** : เพื่อสำรวจสภาวะทันตสุขภาพของบุคลากรโรงพยาบาลสมเด็จพระ  
บรมราชเทวี ณ ศรีราชา ปี พ.ศ. 2550

**รูปแบบการวิจัย** : การศึกษาเชิงพรรณนา

**สถานที่ทำการศึกษา** : ฝ่ายทันตกรรม โรงพยาบาลสมเด็จพระบรมราชเทวี ณ ศรีราชา

**วิธีการศึกษา** : เครื่องมือที่ใช้เป็นแบบสำรวจที่ผู้วิจัยสร้างขึ้น มีผลการทดสอบความ  
เที่ยงได้ค่าความเชื่อมั่นที่ระดับ 0.90 มีเนื้อหาการสำรวจประกอบด้วย  
แบบประเมินอนามัยช่องปากขององค์การอนามัยโลกปี ค.ศ. 1986  
ดัชนีระดับรุนแรงของโรคฟันผุ (Graiger's severity index) และสภาวะ  
โรคเหงือก ทันตแพทย์ผู้ทำการตรวจสภาวะทันตสุขภาพของบุคลากร  
2 คน มีการทดสอบความเที่ยงระหว่างบุคคล ผลการทดสอบความเที่ยง  
ได้ค่าความเชื่อมั่นที่ระดับ 0.81

**ผลการศึกษา** : บุคลากรที่สำรวจมีจำนวน 350 คน เป็นผู้หญิง คิดเป็นร้อยละ 80.29  
มีอายุเฉลี่ย 37.51 ปี บุคลากรมีโรคฟันผุ คิดเป็นร้อยละ 67.14 มีค่า  
เฉลี่ยฟันผุถอนออก เท่ากับ 10.17 ซี่/คน ฟันที่มีการอุดฟัน ส่วนใหญ่มี  
การอุด 1 ด้าน มีค่าเฉลี่ย 1.25 ซี่/คน บุคลากรมีเหงือกอักเสบ คิดเป็น  
ร้อยละ 87.41 ในจำนวนนี้ เป็นบุคลากรที่มีดัชนีแผ่นคราบจุลินทรีย์  
ระดับ 1 คิด เป็นร้อยละ 49.43 และเป็นบุคลากรที่มีดัชนี แสดงสภาวะ  
โรคเหงือก ระดับ 1 คิดเป็นร้อยละ 57.71 บุคลากรมีดัชนีแผ่นคราบหิน  
น้ำลายระดับ 1 คิดเป็นร้อยละ 17.71 โดยมีค่าเฉลี่ยส่วนของแผ่นคราบ  
หินน้ำลาย เท่ากับ 3.67 ส่วน/คน จากการแบ่งส่วนของช่องปากเป็น  
12 ส่วน

**สรุป** : ผลการศึกษาได้แสดงสถานการณ์ และปัญหาด้านทันตสุขภาพของ  
บุคลากร ทำให้การวางแผนด้านทันตกรรมป้องกันสำหรับบุคลากร  
ในโรงพยาบาลมีประสิทธิภาพมากขึ้น

**คำสำคัญ** : โรคฟันผุ, ระดับความรุนแรงของโรคฟันผุ, ดัชนีแผ่นคราบจุลินทรีย์,  
ดัชนีแสดงสภาวะโรคเหงือก, ดัชนีแผ่นคราบหินน้ำลาย

The dental health surveillance has defined the situation of dental caries and periodontal diseases for effective dental health planning. Thailand dental health surveillance has been done five times since 1977 to 2000 and the 6<sup>th</sup> dental health surveillance was done in 2007. The majority of dental problems in the adult were dental caries and periodontal diseases.<sup>(1)</sup> The 5<sup>th</sup> dental health surveillance in 2000 - 2001 found that 85.60% of adults with age 35 - 44 years old have dental caries and/or tooth loss, 59.70% of adults had dental caries without treatment.<sup>(2)</sup> Furthermore, an elderly often had many teeth loss and lower quality of life from periodontal disease which can be prevented.<sup>(3)</sup>

The surveillance of staffs' dental health at Queen Savang Vadhana Memorial Hospital aimed to assess dental health situation and identify dental problems for planning which promote dental healthy, prevention program and reduce dental cost of dental treatment.

### Objective

To survey the status of staff's dental health at Queen Savang Vadhana Memorial Hospital in 2007.

### Materials and Methods

The subjects were 350 staff members, recruited from a simple random sampling from dental health investigation in July - August 2007.

The researcher conducted instrument which consisted of WHO Oral Health Assessment Form (1996 simplified)<sup>(4)</sup>, the Graiger's Severity Index (GSI)<sup>(5)</sup> and the gingival status (Loë and Silness, 1963).<sup>(6)</sup> The dental caries surveillance was classified by the WHO Oral Health Assessment Form (1996 simplified)<sup>(4)</sup> and

the degree of caries surveillance was classified by Graiger's Severity Index<sup>(5)</sup> indicated 0 - 3 degrees. These are 0 degree was no lesion, 1 degree was pit and fissure caries, 2 degree was proximal caries and 3 degree was anterior dental caries and smooth of posterior. Gingival status<sup>(5-7)</sup> indicated 3 indexes consisted of plaque index (PI), gingival index (GI) and calculus surface index (CSI).

Plaque index indicated 4 scores. These are 0 score was no plaque in gingival area; 1 score was film of plaque that can only be recognized by explorer; 2 scores was soft debris at tooth surface near gingival area; and 3 scores was abundance of soft debris. Gingival index indicated 4 scores. These are; 0 score was normal gingival; 1 score was mild inflammation; 2 scores was moderate inflammation; and 3 scores was severe inflammation. Calculus surface index is indicated by two scores. These are; 0 score was no calculus; and 1 score was supragingival calculus. The Decayed Missing and Filled Teeth (DMFT) were identified as missing, filling, dental caries without treatment and recurrent dental caries.

The reliability of the instrument was tested by the researcher as one of the dentists used the instrument to survey thirty out patients whom had been investigated at the Department of dentistry of Queen Savang Vadhana Memorial Hospital in May 2007 and the level of reliability was 0.90.

The inter-rater reliability of the two dentists was also tested by William A. Scott's method. The two dentists who would survey the subjects had used the instrument to survey the dental health of the same thirty out patients whom had been investigated at the Department of dentistry of Queen Savang Vadhana

Memorial Hospital in June 2007. The level of inter-rater reliability was 0.81. The data were descriptively analyzed by SPSS version 12 statistics program.

**Results**

**Staffs demographic**

Three hundred and fifty staffs members were surveyed. Their ages range between 20 - 60 years old with the average of 37.51 years old. 80.29% of the female staffs members were of the average ages of 36.60 years old, whereas 19.71% of the male staffs members were of the average ages of 41.17 years old.

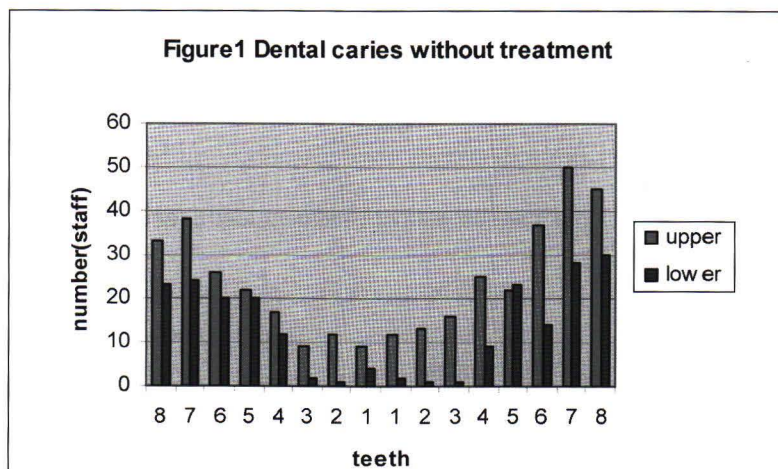
**Dental caries status**

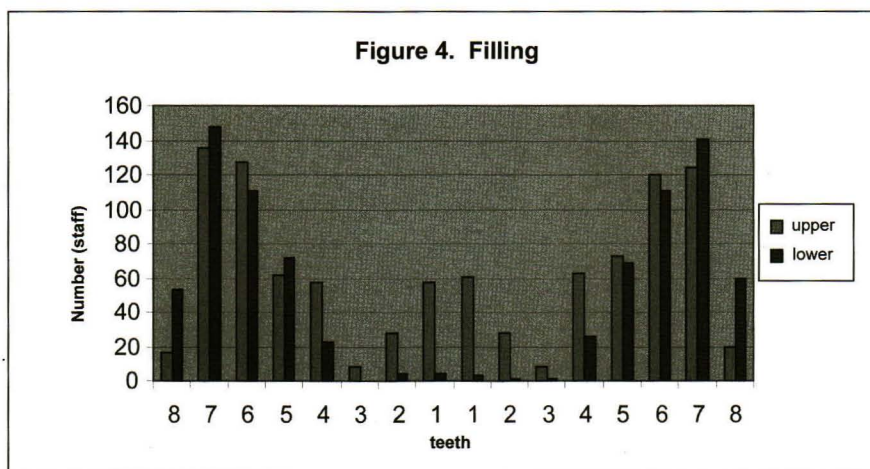
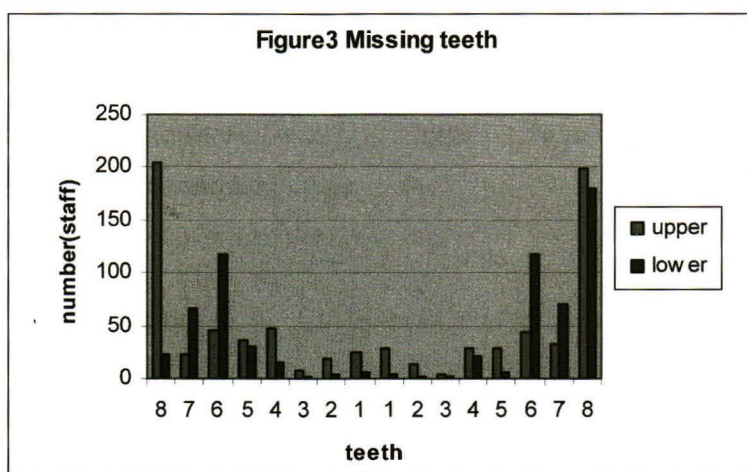
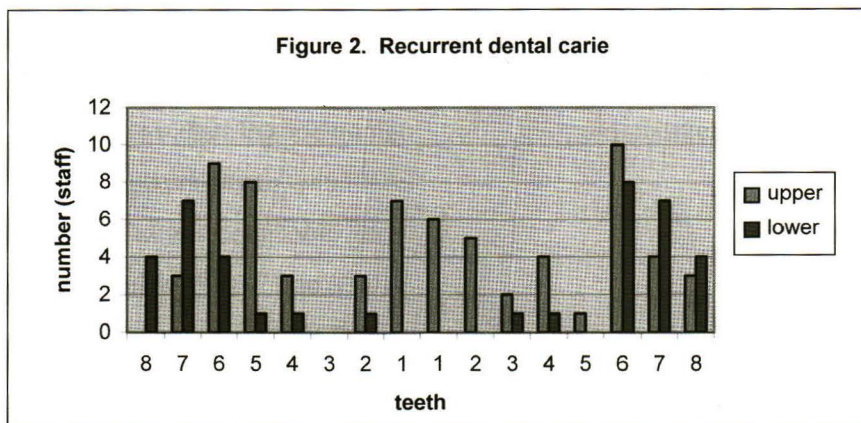
Three hundred and fifty staffs members had percentages of staffs with dental carious teeth without treatment, recurrent dental carious teeth, missing teeth, and filled teeth equal to 48.00%, 19.14%, 88.00% and 77.43% respectively. The average DMFT was 10.17 teeth per staff member.

Most of dental carious teeth without treatment were the upper 2<sup>nd</sup> and 3<sup>rd</sup> molars. Most of the filled teeth were the lower 2<sup>nd</sup> and upper 2<sup>nd</sup> molars. Consequently, most of the recurrent dental carious teeth were the upper 1<sup>st</sup> and lower 1<sup>st</sup> molars. And also most of the missing teeth were the upper and lower third molar. (Figure1 - 4)

**Table 1.** Number and percentage of the staffs, number of teeth and average DMFT identified by DMFT.

Dental caries status (DMFT)	Number of staffs (staffs)	Percentage of staffs	Number of teeth (teeth)	Average DMFT (teeth/staff)
Dental carious without treatment	168	48.00	532	1.52
Recurrent dental carious	67	19.14	99	0.28
Missing teeth	306	88.00	1,384	3.95
Filling	271	77.43	1,547	4.42
DMFT (teeth/staff)			3,562	10.17





**Figure 1-4.** Number of the staffs with dental carious without treatment teeth, recurrent dental carious teeth, missing teeth and filled teeth.

Scale of teeth

- 1 = central incisor
- 2 = lateral incisor
- 3 = canine
- 4 = first premolar
- 5 = second premolar
- 6 = first molar
- 7 = second molar
- 8 = third molar

### Graiger's Severity Index

The percentages of staffs members identified by Graiger's Severity Index consisted of 0, 1, 2 and 3 degree were found 43.14%, 24.00%, 22.86% and 10.00% respectively. (Table 2)

The teeth were need to be filled are 436 teeth for 1 surface, 154 teeth for 2 surfaces, 18 teeth for 3 surfaces and no teeth were need to be filled more than 3 surfaces. The teeth were need to be extract are 61 dental carious teeth, 12 from periodontitis teeth, 34 from impacted teeth without extraction and 3

available for dentures. (Table 3)

### Gingival status

9.14 % of the staffs had no plaque in gingival area. The percentages of staffs with plaque index score 1, 2, and 3 were 49.43%, 39.43% and 2.0% respectively. (Table 4) The lower teeth were found with plaque index score 2 and 3 in the lingual surface of the anterior and posterior. The upper teeth were found with plaque index score 2 and 3 in the buccal and palatal surface of the posterior. (Figure 5)

**Table 2.** Number and percentage of the staffs identified by Graiger's Severity Index.

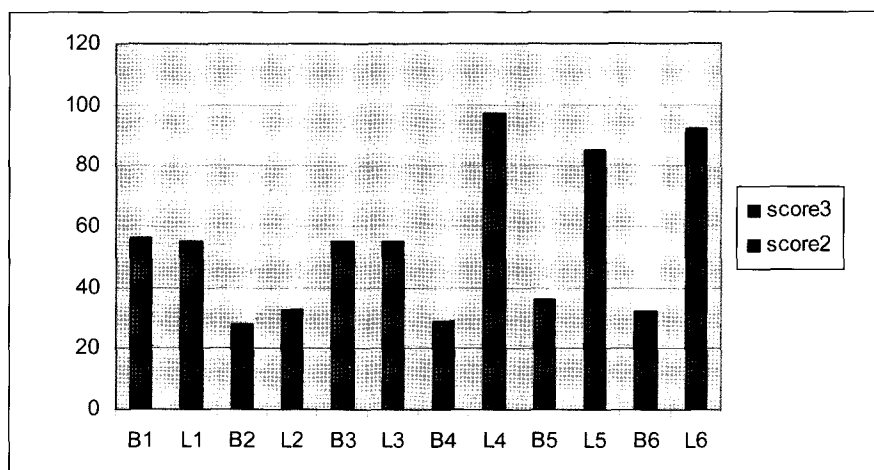
Graiger's Severity Index (GSI)	Number of staffs (staffs)	Percentage of staffs
0 No lesion	151	43.14
1 Pit and fissure caries	84	24.00
2 Proximal caries	80	22.86
3 Anterior dental caries and smooth surface of posterior	35	10.00
<b>Total</b>	<b>350</b>	<b>100.00</b>

**Table 3.** Number and average teeth of the staffs identified by treatment needs.

Treatment needs	Number of teeth (teeth)	Average Per staff
<b>Teeth were need to be filled</b>		
1 surface	436	1.25
2 surface	154	0.44
3 surface	18	0.05
> 3 surface or crown	0	0.00
<b>Teeth were need to be extracted</b>		
Dental carious teeth	61	0.17
Impact teeth	34	0.10
Periodontitis teeth	12	0.03
Availabled for dentures	3	0.01

**Table 4.** Number and percentage of the staffs identified by plaque index.

Plaque index (PI)	Number of staffs (staffs)	Percentage of staffs
0 No plaque in gingival area	32	9.14
1 Film of plaque that can only be recognized by explorer	173	49.43
2 Soft debries at tooth surface near gingival area	138	39.43
3 Abundance of soft debries	7	2.00

**Figure 5.** Plaque index score 2, 3 found on tooth surface.

B1 = Buccal of upper right posterior

L1 = Palatal of upper right posterior

B2 = Labial of upper anterior

L2 = Palatal of upper anterior

B3 = Buccal of upper left posterior

L3 = Palatal of upper left posterior

B4 = Buccal of lower left posterior

L4 = Lingual of lower left posterior

B5 = Buccal of lower anterior

L5 = Lingual of lower anterior

B6 = Buccal of lower right posterior

L6 = Lingual of lower right posterior

#### Gingival index (GI)

12.86% of the staffs had normal gingival. The percentages of the staffs with gingival inflammations score 1, 2 and 3 were 57.71%, 26.86% and 2.57% respectively. (Table 5)

The calculus surface index (CSI) was defined as 12 sextants of oral cavity; each jaw are 6 sextants. 82.29% of the staffs had no calculus. 17.71% of the staffs had supragingival calculus and the amounts of

1,285 sextants were found and the average was 3.67 sextants per staff member also. (Table 6)

Regarding to the gingival status with plaque index score 2 - 3 identified by jobs indicated the highest 68.00% of the mechanic staffs and the higher 51.61% of the servant staffs. These were congruent to the percentages of the mechanic staff and servant staff with gingival inflammations score 2 - 3 with 88.00% and 90.32% respectively. The percentages



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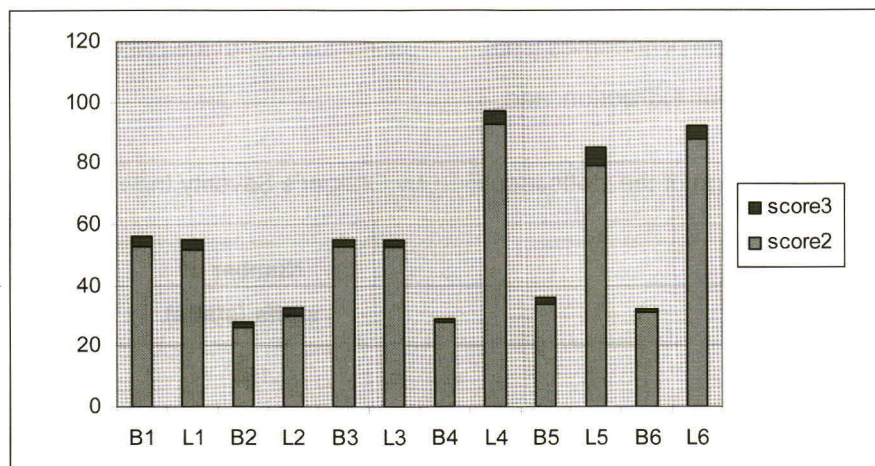
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of the staffs with plaque index score 2 - 3 in general employee, nurse assistant and registered nurse were found 42.68%, 40.91% and 35.79% respectively. The lower 20.45% of the medical staffs with plaque index

score 2 - 3 were found whereas the higher 61.36% of the medical staffs with gingival inflammations score 2-3. (Table 7)

**Table 5.** Number and percentages of staffs identified by gingival index.

Gingival index (GI)	Number of staffs (staff)	Percentage of staffs
0 Normal gingival	45	12.80
1 Mild inflammation	202	57.71
2 Moderate inflammation	94	26.86
3 Severe inflammation	9	2.57

**Table 6.** Number and percentage of the staff, number of sextants and average sextants per staff identified by calculus surface index.

Calculus surface index (CSI)	Number of staffs(staffs)	Percentage of staffs	Number of sextants (sextants)	Average of sextants (sextants/staff)
No calculus	288	82.29	2,915	8.33
Supragingival calculus	62	17.71	1,285	3.67

**Table 7.** Number and percentages of the staff identified by jobs and plaque index (PI) score 2-3 and gingival index (GI) score 2 – 3.

Jobs	Total (staffs)	Plaque index (PI) score 2-3		Gingival index (GI) score 2-3	
		Number (staffs)	Percentage of staffs	Number (staffs)	Percentage of staffs
		Registered nurse	95	34	35.79
General employee	82	35	42.68	17	20.73
Servant staffs	62	32	51.61	56	90.32
Nurse assistant	44	18	40.91	14	31.82
Medical staffs	44	9	20.45	27	61.36
Mechanic staffs	25	17	68.00	22	88.00

## Discussion

### Dental caries status of staffs at Queen Savang Vadhana Memorial Hospital

The results showed the high 77.43% of the staff with dental treatment or filling which were higher than 40.30% of the adult people age 35 - 44 years old with dental treatment or filling in Thai dental health surveillance 2000 - 2001.<sup>(2)</sup> The average DMFT per staffs members was 10.17 which also higher than the 5.48 average DMFT per people age 30 - 70 years old at Sakonnakon.<sup>(8)</sup> These indicated that the dental caries statuses of staffs at Queen Savang Vadhana Memorial Hospital are generally healthier than the people due to their accessible dental care services. However, the 88.00% of the staff with missing teeth was higher than 85.60% of the adult population age 35 - 44 years old with missing teeth in Thai dental health surveillance 2000 - 2001<sup>(2)</sup> because of the extraction need for 3<sup>rd</sup> molar impacted teeth.

### Gingival status of staffs at Queen Savang Vadhana Memorial Hospital

The results showed 90.86% of the staff with dental plaque accumulation and 87.41% of staff with gingivitis. The most had film of plaque that could only be recognized by explorer (PI=1) 49.43% and mild gingival inflammation (GI=1) 57.71%. The soft debries at tooth surface near gingival area (PI=2) and abundance of soft debries (PI=3) were 41.43%. The distribution of plaque index score 2-3 were found most at buccal and palatal surface of upper posterior teeth and lingual surface of all lower teeth. Corresponding to the study of 542 people age 3-40 years old at Ubonratchathani with the distribution of supragingival calculus were found most at buccal surface of upper

posterior teeth and lingual surface of all lower teeth.<sup>(9)</sup>

This study has found 17.71% of the staff with supragingival calculus which lower than the study of 152 the adult age 25 - 44 years old at Chantaburi with 89.29% of supragingival calculus.<sup>(10)</sup> Thus, the results indicated that the staff had better oral hygiene care than the general population. Further, the high percentages of mechanic and servant staffs with plaque index score 2 - 3 and gingival inflammations score 2 - 3 indicated that they should be gingival treatment urgently and strictly controlled of dental health status also. According to this data dental health care program should be planned ordering in each group.

Our findings showed that although the staffs had low supragingival calculus, they still had high dental plaque accumulation and gingival inflammation. It can be explained by the possibility that most staffs have visited their dentists regularly for dental care scaling but they could not take good care of their oral hygiene so that they accumulated new mass of dental plaque, especially adjacent to gingival tissue, and caused gingival inflammation. Our findings had also agreed with the general accept that dental plaque is a direct cause of gingivitis.<sup>(7)</sup> Educational programs are required to motivate staffs, especially high problem groups such as mechanic staffs and servant staffs, to utilize the dental health status.

Further, long-term studies may be necessary to identify other factors which could influence oral hygiene status, such as knowledge attitude or practice of dental health, and the effectiveness of the preventive programs to improve dental health of our staffs.

## Conclusion and suggestion

The surveillance of staffs' dental health at Queen Savang Vadhana Memorial Hospital has identified dental health situation. The results could be used in staff's dental health promotion such as dental health promotion, right brushing technique, after lunch brushing and special time periodontal treatment which effective dental health planning for staffs members. Although, the surveillance has defined the dental problems but it still need to be improved to update; for new clinical promoted program.

## References

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