

# Prevalence and Factors Associated with the Utilization of Dental Care Services among Factory Workers in Nava Nakorn Industrial Estate, Pathumthani Province, Thailand

Jeeratip Jaidee MS\*, Amornrat Ratanasiri PhD\*,  
Supaporn Chatrchaiwiwatana PhD\*\*, Surasak Soonthon PhD\*\*\*

\* Department of Community Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

\*\* Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand

\*\*\* Department of Pharmacology, Sirindhorn Public Health College, Suphanburi, Thailand

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**Objective:** The present study aimed to find out the utilization prevalence of dental care services among factory workers over a period of one year and factors associated with utilization of dental care services.

**Material and Method:** This was a cross-sectional analytic study. The study population was factory workers in Nava Nakorn Industrial Estate randomly sampled using Probability Proportion to Size Cluster Sampling Method. The tool was a questionnaire about utilization of dental care services.

**Results:** Among the sample group of 1,500 workers from 16 factories, almost 2/3 (63.9%) had never used any dental care services in the previous year while only 36.1% did. A multivariable logistic regression analysis showed that workplace, accommodation, tooth decay, toothache history, transportation, experience in using social security fund for dental care services, availability and accessibility of dental care services, brushing teeth regularly after meals, using dental care services regularly in a dental clinic, and agreement with the idea that a tooth extraction and medication by a dentist could reduce the risk of progression of disease, statistical significance ( $p$ -value  $< 0.05$ ), were factors associated with the utilization of dental care services at  $R^2$  (The Nagelkerke R Square) 0.38.

**Conclusion:** That the prevalence of the factory workers who did not use dental care services during the last one year was 63.9 percent. This study identified three groups of factors associated with the utilization of dental care services as: 1) Predisposing factors, 2) Enabling factors, and 3) Need factors.

**Keywords:** Utilization of dental care services, Factory workers, Factors associated, Prevalence of dental care service, industrial estate

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At present, dental care services system in Thailand have improved their efficiency in three main aspects: 1) improvement of inputs in health system, 2) provision of health services, and 3) increased effectiveness of dental care services. As a result, the ratio of dentists to population is now decreased.

The latest national oral health survey during 2006-2007 (the 6<sup>th</sup> survey) showed that work force population (age between 35-44 years old) had problems of tooth decay and tooth loss at 82.84%, average tooth

loss at 3.92 teeth per person, and average number of functioning teeth was only at 19.57 teeth per person<sup>(1)</sup>. According to a survey in 2009, the ratio of dentists to population was approximately 1:8,000; however, oral health problems have not decreased accordingly.

Findings from the national oral health survey in 2006-2007 clearly showed that work force population in Thailand was facing with a tooth loss problem resulting in fewer functioning teeth in the future. This problem corresponded to results from a survey of factors associated with tooth loss from tooth decay in factory workers in 2011<sup>(2)</sup>. It was found that the sample group had tooth decay 68.9%. The prevalence of tooth loss caused by tooth decay was 62.2%. The most important issue was that 74.2% of this sample

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**Correspondence to:**

Ratanasiri A, Department of Community Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.  
Phone: +66-85-0011531  
E-mail: [amorat@kku.ac.th](mailto:amorat@kku.ac.th)

group had never used any dental care services in the previous year. These findings show that factory workers' utilization of dental care services was limited, particularly a dental health check to treat and prevent tooth decay. The decision to visit or not to visit a dentist for an annual dental check involves various factors. This research studied both enabling and hindering factors, which influenced workers' decision to seek dental care services. These factors varied by person, time, and place. The prevalence of the utilization of dental care services over one year period is different in various countries<sup>(2-8)</sup>. Thailand had the lowest prevalence rate of the utilization of dental care services in one year. It indicated that there were more hindering factors for Thai population to use dental care services than in other countries.

A literature review on factors associated with the utilization of dental care services in both quantitative and qualitative studies in the past 5-10 years revealed enabling and hindering factors, which can be categorized into two groups as follows:

1) Economic factors. Income was an important factor and was most frequently identified. It indicated the ability to pay for dental care fees and, at the same time, a barrier in acquiring dental care services if there was a limitation in household expenses<sup>(9)</sup>. Household economy was a factor that proved to be a predicting variable—a key variable that relates to utilization of dental care services by controlling other variables and relates to dental care fees factor in both government and private dental clinics. Many studies found that income was an important factor for clients to consider before visiting a dental clinic, especially for populations with limited income<sup>(10-12)</sup>. However, a study in Thailand found a contradiction that there was no relation between income and utilization of dental care services<sup>(2)</sup>. Another important economic factor was oral health insurance or social security coverage, which helped increase the ability to acquire dental care services. When oral health insurance or social security coverage was limited, utilization of dental care services would be affected. For instance, some factory workers were covered by the social security fund, which entitled them for up to 600 baht per year for dental care services. This amount of money can only cover either teeth scaling or fillings or tooth extraction, which is not sufficient for dental care services to control and cure tooth decay in their current dental problem<sup>(9)</sup>. However, social security or oral health insurance is another option in utilizing dental care services for persons who consider dental care fees are too high to pay.

2) Non-economic factors. These factors were social factors and social characteristics such as age, gender, marital status, living location and level of education. These factors influenced the utilization of dental care services<sup>(10)</sup>. Age factor, for example, it was found that the older tended to use dental care services more in order to look after and maintain their teeth. Urban people were more likely to take care of their oral health and go to visit dental clinic more often than rural people<sup>(11)</sup>. In addition, oral health perception and awareness was another important factor. Workers who were aware of their oral health tended to go to a dental clinic and do so more often when they had a dental or oral health problem. Finally, the insufficient number of dental care services in a vicinity also effected the utilization. If dental care services are available and convenient, people tend to go to a dentist more often.

This study aimed to find out the utilization prevalence of dental care services in the previous one-year period and to identify factors associated with utilization of dental care services among factory workers in order to establish a model of utilizing dental care services to prevent tooth loss from tooth decay among factory workers.

#### **Material and Method**

This research employed a cross-sectional analytic study. The sample was 1,500 factory workers randomly recruited by inclusion (target populations) from 214,700 workers and exclusion (study populations) criteria from 122,429 workers in 108 factories.

Inclusion criteria: workers who volunteered to participate in this study must;

1) Be a factory worker in Nava Nakorn Industrial Estate, Pathumthani Province, Thailand in 2014.

2) Be a factory worker who had passed the probation period and hired as a permanent employee.

3) Be a factory worker who has worked in Nava Nakorn Industrial Estate for at least one year.

Exclusion criteria were those workers who were not Thai nationals by birth, cannot speak Thai, live outside the study area and did not want to participate in this study.

4) Be a worker who do not live in Nava Nakhon Industrial Estate.

#### **Sample size and sampling technique**

Sample size was calculated by using Program Epi-Info. The total sample was 1,500.

1) Reliability 95% ( $\alpha$  equal 0.05).

2) Actual prevalence rate of utilizing dental care services in the past year was taken from a literature review at 36% ( $p = 0.36$ ).

3) Acceptable difference is a relative error value. 10% approximative error from the actual prevalence rate taken from a literature review ( $d = 0.036$ )<sup>(9)</sup> is acceptable.

4) This study defined the sample size by using a cluster-sampling method resulting in 16 clusters.

5) Study population, optional size equals to 122,429 subjects.

The Probability Sampling Method was employed with Probability Proportion to Size Cluster Sampling Method: PPS Cluster Sampling Method resulting in 16 clusters with the total of 1,500 samples.

The tool used for gathering information in this research was through questionnaires about the utilization of dental care services. The questionnaires were developed from reviewing relevant documents and research. Factors associated with utilization of dental care services were divided into three groups, i.e.: 1) Predisposing Characteristics factors or motivation for workers to seek dental care services, 2) Enabling Resources Factors or resources available and facilitating the utilization of dental care services by factory workers, and 3) Having need factors or personal requirements for a decision to use dental care services.

After developing the research tool covering factors derived from literature review, a panel of experts was consulted for content validity. Then, the drafted questionnaires were pretested and revised.

Information gathering process

1) Explain work process and ask for cooperation from the sample group.

2) Have volunteers register and sign the consent form before filling out the questionnaires.

3) Have volunteers complete the questionnaires with the researcher to clarify any questions.

4) Check for completion of questionnaires.

5) Collect questionnaires and key into a database using SPSS program for Windows.

6) Key in data using a double data entry method by different persons and check the data before conducting data analysis.

#### **Data analysis**

SPSS program for Windows version 22 was used for analyzing data as follows:

1) Descriptive statistics was used in case of frequency distribution to describe the results in percentage and mean.

2) Bivariate statistical analysis, Chi-square test and t-test were used to compare the differences between two groups when each group has a normal frequency distribution.

3) Binary logistic regression analysis was used for analyzing multivariate data.

This research study was approved by the Ethics Committee of Khon Kaen University on Research in Human Subjects as of document number HE571074.

## **Results**

### ***Socio-demographic characteristics***

The response rate 97% from 1,500 factory workers, aged between 19-59 years old with an average age at 31 years 9 months. Most of the samples (85.5%) had lower than bachelor degree education, and almost two-thirds (63.9%) did not have any dental care services in the past year.

#### ***1) Workplace***

It was found that workers who had used dental care services in the previous year were from DDK (Thailand) Co. Ltd. the most followed by workers in Tostem (Thailand) Co. Ltd. and Daisin Co. Ltd., respectively. Workers who did not have dental care services in the past year were mostly from Oishi Trading Co. Ltd. followed by Super Product Co. Ltd., and DHL Supply Chain (Thailand) Co. Ltd.

#### ***2) Gender***

Female workers were found to have acquired dental care services as high as 66%, which was much higher than the 33.9% of male workers. Similarly, more than half of workers who did not acquire dental care services in the past year were female while 45.6% was male workers.

#### ***3) Age***

It was found that both groups were between 19-34 years old the most, followed by 35-44 years old and over 45 years old, respectively. The youngest was 19 years old while the oldest was 59 years old with an average age of sample group at 31 years 9 months (standard deviation = 7.57).

#### ***4) Education***

Four-fifths (more than 80%) of workers in both groups had lower than bachelor degree education, 13% had a bachelor degree with only 1% having higher than a bachelor degree.

### 5) Average monthly income

Workers who had acquired dental care services in the previous year has the highest average monthly income 12,001-15,000 baht, followed by 9,000-12,000 baht and 15,001-25,000 baht, respectively, which is higher than the average income of workers who had never acquired dental care services in the previous year. The average monthly income of the latter group is 9,000-12,000 baht; 12,001-15,000 baht and 15,001-25,000 baht, respectively (average income of the sample group is 15,524.87 baht).

### Multiple correlation and annual utilization of dental care services of the sample group of factory workers

From a multivariable correlation analysis generated by Binary logistic regression analysis, it was found that factors which has significant statistic after confounding factors were controlled, were workplace (AOR = 3.49, 95% CI = 1.13-5.3,  $p$ -value = 0.036), accommodation (AOR = 2.06, 95% CI = 1.30-3.35,  $p$ -value = 0.026), teeth cavities (AOR = 2.49, 95% CI = 1.78-3.35,  $p$ -value = 0.001), toothache history (AOR = 3.80, 95% CI = 2.70-5.35,  $p$ -value = 0.001), having transportation vehicle (AOR = 2.09, 95% CI = 1.29-3.39,  $p$ -value = 0.002), experience in using social security fund for dental care services (AOR = 2.13, 95% CI = 1.14-3.11,  $p$ -value = 0.001), availability and accessibility of dental care services in the Nava Nakorn Industrial Estate (AOR = 2.08, 95% CI = 1.14-3.77,  $p$ -value = 0.016), brushing teeth regularly after meal (AOR = 2.95, 95% CI = 1.83-4.22,  $p$ -value = 0.026), using dental care services regularly in a dental clinic (AOR = 2.63, 95% CI = 1.48-4.66,  $p$ -value = 0.001), and agreement with the idea that in case of severe tooth decay, toothache, and swollen and infection; a tooth extraction and medication by a dentist can reduce the risk of progression of decay (AOR = 1.74, 95% CI = 1.18-2.58,  $p$ -value = 0.005) at  $R^2$  (correlation value) 0.38 (Table 1).

### Discussion

This study showed that the utilization prevalence rate of dental care services among factory workers in Nava Nakorn Industrial Estate in the previous year compared to the study of Chartchaiwattana<sup>(9)</sup> was equal at 36.1%. Most of factory workers never acquired dental care services. The utilization prevalence rates of both public and private dental care services over the past one year of population were different in each country. For instance, in Japan, Sweden, the United States of America, Australia, Turkey, Greece, Indonesia, Spain and

Thailand the prevalence rates were 64, 60, 58, 57, 39.6, 32.6, 31.7, 26.7 and 26.4 percent, respectively<sup>(2-8)</sup>. Prevalence rates of utilization indicate that different factors in each country influence or associate with the decision to use dental care services in various ways. Therefore, we cannot clearly explain the prevalence of utilizing dental care services among factory workers in Nava Nakorn Industrial Estate by associated factors. The utilization of dental care services varies by person, place, and time. However, these factors can be categorized into two main groups, i.e. economic factors and non-economic factors.

### The economic factors

Economic condition or income is a variable that relates with the utilization of dental care services. This factor indicates the ability to pay for treatment fees and the barrier in acquiring services. This study showed with statistics significance that over the period of one year, factory workers who lived in an apartment acquired dental care services 2.06 times of workers who lived in a rented room on a monthly basis. Factory workers who owned private transportation used dental care services 2.09 times of those who did not. Factory workers who had experienced using dental health benefits had dental care services 2.13 times of workers who had no experience. Confounding factors were controlled in the calculation. These factors clearly showed that economic factors affected the utilization of dental care services by factory workers of dental care utilization among poor Canadian workers using Gelberg-Andersen Behavioral Model to predict factors associated with utilizing dental care services of poor workers in the 25-34 years age group in Canada<sup>(10)</sup>. The sample group with a good record in paying for dental treatment would utilize dental care services in previous year 1.62 times of those who were unable to pay their bills. Income, dental insurance coverage and financial were barriers to dental care among Canadian adults<sup>(11)</sup>. The present study clearly indicated that income factor influenced the utilization of dental care services of Canadian adults. The present study found that sample group with low income, around 19.3%, and those who did not have dental care benefits, 39.1%, acquired an annual dental care less than those who had dental care benefits with statistical significance. The low income and non-dental care benefit were the most significant factors in utilizing dental care services<sup>(12)</sup>. The multivariable analysis after controlling confounding factors showed that sample group of the poor acquired dental care services in one year 0.35 times less than

**Table 1.** Multiple logistic regression analysis of association variables and dental care during the last one year of industrial workers

Variables	Use of dental care during the last One year of industrial workers		COR (95% CI)	AOR (95% CI)	p-value
	No n (%)	Yes n (%)			
1. Industries/companies					
Aluspec Extrusion	62 (62.0)	38 (38.0)	3.60	3.49	0.036
Tos Tem Thai Limited	47 (39.2)	73 (60.8)	(1.15, 4.35)	(1.13, 5.35)	
2. Type of accomodation					
Rented room	650 (80.1)	162 (19.9)	2.34	2.06	0.026
Apartment	228 (30.4)	460 (69.9)	(1.68, 3.36)	(1.30, 3.35)	
3. Having tooth decay and toothache					
Yes	531 (67.0)	262 (33.0)	3.63	2.49	0.001
No	280 (39.6)	427 (61.4)	(2.23, 5.38)	(1.78, 3.35)	
4. Having toothache history					
No	250 (34.7)	462 (65.3)	4.42	3.80	0.001
Yes	185 (22.5)	639 (77.5)	(3.23, 6.28)	(2.70, 5.35)	
5. Having transportation vehicle					
No	69 (39.5)	110 (61.5)	3.35	2.09	0.002
Yes	848 (64.2)	473 (35.8)	(2.85, 6.57)	(1.29, 3.39)	
6. Having used dental care services benefit					
No	828 (86.4)	130 (13.6)	5.80	2.13	0.001
Yes	261 (48.2)	281(51.8)	(3.18, 7.57)	(1.14, 3.11)	
7. Having sufficient dental care services in Nava Nakorn estate					
Yes	310 (64.7)	169 (35.3)	4.14	2.08	0.016
No	348 (34.1)	673 (65.9)	(2.89, 6.69)	(1.14, 3.77)	
8. Brushing after meal regularly					
No	648 (71.3)	262 (28.7)	4.46	2.95	0.026
Yes	130 (22.1)	460 (77.9)	(2.98, 7.54)	(1.83, 4.22)	
9. Using dental care services regularly in a dental clinic					
No	548 (66.2)	280 (33.8)	3.52	2.63	0.001
Yes	115 (17.2)	557 (82.8)	(2.24, 5.28)	(1.48, 4.66)	
10. Agreement with the idea that in case of severe tooth decay, toothache, and swollen and infection; a tooth extraction and medication by a dentist can reduce the risk of progression of disease					
Disagree	126 (72.0)	49 (28.0)	2.24	1.74	0.005
Agree	560 (42.3)	765 (57.7)	(1.85, 4.52)	(1.18, 2.58)	

those from the richer group. In addition, those who did not have dental care benefits utilized dental care services 0.44 times less than those who had one with statistic significance. The utilization of dental care services by pregnant women in Canada revealed that 48% of sample pregnant women did not have a dental care service to check their oral health<sup>(13)</sup>. From the

analysis, factors that were significantly associated with not utilizing dental care services were due low household income, lack of dental care benefits, and low education<sup>(14)</sup>. The populations aged 20-40 years old. The study found that only 6.5% visited a dentist clinic. The main reasons for not visiting a dentist were poverty and high dental treatment fees. The study

identified barriers to utilize dental care services of older adults in USA as income factor and insufficient dental health care coverage, which affected 46.5% of the sample group who could not afford dental treatment. Other factors were education, gender, race, residential location, and distance to dental care services, etc., Pizarro<sup>(16)</sup>. The utilization of dental care services according to health insurance coverage in Spain, were supported by economic factors, in particular, social status and dental health care coverage. According to this study, the sample group who had health insurance used dental care services 2.2 times more than those who did not have dental health insurance coverage with statistical significance, pattern and factors associated with utilization of dental services among older adults in rural Victoria<sup>(18)</sup>. The present study found that 49.8% of samples did not use dental care services in the past year because of low income. This finding corresponds to the qualitative study<sup>(17)</sup> factors relating to tooth loss due to dental caries among industrial workers in industrial estates in Pathumthani and Phranakhon Sri Ayutthaya Provinces. From in-depth interviews with the sample group of factory workers, it was found that they had never used dental care services due to financial constraints in terms of both high dental treatment fees and insufficient dental health care coverage. Therefore, it can be seen that income factor has been most cited. Ability to pay their treatment bills is a primary barrier for utilizing services and in seeking healthcare services<sup>(18,19)</sup>.

The non-economic factors, the study found that the sample without tooth caries used dental care services 2.49 times of those with tooth caries, leading to an assumption that workers who use dental care services regularly will not have tooth decay<sup>(9)</sup>. There were factors relating to tooth loss due to dental caries among industrial workers in Industrial Estates in Pathumthani and Phranakhon Sri Ayutthaya Provinces. The study showed that the sample group of workers who used dental care services had lower prevalence rate of tooth decay. The study also showed that a sample group of factory workers who visited a dental clinic had tooth fillings 2.36 times of those who had never used dental care services with statistical significance. The dental caries prevalence and dental care utilization among the very old, explained in a similar way, that a sample group of the elderly, who regularly used dental care services every year, had low prevalence of tooth decay because they had prepared good oral hygiene for using a denture. The utilization of dental care services for checking and maintaining oral health

regularly could reduce the prevalence of tooth decay. A systematic review of 28 studies showed the effectiveness of regular dental check every six months in reducing the prevalence of tooth decay with statistical significance<sup>(20,21)</sup>.

The sample group of workers who had toothache history used dental care services 3.80 times of those who did not have a toothache history. This finding corresponded to the study of Supaporn Chartchaiwattana<sup>(9)</sup>. In-depth interviews with a sample group of industrial workers identified the reasons that most of the workers had never used dental care services as follows.

The monthly income of factory workers (average 12,000 baht per month) and monthly cost of living (average cost of accommodation, utilities, food and other living expenses at 8,000-9,000 baht per month) and insufficient health insurance benefits (social security fund for dental treatment such as scaling, filling, and extracting 600 baht per year), together with high cost of dental care services (teeth scaling 600-1,200 baht, tooth fillings 400-1,200 baht, and tooth extracting 400-800 baht each), prevented factory workers from availing themselves of dental care services. It clearly showed that factory workers must choose only one service for social security fund of 600 baht per year. From interviews with sample workers, it was found that workers chose tooth extracting most to cure toothache due to time and financial constraints. Factory workers who brushed their teeth after meals used dental care services 2.95 times of those who did not with statistical significance. This study showed that the sample group of workers who had a positive attitude towards oral health care would check their dental health regularly and have their annual dental check by a dentist. This finding concerns need factors or requirements that if people were aware of health problems and the need of utilizing health care services, they would seek health care services for their own well-being. There is a relationship concerning knowledge, attitude and good dental care behavior and which results in good oral health conditions<sup>(22)</sup>.

### **Conclusion**

The study of sample group of 1,500 industrial employees found that 63.9% of factory workers had never used dental care services in the previous year. According to a bivariate correlation analysis of factors influencing the utilization to dental care services of factory workers in the previous year, the study found 31 relevant factors. However, Binary Logistic

Regression Analysis found that there were 10 factors with statistical significance associated with factory workers' utilization of dental care services in the previous year as: workplace, type of accommodation, tooth decay, toothache history, owning transportation, experience in using social security fund for dental care services, availability and accessibility of dental care services, brushing teeth regularly after meals, using dental care services regularly in a dental clinic, and agreement with the idea that a tooth extraction and medication by a dentist can reduce the risk of progression of disease in case of severe tooth decay, toothache, and swelling and infection.

This model can explain the Nagelkerke R Square ( $R^2$ ) at 38. The factors found in this study reflected the main hindering factors to the utilization of dental care services among factory workers. These factors should be considered in designing an experimental study or an operation research to promote the annual utilization of dental care services of factory workers. According to Behavioral Model of Health Services Utilization, there are three factors to be considered as the followings:

1) Predisposing factors defined as social and cultural characteristics of workers e.g. demographic characteristics such as gender, age, type of work, as well as type of workplace.

2) Enabling factors or ability to have dental care services which include dental care welfare or social security benefits, time, convenient transportation, availability of dental service facilities, and income.

3) Need factors of workers such as the awareness of oral health and attention in oral healthcare, e.g. more regular tooth brushing and more dental examinations and overall dental care.

#### **What is already known on this topic?**

Factor workers utilize dental care services lower than expected. Casual factors regarding their accessibility to dental care services are controversial.

#### **What this study adds?**

This study demonstrated factors related to accessibility to dental care services. It could be benefit to dental health prevention and promotion.

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#### **Potential conflicts of interest**

None.

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ความชุกและปัจจัยที่มีความสัมพันธ์กับการเข้ารับบริการทันตกรรมของพนักงานโรงงานอุตสาหกรรม นิคมอุตสาหกรรม  
นวนคร จังหวัดปทุมธานีประเทศไทย

จีรทีปต์ ใจดี, อมรรัตน์ รัตนศิริ, สุภาภรณ์ ฉัตรชัยวัฒนา, สุรศักดิ์ สุนทร

วัตถุประสงค์: เพื่อศึกษาความชุกของการไปใช้บริการทันตกรรมของพนักงานโรงงานอุตสาหกรรมในรอบ 1 ปี ที่ผ่านมาและปัจจัยที่มีความสัมพันธ์กับการไปใช้บริการ

วัสดุและวิธีการ: การศึกษาภาคตัดขวางเชิงวิเคราะห์ในกลุ่มพนักงานโรงงานอุตสาหกรรมนิคมอุตสาหกรรมนวนคร จังหวัดปทุมธานีประเทศไทยประจำปี พ.ศ. 2557 โดยวิธีการสุ่มตัวอย่างแบบกลุ่มตามสัดส่วนของความน่าจะเป็น (Probability Proportion to Size Cluster Sampling Method) โดยใช้แบบสอบถามการเข้าถึงบริการทันตกรรมของพนักงานโรงงานอุตสาหกรรมในนิคมอุตสาหกรรมนวนคร

ผลการศึกษา: กลุ่มตัวอย่างจำนวน 1,500 ราย จากจำนวน 16 โรงงานอุตสาหกรรมเกือบ 2 ใน 3 (63.9%) ของพนักงานโรงงานที่ไม่เคยเข้ารับบริการทันตกรรมในรอบปีจากการวิเคราะห์ความสัมพันธ์โดยใช้สถิติวิเคราะห์ความถดถอยโลจิสติก พบว่าปัจจัยที่สัมพันธ์กับการไปใช้บริการทันตกรรมคือ ปัจจัยโรงงานอุตสาหกรรมลักษณะที่ตกเป็นพักห้องเช่า มีพื้นที่เป็นรู มีประวัติเคยปวดฟัน มีรอยนต์ส่วนตัว เคยใช้วัสดุการ มีสถานบริการในพื้นที่เพียงพอ แปร่งฟันหลังอาหารทุกครั้ง เคยได้รับการเป็นประจำและเห็นด้วยกับค่าค่าที่ว่าการฉีฟันฟูมาก ๆ ปวดบวม ๆ โดยทันตแพทย์สามารถป้องกันไม่ให้เกิดการลุกลามของเชื้อโรคได้อย่างมีนัยสำคัญทางสถิติ ( $p < 0.05$ ) ที่ขนาดความสัมพันธ์ของ  $R^2$  (Nagelkerke R Square) ในแบบจำลองนี้เท่ากับ 0.38 สรุป: ปัจจัยที่ควรพิจารณาคือ ปัจจัยในการไปใช้บริการทันตกรรม, ปัจจัยในด้านแหล่งทรัพยากรที่มีให้ และปัจจัยด้านความต้องการและความจำเป็นในการไปใช้บริการทันตกรรม