

Incidence Rate and Complications of Dental Caries Among the Intermediate Pupils in Selected Elementary Schools in the First District of Ilocos Sur

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ABSTRACT

This study was conceptualized to determine the incidence and complications of dental caries among the intermediate pupils in selected elementary schools in the First District of Ilocos Sur.

The study made use of a questionnaire-checklist adapted from the study of Eder (2001). Frequencies and percentages, mean, and simple correlation analysis were the statistical tools used in the treatment of the data gathered.

Findings reveal that majority of the respondents are female who had their first eruption of teeth at 6-8 months. Most of the respondents' parents are secondary graduates, semi-skilled with family size of eight, with monthly income between Php1001-5,000, and residing outside Poblacion.

Overall, the level of practices of the respondents on oral hygiene, oral habits, and food habits is "low" and San Idefonso Central School Sur has the highest incidence of dental caries.

Parent's educational attainment, parent's occupation, family monthly income, and family size were significantly related to the incidence of dental caries among the respondents.

Keywords: incidence rate, complications, dental caries, first district

INTRODUCTION

The teeth are important parts of the human body be it in health and nutrition or the aspect of aesthetic value. Many people endure much pain due to inability to take care of their teeth.

The teeth are the hardest substances in the human body. Besides being essential for chewing, the teeth play an important role in speech. The parts of the teeth include the enamel, dentin, pulp, cementum, and the periodontal ligament. A normal adult mouth has 32 teeth, which (except for wisdom teeth) have erupted by about age 13. The crown of each tooth projects into the mouth. The root of each tooth descends below the gum line, into the jaw. There are several conditions that affect the teeth. These include cavities, tooth decay, periodontitis, gingivitis, plaque, tartar, and others (<http://www.webmd.com/oral-health/picture-of-the-teeth>).

The oral health status of Filipino children is alarming. The 2006 National Oral Health Survey (NOHS, DOH, 2011) investigated the oral health status of Philippine public elementary school students. It revealed that 97.1 percent of six-year-old children suffer from tooth decay. More than four out of every five children of this subgroup manifested symptoms of dentinogenic infection. In addition, 78.4 percent of 12 year old children suffer from dental caries and 49.7 percent of the same age group manifested symptoms of dentinogenic infections. The severity of dental caries, expressed as the average number of decayed teeth indicated for filling/extraction or filled permanent teeth (DMFT) or temporary teeth (dmft), was 8.4 dmft for the six-year-old age group and 2.9 DMFT for the 12-year-old age group. Filipinos bear the burden of gum diseases early in their childhood. According to NOHS, 74 percent of 12 year old children suffer from gingivitis. If not treated early, these children become susceptible to irreversible periodontal disease as they enter adolescence and approach adulthood.

In general, tooth decay and gum diseases do not directly cause disability or death. However, these conditions can weaken bodily defenses and serve as portals of entry to other more serious and potentially dangerous systemic diseases and infections. Serious conditions include arthritis, heart disease, endocarditis, gastrointestinal diseases, and ocular-skin-renal diseases. Aside from physical deformity, these two oral diseases may also cause disturbance of speech significant enough to affect work performance, nutrition, social interactions, income, and self-esteem. Poor oral health poses detrimental effects on school performance. In fact, children who suffer from poor oral health are 12 times more likely to have restricted-activity days. In the Philippines, toothache is a common ailment among schoolchildren and is the primary cause of absenteeism from school. Indeed, dental and oral diseases create a silent epidemic, placing a heavy burden on Filipino schoolchildren (DOH, 2011).

According to Kozier (1992), oral diseases are important considerations in public health and preventive dentistry for several reasons like universal prevalence.

Rarely as he stated ever does anyone go unaffected by at least one of these diseases and most people are affected by several during their lifetime. Another, most oral disease does not undergo remission or termination if left untreated, as do many diseases, but accumulate a backlog of unmet need that can ultimately end in the loss of teeth.

Most recent studies show that dental problem is one of the main reasons of absenteeism which eventually lead to students dropping out from school (DepEd, 2011). According to Education Secretary Armin Luistro, the project is expected to minimize school absenteeism and better students' performance. Experience shows that when children are bothered by dental problems, they could hardly focus on the lesson and would not participate in activities, thus, affecting their learning ability.

For these reasons the researcher was prompted to conduct this study. The results of this study would serve as baseline data to conduct further research and help officials of the different schools including the LGUs to come up with a more effective program that may address the dental needs of the elementary pupils.

This study aimed to determine the incidence and complications of dental caries among the intermediate pupils in the selected elementary schools of the First District of Ilocos Sur.

Specifically, this study sought to describe the profile of the respondents in terms of age at first eruption of milk teeth, sex, parent's highest educational attainment, parent's occupation, family monthly income, family size, and place of residence; determine the extent of dental health practices of the respondents in terms of oral hygiene, oral habits, and food habits; further determine the incidence of dental caries among the intermediate pupils in selected elementary schools in the First District of Ilocos Sur; determine the complications of dental caries among the respondents; and determine the relationship between the incidence of dental caries and the profile of the respondents and dental health practices.

Teeth are made up of hard materials composed of calcium, phosphorus, and other mineral salts. The material in the majority of the tooth is called dentine. The hard, shiny layer that is brushed is called the enamel. Dental anatomy is a field of anatomy dedicated to the study of tooth structure. The development, appearance, and classification of teeth fall within the field of study, though dental occlusion or contact among teeth, does not. Dental anatomy is also a taxonomic science as it is concerned with the naming of teeth and their structures. This information serves a practical purpose for dentists, enabling them to easily identify teeth and structures

during treatment. The anatomic crown of a tooth is the third molar. Third molars are commonly called "wisdom teeth" and may never erupt into the mouth or form at all.

A number of problems affect the oral health of children, namely: tooth decay, thumb sucking, tongue thrusting, lip sucking, and early tooth loss. Even though baby teeth are eventually replaced with permanent teeth, keeping baby teeth healthy is important to a child's overall health and well-being. Early childhood caries, nursing caries, and nursing bottle syndrome occur when a baby's teeth are in frequent contact with fruit juices, milk formula, fruit juice diluted with water, sugar, or any other sweet drink. Human breast milk can cause tooth decay. If untreated, bacteria start feeding on the sugars causing tooth decay. Badly decayed tooth could lead to an abscessed tooth, with possibility of infection elsewhere (Aquafresh, 2012).

"A significant association was observed between the extent of tooth loss and heart disease prevalence." After adjustment for social and genetic factors such as gender, marital status, education, and race/ethnicity, the researchers reported that the respondents who had missing teeth were significantly more likely to have heart disease than those who did not have tooth loss. According to this study, the percentages of respondents likely to have heart disease associated with tooth loss are as follows: 1 to 5 missing teeth: 6.8 percent, 6 to 31 missing teeth: 10.2 percent, and complete tooth loss: 11.5 percent. Prevention and control of heart disease risk factors and good oral health maintenance should be included in health promotion counseling (American Journal of Preventative Medicine, 2005.)

In the Philippines, a family of five with total monthly income of less than P10,000 (US\$244) is considered **poor**, according to a new estimate of the National Statistics Coordination Board (NSCB). In 2006, the same family is considered poor if its household income is not more than P8,569 per month. The NSCB explained that the new income threshold covers only basic needs like food, clothing, shelter, and transportation and does not include spending for recreation. This, however, has already taken into account the recent surge of prices in oil, rice, and other commodities. Almost 27 percent of Filipino families were considered poor in 2006.

According to the study of Liana et al. (2009), dental caries is a major health problem affecting an estimated 90 percent of school children worldwide. This cross-sectional study aimed to evaluate oral health knowledge, attitude, and practices among secondary school students in Kuching, Sarawak. Data was collected using a pretested questionnaire on 209 randomly selected students from four schools. Results showed no significant differences between the gender and age groups in terms of knowledge level, but significant differences were observed between the

schools. The students had positive attitude towards the dental services, but their dental visits were still low due to fear of dental needle and handpieces. Toothbrush and toothpaste were still the most commonly used oral hygiene aids. As compared to parents and friends, dentist was perceived to have more influence on oral hygiene practices among the students. Girls consumed more sweets, snacks, and soft drinks than boys.

According to Gamboa (1984), with an annual population growth of 2.71 percent per year, the government is harnessing all available resources so that every Filipino can enjoy a decent way of life. Since the majority of the population is in the rural areas, priority health services are directed towards this particular segment. Because of meager income among the rural population all health services are given free, except for major operations, medicines, and dental procedures such as the construction of partial and full dentures, porcelain restorations, root canal therapy, and major oral surgery. Older people in the rural areas still adhere to their beliefs and traditions to alleviate the pain of toothache, particularly in the areas which cannot be reached by dentists. Because their fees are minimal, the services of quack doctors/dentists and faith healers are still sought. In the Philippines, although dental health services have been given a low priority by the government, preventive dental health programs are being implemented throughout the country. These include mouth rinsing with sodium fluoride solutions, supervised tooth brushing with fluoride toothpaste, and the use of fluoride-containing varnish and fluoride tablets. Water fluoridation exists in two pilot areas and there is an intensive dental health education campaign. Indigenous health workers augment the inadequate dental manpower in attempting to attain and maintain the global indicator for oral health.

METHODOLOGY

The study used the descriptive-correlational method of research. The population of the study comprised all the Grades IV and V pupils of the selected elementary schools of the First District of Ilocos Sur.

A questionnaire-checklist was adapted from the study of Eder (2001). Part I of the questionnaire consisted of the Personal Information Sheet to gather the socio-demographic characteristics of the respondents. Part II provided the dental health practices with oral hygiene practices, oral habits, and food habits. Part III includes the checklists of the complications of dental caries namely tooth loss, dental abscess, gingivitis, rotting teeth, and others (submandibular swelling, etc.). Record review from the Department of Education (DepEd) Division of Ilocos Sur was also used.

The researcher secured approval and endorsements from the Department of Education (DepEd), Division of Ilocos Sur and gathered the needed data from the schools included in the study.

Statistical tools used were frequency and percentage to describe the profile of the respondents, mean to describe the extent of dental practices of the respondents, and simple correlation analysis to find out the relationship between the incidence and complications of dental caries and the profile and dental practices of the respondents.

RESULTS AND DISCUSSION

Profile of the Respondents

Most (156 or 54.73%) of the respondents had the first eruption of their teeth at age 6-12 months. Only three (1.05%) had the first eruption of their teeth at age 16-23 months. Majority (177 or 62.11%) of the respondents are female. There are only 108 (37.89%) male respondents. Majority (269 or 94.40%) of the respondents had their first eruption of their milk teeth at 6-8 months; only 16 (5.60%) at nine months and above. A greater percentage (113 Or 39.65%) of the parents of the respondents are high school undergraduates. Eighty two (28.77%) are elementary graduates, 20 (7.1%) are college undergraduates, and only five (1.75%) are college graduates.

Almost half (127 or 44.56%) of the parents of the respondents are semi-skilled; 114 (40.0%) are skilled, and only four (1.4%) have no jobs. Many (130 or 45.61%) of the respondents have a family monthly income of Php1001-5,000; 63 (22.11%) have Php5001-10,000, while only five (1.75%) have above Php15,000. A great number (133 or 46.67%) of the respondents belong to the family size of 8 and above and 63 (22.10%) belong to the family size of five and below. Majority (199 or 69.82%) of the respondents reside outside the poblacion while 86 (30.18%) reside within the poblacion.

Extent of Dental Health Practices of the Respondents

On Oral Hygiene Practices. Overall, it can be seen in Table 1 that the respondents' level of practice on oral hygiene was as "Low" as shown by the mean rating of 2.40. Among the schools involved in this study, the table shows that the respondents in San Ildefonso Central School "Never" use mouthwash and dental floss nor change their toothbrush every six months (mean =1.60; 1.03 and 1.80, respectively). The findings could be due to the fact that most of the respondents are "poor" as evidenced by their monthly family income of Php1001-5,000 with family members of above eight.

On Oral Habits. It could be gleaned in Table 1 that the level of practice in terms of oral habits was also "Low" as evidenced by the overall mean of 2.06.

On **Food Habits**. Table 1 also shows that the level of practice in terms of food habits was "Fair" as attested by the overall mean of 2.84. Among the items, it could be noted that the respondents obtained "High" (mean=3.45 and 4.10, respectively) level of practice on eating citrus fruits and vegetables daily.

As a whole, the level of practice of the respondents is "Low" as shown by the grand mean of 2.43.

Table 1. Item mean response on the extent of dental health practices of the respondents.

Practices	San Ildefonso		Sto. Domingo		Magsingal South		As a Whole	
	Mean	DR	Mean	DR	Mean	DR	Mean	DR
Daily unless the item requires in another frequency								
A. Oral Hygiene Practices								
1. Routine brushing of teeth after eating meals.	3.23	VO	3.36	VO	3.40	O	3.33	VO
2. Use toothpaste (every brushing time)	4.23	A	4.67	A	4.78	A	4.56	A
3. Use toothpick after eating meals or snacks.	1.82	S	2.50	S	1.98	S	2.10	S
4. Use dental floss after eating meals or snacks	1.03	N	1.92	S	1.80	N	1.58	N
5. Use mouthwash (Bactidol) Listerine, etc.)	1.60	N	1.80	N	1.82	S	1.74	N
6. Dental check-up every six (6) months.	1.90	S	2.67	O	2.46	S	2.34	S
7. Use toothbrush with fine and soft bristles.	2.63	O	2.61	O	2.64	O	2.63	O
8. Use toothbrush that can reach morals.	2.10	S	2.15	S	2.82	O	2.36	S
9. Change toothbrush every three (3) months.	1.80	N	1.60	N	1.87	S	1.76	N
10. Wash the mouth after meals or snacks.	1.96	S	1.26	N	1.67	N	1.63	N
Overall	2.23	I	2.46	L	2.52	L	2.4	L
B. Oral Habits								
1. Mouth Breathing.	1.90	S	1.87	S	1.90	S	1.89	S
2. Thumb/finger sucking.	1.98	S	1.65	N	1.76	N	1.80	N
3. Nail biting	1.61	N	1.81	S	1.74	N	1.72	N
4. Lip sucking	2.62	O	2.32	S	2.65	O	2.53	S
5. Pencil or any object, biting.	2.73	O	2.43	S	2.63	O	2.60	S
6. Grinding of teeth (bruxism)	1.80	N	1.70	N	1.90	S	1.8	N
Overall	2.11	L	1.96	L	2.10	L	2.06	I
C. Food Habits								
1. Eat candies, chocolates, etc. between meals.	3.50	VO	3.20	O	3.40	O	3.37	O
2. Eat junk foods between meals.	2.73	O	2.60	S	2.89	O	2.74	O
3. Drink carbonated soft drinks.	2.89	O	2.71	O	2.61	O	2.74	O
4. Eat citrus fruits daily.	3.45	VO	3.41	VO	3.23	O	3.36	O
5. Drink milk everyday.	1.89	S	2.60	S	2.57	S	2.35	S
6. Eat vegetables daily.	4.10	VO	4.18	VO	4.21	A	4.26	A
7. Eat sandwich every meals.	1.87	S	1.80	N	1.98	S	1.88	S
8. Eat biscuits, cookies, and the like.	3.35	O	3.20	O	3.18	O	3.24	O
Overall	2.97	F	2.96	F	2.58	L	2.84	F
As a Whole	2.44	L	2.46	L	2.40	L	2.43	L

Legend:

Item	Overall
4.21-5.00 Always (A)	Very High (VH)
3.41-4.20 Very Often (VO)	High (H)
2.61-3.40 Often (O)	Fair (F)
1.81-2.60 Seldom (S)	Low (L)
1.01-1.80 Never (N)	Very Low (VL)

Incidence of Dental Caries Among the Intermediate Pupils

It can be seen in Table 2 that among the areas under study, San Ildefonso Central School, San Ildefonso, Ilocos Sur has the highest incidence rate (844.44) followed by Sto. Domingo South Central School, Sto. Domingo, Ilocos Sur with an incidence rate of 510.64. Magsingal South Central School, Magsingal, Ilocos Sur has the lowest incidence rate of 290.16.

Table 2. Incidence rate of dental caries among the intermediate pupils in selected elementary schools in the first district of Ilocos Sur.

Area	Population at Risk	Cases	Incidence Rate (Per 1,000 Pop)
San Ildefonso Central School San Ildefonso, Ilocos Sur	45	38	844.44
Sto. Domingo South Central School Sto. Domingo, Ilocos Sur	47	34	510.64
Magsingal South Central School Magsingal, Ilocos Sur	193	56	290.16
Total	285	128	

Table 3 shows that dental abscess had the highest number of cases (116) in terms of complications of dental caries among the respondents. Tooth loss has 41 cases; gingivitis has six; and only one case was noted in rotting teeth.

Table 3. Complications of dental caries among the intermediate pupils in the selected elementary schools in the first district of Ilocos Sur.

Complication	Number of Cases
Tooth loss	41
Dental abscess	116
Gingivitis	6
Rotting teeth	1
Others (submandibular swelling, etc)	0

Relationship Between the Incidence of Dental Caries and the Profile of the Respondents

Table 4 reveals that there is no significant relationship between the incidence of dental caries and sex, age at first eruption of milk teeth, and place of residence as evinced by the computed r-values of 0.0386, 0.0416, and 0.0216, respectively. Significant relationship was noted between the incidence of dental caries and the parent's highest educational attainment, parent's occupation, family monthly income, and family size as attested by the computed r-values of 0.1823, 0.1921, 0.1936 and 0.1756, respectively.

Table 4. Correlation coefficients between the incidence of dental caries and the socio-demographic profile of the respondents.

Variable	r-value	r-prob	Decision
Age at first eruption of milk teeth	0.0386	p>.05	Do not reject H,
Sex	0.0416	p>.05	Do not reject H,
Parent's highest Educational Attainment	0.1823	P<.05	Reject H,
Parent's Occupation	0.1921	P<.05	Reject H,
Family Monthly Income	0.1936	P<.05	Reject H,
Family size	0.1756	P<.05	Reject H,
Place of residence	0.0216	p>.05	Do not reject H,

Significant at .05 level

Relationship between Dental Health Practices and the Incidence of Dental Caries of the Respondents

Table S shows significant relationships between the dental health practice of oral hygiene, oral habits, and food habits and the incidence of dental caries among the respondents as indicated by the computed r-values of 0.1373, 0.1416 and 0.1811, respectively. This implies that the practices of dental health could affect the incidence of dental caries which validates the findings of Zero (2009) who states that children's caries risk is minimized by limiting their consumption of sugar-containing soft drinks.

Table 5. Correlation coefficients between the dental health and the incidence of dental caries of the respondents.

Practice	r-value	r-prob	Decision
A. Oral Hygiene Practices	0.1373	p>.05	Reject H,
B. Oral Habits	0.1416	p>.05°	Reject H,
C. Food Habits	0.1811	P<.05	Reject H,

CONCLUSIONS

Based on the findings, the researcher made the following conclusions. Majority of the respondents are females and had the first eruption of their teeth at age 6-12 months. Most of the respondents had parents who are secondary undergraduates and semi-skilled; had a family monthly income of Php1,001-5,000 belonged to a family size of above eight, and resided outside Poblacion. The overall level of practice of the respondents on oral hygiene, oral habits, and food habits is "Low". San Ildefonso Central School obtained the highest incidence rate of dental caries. Dental abscess has the highest number of cases in terms of complications of dental caries among the respondents. Parent's educational attainment, parent's occupation, family monthly income, and family size were significantly related to the incidence of dental caries. The respondents' practice on oral hygiene, oral habits, and food habits is significantly related to the incidence of dental caries.

RECOMMENDATIONS

Based on the aforementioned conclusions, the researcher recommends that programs on dental health of the DepEd Division of Ilocos Sur be intensified to address the dental needs of the elementary pupils, and collaborative Regional Fora should be organized to determine problems and issues that arise from various aspects that contribute to the occurrence of dental problems. There should be collaborative effort of the NGOs and LGUs to continuously monitor the dental health care and practices of elementary pupils. Principals and heads of the different elementary schools in collaboration with LGUs, the local community, and most especially the PTCA should work hand in hand in formulating a "Nutritious Diet Plan" of the different canteens, minimizing selling sweets and monitor the food peddlers outside the school premises to check on their sanitary permits to operate or sell. Routine food nutraceutical analysis should be made on food samples both from

school canteen and outside school premises to ensure food safety and to have reference data base on nutrient content of the food that the pupils eat.

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